

Southern Pacific Transportation Company

Phase 2B Report
RCRA Facility Investigation
and Extent of Contamination
Investigation

*Houston Wood Preserving Works
Houston, Texas*

September 10, 1999

W.O. #422-09

Environmental Resources Management
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Southern Pacific Transportation Company

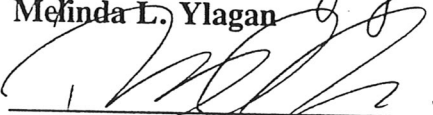
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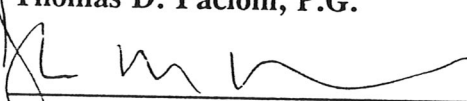
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1.0

INTRODUCTION

Environmental Resources Management (ERM) has prepared this report to document the results of Phase 2B of a RCRA Facility Investigation (RFI) and an Extent of Contamination (EOC) investigation. The RFI is being completed at the former Houston Wood Preserving Works (HWPW) site pursuant to Texas Natural Resource Conservation Commission (TNRCC) Permit No. HW-50343-000 issued to Southern Pacific Transportation Company (SPTCo) on June 20, 1994. Concurrent with the RFI, the EOC investigation is being completed in the area of a closed permitted surface impoundment pursuant to TNRCC Compliance Plan CP-50343-000 issued to SPTCo on June 20, 1994.

The site consists of a 33-acre tract of land located at 4910 Liberty Road, Houston, Harris County, Texas. The site is approximately 1.5 miles northeast of the intersection of U.S. Highway 59 and Interstate Highway 10 (Figure 1-1).

The site was utilized for wood treating operations until 1985, and is currently utilized for railroad storage and other railroad operations. A detailed description of the site history was provided in a Phase 2A RFI/EOC Investigation Report (ERM, 1998).

Based on the conclusions of a RCRA Facility Assessment completed on behalf of the U.S. EPA (PRC EMI, 1993) and as described in Provision VIII of the Permit, ten solid waste management units (SWMUs) and six areas of concern (AOCs) are subject to the RFI. The EOC investigation is part of the post-closure care requirements described in Section VIII of the Compliance Plan.

1.1

BACKGROUND

An EOC work plan was submitted to the TNRCC (IC, 1994a) and subsequently was approved with modifications on September 29, 1995. An RFI work plan also was submitted to the TNRCC (IC, 1994b) and subsequently was approved with modifications on October 16, 1995. Based on the technical approach described in the work plan, ten SWMUs and two AOCs are subject to investigation. For the RFI/EOC investigations, the site was grouped into four investigation areas listed below.

<i>Area No.</i>	<i>Area Name</i>	<i>SWMU/AOC Included</i>
Area 1	Off-Site Drainage Area	SWMU 2, AOC 6
Area 2	Tie Storage Area	SWMU 12
Area 3	Former Process Areas	SWMUs 4, 5, 6, 7, 8, 9, 10, 11, AOC 1
Area 4	Former Surface Impoundment	Closed Permitted Unit

The RFI/EOC investigations are being completed using a phased approach. Phase 1 was completed and approved by TNRCC on January 13, 1997. Phase 2

was initiated in 1997 and has been subdivided to assure more adequate definition of investigation objectives. A Phase 2A RFI/EOC Investigation Report was completed and submitted to the TNRCC on February 13, 1998.

A detailed chronology of investigations and report submittals was provided in the Phase 2A RFI/EOC Investigation Report (ERM, 1998).

1.2 CONCEPTUAL APPROACH

The scope and objectives of the RFI/EOC investigations are described in the Permit, Compliance Plan and work plans approved by TNRCC. Based on the complex environmental setting of the site, the RFI and EOC investigations are being completed utilizing a phased approach. Each successive phase builds upon the compendium of data gathered during previous phases in order to address the overall objectives of the RFI/EOC process. This Phase 2B RFI/EOC report is intended as a status update for the RFI/EOC investigations.

This report includes a description of the methods and procedures used during the Phase 2B field activities, and summarizes the data collected as part of Phase 2B. As described in Section 6.0 herein, additional investigation is warranted to more fully address the requirements of the RFI and EOC process. However, SPTCo is presenting this report as an interim update in order to advise the TNRCC of the RFI/EOC progress. It is anticipated that an interpretation of the site conceptual model (i.e., extent of affected media, geology and hydrogeology) will be presented in an RFI/EOC summary report that will be submitted under separate cover.

PHASE 2B RFI/EOC OBJECTIVES AND SCOPE

The objective of the RFI/EOC process is to investigate potential impacts and/or releases from waste management units associated with former wood treating operations. The approach for completing the RFI and EOC investigations was outlined in the Phase 2A RFI/EOC Investigation Report (ERM, 1998). In summary, each phase was focussed to meet specific objectives of the permit and compliance plan, but also included elements important to cleanup and closure goals (e.g., risk evaluation) for the site. The technical approach for the investigation is to collect sufficient, quality data to meet the objectives of the RFI/EOC. A multi-phase, full-scale investigation has been designed to determine the nature and extent of affected media. The specific objectives of Phase 2B included the following:

- To further assess the apparent lateral extent of impacted soils on site and off site (if any), as appropriate, based on comparison of concentrations of reported constituents of interest (COI) to appropriate TNRCC Risk Reduction Standards and/or background concentrations;
- To further assess the apparent vertical extent of impacted soils on site and off site (if any), as appropriate, based on comparison of reported concentrations of COI to TNRCC Risk Reduction Standards and/or background concentrations;
- To further assess the apparent extent of impacted ground water underlying the site and underlying adjacent off-site properties (if any); and
- To obtain additional site-specific hydrogeologic and geochemical data to facilitate fate and transport evaluations for dissolved COI or non-aqueous phase liquid (NAPL) in ground water.

Phase 2B was designed to collect soil and ground water samples from locations that were targeted for further evaluation of the (lateral and vertical) extent of affected media. The scope of Phase 2B included the following:

- Completion of 8 surface soil borings,
- Completion of 19 subsurface soil borings,
- Completion of 6 monitor wells,
- Collection of 21 investigative surface soil samples,
- Collection of 34 investigation subsurface soil samples,
- Analysis of 24 SPLP soil samples using Synthetic Precipitation Leaching Procedure (SPLP) methodology,
- Collection 27 investigative ground water samples, and

- Collection of 16 quality control (QC) soil and ground water samples.

Each sample was analyzed for the volatile and semivolatile COI by SW-846 Methods 8260 and 8270, respectively. These COI are listed in the Compliance Plan and are summarized in Table 2-1.

3.0

METHODOLOGY AND PROCEDURES

The Phase 2B field activities were conducted between September 28, 1998 and November 23, 1998. A description of the methods and procedures utilized for the following are included in this section:

- Soil assessment,
- Ground water assessment,
- Surveying, and
- Residuals management.

For continuity, the nomenclature to designate strata provided in the Phase 2A RFI/EOC Investigation Report (ERM, 1998) has been maintained. The native cohesive and transmissive zones underlying the site are designated alphabetically from shallowest to deepest. From shallowest to deepest, the lithologic zones that underlie the site include fill material, the A-Cohesive Zone (A-CZ), A-Transmissive Zone (A-TZ), B-Cohesive Zone (B-CZ), B-Transmissive Zone (B-TZ), C-Cohesive Zone (C-CZ), C-Transmissive Zone (C-TZ), and D-Cohesive Zone (D-CZ).

3.1

SOIL ASSESSMENT

Soil borings were completed to evaluate soil type, to assess potential soil impacts visually and with field screening methods, and to collect soil samples. The borings were completed using the following methodologies:

- Hand Augering,
- Direct-push coring,
- Hollow-stem auger drilling, and
- Wet rotary drilling.

Direct-push coring, hollow-stem auger drilling and wet rotary drilling services were provided by Best Drilling Services of Houston, Texas. A description of the procedures and methods used is included in Appendix A. A list of each boring completed as part of Phase 2B, including the use/classification, depth and completion method, is included in Table 3-1. Soil boring logs and monitor well completion diagrams are provided in Appendix B.

3.1.1

Field Screening

Each soil boring was continuously cored, and the recovered portion of each core was logged and screened with fluorescent light and an organic vapor meter (OVM) as described in Appendix A.

3.1.2 *Surface Soil Assessment*

During Phase 2B, 21 investigative surface soil samples were collected. Each surface soil sample was analyzed for the COI listed in Table 2-1. Thirteen of the 21 surface soil samples were collected from selected subsurface soil boring locations (these subsurface soil borings also provided subsurface soil samples). The remaining eight surface soil samples were collected using a hand auger. The surface soil sampling locations are presented in Figure 3-1. In addition, 14 of the surface soil samples were analyzed using the SPLP methodology (SW-846 Method 1312). Leachate was analyzed for the same constituent list as the soil samples.

3.1.3 *Subsurface Soil Assessment*

Nineteen subsurface soil borings were completed as part of the Phase 2B investigation. In addition, monitor wells were installed in six of these borings (see Table 2-1 and Section 3.2). The subsurface soil sampling locations are presented in Figure 3-1. The soil borings were logged and sampled as described in Appendix A. Boring logs and monitor well completion diagrams are provided in Appendix B. For this phase of investigation, borings were advanced in the following zones:

- Two borings terminated in the A-CZ;
- One boring terminated in the A-TZ;
- Six borings terminated in the B-CZ;
- Three borings terminated in the B-TZ;
- Four borings terminated in the C-CZ;
- Three borings terminated in the D-CZ.

Borings that were advanced into the C-TZ or B-TZ were completed with steel surface casing to the base of the C-CZ or B-CZ, as described in Appendix A.

From these borings, 34 investigative subsurface soil samples were collected. A minimum of two and a maximum of four subsurface soil samples were collected from each boring and were analyzed for the COI listed in Table 2-1. One soil sample was collected from the interval with the highest OVM measurement. A second soil sample was collected from the total depth of the boring. If surface casing was installed, an additional soil sample was collected at the depth equivalent of the base of the surface casing.

Each subsurface soil sample was analyzed for the COI listed in Table 2-1. In addition, 11 of the subsurface soil samples were analyzed using SPLP methodology. Leachate was analyzed for the same COI as the subsurface soil samples.

As part of Phase 2B, subsurface soil samples were collected from the following zones:

- Eight subsurface soil samples were collected from the A-CZ;
- Twelve were collected from the B-CZ;
- One was collected from the C-TZ; and
- Thirteen were collected from the C-CZ.

For ease of review, the Phase 2B sampling program has been segregated by investigation area, and is summarized in the following tables:

- Table 3-2 - Off-Site Drainage Area
- Table 3-3 - Tie Storage Area
- Table 3-4 - Former Process Area

Note that samples were not collected from within the closed, permitted unit.

3.2

GROUND WATER ASSESSMENT

A ground water assessment was completed to evaluate site hydrogeology, collect ground water samples, and assess whether NAPL (if present) would accumulate in wells completed in discrete transmissive zones. The ground water assessment included installation of monitor wells, collection of fluid level measurements, and ground water sampling. The following ground water samples were collected:

- Grab samples collected from soil borings,
- Monitor wells completed during Phase 2B, and
- Monitor wells completed during previous phases.

Two A-TZ monitor wells were installed using hollow-stem auger drilling methods. Four surface-cased monitor wells were installed using a combination of wet rotary and hollow-stem auger drilling methods. A description of monitor well installation, completion, development, and sampling is provided in Appendix A. Boring logs and monitor well completion diagrams and Texas Well Drillers Reports are provided in Appendix B.

3.2.1

Ground Water Grab Samples

Independent of the monitor well sampling activities, nine ground water grab samples were collected from selected soil borings: six from the A-TZ and three from the B-TZ. Ground water grab samples were collected from soil borings installed by direct-push and hollow-stem auger drilling methods. A description

of the sampling procedures is provided in Appendix A. For ease of review, the Phase 2B sampling program has been segregated by investigation area, and is summarized in the following tables:

- Table 3-2 - Off Site Drainage Area
- Table 3-3 - Tie Storage Area
- Table 3-4 - Former Process Areas

Note that no samples were collected from within the closed, permitted unit.

3.2.2 *Monitor Well Installation*

Six monitor wells were installed in soil borings described above. The monitor wells were completed in the following zones:

<i>Transmissive Zone</i>	<i>Monitor Well ID</i>	<i>Notes</i>
A-TZ	MW-20A	
A-TZ	MW-22A	completed as part of a two-well nest
B-TZ	MW-22B	<ul style="list-style-type: none"> • 8-inch steel surface casing installed to 24 feet below grade • completed as part of a two-well nest
C-TZ	MW-19C	<ul style="list-style-type: none"> • 8-inch steel surface casing installed to 57.5 feet below grade
C-TZ	MW-21C	<ul style="list-style-type: none"> • 12-inch steel surface casing installed to 22 feet below grade • 8-inch steel surface casing installed to 46 feet below grade
C-TZ	MW-23C	<ul style="list-style-type: none"> • 6-inch steel surface casing installed to 57 feet below grade

The monitor well locations are shown on Figure 3-1 and well completion details are provided in Table 3-5. As noted above, a string a carbon steel surface casing was installed where applicable to reduce the potential for cross-contamination between zones. At locations where well nests were completed (e.g., MW-22), the wells were completed as near as practical to each other, but were screened in separate transmissive zones.

3.2.3 *Fluid Level Measurements*

Because low-flow sampling procedures were utilized for this sampling event (see Appendix A), it was important to reduce disruption of the water column to the extent practical prior to sampling. To accomplish this, light NAPL (LNAPL) measurements were made first with an MMC[®] Model D-240 oil/water interface probe. Next, water levels were measured using the oil/water interface probe.

Following ground water sampling, dense NAPL (DNAPL) and total depth measurements were collected with the oil/water interface probe.

These measurements were collected in accordance with the methodology described in EPA's low-flow guidance (U.S. EPA, April 1996) which suggests that a probe be lowered gently through the water column to the bottom of the well following sampling collection.

3.2.4 *Monitor Well Sampling*

In addition to the nine ground water grab samples (see Section 3.2.1), 18 investigative ground water samples were collected from site monitor wells. Samples were collected from wells completed during Phase 2B and from monitor wells completed during previous investigation phases. Eight ground water samples were collected from monitor wells completed in the A-TZ; three ground water samples were collected from monitor wells completed in the B-TZ; and six ground water samples were collected from monitor wells completed in the C-TZ. The Phase 2B sampling program is summarized in the following tables:

- Table 3-2 - Off Site Drainage Area
- Table 3-3 - Tie Storage Area
- Table 3-4 - Former Process Areas

Monitor wells were sampled in accordance with EPA-recommended low-flow sampling techniques. A description of the sampling procedures is provided in Appendix A.

3.2.5 *QC Sampling*

Nine quality control (QC) samples were collected during soil sampling activities as follows:

- Three duplicate surface soil samples and
- Six duplicate subsurface soil samples.

Fifteen QC samples were collected during ground water sampling activities as follows:

- Five duplicate ground water samples,
- Two matrix spike/matrix spike duplicates,
- Six trip blanks,
- One equipment blank, and
- One field blank.

QC samples were collected and analyzed along with investigative samples to assess the variability introduced in sampling, handling, shipping, and analysis. The analytical program for the QC samples followed the analytical program for the associated investigative samples. The QC samples were documented in the field logbook and Chain-of-Custody form, stored, and shipped with the investigative samples.

Approximately one duplicate for every six soil samples and one duplicate for every five water samples were collected. Duplicate samples are samples that have been divided into two or more portions at some step in the sampling or measurement process. Each portion is then carried through the remaining steps in the process. A sample may be replicated in the field or at some point in the analytical process. Replication of samples generates information on the precision of the methods involved. Field replication provides information on the precision of homogeneity, handling, shipping, storage, laboratory preparation, and analysis techniques. Duplicates were analyzed for identical parameters as the investigative samples. The duplicate samples were labeled with a different and appropriate identification number. The identification number was also recorded in the field logbook. The sample jars for the regular and duplicate samples were filled in alternate succession for each required analysis (e.g., fill the SVOC sample container and then the SVOC duplicate container).

One field blank was collected for the Phase 2B sampling event. Field blank samples provide information about potential contamination of the samples during exposure to ambient conditions at the site during sample collection. In addition, field blanks help in assessing the effect or presence of constituents introduced into sample during analysis. The field blank consisted of commercial distilled water. The field blank was exposed to ambient conditions during the collection of a single investigative sample, and then sealed and stored with the investigative samples.

One rinsate blank was collected for the Phase 2B sampling event. A rinsate sample is a sample of the final rinse water from a decontaminated sampling tool. One rinsate sample was collected during the ground water sampling activities as a QC check of the decontamination procedures used for sampling equipment.

One Matrix Spike (MS) sample was collected for every 20 ground water samples (7% frequency). The MS samples, and associated MS Duplicate samples are collected concurrently with the investigative samples and spiked at the laboratory with a known concentration of constituents. The percent recovery of the spiked constituents provides information regarding the relative matrix interference introduced by the sample media.

3.3

SURVEYING

Following completion of site activities, a professional land surveyor registered in Texas surveyed the Phase 2B sampling locations, elevations and coordinates. At each location, lateral coordinates (northing and easting) were surveyed to the nearest 0.1 foot, and ground surface elevations were surveyed to the nearest 0.01 foot. At monitor well locations, the top the PVC well casing (with the cap removed) was surveyed to the nearest 0.01 foot. The surveyor, Thompson Surveying Company of Houston, Texas, utilized benchmarks established by the *City of Houston Monumentation System*. Elevations of monitor wells and soil borings are relative to the on-site City of Houston monument 5558-0414 and the 1973 published adjustment. Lateral coordinates of monitor wells and soil borings are based on the Texas State Plane Coordinate System (NAD 1927).

3.4

RESIDUALS MANAGEMENT

Soil cuttings generated during drilling operations were placed in covered roll-off boxes and 55-gallon drums with lids. The containers were labeled and stored temporarily at the site. Representative soil samples were collected and analyzed for characterization purposes. Based on the reported soil analytical results, the soil was classified and segregated for disposal at the following facilities:

- 11 tons of soil were disposed at the USA Waste facility in Deer Park, Texas; and
- 54 drums of soil were disposed at the Ensco facility in El Dorado, Arkansas.

Purge water and drilling mud (fluids) generated during monitor well development were placed in 55-gallon drums with lids and a covered roll-off box. Containers were labeled and stored temporarily at the facility. Representative samples were collected and analyzed for characterization purposes. Based on the reported analytical results, the fluids were classified and segregated for disposal at the following facilities:

- 54 drums of drilling mud were disposed at the Ensco facility in El Dorado, Arkansas; and
- 6 tons of purge water, development water and drilling mud were disposed at the USA Waste facility in Deer Park, Texas.

Soil and fluid disposal manifests will be included in the Annual Report.

4.0 *SITE GEOLOGY AND HYDROGEOLOGY*

4.1 *SITE GEOLOGY*

A detailed description of each geologic unit was provided in the Phase 2A RFI/EOC Investigation Report (ERM, 1998). Updated geologic cross-sections and a cross-section location map are provided in Figures 4-1 through 4-5. The data and observations documented during Phase 2B corroborate the results of the Phase 2A investigation.

4.2 *SITE HYDROGEOLOGY*

Ground water elevations were measured at each monitor well on November 23, 1998 to help assess ground water flow direction and gradient. Representative potentiometric surface contour maps for the A-TZ, B-TZ and C-TZ are provided in Figures 4-6, 4-7, and 4-8, respectively. The flow directions and gradients illustrated are consistent with observations from prior monitoring events.

4.2.1 *Horizontal Ground Water Flow*

Based on interpretation of the contour maps for both the A-TZ and B-TZ, ground water appears to flow toward the northeast. The horizontal hydraulic gradient is typically 0.001 ft/ft in both the A-TZ and the B-TZ.

Based on interpretation of the C-TZ contour map, ground water flows toward the east-southeast with a horizontal hydraulic gradient of 0.003 ft/ft. The data and observations described herein generally corroborate the results of the Phase 2A investigation.

4.2.2 *Vertical Ground Water Flow*

Monitor well nests have been constructed at five locations at the site. The well nests consist of two or three monitor wells that are located as near as practical to each other, but are screened in separate transmissive zones. The well nest locations, screen intervals, and ground water elevations (feet MSL) measured on November 23, 1998 are summarized below:

Tie Storage Area

MW-12A	A-TZ	43.95 feet MSL
MW-12B	B-TZ	43.91 feet MSL
MW-12C	C-TZ	22.03 feet MSL

Closed Surface Impoundment

MW-10A	A-TZ	43.78 feet MSL
MW-10B	B-TZ	43.72 feet MSL

MW-11A	A-TZ	43.63 feet MSL
MW-11B	B-TZ	43.87 feet MSL

Former Process Areas

MW-15A	A-TZ	41.95 feet MSL
MW-15C	C-TZ	23.51 feet MSL

MW-18A	A-TZ	35.31 feet MSL
MW-18C	C-TZ	25.26 feet MSL

Off-Site Drainage Area

MW-22A	A-TZ	43.97 feet MSL *
MW-22B	B-TZ	43.61 feet MSL

* measured on 1/29/99

At each location where the A-TZ and B-TZ are screened, the measured ground water elevations for the two zones are within one foot. As a result, the horizontal flow direction and gradient for the two zones are similar. The A-TZ and B-TZ are separated by approximately 5 feet of clay with interlaminated silty and/or sandy seams which form the upper portion of the B-CZ. These observations suggest that the A-TZ and B-TZ have substantial hydraulic communication.

Based on the measured ground water elevations, the vertical hydraulic gradient between the A-TZ/B-TZ and the C-TZ appears to be downward. The C-TZ is overlain by 25 to 40 feet of clay, and the potentiometric surface of the C-TZ is lower than the A-TZ or B-TZ by an average of 22 feet, where present.

The data and observations described herein generally corroborate the results of the Phase 2A investigation.

5.0 ANALYTICAL RESULTS

5.1 SURFACE SOIL ANALYTICAL RESULTS

The analytical results from surface soil samples collected during Phase 2B are summarized in Table C-1 (in Appendix C). The laboratory analytical reports are provided in Appendix D.

A figure (i.e., bubble plot) illustrating reported concentrations of chrysene was developed from the compendium (i.e., Phase 1, Phase 2A and Phase 2B) of surface soil results. Chrysene was selected because its distribution and range of detected concentrations are representative of the SVOCs reported in surface soil samples. The relative distribution of chrysene in surface soil samples is provided in Figure 5-1.

5.2 SUBSURFACE SOIL ANALYTICAL RESULTS

The analytical results from subsurface soil samples collected during Phase 2B are summarized in Table C-2 (in Appendix C). The laboratory analytical reports are provided in Appendix D.

A figure (i.e., bubble plot) illustrating reported concentrations of benzo(a)anthracene and naphthalene in subsurface soil was developed from the compendium (i.e., Phase 1, Phase 2A and Phase 2B) of subsurface soil results (Figures 5-2 and 5-3). The figures illustrate the relative distribution of benzo(a)anthracene and naphthalene, respectively, in subsurface soil. Benzo(a)anthracene and naphthalene were selected as representative of the SVOCs reported in subsurface soil samples. In addition, a figure illustrating reported concentrations of naphthalene from the deepest soil samples collected at each location is shown in Figure 5-4. Note that Figure 5-4 should be used only as a guide. Although the sample depths are indicated on the figure, samples were not collected at the base of each boring location. Accordingly, the extent of affected soil at a sampling location may be understood based on other data and observations. For example, information such as adjacent soil analytical data field screening, observations and laser-induced fluorescence data will be utilized to help determine the depth of affected material.

5.3 GROUND WATER ANALYTICAL RESULTS

The combined set of Phase 2B ground water samples (i.e., grab and monitor well samples) were collected from the following zones:

- A-TZ - 15 samples
- B-TZ - 6 samples
- C-TZ - 6 samples

The combined analytical results from grab samples and monitor well samples collected during Phase 2B are summarized in Table C-3 (in Appendix C). The laboratory analytical reports are provided in Appendix D. Note also that point-of-compliance monitor wells associated with the Closed Permitted Unit are sampled semiannually pursuant to the Compliance Plan, and those results are summarized under separate cover.

Figures (i.e., bubble plots) illustrating reported concentrations of naphthalene were developed from the compendium (i.e., Phase 1, Phase 2A and Phase 2B) of ground water results the A-TZ, B-TZ, and C-TZ (Figures 5-5, 5-6, and 5-7, respectively). The figures illustrate the relative distribution of naphthalene in ground water samples from each transmissive zone. Naphthalene was selected because its distribution and range of detected concentrations are representative of the SVOCs reported in ground water samples.

5.4 ***LEACHATE ANALYTICAL RESULTS***

The analytical results from the soil leachate analysis for the combined with surface and subsurface soil samples (combined) collected during Phase 2B are summarized in Table C-4 (in Appendix C). The laboratory analytical reports are provided in Appendix D.

5.5 ***QUALITY CONTROL ANALYTICAL RESULTS AND DATA USABILITY REVIEW***

The following samples served as quality control samples for the Phase 2B sampling event:

- 10 duplicate soil samples
- 5 duplicate water samples
- 2 MS/MSD water samples
- 6 trip blanks
- 1 equipment blank
- 1 field blank
- laboratory surrogates
- Approximately 1 duplicate sample was collected for every 5 investigative samples and 1 MS/MSD sample was collected for every 14 water samples.
- A trip blank accompanied every water sample submitted for volatile organic analyses.
- A representative equipment blank and field blank were collected and submitted for the Phase 2B sampling event.
- Surrogate results were within acceptable ranges.

DATA REVIEW

A preliminary data evaluation was performed to identify any significant deficiencies which required immediate action or attention by the laboratory. A summary of the results is provided herein. Additional validation will be performed prior to the risk evaluation to develop recommendations regarding data usability. The preliminary data evaluation consisted of:

- a) confirmation that relevant QA/QC components were included in the data packages for each Sample Delivery Group,
 - b) procedural and numerical QC checks of protocol/criteria which must be achieved by the laboratory in accordance with the method (e.g., analysis of method blanks, MS/MSD recovery, surrogate recovery),
 - c) review of the results of QA/QC samples such as method blanks, and field blanks, and
 - d) review of detection limits.
- QA/QC packages included the following components for each of 12 SDGs associated with the Phase 2B investigation: SDG narrative, chain of custody, Form I analysis data sheets, Form II surrogate recovery report, Form III MS/MSD recovery report, Form IV method blank summary, Form V instrument performance check, Form VI initial calibration, Form VII continuing calibration check, Form VIII internal standard area form.
 - Qualifiers were applied to the data on the Form I reports by the laboratory. Qualifiers include B (indicating detection of the constituent in a method blank) and J (indicating detection below the sample quantitation limit). These qualifiers indicate uncertainty in the reported concentration. Qualifiers are not reflected in data summary tables presented in the text of this report because the summary tables report the data relative to sample quantitation limits.
 - No qualifiers have been applied by validators based upon preliminary data review.
 - In accordance with the analytical methods, reanalysis of some samples was performed due to QC failures in the initial sample analysis. Reanalysis is intended to reduce uncertainty in the reported results.
 - For analysis of volatile constituents, no soil samples and less than 10% of the ground water samples were diluted for analysis. For analysis of semivolatile constituents, 17% of the soil samples and 70% of the ground water samples were diluted for analysis. Sample quantitation limits were adjusted by the laboratory accordingly.

- Instrument calibrations were performed within acceptable limits specified by the method. Internal standard recoveries were reported and flagged in accordance with the method.
- Laboratory performance (e.g., surrogate recoveries, spike recoveries, relative percent deviations between laboratory duplicates) was within control limits for the large majority of parameters. A preliminary review of these indicators and results of Laboratory Control Samples (LCS) indicate accuracy was suitable for the data's intended use.
- Blank samples (e.g., trip blanks, equipment rinse blanks, field blanks, laboratory method blanks) were evaluated to identify artifacts introduced during sampling, shipping, handling, and lab preparation of the samples. Constituents were not reported above quantitation limits in trip blanks. Benzene was reported at 3.52 $\mu\text{g/L}$ in one equipment rinsate blank collected November 11, 1998 (SDG# 9811312). Toluene was reported at 1.97 $\mu\text{g/L}$ in one field blank collected November 17, 1998 (SDG# 9811525). The blank sample results indicate no significant or widespread contamination of the samples. The impact of the detections cited on usability of the data will be identified in the risk evaluation.

Based upon preliminary review, the data are suitable for use in site characterization. This data review will be further refined during additional data validation.

CONCLUSIONS AND RECOMMENDATIONS

Although broad in scope, the Phase 2 field activities have not provided sufficient data to fully characterize the nature and extent of releases in soil and ground water. Accordingly, this report is not intended to fulfill the requirements for submittal of a Final Ground Water Report or an EOC Investigation Final Report. Additional investigation will be proposed during the fourth quarter 1999 for off-site areas.

REFERENCES

- Environmental Resources Management (ERM, 1998); *Phase 2-A Report RCRA Facility investigation and Extent of Contamination Investigation*, Houston Wood Preserving Works, Houston, Texas; February 13, 1998.
- Industrial Compliance (IC 1994a); *Extent of Contamination Investigation Work Plan*, Southern Pacific Transportation Company, Former Wood Preserving Works, 4910 Liberty Road, Houston, Texas; September 16, 1994.
- Industrial Compliance (IC 1994b); *RCRA Facility Investigation Work Plan*, Southern Pacific Transportation Company, Former Wood Preserving Works, 4910 Liberty Road, Houston, Texas; October 14, 1994.
- PRC Environmental Management, Inc. (PRC EMI, 1993); *RCRA Facility Assessment Report*, Southern Pacific Transportation Company, Houston, Texas; October 1993.

Tables

September 10, 1999

W.O. #422-09

Environmental Resources Management
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TABLE 2-1

Constituents of Interest

Houston Wood Preserving Works
Houston, Texas

<i>Constituent</i>	<i>Practical Quantitation Limit</i>	<i>SW-846 Method</i>
Acenaphthene	0.010	8270B
Acenaphthylene	0.010	8270B
Anthracene	0.010	8270B
Benzene	0.005	8260A
Benzo(a)anthracene	0.010	8270B
Benzo(a)pyrene	0.010	8270B
Bis(2-ethyl hexyl)phthalate	0.010	8270B
bis(2-Chloroethoxy)methane	0.010	8270B
Chlorobenzene	0.005	8260A
2-Chloronaphthalene	0.010	8270B
Chrysene	0.010	8270B
Dibenzofuran	0.010	8270B
1,2-Dichloroethane	0.005	8260A
Dichloromethane	0.005	8260A
2,4-Dimethylphenol	0.010	8270B
Di-n-butyl phthalate	0.010	8270B
4,6-Dinitro-o-cresol	0.050	8270B
2,4-Dinitrotoluene	0.010	8270B
2,6-Dinitrotoluene	0.010	8270B
1,2-Diphenylhydrazine	0.010	8270B
Ethylbenzene	0.005	8260A
Fluoranthene	0.010	8270B
Fluorene	0.010	8270B
2-Methylnaphthalene	0.010	8270B
Naphthalene	0.010	8270B
Nitrobenzene	0.010	8270B
4-Nitrophenol	0.050	8270B
N-Nitrosodiphenylamine	0.010	8270B
Pentachlorophenol	0.050	8270B
Phenanthrene	0.010	8270B
Phenol	0.010	8270B
Pyrene	0.010	8270B
Toluene	0.005	8260A
Xylenes	0.005	8260A

NOTES:

Modified from Compliance Plan CP-50343 Table I.
Practical Quantitation Limits are shown in mg/L.

TABLE 3-1

Phase 2B Soil Boring Summary
RFI/EOC InvestigationHouston Wood Preserving Works
Houston, Texas

Sampling Location	Surface Soil Locations	Subsurface Soil Locations	Monitor Well Locations	Ground Water Grab Locations	Total Depth (feet bgs)	Zone of Termination	Investigation Function	Drilling Method
MW-19C	---	SB	MW	---	73	D-CZ	Monitor Well	H.S.A/W.R.
MW-20A	---	---	MW	---	25	B-CZ	Monitor Well	H.S.A
MW-21C	SS	SB	MW	---	72.5	D-CZ	Monitor Well	H.S.A/W.R.
MW-22A	SS	---	MW	---	25	B-CZ	Monitor Well	H.S.A
MW-22B	---	SB	MW	---	38	C-CZ	Monitor Well	H.S.A/W.R.
MW-23C	SS	SB	MW	---	72.5	D-CZ	Monitor Well	W.R
SB-21	SS	---	---	GRAB	24	A-TZ	Soil Boring	D.P.S.
SB-22	SS	SB	---	GRAB	45	B-CZ	Soil Boring	H.S.A
SB-24	---	SB	---	---	50	B-CZ	Soil Boring	H.S.A
SB-25	---	SB	---	GRAB	50	B-CZ	Soil Boring	H.S.A
SB-26	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-27	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-28	SS	SB	---	GRAB	50	B-TZ	Soil Boring	H.S.A
SB-29	SS	---	---	GRAB	35	B-TZ	Soil Boring	H.S.A
SB-30	---	---	---	GRAB	34	B-TZ	Soil Boring	D.P.S.
SB-31	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-32	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-33	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-34	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-35	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-36	SS	---	---	---	2	Surface	Surface Soil	Hand Auger
SB-37	SS	SB	---	GRAB	24	C-CZ	Soil Boring	D.P.S.
SB-38	SS	SB	---	---	33	C-CZ	Soil Boring	D.P.S.
SB-39	SS	SB	---	---	30	C-CZ	Soil Boring	D.P.S.
SB-40	SS	SB	---	GRAB	54	B-CZ	Soil Boring	H.S.A
SB-43	SS	SB	---	---	24	A-CZ	Soil Boring	D.P.S.
SB-44	SS	SB	---	---	24	A-CZ	Soil Boring	D.P.S.

NOTES:

SS = Surface Soil Sample Collected

SB = Subsurface Soil Sample Collected

MW = Monitor Well Completed

GRAB = Ground Water Grab Sample Collected

Soil Boring SB-23 was converted into Monitor Well MW-23C.

H.S.A. = Hollow-Stem Auger

D.P. S. = Direct-Push Sampling

W. R. = Wet Rotary

--- = Sample Not Collected

bgs = below ground surface

TABLE 3-3

Summary of Phase 2B Soil and Ground Water Samples
Tie Storage Area

Houston Wood Preserving Works
Houston, Texas

Sample Location	Sample ID	Sample Interval *	Tie Storage Area		
			Surface Soil	Subsurface Soil	Ground Water
SB-24	SB24-34	34-36		X	
	SB24-49	49-50		X	
SB-25	SB25-35	35-36		X	
	SB25-48	48-50		X	
	SB25-A	A-TZ			G
SB-26	SB26-00	0-1	X, S		
SB-32	SB32-00	0-1	X, S		
MW-20A	MW-20A	A-TZ			MW
MW-21C	MW21C-00	0-1	X, S		
	MW21C-08	8-10		X, S	
	MW21C-20	20-22		X	
	MW21C-44	44-46		X, D	
	MW21C-72	72-74		X, D	
	MW-21C	C-TZ			
MW-12A	MW12A-RFI2B	A-TZ			MW
MW-12B	MW12B-RFI2B	B-TZ			MW
MW-12C	MW12C-RFI2B	C-TZ			MW
MW-13	MW13-RFI2B	A-TZ			MW
MW-14	MW14-RFI2B	B-TZ			MW
MW-15A	MW15A-RFI2B	A-TZ			MW
MW-15B	MW15C-RFI2B	C-TZ			MW
INVESTIGATIVE SAMPLE SUBTOTAL:			3	8	10
SPLP ANALYSIS SUBTOTAL:			3	2	

NOTES:

X = Investigative Soil Sample
S = SPLP Analysis
D = Duplicate Sample

G = Grab Sample
MW = Monitor Well Sample
* = Feet below ground surface, or transmissive zone for grab samples.

TABLE 3-4

Summary of Phase 2B Soil and Ground Water Samples
Former Process Areas

Houston Wood Preserving Works
Houston, Texas

Sample Location	Sample ID	Sample Interval *	Former Process Areas		
			Surface Soil	Subsurface Soil	Ground Water
SB-23**	SB23-00	0-1	X, S		
	SB23-31	31-33		X, S	
	SB23-55	55-57		X, S	
	SB23-60	60-62		X	
	SB23-73	73-75		X, S	
MW-19C	MW19C-38	38-40		X, S	
	MW19C-55	55-57		X, S	
	MW19C-60	60-62		X, S	
	MW19C-73	73-75		X, S	
	MW19C	C-TZ			MW
MW-23C*	MW-23C	C-TZ			MW
SB-21	SB21-00	0-1	X		
	SB21-A	A-TZ			G, D
SB-22	SB22-00	0-1	X		
	SB22-32	32-33		X	
	SB22-44	44-45		X, S	
	SB22-A	A-TZ			MW
MW-16	MW16-RFI2B	A-TZ			MW
MW-17	MW17-RFI2B	A-TZ			MW
MW-18	MW18a-RFI2B	A-TZ			MW
MW-18	MW18c-RFI2B	C-CZ			MW
INVESTIGATIVE SAMPLE SUBTOTAL:			3	10	8
SPLP ANALYSIS SUBTOTAL:			1	8	

NOTES:

X = Investigative Soil Sample

S = SPLP Analysis

D = Duplicate Sample

G = Grab Sample

MW = Monitor Well Sample

* = Feet below ground surface, or transmissive zone for grab samples.

** = Soil boring SB-23 was completed as monitor well MW-23C.

TABLE 3-2

Summary of Phase 2B Soil and Ground Water Samples
Off-Site Drainage Area

Houston Wood Preserving Works
Houston, Texas

Sample Location	Sample ID	Sample Interval *	Off-Site Drainage Area		
			Surface Soil	Subsurface Soil	Ground Water
SB-27	SB27-00	0-2	X		
SB-28	SB28-00	0-2	X		
	SB28-40	40-42		X	
	SB28-49	49-50		X	
	SB28-A	A-TZ			G
	SB28-B	B-TZ			G
SB-29	SB29-00	0-1	X		
	SB29-A	A-TZ			G
	SB29-B	B-TZ			G
SB-31	SB31-00	0-1	X		
SB-30	SB30-B	B-TZ			G, D
SB-33	SB33-00	0-1	X, D, S		
SB-34	SB34-00	0-1	X, S		
SB-35	SB35-00	0-1	X, S		
SB-36	SB36-00	0-1	X, S		
SB-37	SB37-00	0-1	X, D, S		
	SB37-12	12-14		X	
	SB37-22.5	22.5-24		X, D	
	SB37-A	A-TZ			G, D
SB-38	SB38-00	0-1	X		
	SB38-10	10-12		X	
	SB38-31	31-33		X, D	
SB-39	SB39-00	0-1	X, S		
	SB39-12	12-14		X, D	
	SB39-27	27-30		X	
SB-40	SB40-02	2-3	X		
	SB40-33	33-34		X, D	
	SB40-53	53-54		X	
	SB40-A	A-TZ			G
SB-43	SB43-00	0-1	X, D, S		
	SB43-07	7-9		X	
	SB43-13	13-15		X	
	SB43-21	21-24		X, S	
SB-44	SB44-00	0-1	X, S		
	SB44-15	15-17		X, S	
	SB44-22	22-24		X	
MW-22A	MW22A-00	0-1	X		
	MW-22A	A-TZ			MW
MW-22B	MW22B-22	22-24		X	
	MW-22B	B-TZ			MW
INVESTIGATIVE SAMPLE SUBTOTAL:			15	16	9
SPLP- ANALYSIS SUBTOTAL:			8	2	

NOTES:

X = Investigative Soil Sample
S = SPLP Analysis
D = Duplicate Sample

G = Grab Sample
MW = Monitor Well Sample

* = Feet below ground surface, or transmissive zone for grab samples.

TABLE 3-5

Summary of Phase 2B Monitor Well Completion Details

Houston Wood Preserving Works
Houston, Texas

Monitor Well Identification No.	Was Surface Casing Installed ?		Boring Diameter (inches)	Total Depth (feet bgs)	Screened Interval Depth (feet bgs)	Lithologic Zone Screened	Length of Sump (feet)	Ground Surface Elevation (feet MSL)	TOC Elevation (feet MSL)
	yes	no							
MW-19C	yes		10 (a)	73	62.5 - 72.5	C-TZ	0.5	50.08	53.05
MW-20A	no		8.25	25.5	15 - 25	A-TZ	0.5	47.47	50.43
MW-21C	yes		16 (a)	73	62.5 - 72.5	C-TZ	0.5	46.62	49.05
MW-22A	no		8.25	20.5	10 - 20	A-TZ	0.5	45.88	46.07
MW-22B	yes		10 (a)	38	27.5 - 37.5	B-TZ	0.5	45.61	45.86
MW-23C	yes		10 (a)	73	62.5 - 72.5	C-TZ	0.5	48.85	51.91

NOTES:

bgs - below ground surface

MSL - Mean Sea Level

(a) Reflects boring diameter to base of surface casing; beneath largest surface casing, boring diameter = 8.25 inches.

Figures

September 10, 1999

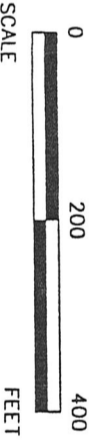
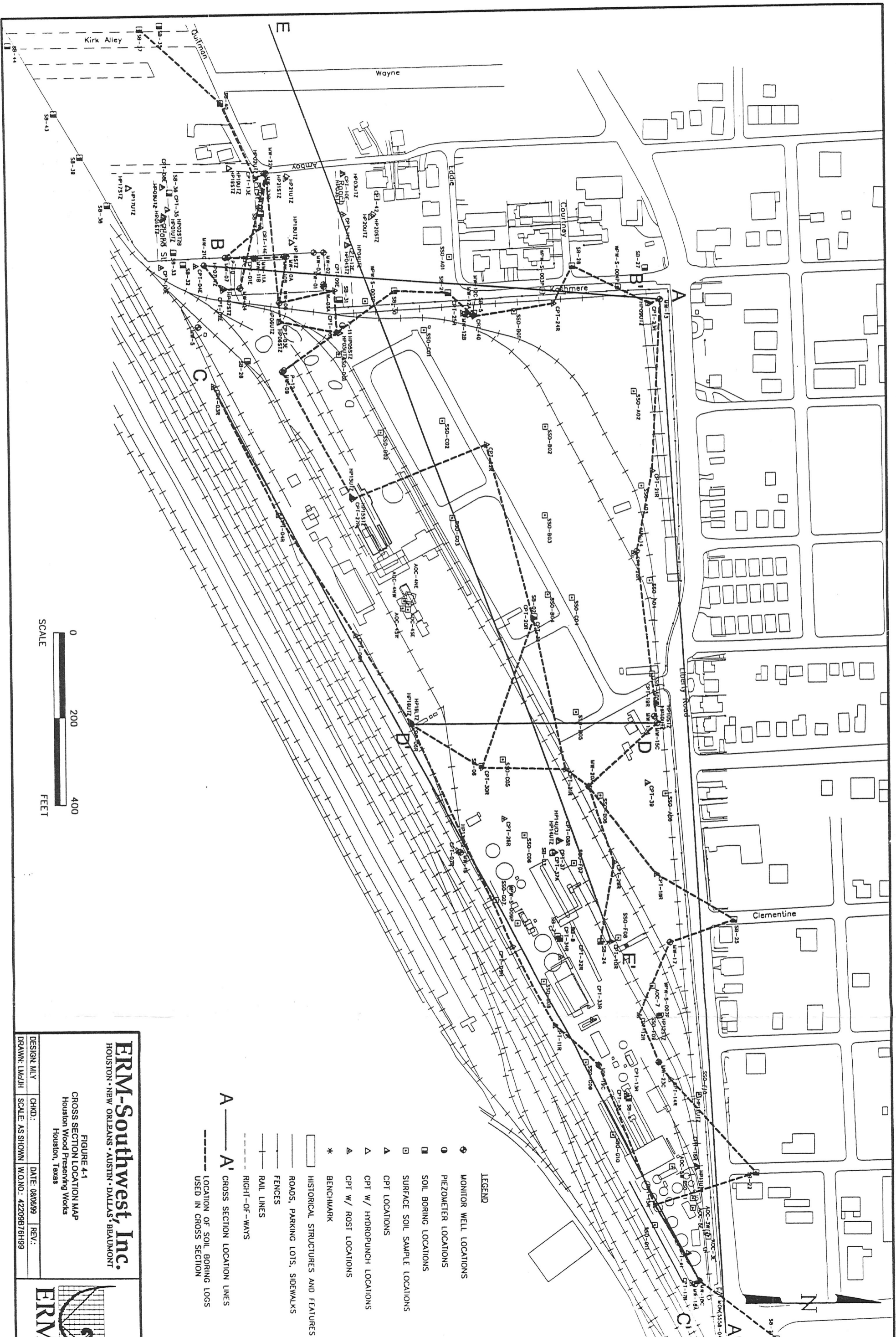
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Environmental Resources Management

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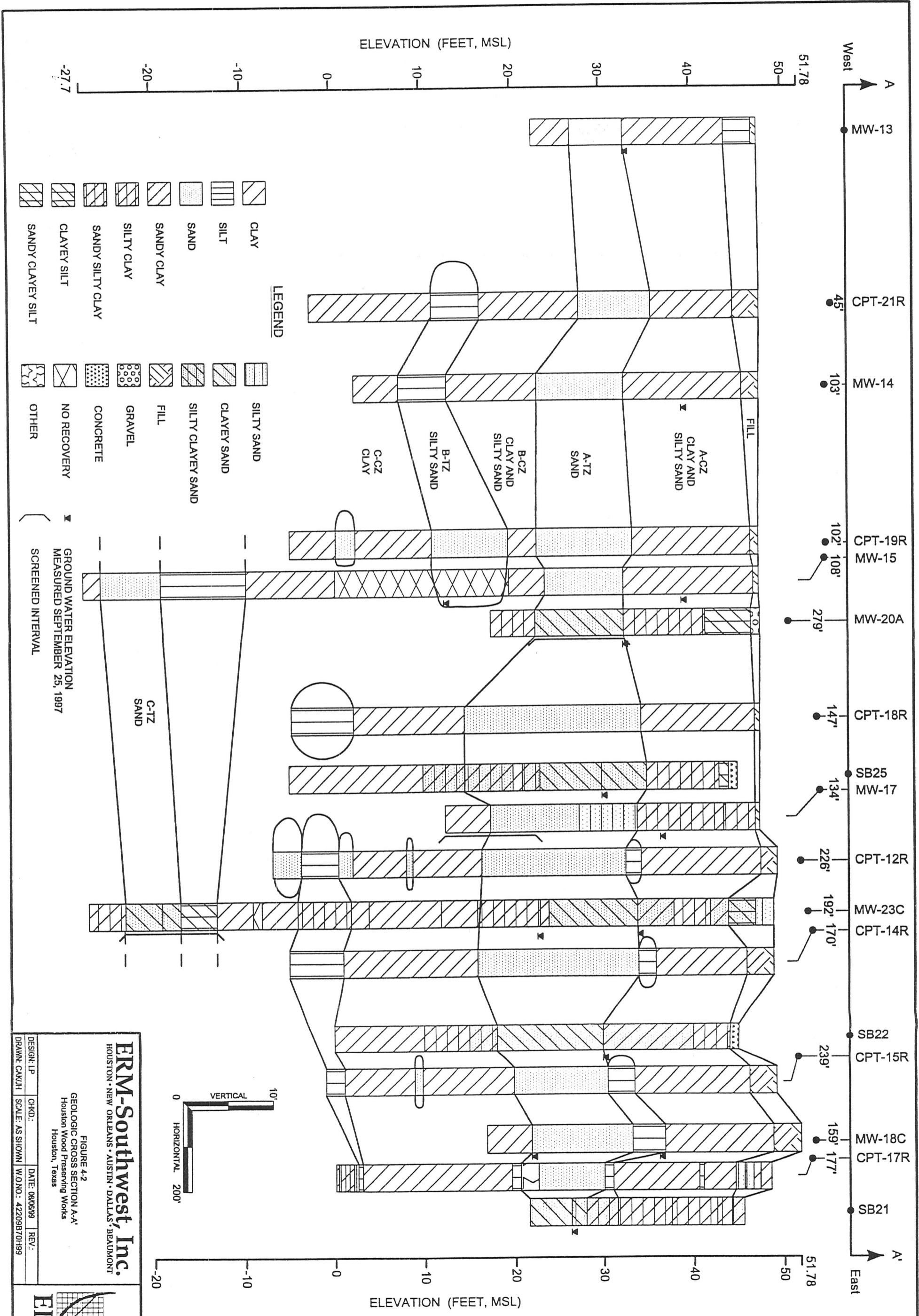
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FIGURE 4-1
 CROSS SECTION LOCATION MAP
 Housion Wood Preserving Works
 Houston, Texas

DESIGN: MLV	CHKD:	DATE: 08/08/99	REV:
DRAWN: LMD/JH	SCALE: AS SHOWN	W.O.N.O.: 422098/78H99	

- LEGEND**
- ☉ MONITOR WELL LOCATIONS
 - PIEZOMETER LOCATIONS
 - SOIL BORING LOCATIONS
 - ▣ SURFACE SOIL SAMPLE LOCATIONS
 - △ CPT LOCATIONS
 - ▽ CPT W/ HYDRO-PUNCH LOCATIONS
 - ▲ CPT W/ ROST LOCATIONS
 - * BENCHMARK
 - ▭ HISTORICAL STRUCTURES AND FEATURES
 - ROADS, PARKING LOTS, SIDEWALKS
 - FENCES
 - RAIL LINES
 - RIGHT-OF-WAYS
 - A—A' CROSS SECTION LOCATION LINES
 - LOCATION OF SOIL BORING LOGS USED IN CROSS SECTION

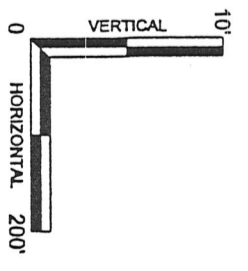




LEGEND

	CLAY		SILTY SAND
	SILT		CLAYEY SAND
	SAND		SILTY CLAYEY SAND
	SANDY CLAY		FILL
	SANDY SILTY CLAY		GRAVEL
	CLAYEY SILT		CONCRETE
	SANDY CLAYEY SILT		NO RECOVERY
			OTHER

GROUND WATER ELEVATION
MEASURED SEPTEMBER 25, 1997
SCREENED INTERVAL

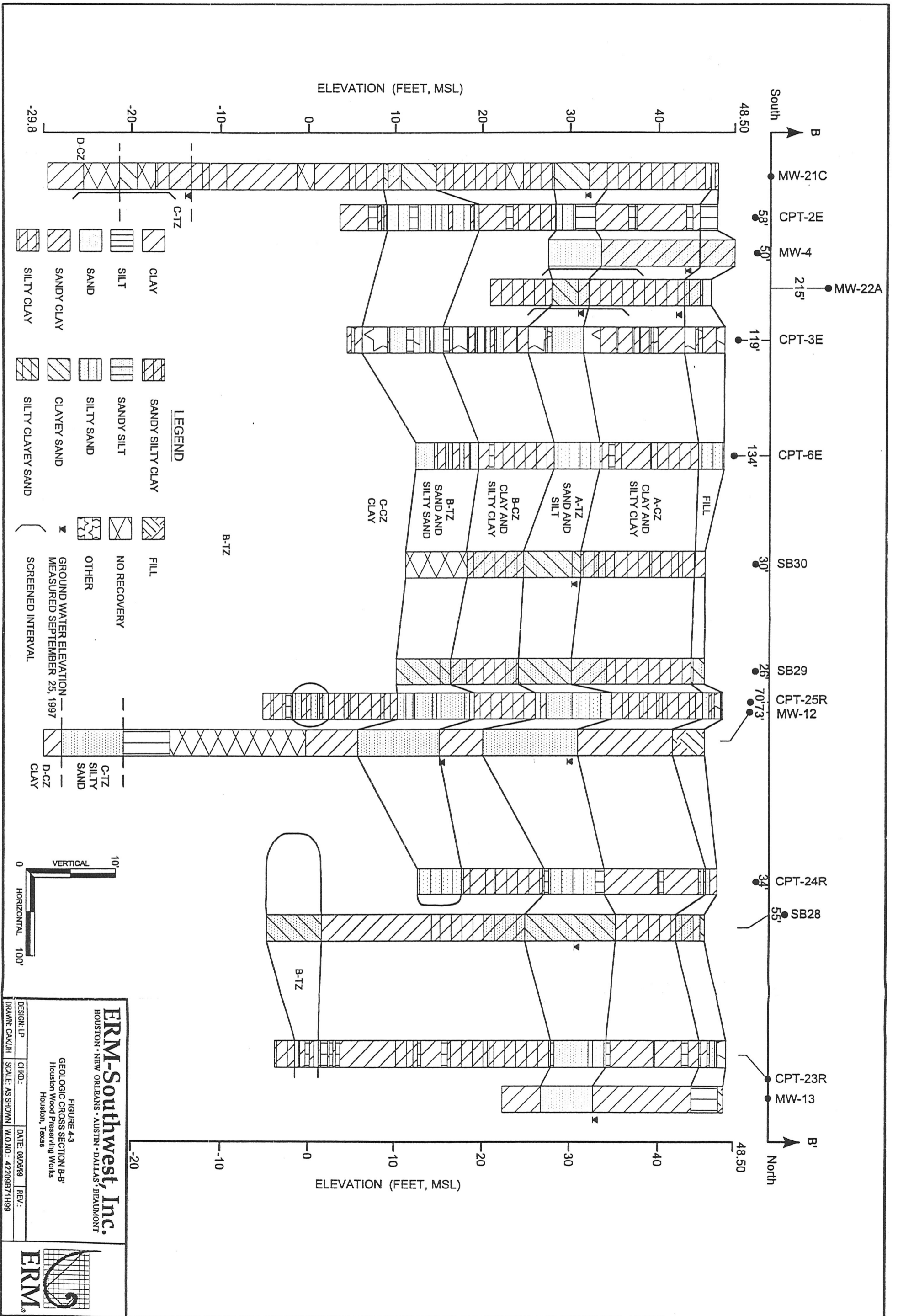


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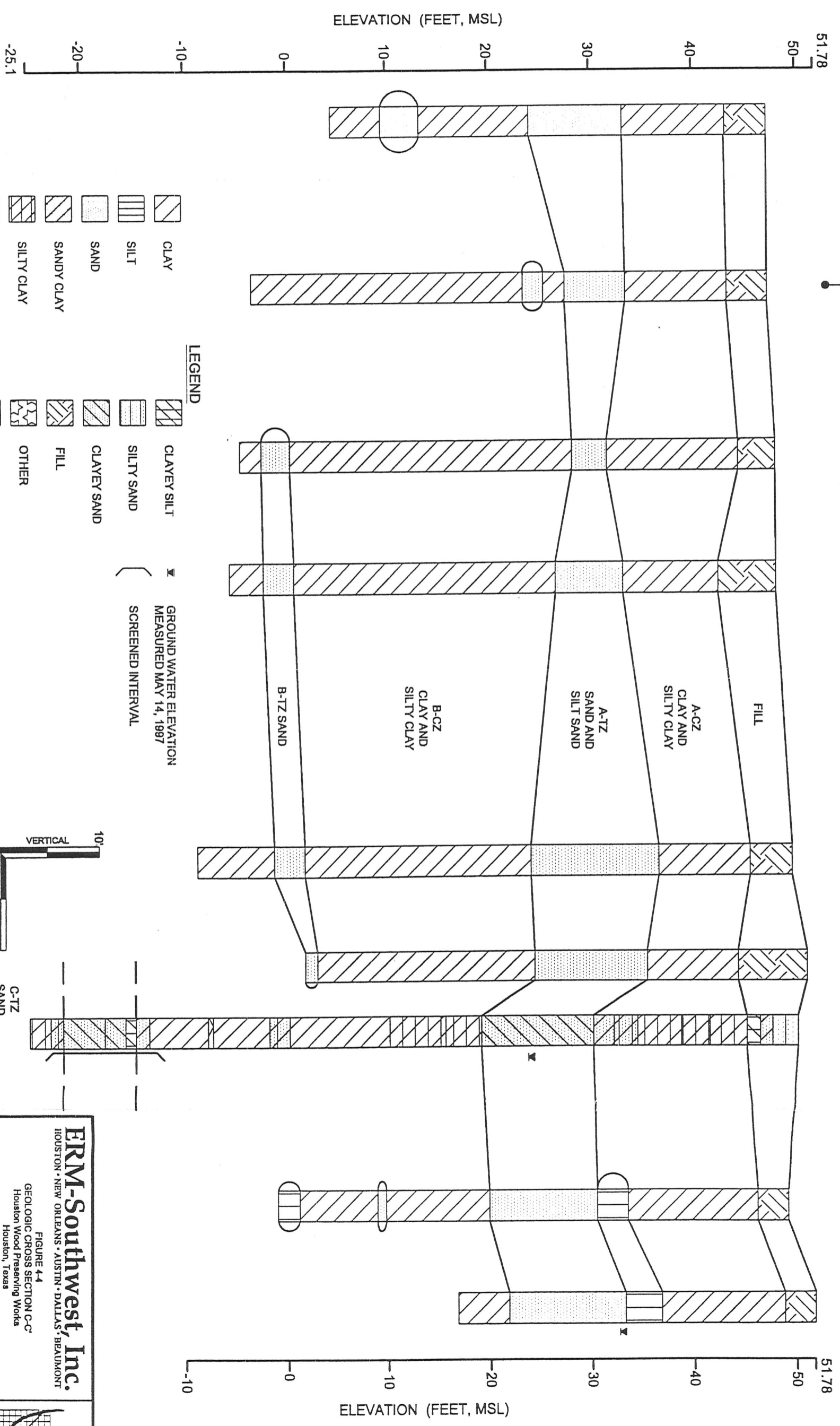
FIGURE 4.2
GEOLOGIC CROSS SECTION A-A'
Houston Wood Preserving Works
Houston, Texas

DESIGN: LP	CHKD.:	DATE: 08/06/99	REV.:
DRAWN: CAK/JH	SCALE: AS SHOWN	W.O.NO.: 42209B/70H99	





Southwest
 C
 CPT-03R
 CPT-04R
 38'
 CPT-05R
 CPT-06R
 CPT-09R
 CPT-11R
 MW-19C
 CPT-15R
 MW-18C
 C
 Northeast

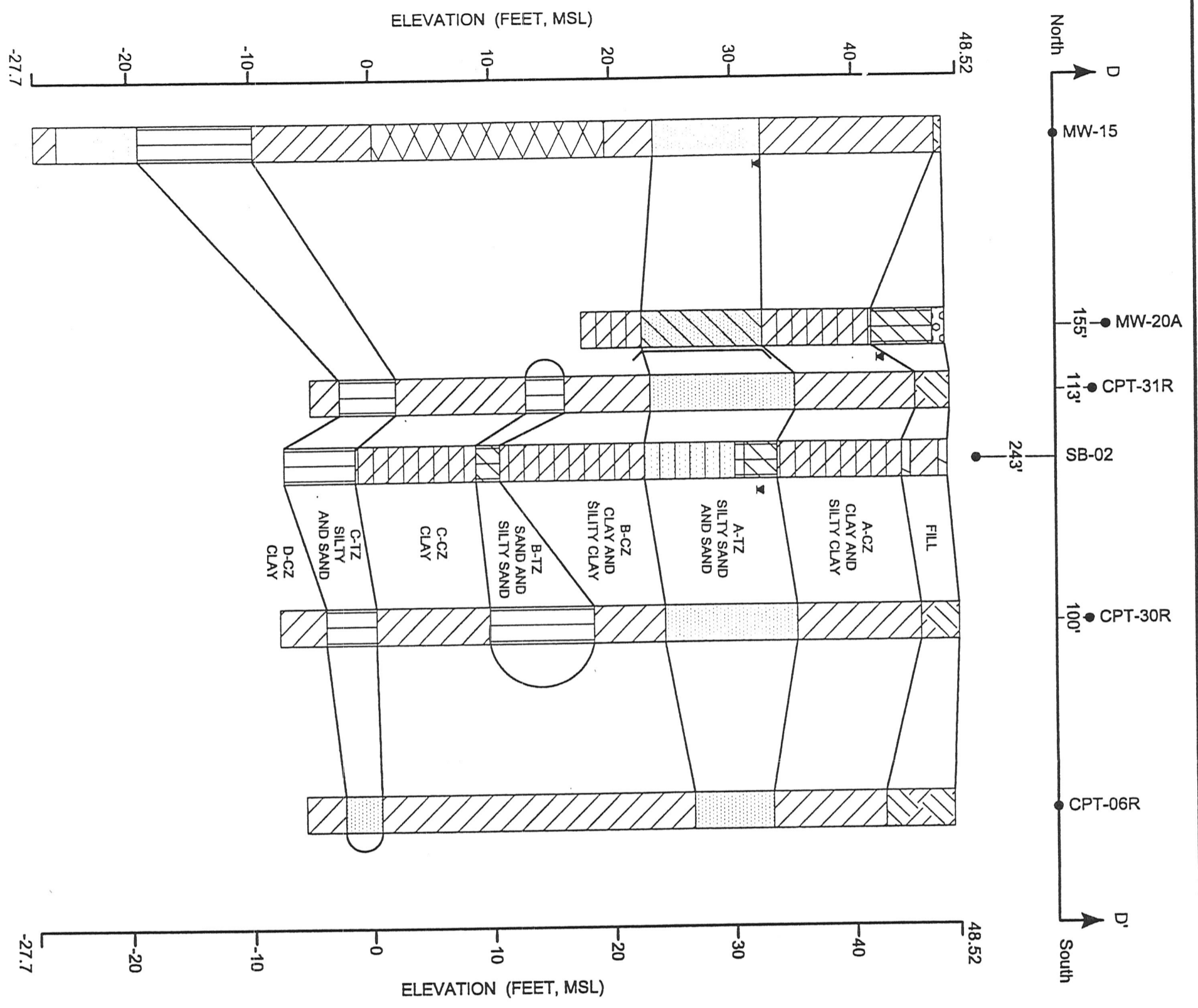


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FIGURE 14
 GEOLOGIC CROSS SECTION C-C'
 Houston Wood Preserving Works
 Houston, Texas

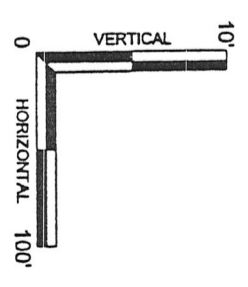
DESIGN: LP	CHKD.:	DATE: 07/23/99	REV.:
DRAWN: CAK	SCALE: AS SHOWN	W.O.NO.: 42209B868G99	





- LEGEND**
- CLAY
 - SILTY SAND
 - SILTY CLAY
 - SAND
 - CLAYEY SAND
 - CLAYEY SILT
 - FILL
 - GRAVEL
 - NO RECOVERY
 - OTHER

▲ GROUND WATER ELEVATION
MEASURED MARCH 1997
▭ SCREENED INTERVAL

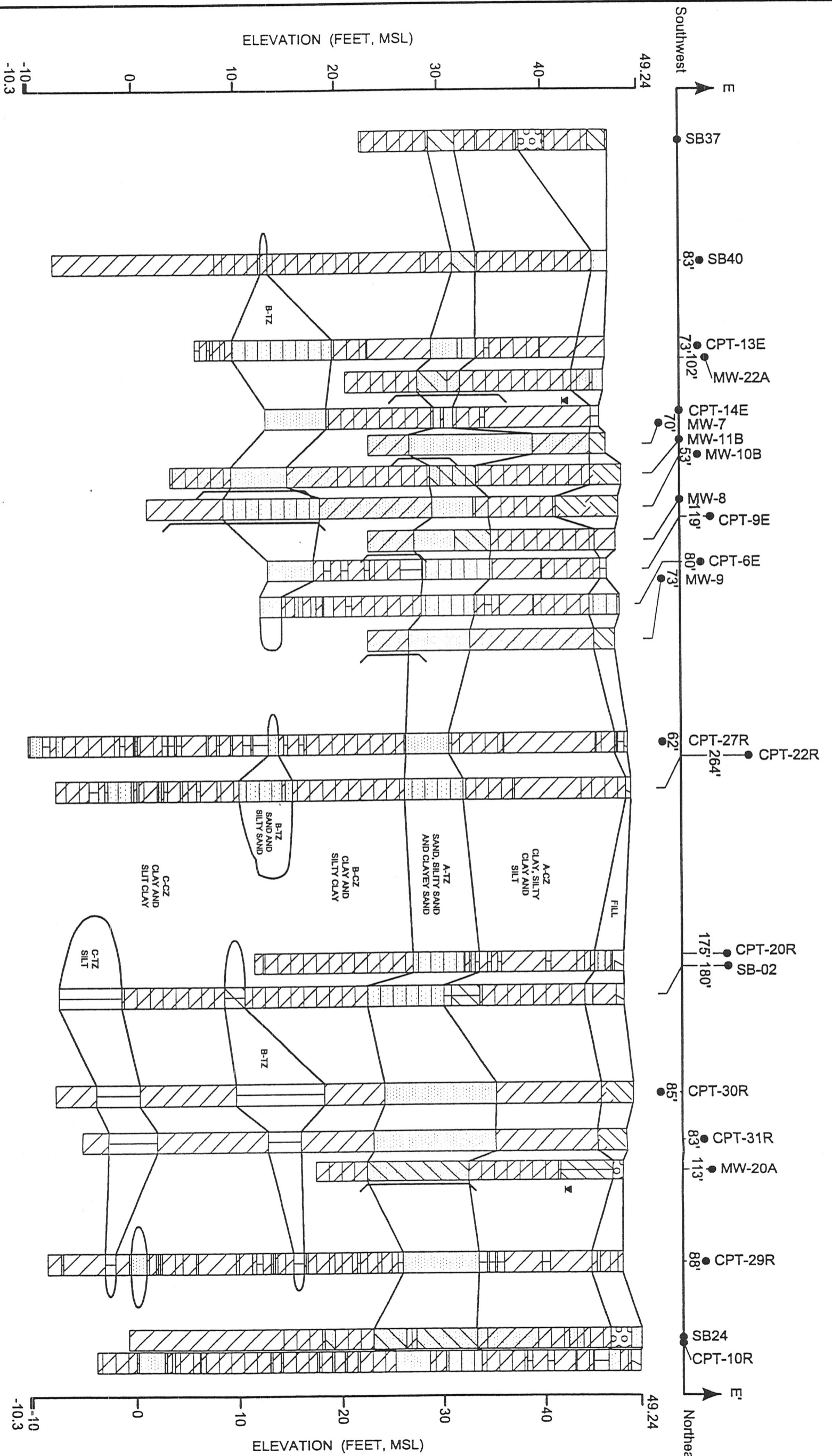


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FIGURE 4-5
GEOLOGIC CROSS SECTION D-D'
Houston Wood Preserving Works
Houston, Texas

DESIGN: LP	CHKD: AS	DATE: 08/03/99	REV: 1
DRAWN: CW/JH	SCALE: AS SHOWN	W.O. NO.: 42208927H99	



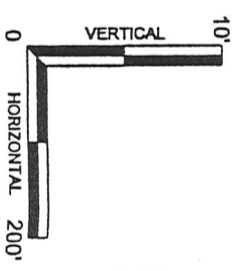


LEGEND

	CLAY		SANDY CLAYEY SILT		SANDY CLAY		FILL
	SILT		SILTY SAND		SILTY CLAY		GRAVEL
	SAND		CLAYEY SAND		SANDY SILTY CLAY		CONCRETE
	COARSE SAND		SILTY CLAYEY SAND		CLAYEY SILT		OTHER

GROUND WATER ELEVATION
MEASURED SEPTEMBER 25, 1997

SCREENED INTERVAL

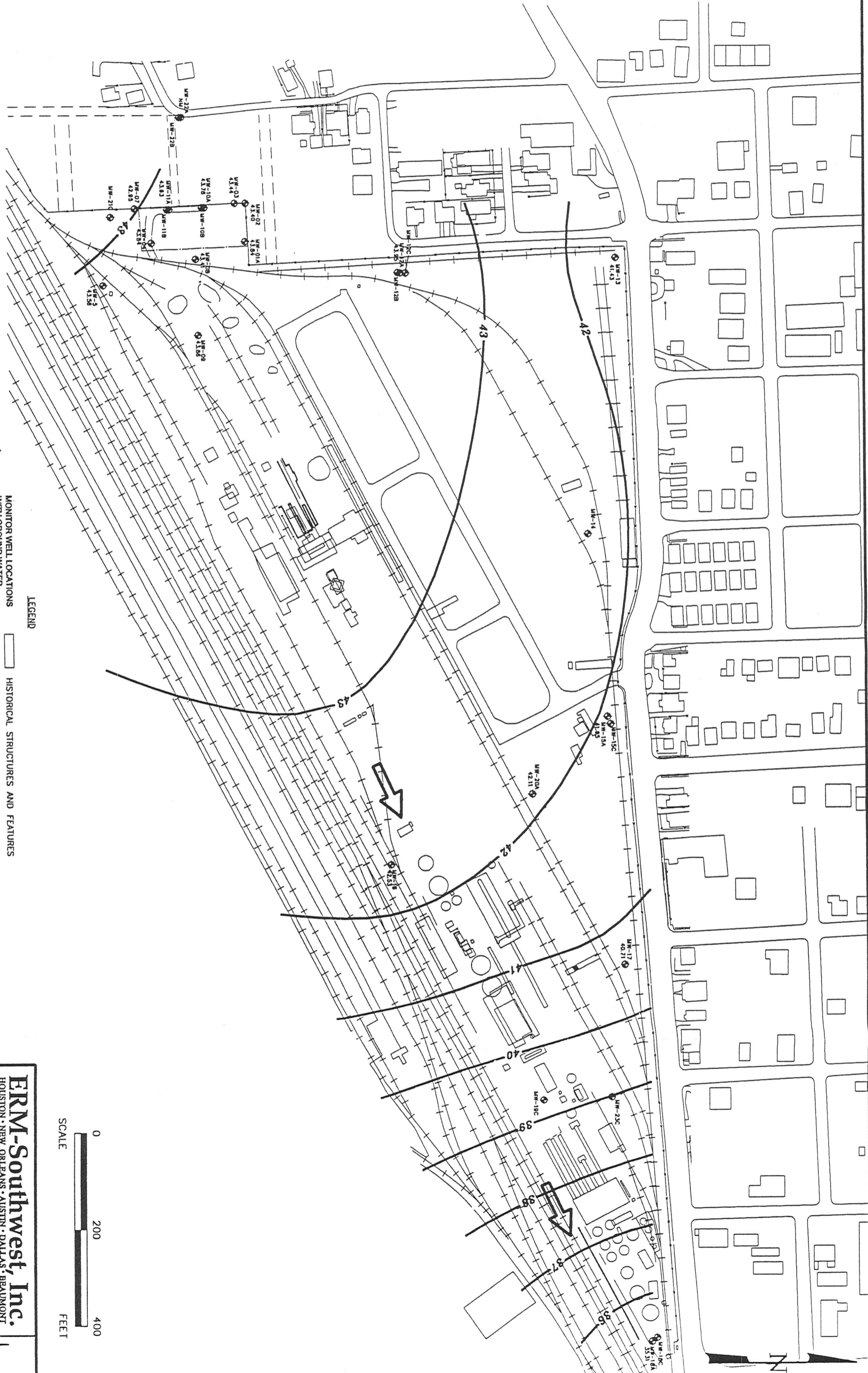


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FIGURE 4-8
GEOLOGIC CROSS SECTION E-E
Houston Wood Preserving Works
Houston, Texas

DESIGN: LP	CHKD:	DATE: 8/08/99	REV:
DRAWN: CAK/JH	SCALE: AS SHOWN	W.D.M.C.: 42209891H99	

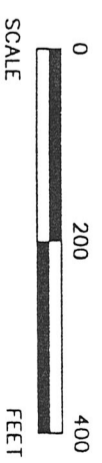




- NOTES:
1. GROUND WATER ELEVATIONS MEASURED ON 11/23/98.
 2. NM = NOT MEASURED
 3. CONTOUR INTERVAL = 1'

LEGEND

- MW-09 42.98
- 40
- GROUND WATER FLOW DIRECTION
- HISTORICAL STRUCTURES AND FEATURES
- ROADS, PARKING LOTS, SIDEWALKS
- FENCES
- RAIL LINES
- RIGHT-OF-WAYS

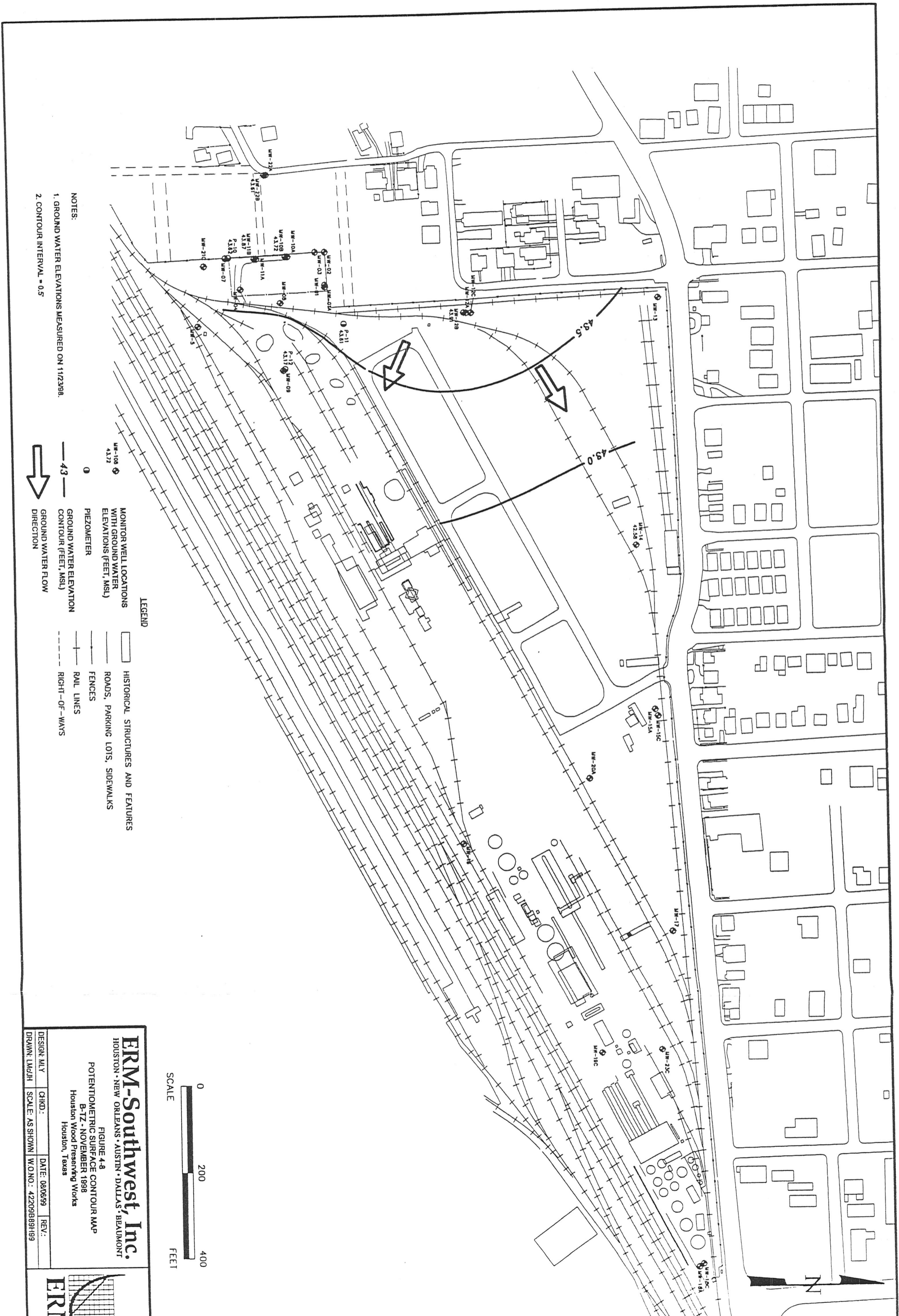


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FIGURE 4-7
POTENTIOMETRIC SURFACE CONTOUR MAP
A-TZ - NOVEMBER 1998
Houston Wood Preserving Works
Houston, Texas

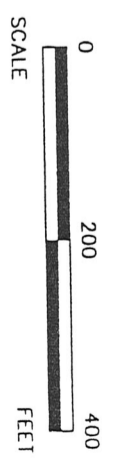
DESIGN: MALV	CHKD:	DATE: 08/03/99	REV:
DRAWN: LAM/SH	SCALE: AS SHOWN	W.O.NO.: 42209898H199	





NOTES:
 1. GROUND WATER ELEVATIONS MEASURED ON 1/12/2008.
 2. CONTOUR INTERVAL = 0.5'

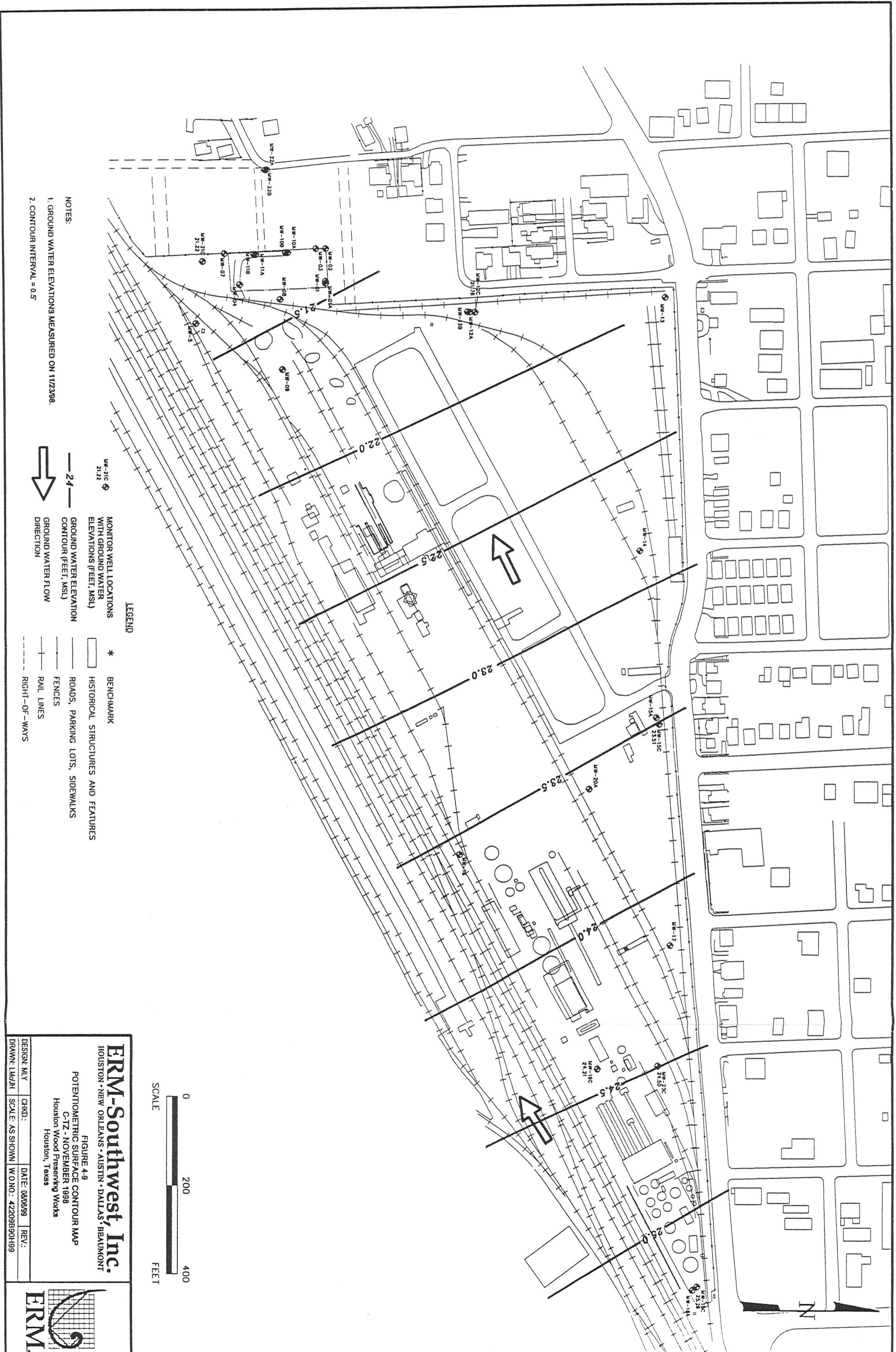
- LEGEND**
- MONITOR WELL LOCATIONS WITH GROUND WATER ELEVATIONS (FEET, MSL)
 - PIEZOMETER
 - GROUND WATER ELEVATION CONTOUR (FEET, MSL)
 - GROUND WATER FLOW DIRECTION
 - HISTORICAL STRUCTURES AND FEATURES
 - ROADS, PARKING LOTS, SIDEWALKS
 - FENCES
 - RAIL LINES
 - RIGHT-OF-WAYS



ERM-Southwest, Inc.
 HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BEAUMONT

FIGURE 4-B
 POTENTIOMETRIC SURFACE CONTOUR MAP
 B-TZ - NOVEMBER 1998
 Houston Wood Preserving Works
 Houston, Texas

DESIGN: MLY	CHKD: []	DATE: 08/06/99	REV: []
DRAWN: LMK/JH	SCALE: AS SHOWN	W.O. NO.: 42209889H99	

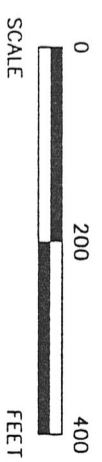


NOTES:
 1. GROUND WATER ELEVATIONS MEASURED ON 11/23/98.
 2. CONTOUR INTERVAL = 0.5'

LEGEND

MONITOR WELL LOCATIONS WITH GROUND WATER ELEVATIONS (FEET, MSL)
 BENCHMARK
 HISTORICAL STRUCTURES AND FEATURES
 ROADS, PARKING LOTS, SIDEWALKS
 FENCES
 RAIL LINES
 RIGHT-OF-WAYS

24' GROUND WATER ELEVATION CONTOUR (FEET, MSL)
 GROUND WATER FLOW DIRECTION



ERM-Southwest, Inc.
 HOUSTON • NEW ORLEANS • AUSTIN • DALLAS • BRAUNKONT

FIGURE 4.9
 POTENTIOMETRIC SURFACE CONTOUR MAP
 C-TZ - NOVEMBER 1998
 Houston Wood Preserving Works
 Houston, Texas

DESIGN: MLT	CHKD:	DATE: 08/09/99	REV.:
DRAWN: LMJ/H	SCALE: AS SHOWN	W.O.NO.: 42209B90H199	

Field Procedures and Methods
Appendix A

September 10, 1999
W.O. #422-09

Environmental Resources Management
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 579-8999

Appendix A

Field Procedures and Methods

A.1 *SURFACE SOIL BORINGS AND SAMPLING*

Surface soil borings were advanced to 2 feet below grade using a hand auger. Prior to collecting samples at each location, new latex gloves were worn by field sampling personnel. Each soil sample was homogenized in a stainless steel bowl and placed in clean, laboratory-supplied containers and sealed with as little headspace as practical. Each sample container was labeled with the sample identification, date, and time of sample preparation, and the requested analysis. The samples were stored in a cooler containing sufficient ice to maintain a sample temperature of approximately 4°C. The sample containers were wrapped in bubblewrap and packed in coolers with ice for overnight delivery to QWAL Laboratories in Pittsburg, Kansas.

After sampling, surface locations were marked with clearly labeled stakes for later surveying. Hand tools were decontaminated between sample locations by cleaning with a brush, using a wash of Liquinox® detergent and potable water, followed by rinsing with distilled water.

In addition, surface soil samples were also collected from some of the subsurface soil borings described in the next section.

A.2 *SUBSURFACE SOIL BORINGS AND SAMPLING*

Subsurface soil borings were completed using the following methodologies:

- Direct-push sampling,
- Hollow-stem auger drilling, and
- Mud rotary drilling.

Drilling services were provided by Best Drilling Services of Houston, Texas.

A.2.1 *Direct Push Sampling*

Continuous soil cores were obtained using a 2-inch diameter, 3-foot long barrel sampler. The sampler was custom designed and fabricated by the drilling subcontractor, Best Drilling Services. The sampler was modeled after the hollow-stem auger split spoon. Therefore, the commonly used acetate sleeves were not utilized. The sampler was decontaminated between each sample push by cleaning with a brush, using a wash of Liquinox® detergent and potable water, followed by rinsing with distilled water.

For each core interval, recovery was noted and the soil was characterized by texture, color, moisture content, plasticity, stiffness, odor and staining, if present. The core recoveries were screened with an ultraviolet (UV) light to help detect fluorescing organic compounds, if present. In addition, each core was initially screened with a Thermo Environmental Instruments Inc., Model 580B Organic Vapor Meter (OVM) equipped with a photo-ionization detector (PID) and a 10.8 eV bulb. The 2-foot section from each interval with the highest PID reading was placed in a resealable plastic bag and allowed to equilibrate for approximately 10 minutes. Subsequently, the headspace gases that accumulated in the bag were screened again with the PID. The PID data is included in the description column of the soil boring logs. Boring logs are included in Appendix B.

Upon completion of the boring, the borehole was filled to grade with bentonite chips and hydrated with potable water. The soil boring locations were marked with clearly labeled stakes for later surveying. Soil cuttings generated during sampling were contained in 55-gallon drums.

A.2.2 *Hollow-Stem Auger Drilling*

Soil borings were also advanced by Best Drilling Services of Houston, Texas using a truck-mounted Mobile B-59 drilling rig equipped with 8.25-inch outside diameter and 4.25-inch inside diameter hollow-stem augers. The soil borings were continuously cored using split-spoon samplers. The sampler was decontaminated between each sample push and location by cleaning with a brush, using a wash of Liquinox® detergent and potable water, followed by rinsing with distilled water.

For each sample interval, recovery was noted and the soil was characterized and screened as described above. Boring logs, including results of the UV and OVM screening, are included in Appendix B.

Upon completion of the boring, the borehole was either tremie-grouted to ground surface or converted to a monitor well. At locations that were grouted, a grout mix consisting of Portland cement and approximately 3 to 5% bentonite, by weight, was used. The soil boring locations were marked with clearly labeled stakes for later surveying. Soil cuttings generated during drilling were contained in 55-gallon drums and roll-off boxes.

A.2.3 *Wet Rotary Drilling*

Wet rotary drilling techniques were utilized when surface casing was installed. The drilling mud used with wet rotary drilling provides support to the walls of the boring and helps to prevent caving or collapse. Wet rotary techniques also provide drilling capabilities below steel surface casing. A truck-mounted

Failing 1500 drilling rig equipped with a split spoon sampler and various diameter drill bits was used to advance the boring. Various diameter pre-threaded steel casing was used for surface casing.

The mud pit consisted of a portable, sheet metal, boat-shaped container. The initial drilling mud consisted of potable water and powdered bentonite. As the solids content of the drilling mud increased, some mud was removed from the mud pit and potable water was added.

Soil cuttings and liquids generated during drilling were contained in 55-gallon drums and roll-off boxes.

A.2.3.1 Surface Casing Installation

Surface casing was installed when a monitor well was installed in the B-TZ or C-TZ. Prior to surface casing installation, a pilot hole was cored and logged to the total depth of the surface casing using hollow-stem auger drilling techniques. The bottom of the surface casing was set in a competent clay zone above the B-TZ or C-TZ as directed by an on-site ERM geologist.

The surface casings were installed using the following procedures:

- The pilot hole was reamed to the appropriate diameter to accept the steel isolation casing. The reamed holes were at least 2-inches larger in diameter than the casing.
- The drilling mud in the mud pit was thinned by removing high solids drilling mud and adding potable water.
- The mud pump, hoses, and entire fluid system were flushed thoroughly with clean potable water.
- The bottom end of the casing was sealed with Plaster of Paris and secured with a PVC cap.
- The sealed casing was lowered down the hole to its positive buoyancy point (i.e., until the casing floated in the hole).
- Potable water or new drilling mud was added inside the casing to overcome buoyancy, if needed.
- The casing was set firmly at total depth in the targeted clay zone.
- The casing was tremie-grouted in place, from bottom to top, thereby displacing original drilling fluids from the annular space into the mud pit.

- The casing and grout set for a minimum of 12 hours, and when possible, the drilling rig was left in place to hold the casing until it set.
- Drilling fluids were removed from the mud pit and the mud pit was thoroughly cleaned and rinsed with potable water.
- The drilling hoses, pumps, the kelly, and entire fluid system were re-flushed.
- New mud was mixed with fresh potable water for further drilling.
- After the minimum 12-hour wait, the PVC end-cap was drilled out with a 4-7/8 inch OD (nominal) drill bit.
- Continuous coring proceeded by using a split-spoon sampler ahead of the drill bit to the total investigative depth.
- A monitor well was installed as described below.

A.3

Monitor Well Installation

Monitor wells completed in the A-TZ were installed using hollow-stem auger drilling techniques as described in Section A.2.2. Monitor wells completed in the C-TZ were installed using a combination of wet rotary and hollow-stem auger drilling as described in Section A.2.3. The presence of ground water was inferred from the degree of saturation noted in the soil boring logs recorded during installation of the associated soil boring. The screen was placed so that it captured the bottom of the uppermost observed transmissive zone.

The wells were constructed with new 2-inch diameter Schedule 40 PVC flush-joint threaded riser pipe and 10 feet of 0.010-inch machine-slotted screen. A sump designed to trap silt or clay particles which may become entrained in the well during development or purging was attached to the bottom of each well screen. The annular space in each well was filled slowly, to prevent bridging, with a 20/40 commercial grade silica sand filter pack to a depth 2 feet above the top of the well screen. Approximately 2 feet of pelletized bentonite were then placed above the sand pack and subsequently hydrated with potable water. The remainder of the annular space was then tremie-grouted to ground surface with a grout mix consisting of Portland cement and approximately 3 to 5% bentonite, by weight. Each monitor well was secured with a locking, water-tight cap and completed above grade. Protective covers were placed over the secured monitor well and incorporated into a 4-foot by 4-foot square concrete pad. Four protective bollards, painted yellow, were installed within four feet of the monitor well.

A.4 *WELL DEVELOPMENT AND SAMPLING*

A.4.1 *Monitor Well Development*

Each monitor well was developed by hand bailing to remove drilling residues and fine-grained material from the screened interval of the transmissive zone, and in order to obtain water samples that are reasonably representative of the actual ground water quality at each location. Water level measurements were collected prior to development and sampling in order to calculate well volumes and to provide for adequate ground water recovery. A graduated bucket was used to measure the volume of water removed.

During development, water quality parameters such as pH, specific conductivity (SC), temperature, and turbidity were monitored. More than 3 well volumes of water were removed from each monitor well using PVC bailers.

A.4.2. *Ground Water Sampling From Soil Borings (Grab samples)*

A ground water grab sample was collected from selected soil borings. When a grab sample was collected from soil borings installed using direct push sampling techniques, a temporary steel screen was placed in the boring to keep the boring open. New plastic tubing was inserted inside the screen and a ground water sample was collected using a peristaltic pump. This technique is also known as the hydropunch method. Grab samples were also collected from soil borings installed using hollow-stem auger techniques. A PVC bailer was used to collect the grab sample from hollow-stem auger borings. The screen and PVC bailer were decontaminated between each sample collection by cleaning with a brush, using a wash of Liquinox® detergent and potable water, followed by rinsing with distilled water.

Each water sample was placed in clean, laboratory-supplied containers with preservative and stored in a cooler containing sufficient ice to maintain a temperature of approximately 4°C. Samples designated for volatile organic compound (VOC) analysis were sealed with no headspace. Each sample container was labeled with the sample identification, date, and time of sample preparation, and the requested analysis. The sample containers were wrapped in bubblewrap and packed in coolers with ice for overnight delivery to QWAL Laboratories in Pittsburg, Kansas.

A.4.3 *Ground Water Sampling From Monitor Wells*

After development, the wells were allowed to equilibrate to near-static conditions and then were sampled. Monitor wells were sampled in accordance with EPA-recommended low-flow sampling protocols. At each location, a

peristaltic pump with disposable polyethylene tubing was used to pump the wells at a rate of less than 0.5 L/min. Measurements of water quality parameters (pH, specific conductivity, temperature, and turbidity) were collected at a frequency of once every 5 to 10 minutes. After the water quality parameters stabilized for 3 consecutive readings, purging was considered complete, and a ground water sample was collected. Each water sample was placed in clean, laboratory-supplied containers with preservative and stored in a cooler containing sufficient ice to maintain a temperature of approximately 4°C. Samples designated for VOC analysis were sealed with no headspace. Each sample container was labeled with the sample identification, date, and time of sample preparation, and the requested analysis. The sample jars were wrapped in bubblewrap and packed in coolers with ice for overnight delivery to QWAL Laboratories in Pittsburg, Kansas.

A.5

Decontamination Pad

A decontamination pad was built on site in an accessible location to sampling and drilling equipment. Heavy-duty plastic was laid out on flat ground surface and secured in place with wood beams. The edges of the plastic were wrapped around the wood beams to prevent their exposure to the decontamination process.

A high-pressure washer and steam cleaner were used to decontaminate drilling and associated sampling equipment (i.e., core barrels). Decontamination fluids were containerized in labeled 55-gallon drums with lids.

Boring Logs and Well Completion Details
Appendix B

September 10, 1999
W.O. #422-09

Environmental Resources Management
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 579-8999

**SB21
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB21 Date Drilled 10/09/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 24' Boring Diam. 2"
 N. Coord. 729023.67' E. Coord. 3168355.13' Surface Elevation 45.51' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES



















Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVN READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
45.51	0					0-3	0-1.4	SANDY SILTY CLAY: Very dark gray 2.5Y3/1; hard; low plasticity; moist; small roots; small gravel (<0.3" diameter); small shell fragments; friable; no odor. At 0-1' collect surface soil sample SB21-00 and SPLP.
45						1.4-3	1.4-3	
						3-6	3-8	SILTY CLAY: Very dark gray 2.5Y3/1; stiff PP=1.5-2.0; plastic; moist; trace small roots.
	5					6-9		SILTY CLAY: Dark gray 2.5Y4/1; stiff PP=1.25-2.0; plastic; moist; some small caliche nodules (0.1-0.5" diameter); no odor.
40						9-12	8-14	SILTY CLAY: Light gray 5Y7/1 mottled light olive brown 2.5Y5/6 and dark gray 2.5Y4/1; stiff PP=1.0-2.0; very plastic; moist; no odor.
	10					12-15		
	15					15-18	14-17.5	SANDY SILTY CLAY: Light gray 5Y7/2; very stiff; plastic; moist; trace to some Mn-concretions and black speckles. Some Mn-concretions have reddish brown 5YR4/4 halos.
30						18-21	17.5-19.2	CLAYEY SILTY SAND: Light greenish gray 5GY7/1; medium dense; moist; very fine grained; no odor.
	20					21-24	19.2-24	CLAYEY SAND: Brown 10YR5/3; wet; loose to very loose; fine grained; well sorted; subrounded to rounded; no odor. At 21' collect ground water grab sample SB21-A and duplicate
25								T.D. = 24'

**SB22
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB22 Date Drilled 09/29/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 45' Boring Diam. 8.25"
 N. Coord. 728979.34' E. Coord. 3167971.31' Surface Elevation 44.91' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVN READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
44.91	0					0-3	0-1	ASPHALT: Asphalt pavement; some small gravel, subangular, 0.25 to 0.5" diameter; sand, gray 7.5YR5/1, loose.
							1-5	SILTY CLAY: Very dark gray 10YR3/1; stiff PP=1.25-2.0; plastic; moist. At 1-2' Collect surface soil sample SB22-00
						3-5		At 3.0' grades with some caliche nodules (0.25-0.5" diameter), rounded to subrounded
40	5					5-10	5-15	At 4.7' grades gray 10YR5/1 SANDY CLAY: Gray 2.5YR6/1 mottled with greenish gray 10GY6/1; stiff PP=1.5-2.0; plastic; moist; some iron-like coloration as dark yellowish brown 10YR4/6. At 7.0' trace to some small caliche nodules (0.125-0.5" diameter), subrounded.
35	10				1	10-15		At 10.0' grades gray 10YR6/1 mottled with yellowish brown 10YR5/8; At 13.0' grades to wet
30	15					15-20	15-27	At 15' Collect ground water grab sample SB22-A CLAYEY SAND: Light olive gray 5Y6/2; loose; fine grained; well rounded; well sorted; wet; very slight odor.
25	20				2	20-25		At 20.0' grades to olive gray 5Y5/2
20	25				4			

**SB22
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB22 Date Drilled 09/29/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 45' Boring Diam. 8.25"
 N. Coord. 728979.34' E. Coord. 3167971.31' Surface Elevation 44.91' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

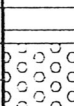
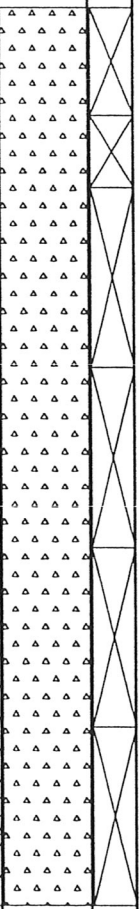





Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25						25-27		At 25.0' grades to olive 5Y4/3 mottled with greenish gray 10GY6/1.
					36	27-29	27-30	SILTY SANDY CLAY: Brown 10YR5/3 mottled with light gray 2.5Y7/1; very stiff to hard PP=2.25-4.5; plastic; moist; slight odor; trace small black nodules.
					57	29-30		At 29.0' grades to light gray 2.5Y7/1 mottled with brown 10YR5/3; no black nodules.
15	30				101	30-35	30-35	SILTY CLAY: Strong brown 7.5YR4/6 mottled with gray 7.5YR6/1; very stiff to hard PP=3.0-4.0; moist; with sand lenses; light yellowish brown 2.5Y6/3; very fine to fine grained; well sorted; well rounded; no visible staining; odorous. At 32-33' Collect soil sample SB22-32
10	35					35-40	35-45	CLAY: Strong brown 7.5YR4/6 mottled with light olive gray 5Y6/2; very stiff to hard PP=3.5-4.5; plastic; moist; with some silt; very slight to no odor.
5	40					40-45		
0	45				6			At 44-45' collect soil sample SB22-44 with SPLP T.D. = 45'
-5	50							

**SB24
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB24 Date Drilled 09/28/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728626.38' E. Coord. 3167443.77' Surface Elevation 49.24' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
49.24	0					0-3	0-1 1-3	SILTY SAND: White to gray; loose; subangular to angular; dry; some gravel (Fill). GRAVEL: loose; subangular; some sand; some silt; dominant black staining; sticky; trace wood; faint fluorescence; odorous.
45	5				71	3-5 5-10	3-5.6 5.6-7	SILTY CLAY: Very dark gray 10YR3/1; firm; plastic; moist; trace black staining; odorous At 4.5' grades with very fine grained sand, trace wood fragments At 5.0' grades with trace gravel, diameter 0.5-1.0"
40	10				151	10-15	10-15	SANDY SILTY CLAY: Very dark gray 10YR3/1; soft to firm; low plasticity; moist; very fine grained sand; no fluorescence; odorous.
35	15				62	15-20	15-16 16-22	SANDY SILTY CLAY: Greenish gray; soft; plastic; moist; odorous. CLAYEY SAND: Greenish gray; very loose; wet; fine grained; well sorted.
30	20					20-25		At 20.0' grades to olive gray 5Y5/2; odorous
25	25				191		22-23 23-26.2	SILTY CLAY: Olive 5Y4/3; stiff PP=1.25; plastic; moist; some very fine grained sand. CLAYEY SAND: Olive 5Y4/3; very loose; wet; fine grained; dark brown staining; sheen on water; odorous.

**SB24
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB24 Date Drilled 09/28/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728626.38' E. Coord. 3167443.77' Surface Elevation 49.24' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES










Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVUM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25						25-30		At 25.0' grades to medium grained sand
							26.2-30	SILTY CLAY: Light olive gray 5Y6/2 mottled with olive brown 2.5Y4/4; very stiff PP=2.5-4.0; plastic; moist.
20						30-35		
							30-31	CLAYEY SAND: Olive 5Y5/3; loose; wet; fine to medium grained sand; well sorted.
							31-35	SILTY CLAY: Gray 2.5Y6/1 mottled with yellowish red 5YR4/6; stiff PP=1.0-2.0; plastic; moist; with fine grained sand; some dark brown staining.
15					222	35-40		At 34.0-36' collect soil sample SB24-34 At 34.5' grades to dark reddish brown 5YR3/4 CLAY: dark reddish brown 5YR3/4 mottled with olive gray 5Y5/2; very stiff PP=3.0-4.0; plastic; moist; very slight odor.
							35-50	
10						40-45		At 40.0' grades to yellowish red 5YR4/6 mottled light olive gray 5Y6/2
							45-50	
5								
					23			
0								
50								At 49.0-50' collect soil sample SB24-49 T.D. = 50'

**SB25
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB25 Date Drilled 09/29/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728932.90' E. Coord. 3167697.23' Surface Elevation 44.91' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
44.91	0					0-1	0-1	ASPHALT: Asphalt pavement; sand, loose.
						1-3	1-2	CLAYEY SILT: Very dark gray 2.5Y3/1; hard to very hard PP>4.0; plastic; moist.
						3-5	2-5	SILTY CLAY: Gray 2.5Y6/1 mottled with light olive brown 2.5Y5/6; very stiff PP=2.0-3.0; plastic; moist; trace caliche nodules (0.5" diameter). At 3' grades to gray 2.5Y5/1 mottled with light olive brown 2.5Y5/6; some caliche nodules (<0.5" diameter).
40	5					5-10	5-10	SILTY CLAY: Dark gray 2.5Y4/1 mottled with greenish gray 5BG6/1 and yellowish brown 10YR5/8; firm to stiff PP=0.5-1.25; plastic; moist; some sand, fine grained. At 7.7' some caliche nodules (<0.3" diameter)
35	10				1	10-15	10-15	CLAYEY SAND: Greenish gray 10GY6/1; dense; very fine grained; well sorted; subrounded to rounded; very moist. At 14' grades to wet
30	15					15-20	15-22	CLAYEY SAND: Olive gray 5Y5/2; loose; well sorted; rounded; fine grained; wet; no odor. At 15' Collect ground water grab sample SB25-A
25	20				4	20-22		At 20' grades to olive gray 5Y4/2, very slight odor
						22-24	22-24	SILTY SANDY CLAY: Greenish gray 10Y6/1; very stiff PP=2.5-3.5; plastic; moist At 23' some caliche nodules (0.2-0.7" diameter)
20	25				61 45	24-25	24-25	SILTY CLAY: Reddish brown mottled with red 2.5YR4/8, greenish gray 5G6/1, and olive 5Y5/4; very stiff PP=3.0-3.75; moist; some caliche nodules (<0.3" diameter).



**SB25
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB25 Date Drilled 09/29/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728932.90' E. Coord. 3167697.23' Surface Elevation 44.91' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				134	25-30	25-35	SANDY SILTY CLAY: Red 2.5YR4/8 mottled with greenish gray 10Y6/1; very stiff to hard PP=2.25-4.5; plastic; moist. At 26' some caliche nodules (0.2-0.7" diameter)
15	30				165	30-35		
10	35				283	35-40	35-50	CLAY: Dark red 2.5YR3/6 mottled with light brownish gray 10YR6/2; firm to very stiff PP=0.5-3.75; very plastic; moist; trace black staining from magnesium-like nodules; no fluorescence. At 35-36' slight odor. Collect soil sample SB25-35
5	40					40-45		At 40' grades with no Mg-like nodules, no odor
0	45					45-50		At 45' grades to reddish brown 5YR4/4, very hard
-5	50				24			At 48-50' Collect soil sample SB25-48 T.D. = 50'



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**SB28
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB28 Date Drilled 09/30/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728573.27' E. Coord. 3165897.88' Surface Elevation 45.22' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES
















Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
45.22	0					0-5	0-0.5 0.5-3.2	CLAYEY SILTY SAND: Black 10YR2/1; loose; poorly sorted; many small roots; some small angular shell fragments; organic; moist; no odor. At 0-1' collect surface soil sample SB28-00
	5					5-10	3.2-10	SILTY SANDY CLAY: Dark gray 10YR4/1; homogeneous; plastic; moist; some small roots; no odor. SILTY CLAY: Gray 2.5Y6/1 mottled with olive yellow 2.5Y6/8; firm to stiff PP=0.5-2.0; plastic; moist; no roots; no odor.
	10					10-15	10-20.3	CLAYEY SAND: Light gray 2.5Y7/1 mottled with olive yellow 2.5Y6/8; dense; very fine grained; well sorted; moist; no odor.
	15					15-20		At 15' grades to wet.
	20					20-25	20.3-25	SANDY SILTY CLAY: Light gray 2.5Y7/1 mottled with olive yellow 2.5Y6/8; very stiff to hard PP=2.0-4.5; plastic; moist; very fine grained sand; no odor.
	25							At 7.0-8.0' very small to very large caliche nodules (0.1-1.5" diameter) At 9-10' medium to large caliche nodules (0.5-1.5" diameter) At 17' Collect ground water grab sample SB28-A

**SB28
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB28 Date Drilled 09/30/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 50' Boring Diam. 8.25"
 N. Coord. 728573.27' E. Coord. 3165897.88' Surface Elevation 45.22' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
20	25					25-30	25-31	SILTY CLAY: Yellowish red 5YR4/6 mottled with light gray 10YR7/2; very stiff PP=1.25-3.5; very plastic; moist.
15	30					30-35	31-43.7	CLAY: Red 2.5 YR4/6; stiff to hard PP=1.25-4.5; very plastic; moist; some very fine grained sand lenses, buff.
10	35					35-40		At 36.3' some small white and black nodules, 0.125-0.25" diameter
5	40					40-45		At 40-42' Collect soil sample SB28-40
0	45					45-50	43.7-50	CLAYEY SAND: Yellowish red 5YR4/6; dense; very fine grained; well sorted; moist; no odor. At 45' grades to wet At 47.0' collect ground water grab sample SB28-B At 49-50' collect soil sample SB28-49 T.D. = 50'



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**SB29
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB29 Date Drilled 09/30/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 35' Boring Diam. 8.25"
 N. Coord. 728289.77' E. Coord. 3165954.87' Surface Elevation 45.17' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
45.17	0					0-3	0-1.5	CLAYEY SILTY SAND: Black 5Y2.5/1; loose; plastic; moist; many roots; many gravel, 1-2" diameter, subangular. (Organic layer). At 0-1' collect surface soil sample SB29-00
						1.5-6.3	SILTY CLAY: Very dark gray 5Y3/1; firm to stiff PP=0.5-2.0; very plastic; moist; some very fine grained sand; trace very small roots.	
						3-5		
40	5					5-10	6.3-11	SILTY CLAY: Light gray 5Y7/1 mottled with olive yellow 2.5Y6/8; stiff PP=1.25-1.75; very plastic; moist. At 6.3-6.5' some small caliche nodules
						10-15		
35	10					10-15	11-15	At 9.5-9.7 some small caliche nodules; trace small black Mg-like or Fe-like nodules. SANDY CLAY: Greenish gray 10G6/1 mottled with gray 2.5Y5/1 and light olive brown 2.5Y5/6; firm PP=0.25-1.0; plastic; moist.
						15-20	15-21	CLAYEY SAND: Gray 5Y6/1; loose; very fine to fine grained; well sorted; subrounded to rounded; wet.
						20-25		
25	20					20-25	21-22.5	At 20' collect ground water grab sample SB29-A SILTY SANDY CLAY: Light gray 5Y7/2 mottled with olive yellow 2.5Y6/8; very stiff PP=2.0-3.0; plastic; moist.
							22.5-27	SILTY CLAY: Light gray 5Y7/2 mottled with yellowish red 5YR4/6; very stiff PP=3.0-4.0; plastic; moist.



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**SB29
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB29 Date Drilled 09/30/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 35' Boring Diam. 8.25"
 N. Coord. 728289.77' E. Coord. 3165954.87' Surface Elevation 45.17' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

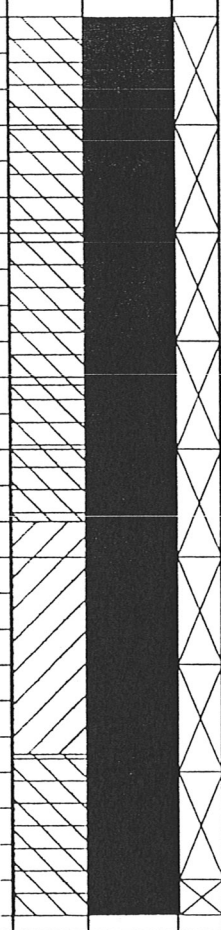
Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVN READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
20	25					25-30		
							27-28.8	SANDY SILTY CLAY: Light gray 5Y7/2 mottled yellowish red 5YR4/6; stiff to very stiff PP=1.0-2.5; plastic; moist.
							28.8-30	CLAYEY SAND: Light gray 5Y7/2; dense; very fine to fine grained; well sorted; subrounded to rounded; moist.
15	30					30-35	30-35	CLAYEY SAND: Yellowish red 5YR4/6 mottled light gray 5Y7/2; loose to medium dense; very fine to fine grained; well sorted; subrounded to rounded; wet.
								At 33' Collect ground water grab sample SB29-B and MS/MSD.
10	35							T.D. = 35'
5	40							
0	45							
	50							

**SB30
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB30 Date Drilled 10/12/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 34' Boring Diam. 2"
 N. Coord. 728167.71' E. Coord. 3165947.86' Surface Elevation 45.22' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

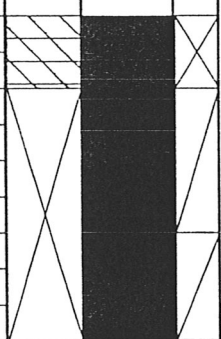
Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
45.22	0					0-3	0-3	SILTY CLAY: Black 10YR2/1; soft to very soft; high plasticity; moist; many organics; no staining; no odor.
						3-6	3-6	SILTY CLAY: Dark gray 2.5Y4/1 mottled with light olive brown 2.5Y5/6; firm; high plasticity; moist; trace small roots; no staining; no odor.
40	5					6-9	6-10.2	SILTY CLAY: Gray 2.5Y6/1 mottled with olive yellow 2.5Y6/8; firm; plastic; moist; trace black nodules (Fe?) (0.3" diameter); no staining; no odor.
						9-12	10.2-12	SILTY SANDY CLAY: Greenish gray 5GY6/1; firm; plastic; moist; no staining; no odor.
						12-15	12-14	SILTY SANDY CLAY: Gray 2.5Y6/1 mottled light olive brown 2.5Y5/6; hard; plastic; moist; trace black concretions (Fe?) with reddish brown halos; no odor.
						14-15	15-18	CLAYEY SAND: Greenish gray 5GY6/1; medium dense; moist to wet; very fine grained; well sorted; no staining; no odor.
30	15					15-18	15-20.5	CLAYEY SAND: Light gray 2.5Y7/1; loose; wet; very fine to fine grained; well sorted; subrounded to rounded; no staining; no odor
						18-21		
25	20					20.5-27	20.5-27	SILTY SANDY CLAY: Greenish gray 10Y6/1; very stiff to hard; plastic; moist; no staining; no odor.
						21-24		
		24-27		At 22.7' grades with mottling of yellowish brown 10YR5/8				

**SB30
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB30 Date Drilled 10/12/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 34' Boring Diam. 2"
 N. Coord. 728167.71' E. Coord. 3165947.86' Surface Elevation 45.22' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
20	25					27-31	27-34	At 26.0' yellowish brown mottling grades to strong brown 7.5YR4/6 NO RECOVERY: collect ground water grab sample from B-zone using hydropunch; SB30-B
15	30					31-34		
10	35							T.D. = 34'
5	40							
0	45							
	50							



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**SB37
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB37 Date Drilled 10/09/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 24' Boring Diam. 2"
 N. Coord. 727591.98' E. Coord. 3165340.67' Surface Elevation 46.42' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING PPM	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
46.42	0					0-3	0-0.2	CLAYEY SANDY SILT: Very dark grayish brown 10YR3/2; loose; moist; with some pebbles and gravel; roots; no odor.
45						0.2-1.9	At 0-1' collect surface soil sample SB37-00 with duplicate and SPLP	
						3-6	1.9-6	FILL: White 5Y8/1; crushed shell fragments (0.1 to 1" diameter) with clayey sand; loose to dense; moist; no odor.
	5					6-9	6-6.2	SILTY CLAY: Dark gray 5Y4/1 mottled with olive 5Y4/4; stiff PP=1.75; plastic; moist; trace lenses of fine grained sand; trace small roots; no odor.
40						9-12	6.2-8.5	CONCRETE: with small pebbles CLAYEY GRAVEL: Light gray 2.5Y7/2; loose; wet; subangular; poorly sorted (0.1-1.0" diameter); no odor.
	10				2.5	12-15	8.5-9	SILTY CLAY: Light brownish gray 2.5Y6/2 mottled olive yellow 2.5Y6/8; stiff PP=1.0; plastic; moist; some small gravel (0.1" diameter); no roots; no odor.
35					4	15-18	9-12.7	SILTY CLAY: Light gray 2.5Y7/1 mottled with yellow 2.5Y7/8; stiff to very stiff PP=1.75-3.25; plastic; moist; no odor.
	15					18-21	12.7-14.7	At 10.4-11.5' with some medium to large caliche nodule (up to 0.8" diameter). At 12-14' Collect soil sample SB37-12
30						21-24	14.7-17.3	SILTY CLAY: Light gray 5Y7/2 mottled reddish brown 5YR4/4; very stiff; plastic; moist; no odor. At 13.8-14.7' white silty clay lenses; white mottled with pale yellow 5Y8/2; soft to firm; moist
	20				3		17.3-24	CLAYEY SAND: Light brown 7.5YR6/4; loose; moist to wet; fine grained; subrounded; well sorted; no odor. At 15.0' Collect ground water grab sample SB37-A and duplicate
25					3			SILTY CLAY: Light gray 5Y7/2 mottled with yellowish brown 10YR5/6; stiff PP=1.5; very plastic; moist; no odor. At 18.0' grades light gray 2.5Y7/2 mottled with strong brown 7.5YR5/6; firm to hard.
	25							At 22.5-24' Collect soil sample SB37-22.5 and duplicate T.D. = 24'

**SB38
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB38 Date Drilled 10/08/98
 Project Phase 2B RFI Owner Southern Pacific RR
 Location Houston Wood Preserving Works Boring T.D. 33' Boring Diam. 2"
 N. Coord. 727513.09' E. Coord. 3165745.29' Surface Elevation 47.52' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Yagan

SKETCH MAP

NOTES



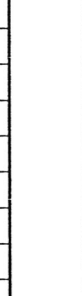

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
47.52	0					0-3	0-0.5	CLAYEY SILTY SAND: Light yellowish brown 10YR6/4; dense; moist; trace small pebbles; no vegetation. At 0-1' Collect surface soil sample SB38-00
							0.5-3.9	
45					25	3-6		SANDY SILTY CLAY: Dark gray 10YR4/1 mottled with yellowish brown 10YR5/8; firm PP=0.5; plastic; moist.
5					24	6-9		SILTY CLAY: Dark gray 7.5YR4/1; very stiff PP=2.0; plastic; moist; slight odor.
40						9-12		SILTY CLAY: Greenish gray 10G6/1 mottled with light olive brown 2.5Y5/6; very stiff PP2.5-3.0; plastic; moist; slight odor. At 8.1' with small caliche to 8.3'
10					32	12-15		At 9.8' visible dark brown liquid stain with odor At 10' grades to greenish gray 10Y6/1 mottled with light olive brown 2.5Y5/6 At 10' trace dark brown staining in microfractures; slight fluorescence At 10-12' Collect soil sample SB38-10
35					31	15-18		At 11.9' small caliche nodules (<0.3" diameter) At 12.5-12.9' some small to medium caliche nodules (0.2-0.7" diameter) At 13.5-13.7' many small caliche nodules (<0.3" diameter) At 13.5' some dark brown liquid; slight fluorescence At 14' grades to very hard PP=4.0-4.5
15					13	18-21	16-17.6	SILTY CLAY: Strong brown 7.5YR4/6 mottled with light greenish gray 5GY7/1; very hard; very plastic; moist; odor.
30						21-24	18.9-20	SANDY SILTY CLAY: Greenish gray 5GY6/1; firm to hard; plastic; moist; very fine grained sand; no odor. At 18' grades to wet; no fluorescence
20						24-27	20-33	CLAYEY SAND: Greenish gray 10GY6/1; medium dense; very fine grained; well sorted; subrounded to rounded; moist to wet; very slight odor. SANDY SILTY CLAY: Strong brown 7.5YR4/4 mottled with light gray 10YR7/1; very stiff to hard PP=1.5-4.0; plastic; moist; odor. At 18' grades to light gray 2.5Y7/1, very slight odor At 22' grades no odor
25								

**SB38
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB38 Date Drilled 10/08/98
 Project Phase 2B RFI Owner Southern Pacific RR
 Location Houston Wood Preserving Works Boring T.D. 33' Boring Diam. 2"
 N. Coord. 727513.09' E. Coord. 3165745.29' Surface Elevation 47.52' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Yagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				6	27-30		At 26' grades to mottled strong brown 7.5YR4/6; very faint odor
30	30				6	30-33		At 30' grades light gray 2.5Y7/1 mottled strong brown 7.5YR4/6; very faint odor; trace dark brown shiny staining in microfractures, fluorescence in microfractures At 31' no fluorescence At 31-33' Collect soil sample SB38-31 and duplicate T.D. = 33'
35	35							
40	40							
45	45							
50	50							

**SB39
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB39 Date Drilled 10/08/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 30' Boring Diam. 2"
 N. Coord. 727453.63' E. Coord. 3165635.93' Surface Elevation 47.32' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES



Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
47.32	0					0-3	0-0.5	SILTY CLAY: Dark yellowish brown 10YR4/4 mottled with dark gray 2.5Y4/1; hard; plastic; moist; some large grained sand; one piece wood (0.5" by 1"); no odor.
							0.5-2.5	
45					26	3-6	2.5-5	At 0-1' Collect surface soil sample SB39-00 and SPLP CLAYEY SAND: Brown 7.5YR5/4; loose; moist to wet; large grained; angular; some large gravel (1"); no odor.
5					26	6-9	5-9.5	SANDY CLAY: Black; soft; plastic; moist; homogeneous; organic odor (Organic). At 3.0' with shiny brown staining; with some small roots; odor SILTY CLAY: Very dark gray 5Y3/1; firm to stiff; plastic; moist; shiny brown staining in microfractures; some small roots. At 6' grades gray 5Y5/1. One piece wood (1"x9").
40					41	9-12	9.5-15	At 9' grades dark gray 2.5Y4/1; some small to medium roots. SILTY CLAY: Blueish gray 5B6/1 mottled with olive yellow 2.5Y6/8; firm to stiff; plastic; moist; no roots; At 9.510.6' trace caliche nodules (0.1-1.3")
10					42	12-15		At 12' with trace dark brown staining in microfractures; with some small to large caliche nodules (0.2-1.0" diameter). At 12-14' Collect soil sample SB39-12 and duplicate
35					41	15-18	15-18	SILTY CLAY: Greenish gray 10GY 6/1 mottled with yellowish brown 10YR5/8; stiff to very stiff PP=1.75-3.0; plastic; moist; trace brown staining in microfractures; odor. At 15.4' some caliche nodules (0.5" diameter)
15					27	18-21	18-24	At 17.5' grades to greenish gray 10GY7/1 SILTY CLAY: Light greenish gray 10Y7/1; firm to stiff PP=2.0; plastic; moist; trace dark brown shiny staining; odor. At 19' grades no staining
30					12	21-24		
20					17	24-27	24-26.1	At 23' trace dark brown to black staining in microfractures; fluorescence. CLAYEY SAND: Yellowish brown 10YR5/4; loose; moist; fine grained; homogeneous; no staining; odor.
25								

**SB39
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB39 Date Drilled 10/08/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 30' Boring Diam. 2"
 N. Coord. 727453.63' E. Coord. 3165635.93' Surface Elevation 47.32' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVN READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				8	27-30	26.1-30	SILTY CLAY: Greenish gray 10G6/1; hard; plastic; moist; no staining; very slight to no odor. At 27' grades no odor At 27-30' Collect soil sample SB39-27 At 28.5' grades with brown 7.5YR4/4 mottling T.D. = 30'
20								
30								
15								
35								
10								
40								
5								
45								
0								
50								



**SB40
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB40 Date Drilled 10/01/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 54' Boring Diam. 8.25"
 N. Coord. 727773.02' E. Coord. 3165514.37' Surface Elevation 46.35' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
46.35	0					0-2	0-1.5	COARSE SAND: Light brownish gray 2.5Y6/2; loose; moist; with small shell fragments; some medium and large shell fragments (.5-1"); some clay (Fill).
45						2-4	1.5-12.7	
						4-9		SILTY CLAY: Very dark gray 2.5Y3/1; firm to stiff PP=1.0-2.0; plastic; moist; some to many red brick fragments (Fill). At 2' grades to very dark gray 10YR5/1. At 2-3' Collect surface soil sample SB40-02 At 3.5' grades to gray 10YR5/1 mottled with yellowish brown 10YR5/8 At 4.0' grades to gray 10YR6/1 mottled with yellowish brown 10YR5/8 At 6.6' some small caliche nodules (<0.3" diameter); trace medium to large caliche nodules (0.5-1.0" diameter)
40	5					9-14		At 9.0' grades with trace black staining from Mg-like nodules
35	10				2	12.7-15	12.7-15	CLAYEY SAND: Light gray 5Y7/2 mottled with olive yellow 2.5Y6/8; very fine to fine grained, loose to medium dense; well sorted, subrounded to rounded; moist.
30	15					14-19	15-18	At 14' grades to wet; collect ground water grab sample SB40-A SILTY CLAY: Yellowish red 5YR4/6 mottled with light gray 5Y7/2; very stiff PP=2.0-3.25; very plastic; moist.
25	20					18-24	18-24	CLAY: Pale yellow 2.5Y7/3; firm to stiff PP=0.5-2.5; plastic; moist; some silt.
25	25					24-29	24-33	SILTY CLAY: Light gray 5Y7/2 mottled with brownish yellow 10YR6/6; stiff to very stiff PP=1.5-2.5; very plastic; moist.

**SB40
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB40 Date Drilled 10/01/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 54' Boring Diam. 8.25"
 N. Coord. 727773.02' E. Coord. 3165514.37' Surface Elevation 46.35' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

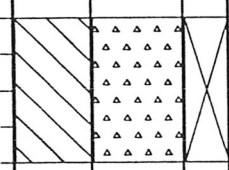
Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25								
20								
	30					29-34		At 28.0' grades to yellowish red 5YR4/6 mottled with light gray 2.5Y7/2 and olive yellow 2.5Y6/8 At 29.0' grades to brownish yellow 10YR6/6 mottled with light gray 5Y7/2
15					6			
	35					34-39	33-34 34-38.3	SILTY SANDY CLAY: Yellowish red 5YR4/6; very stiff PP=2.75; plastic; moist. At 33-34' Collect soil sample SB40-33 and duplicate SILTY CLAY: Yellowish red 5YR5/6 mottled with light gray 5Y7/2; stiff to very stiff PP=1.25-3.0; plastic; moist; blocky.
10								
	40					39-44	38.3-54	CLAY: Red 2.5YR4/6; very stiff to hard PP=3.5-4.25; very plastic; moist.
5					5			
	45					44-49		
0								
	50					49-54		

**SB40
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB40 Date Drilled 10/01/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 54' Boring Diam. 8.25"
 N. Coord. 727773.02' E. Coord. 3165514.37' Surface Elevation 46.35' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
50	-5				4			At 53-54' Collect soil sample SB40-53 T.D. = 54'
55	-10							
60	-15							
65	-20							
70	-25							
75								



**SB43
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB43 Date Drilled 10/12/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 24' Boring Diam. 2"
 N. Coord. 727396.83' E. Coord. 3165534.13' Surface Elevation 47.58' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
47.58	0					0-3	0-1.2	SANDY SILTY CLAY: Light yellowish brown 2.5Y6/3; firm to hard; plastic; moist; some small gravel; trace small roots; no staining; no odor. At 0-1' Collect surface soil sample SB43-00, duplicate, SPLP
							1.2-1.8	CLAYEY GRAVEL: Clay is yellowish brown 10YR5/4; soft; moist. Gravel is white; subangular; large (0.5"-1.5" diameter). No staining, no odor.
45						3-6	1.8-3	SILTY CLAYEY SAND: Black to brown to red; fine to medium grained; moist. Black and brown sand ls loose. Red sand ls cemented (old brick?); sewer-gas-like odor.
	5				16		3-6	SANDY SILTY CLAY: Dark gray 2.5Y4/1; soft to firm; plastic; moist; trace small roots; odor.
							6-9	At 3.8' black to dark brown shiny staining throughout the core. stained areas fluoresce. At 4.1' staining only visible in the microfracture, typically following the root; stained areas fluoresce
40					19		6-9.7	SILTY CLAY: Dark gray 2.5Y4/1; firm; plastic; moist; dark brown shiny staining in microfracture along root traces; odor.
	10				13		9.7-13	At 7-9' Collect soil sample SB43-07 SILTY CLAY: Greenish gray 5GY6/1; hard; plastic; moist; some caliche nodules (0.3-1.5" diameter); very dark gray 5Y3/1 shiny staining starting in microfracture and spreading away from microfracture; odor.
35					8		12-15	SANDY GRAVELLY CLAY: Dark olive gray 5Y3/2; soft; wet; fine to medium grained sand; faint rainbow-like sheen; odor.
	15				6		13-13.4	At 13-15' Collect soil sample SB43-13
							13.4-14	SILTY CLAY: Greenish gray 5GY6/1 mottled with strong brown
	20						14-15	7.5YR5/8; hard; plastic; moist; trace small roots that are stained very dark greyish brown; odor.
							15-18	CLAYEY SAND: Light greenish gray 5GY7/1; medlum dense to dense; moist; fine grained; rounded; well sorted; trace dark staining; no roots; odor.
30							18-21	SILTY CLAY: Greenish gray 5GY7/1 mottled with reddish brown 5YR4/6; very hard; plastic; moist; trace black staining in reddish brown area (Mg?); some sandy clay lenses (1" thick); very slight odor.
	25				3		18-20.5	SANDY CLAY: Greenish gray 5GY7/1; loose to dense; low plasticity; moist; no staining; very slight to no odor.
							20.5-24	At 19' grades to brown 7.5YR5/4 SILTY CLAY: Greenish gray 5GY7/1; soft to firm; high plasticity; moist; no staining; no odor. At 21-24' Collect soil sample SB43-21 and SPLP T.D. = 24'



**SB44
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID SB44 Date Drilled 10/12/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 24' Boring Diam. 2"
 N. Coord. 727297.04' E. Coord. 3165374.86' Surface Elevation 46.88' MSL Datum
 Screen: Type _____ Diam. _____ Length _____ Slot Size _____
 Casing: Type _____ Diam. _____ Length _____ Sump Length _____
 Top of Casing Elevation _____ Stickup _____
 Depth to Water: 1. Ft. _____ (_____) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Alfredo Palacios
 Drilling Method Direct Push Sampling Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
46.88	0					0-3	0-0.7 0.7-1.5 1.5-6.8	CLAYEY SILTY SAND: Light olive brown 2.5Y5/4; medium dense; fine grained; rounded; well sorted; moist; some small roots; trace small pebbles; no odor. At 0-1' Collect surface soil sample SB44-00 and SPLP
45						3-6		CLAYEY GRAVEL: Clay is dark grayish brown 2.5Y3/2; moist. Gravel is white to light pink; angular; 0.3-1.5" diameter. SILTY CLAY: Very dark gray 2.5Y3/1; soft; very plastic; moist; no staining; no odor.
5						6-9	6.8-9	SILTY CLAY: Dark gray 2.5Y4/1 mottled with light olive brown 2.5Y5/6; firm to stiff; plastic; moist; no staining; no odor. At 8.0' dark gray grades gray 2.5Y6/1
40					4	9-12	9-13	At 8.4' 1 large caliche nodule (1.5" diameter) SILTY SANDY CLAY: Gray 2.5Y6/1 mottled with olive yellow 2.5Y6/8; very stiff; plastic; moist; no odor At 10.0' 1" thick lens of small caliche nodules (<0.5" diameter)
10					3	12-15		
35					4	13-15		CLAYEY SAND: Light gray 2.5Y7/1; medium dense; subrounded to rounded; well sorted; moist; no staining; no odor.
15					5	15-18	15-16.3	SANDY CLAY: Light gray 2.5Y7/1 mottled with olive yellow 2.5Y6/8; very stiff; plastic; moist; no staining, no odor. At 15-17' Collect soil sample SB44-15 and SPLP
30						16.3-17	17-18	CLAYEY SAND: Light gray 2.5Y7/1; dense; subrounded to rounded; well sorted; moist; no staining; no odor.
20						18-21	18-21	CLAY: Yellowish red 5YR4/6; hard; very plastic; moist; no staining; no odor. CLAYEY SAND: Light yellowish brown 2.5Y6/3; loose; well sorted; subrounded to rounded; wet; no staining; no odor
25					1	21-24	21-21.7 21.7-24	SANDY CLAY: Brown 10YR5/4; soft; non-plastic; moist; very fine grained; no staining; no odor. SILTY SANDY CLAY: Light gray 10YR7/1 mottled with olive yellow 2.5Y6/8; very stiff to hard; plastic; moist; no staining; no odor. At 22-24' Collect soil sample SB44-22 T.D. = 24'
25								



ERM-Southwest, Inc.

HOUSTON · NEW ORLEANS · AUSTIN · DALLAS · BEAUMONT

MW-19C DRILLING LOG

W.O. NO. 422-09 Boring/Well ID MW-19C Date Drilled 10/15/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 75.2' Boring Diam. 10"
 N. Coord. 728619.81' E. Coord. 3167726.90' Surface Elevation 50.08' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 63' Sump Length 0.5'
 Top of Casing Elevation 53.05' Stickup 3.05'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
50.08	0					0-2.5	0-2.5	SILTY SAND: Light yellowish brown 10YR6/4; very dense; fine grained; dry; angular to subangular; abundant gravel, poorly sorted. At 0-1' collect surface soil sample MW19C-00
					35	2.5-5	2.5-3.7	SANDY CLAY: Dark grayish brown 2.5Y4/2; loose; low plasticity; moist; abundant gravel; slight odor.
	5					5-10	3.7-5	CLAYEY SILT: Black, soft to loose; non-plastic; moist; with some very fine grained sand; somewhat shiny coating; no fluorescence; slight odor.
							5-8.6	SILTY CLAY: Very dark gray 2.5Y3/1; soft to firm; plastic; moist; large blocky ped structure.
							8.6-11.4	SILTY CLAY: Gray 2.5Y5/1; hard; plastic; moist; many small caliche nodules; no staining; very slight odor.
	10				3	10-15	11.4-15.7	SILTY CLAY: Gray 2.5Y5/1 mottled with olive yellow 2.5Y6/8; soft to firm; very plastic; moist; trace small caliche nodules; no staining; very slight odor.
							15-20	SILTY SANDY CLAY: Greenish gray 5GY6/1 mottled with gray 2.5Y5/1; soft; plastic; moist; no staining; no odor.
							18-20	SANDY CLAY: Gray 2.5Y5/1; soft; plastic; moist; no staining; no odor.
	20					20-25	20-31	CLAYEY SAND: Gray 2.5Y6/1; loose; fine grained; subrounded; well sorted; wet; no staining; no odor.
	25							



**MW-19C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-19C Date Drilled 10/15/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 75.2' Boring Diam. 10"
 N. Coord. 728619.81' E. Coord. 3167726.90' Surface Elevation 50.08' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 63' Sump Length 0.5'
 Top of Casing Elevation 53.05' Stickup 3.05'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				14	25-30		At 25.0' grades to olive gray 5Y5/2; strong odor
	30						At 28.0' NAPL present throughout saturated matrix	
	30-35					31-34.5	SILTY CLAY: Gray 2.5Y6/1 mottled with yellowish brown 10YR5/8; very hard; plastic; moist; trace to some microfractures; fluorescence in and around microfractures; strong odor.	
	35					34.5-35	SILTY CLAY: Variegated (brown, white, pink, olive, gray); many caliche nodules; very hard; moist; some microfractures; strong odor.	
	35-40					35-40	SILTY CLAY: Yellowish red 5Y4/6; hard to very hard; plastic; moist; small, angular, blocky ped structure; no staining; no fluorescence; strong odor.	
	40		36		40-45	40-50	At 38-40' collect soil sample MW19C-38 & SPLP At 38.4' lens of small caliche nodules At 38.8' lens of small caliche nodules At 39.5' lens of small caliche nodules CLAY: Red 2.5YR4/6 mottled with greenish gray 10GY6/1; very hard; plastic; moist; some microfractures; strong odor. At 41.0' to 42.0' NAPL present; slight light-brown staining inside microfractures; slight fluorescence. At 43.0' no NAPL or staining; strong odor.	
	45				45-50		At 45.0' some macrofractures(horizontal).	
50	50							



**MW-19C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-19C Date Drilled 10/15/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 75.2' Boring Diam. 10"
 N. Coord. 728619.81' E. Coord. 3167726.90' Surface Elevation 50.08' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 63' Sump Length 0.5'
 Top of Casing Elevation 53.05' Stickup 3.05'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
0	50				7 4 0.7 0.7	50-55	50-52	SANDY SILTY CLAY: Yellowish red 5YR4/6; soft to firm; low plasticity; moist to wet; no staining; slight odor.
						52-57.5	CLAY: Red 2.5YR5/6, very hard; plastic; moist; no staining; very slight odor.	
-5	55					55-57.5	At 55-57' collect soil sample MW19C-55 & SPLP	
						57.5-58 58-62	At 57.5' bottom of 8-inch diameter steel surface casing OTHER: Not sampled	
-10	60					58-63.7	CLAY: Red 2.5YR4/6; very hard; plastic; moist; no staining; no odor. At 60-62' collect soil sample MW19C-60 & SPLP	
						62-66		
						63.7-65	SANDY CLAY: Yellowish red 5YR4/6; soft; plastic; wet; no staining; no odor. Sand is very fine grained, well sorted, subrounded.	
-15	65					65-66	CLAYEY SILT: Yellowish red 5YR4/6; soft; plastic; moist to wet; no staining; no fluorescence; no odor.	
						66-68	CLAYEY SAND: Yellowish red 5YR4/6; loose; very fine grained; subrounded; well sorted; wet; no staining; no odor.	
						68-70	68-72	NO RECOVERY: Probable clayey sand zone. Clayey sand sheen recovered inside core-barrel. Driller reported very easy to drill through this interval.
-20	70	70-72						
		72-75.2	72-73.2	SANDY SILTY CLAY: Yellowish red 5YR4/6; soft to firm; plastic; moist to wet; very fine grained; no staining; no odor.				
		73.2-75.2	At 73.0' to 75.0' collect soil sample MW19C-73 & SPLP SILTY CLAY: Yellowish red 5YR4/6; trace reddish yellow 7.5YR6/8 mottling; very hard; plastic; moist; no staining; no fluorescence; no odor.					



**MW-19C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-19C Date Drilled 10/15/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 75.2' Boring Diam. 10"
 N. Coord. 728619.81' E. Coord. 3167726.90' Surface Elevation 50.08' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 63' Sump Length 0.5'
 Top of Casing Elevation 53.05' Stickup 3.05'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVUM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
-25	75							T.D. = 75.2'
-30	80							
-35	85							
-40	90							
-45	95							
100								



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**MW-20A
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-20A Date Drilled 09/28/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 30' Boring Diam. 8.25"
 N. Coord. 728600.42' E. Coord. 31670990.58' Surface Elevation 47.47' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 15' Sump Length 0.5'
 Top of Casing Elevation 50.43' Stickup 2.96'
 Depth to Water: 1. Ft. 8.54 (11/16/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVN READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
47.47	0					0-3	0-1	SANDY GRAVEL: Pink to white to gray; loose; dry; angular to subangular gravel; fine to medium grained sand (Fill).
	45					3-5	1-6	CLAYEY SILT: Dark gray 2.5Y4/1; firm; non-plastic; moist; some gravel; no odor. At 3.0' grades to very dark gray 2.5Y3/1, hard
	5					5-10	6-15	SILTY CLAY: Dark gray 2.5Y4/1 mottled with light olive brown 2.5Y5/6; firm to very stiff; PP = 1.25-2.5; plastic; moist; no odor. At 6.0-6.5' trace caliche, subrounded, 0.1 to 1" diameter At 8.0-9' trace caliche, subrounded, 0.1 to 1" diameter
	40					10-15	10-15	At 10.0' grades to light olive gray 5Y6/2 mottled with olive 5Y5/6 and dark gray 5Y4/1; with trace very fine grained sand At 11.3' trace caliche nodules, subrounded, 0.5" diameter
	35				0.5	15-20	15-25	CLAYEY SAND: Greenish gray; 10GY5/1; loose; wet; very fine to fine grained; well sorted; no fluorescence; slight odor.
	30				10	20-25		
	25				18			At 24-26' collect soil samples MW20A-24 and MW20A-24D



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**MW-20A
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-20A Date Drilled 09/28/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 30' Boring Diam. 8.25"
 N. Coord. 728600.42' E. Coord. 31670990.58' Surface Elevation 47.47' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 15' Sump Length 0.5'
 Top of Casing Elevation 50.43' Stickup 2.96'
 Depth to Water: 1. Ft. 8.54 (11/16/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				3	25-30	25-30	SILTY CLAY: Greenish gray 10GY5/1 mottled with yellowish red 5YR4/6; very stiff PP = 0.5-2.75; plastic; moist; with very fine grained sand; no odor. At 28-30' collect soil sample MW20A-28 T.D. = 30'



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**MW-21C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-21C Date Drilled 10/26/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 16"
 N. Coord. 727730.42' E. Coord. 3165884.50' Surface Elevation 46.62' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62.5' Sump Length 0.5'
 Top of Casing Elevation 49.05' Stickup 2.43'
 Depth to Water: 1. Ft. 28.38 (11/11/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
46.62	0					0-4	0-0.4	<p>SANDY SILTY CLAY: Very dark grayish brown 10YR3/2; soft; plastic; moist; many roots; some small gravel, subrounded. At 0-1' collect surface soil sample MW21C-00 & SPLP SILTY SAND: with some small gravel; very coarse; sub angular; wet; loose (FILL). OTHER: Wood-like fibers: Black, shiny; mulch-like odor. SILTY CLAY: Greenish gray 5G6/1 mottled with light olive brown 2.5Y5/6; firm to hard; plastic; moist; no staining; slight to no odor. SILTY CLAY: Greenish gray 10GY6/1 mottled with light olive brown 2.5Y5/6; firm; plastic; moist; with some sand; many caliche nodules; with some lenses of silty clay, greenish gray 5GY5/1, soft, plastic, moist; no staining; no odor. At 8-10' collect soil sample MW21C-08 & SPLP</p>
	45				16	4-5	0.4-0.8	
	5				44	5-10	0.8-1.5	
	40					10-14	1.5-5	
	35					12.5-14.5		SANDY CLAY: Light greenish gray 10Y7/1; firm; low plasticity; moist; no staining; no odor.
	30				23	14-18	14.5-18.5	CLAYEY SAND: Light greenish gray 10Y7/1; loose; fine grained; subrounded; well sorted; wet; no staining; no odor.
	25				1.2	18-22	18.5-22	SILTY CLAY: Greenish gray 10GY6/1 mottled with strong brown 7.5YR4/6; firm; plastic; moist; no staining; no fluorescence; no odor. At 20-22' collect soil sample MW21C-20 At 20.0' strong brown grades to yellowish brown 10YR5/8
	20					22-24	22-24	At 22.0' bottom of 12-inch diameter steel casing. Continue with mud rotary drilling
	15					24-28	24-31	Not sampled. SILTY CLAY: Yellowish red 5YR4/6 mottled with light gray 5Y7/1; firm; plastic; moist; no staining; no odor.



**MW-21C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-21C Date Drilled 10/26/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 16"
 N. Coord. 727730.42' E. Coord. 3165884.50' Surface Elevation 46.62' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62.5' Sump Length 0.5'
 Top of Casing Elevation 49.05' Stickup 2.43'
 Depth to Water: 1. Ft. 28.38 (11/11/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25						28-32		
30						31-32	31-32	SANDY CLAY: Light gray 5Y7/2 mottled with red 2.5YR4/6; hard; low plasticity; moist; no staining; no odor.
35						32-34	32-36	CLAYEY SAND: Strong brown 7.5YR5/6; very fine grained; well sorted; subrounded; wet; no staining; no odor.
40						34-36		
45						36-38	36-37.5	SILTY SANDY CLAY: Strong brown 7.5YR5/8; soft; plastic; wet; no staining; no fluorescence; very slight odor.
50						38-42	37.5-38 38-42	CLAYEY SAND: Strong brown 7.5YR4/6; loose; very fine grained; well sorted; subrounded; no staining; no fluorescence; very slight odor. SILTY CLAY: Reddish brown 2.5YR4/4; very hard; very plastic; moist; no staining; no odor.
						42-46	42-46	CLAY: Red 2.5YR4/6; very hard; very plastic; moist; no staining; no odor. At 44-46' Collect soil sample MW21C-44 and MW21C-44D
						46-48	46-48	At 46' Bottom of 8-inch diameter steel casing NOT SAMPLED:
						48-52	48-56	CLAY: Red 2.5YR4/6; very hard; very plastic; moist; trace microfractures; no staining; no odor.



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**MW-21C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-21C Date Drilled 10/26/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 16"
 N. Coord. 727730.42' E. Coord. 3165884.50' Surface Elevation 46.62' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62.5' Sump Length 0.5'
 Top of Casing Elevation 49.05' Stickup 2.43'
 Depth to Water: 1. Ft. 28.38 (11/11/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
50								
-5						52-56		
55						56-60	56-58	CLAY: Yellowish red 5YR4/6; hard; very plastic; moist; some PVC pieces; no staining; no odor.
-10					0	60-64	58-60	SILTY CLAY: Yellowish red 5YR4/6; hard; plastic; moist; no staining; no odor.
60						60-64	60-62.5	SANDY CLAY: Yellowish red 5YR4/6; soft to firm; low plasticity; wet; no staining; no odor.
-15					0	64-66	62.5-64	SILTY CLAY: Yellowish red 5YR4/6; firm to hard; plastic; moist; trace microfractures; no staining; no odor.
65						64-66	64-66	NO RECOVERY: Driller reports that interval drilled like sand.
-20						66-68	66-68	CLAYEY SAND: Strong brown 7.5YR4/6; loose; fine grained; subangular; well sorted; wet; no staining; no odor.
70						68-72	68-72	NO RECOVERY: Driller reports that interval drilled like sand.
-25						72-76	72-76	CLAY: Brown 7.5YR4/3; hard; plastic; moist; iron coloration in macrofracture; no odor. At 72-74' collect MW21C-72 and MW21C-72D
75								



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MW-21C DRILLING LOG

W.O. NO. 422-09 Boring/Well ID MW-21C Date Drilled 10/26/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 16"
 N. Coord. 727730.42' E. Coord. 3165884.50' Surface Elevation 46.62' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62.5' Sump Length 0.5'
 Top of Casing Elevation 49.05' Stickup 2.43'
 Depth to Water: 1. Ft. 28.38 (11/11/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP
NOTES

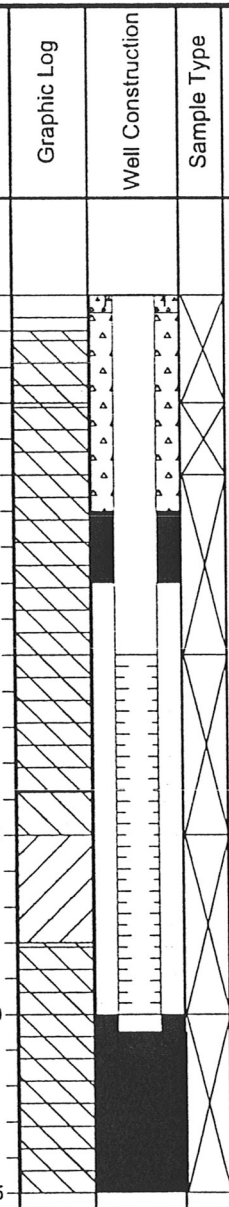
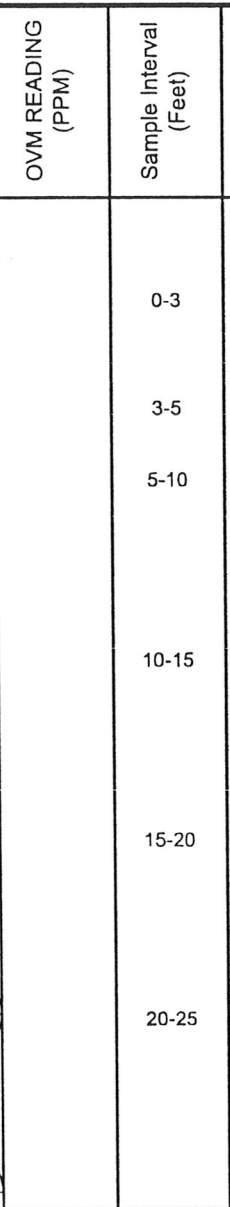
Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
75	-30	[Hatched Box]						T.D. = 76'
80	-35							
85	-40							
90	-45							
95	-50							
100								

**MW-22A
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-22A Date Drilled 10/01/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 25' Boring Diam. 8.25"
 N. Coord. 727875.63' E. Coord. 3165677.21' Surface Elevation 45.88' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 10' Sump Length 0.5'
 Top of Casing Elevation 46.07' Stickup 0'
 Depth to Water: 1. Ft. 4.12 (11/10/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Sonny Tobola
 Drilling Method Hollow Stem Auger Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
45.88	0					0-3	0-1	SILTY SAND: Dark grayish brown 10YR4/2; loose; moist; with gravel, 0.2-0.5" diameter, subangular; some small roots; some angular shell fragments; 1 bottle cap. At 0-1' Collect surface soil sample MW22A-00 & SPLP
45	1-3					3-5	3-13.8	SILTY SANDY CLAY: Dark grayish brown 2.5Y4/2; stiff; plastic; moist; trace small roots; no odor.
	5					5-10		SILTY CLAY: Gray 2.5Y5/1 mottled with olive yellow 2.5Y6/8; stiff; plastic; moist; trace small roots; no odor. At 5.8-6.3' some medium caliche-like gravel (0.5-1" diam.)
40								At 8.0-9.3' some small to large caliche nodules (<1.5")
	10					10-15		
35								
	15					15-20	13.8-15	SANDY CLAY: Light gray 5Y7/2 mottled with olive yellow 5Y6/6; stiff; plastic; moist; no odor.
30							15-18	CLAYEY SAND: Light gray 5Y7/2; very fine to fine grained; well sorted; rounded; wet; no odor.
	20					20-25	18-20	SILTY CLAY: Light gray 5Y7/2 mottled with yellowish red 5YR4/6; hard; plastic; moist; with some very fine grained sand; no odor. At 19.1-19.2' fine grained sand lens, light gray 5Y7/2.
25							20-25	SILTY CLAY: Light gray 2.5Y7/2 mottled with olive yellow 2.5Y6/8; very stiff; plastic; moist; no odor.
	25				T.D. = 25'			



**MW-22B
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-22B Date Drilled 10/27/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 42' Boring Diam. 10"
 N. Coord. 727871.34' E. Coord. 3165678.00' Surface Elevation 45.61' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 27.5' Sump Length 0.5'
 Top of Casing Elevation 45.86' Stickup 0'
 Depth to Water: 1. Ft. 3.70 (11/10/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method HSA/Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
20	25					25-27	25-27.8	SANDY SILTY CLAY: Light gray 5Y7/2 mottled with strong brown 7.5YR5/6; firm; low plasticity; moist; no staining; no odor.
	27-31					27.8-35	CLAYEY SAND: Strong brown 7.5YR5/8; loose to medium dense; very fine grained; well sorted; wet; no staining; no odor.	
15	30					31-33	At 30.5' grades yellowish red 5YR5/6 mottled with light gray 5Y7/2	
	33-35					35-37	NO RECOVERY: Driller reports interval drilled like sand.	
10	35					38-42	SILTY CLAY: Yellowish red 5YR5/6; firm; very plastic; moist; no staining; no odor.	
5	40						T.D. = 42'	
0	45							
50								

**MW-23C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-23C Date Drilled 10/14/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 10"
 N. Coord. 728759.11' E. Coord. 3167721.35' Surface Elevation 48.85' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62' Sump Length 0.5'
 Top of Casing Elevation 51.91' Stickup 3.06'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
48.85	0					0-2	0-2	SILTY SAND: Grayish brown 2.5Y5/2; very dense; angular to subangular; very fine grained; some to many gravel (0.1" to 1" diameter). At 0.0-1' collect surface soil sample SB23-00 and SPLP
						2-5	2-5	CLAYEY SANDY SILT: Black 2.5Y2.5/1; hard; friable; moist; some small gravel (0.1-0.3" diameter); trace sheen; very faint fluorescence; slight odor.
45	5					5-7	5-7	SANDY CLAY: Light gray 2.5Y7/1 hard; plastic; moist; some small gravel (0.1" diameter); no staining; no fluorescence; no odor.
						7-9	7-11	SILTY CLAY: Light gray 2.5Y7/2; firm to hard; plastic; moist; some small gravel (0.1-0.3" diameter); angular to subangular; no staining; no odor.
40	10				3	9-11		
						11-15	11-15	SANDY CLAY: Light gray 2.5Y7/2; firm to hard; plastic; moist; trace organic matter; no staining; very slight odor.
35	15				11	15-19	15-25	CLAYEY SAND: Light gray 2.5Y7/2; loose; wet; very fine to fine grained; well sorted; no staining; no fluorescence; slight odor.
30	20					19-23		At 19.0' grades light yellowish brown 2.5Y6/3
25	25					23-25		At 23.0' with NAPL, strong odor.

**MW-23C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-23C Date Drilled 10/14/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 10"
 N. Coord. 728759.11' E. Coord. 3167721.35' Surface Elevation 48.85' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62' Sump Length 0.5'
 Top of Casing Elevation 51.91' Stickup 3.06'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. _____ (_____)
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
25	25				21	25-29	25-26	<p>CLAY: Yellowish red 5YR4/6; very hard; very plastic; moist; angular blocky substructure; no staining; strong odor.</p> <p>SILTY CLAY: Light gray 2.5Y7.1 mottled with light yellowish brown 2.5Y6/4; hard to very hard; plastic; moist; trace light to medium brown staining in microfractures; strong odor.</p> <p>At 29.0' light yellowish brown grades to yellowish brown 10YR5/6</p> <p>At 31.0-33' collect soil sample SB23-31 and SPLP</p> <p>At 32.0' trace small gravel-size caliche nodules</p> <p>CLAY: Brown 7.5YR5/4 mottled light greenish gray 10GY7/1; hard; very plastic; moist; no staining; odor to strong odor.</p> <p>CLAY: Yellowish red 5YR4/6 mottled with light greenish gray 5GY7/1; very hard; very plastic; moist; small angular blocky substructures trace to some microfractures; trace to no fluorescence; odor to strong odor.</p> <p>At 41.0' grades very slight odor to no odor, no fluorescence.</p> <p>CLAY: Red 2.5YR4/6; very hard; very plastic; moist; trace to some microfractures; small angular blocky substructure; no staining; no odor; no fluorescence</p> <p>SILTY CLAY: Red 2.5YR4/6; very hard; very plastic; trace to some microfractures; moist; no staining; no fluorescence; upon fresh break of the core there is a very faint odor.</p> <p>At 49.0' no odor upon fresh break</p>
						26-33	26-33	
20						29-33	29-33	
30						64		
15						33-37	33-37	
35						37-41	37-45	
10						28		
40						41-45		
5						45-49	45-47	
45						4	47-53	
0		49-53						
50								



**MW-23C
DRILLING LOG**

W.O. NO. 422-09 Boring/Well ID MW-23C Date Drilled 10/14/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 10"
 N. Coord. 728759.11' E. Coord. 3167721.35' Surface Elevation 48.85' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62' Sump Length 0.5'
 Top of Casing Elevation 51.91' Stickup 3.06'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OMV READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
50								
-5						53-57	53-57	CLAY: Red 2.5YR4/6; very hard; very plastic; moist; trace to some microfractures; no staining; no odor; no fluorescence. At 55-57' collect soil sample SB23-55 and SPLP
55					3			
-10						58-62	57-58 — At 57' bottom of 6-inch diameter steel surface casing 58-62 — OTHER: Not Sampled 58-62 — CLAY: Red 2.5YR4/6, very hard; very plastic; moist; no staining, no odor.	
60					0.4			At 60-62' collect soil sample SB23-60
-15						62-66	62-66	CLAYEY SILT: Yellowish red 5YR4/6; soft; plastic; moist to wet; no staining; no fluorescence; no odor; no sheen on the water.
65						66-68	66-68	At 65.5' very slight odor CLAYEY SAND: Yellowish red 5YR4/6; loose; wet; very fine to fine grained; subrounded; well sorted; no staining; very slight odor; one very small (1mm) NAPL globule observed.
-20						68-72	68-72	NO RECOVERY: Driller reported probable sand zone.
70						72-76	72-75	SILTY CLAY: Yellowish red 5YR4/6; very hard; plastic; moist; no staining; no odor. At 73-75' collect soil sample SB23-73 and SPLP At 74.0' trace reddish yellow 7.5YR6/8 mottling
-25					0.4			
75								



MW-23C DRILLING LOG

W.O. NO. 422-09 Boring/Well ID MW-23C Date Drilled 10/14/98
 Project Phase 2B RFI Owner Southern Pacific Trans. Co.
 Location Houston Wood Preserving Works Boring T.D. 76' Boring Diam. 10"
 N. Coord. 728759.11' E. Coord. 3167721.35' Surface Elevation 48.85' MSL Datum
 Screen: Type Schedule 40 PVC Diam. 2" Length 10' Slot Size 0.010"
 Casing: Type Schedule 40 PVC Diam. 2" Length 62' Sump Length 0.5'
 Top of Casing Elevation 51.91' Stickup 3.06'
 Depth to Water: 1. Ft. 29.34 (11/10/98) 2. Ft. ()
 Drilling Company Best Drilling Services Driller Keith Barge
 Drilling Method Mud Rotary Log By M. Ylagan

SKETCH MAP

NOTES

Elevation (Feet)	Depth (Feet)	Graphic Log	Well Construction	Sample Type	OVM READING (PPM)	Sample Interval (Feet)	Description Interval (Feet)	Description/Soil Classification (Color, Texture, Structure)
75	75	[Hatched Box]					75-76	SILTY CLAY: Brown 7.5YR4/3; very hard; plastic; moist; no staining; no odor. T.D. = 76'
-30	80							
-35	85							
-40	90							
-45	95							
-50	100							

ATTENTION OWNER: Confidentiality
Privilege Notice on reverse side
of Well Owner's copy (pink)

State of Texas WELL REPORT

MW-19C

Texas Department of Licensing &
Regulation
P.O. Box 12157
Austin, TX 78711
512-463-7880

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4901 LIBERTY RD, HOUSTON TX Long. 95.148 Lat. 29.75
County _____ (Street, RFD or other) (City) (State) (Zip) Grid # 65.14.8

3) TYPE OF WORK (Check): New Well Deepening Reconditioning Plugging
4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic Industrial Irrigation Injection Public Supply De-watering Testwell
If Public Supply well, were plans submitted to the TNRCC? Yes No

6) WELL LOG:
Date Drilling: _____
Started 10-15 19 98
Completed 10-20 19 98

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
12	Surface	57.5
8	57.5	73

7) DRILLING METHOD (Check): Driven Air Rotary Mud Rotary Bored Air Hammer Cable Tool Jetted Other HOLLOW STEM & MUD ROTARY

From (ft.)	To (ft.)	Description and color of formation material
0	2	Silty sand, yellowish brown
2	4	Sandy clay, dark gray
4	5	Clayey silty, black
5	11	Silty clay, gray
11	18	Silty sandy clay, gray
18	30	Sandy clay, gray
30	31	Clayey sand, gray
31	35	Clayey sand, gray
35	40	Silty clay, red
40	50	Clay, red
50	52	Sandy silty clay, red
52	64	Clay, red

8) Borehole Completion (Check): Open Hole Straight Wall Underreamed Gravel Packed Other _____
If Gravel Packed give interval from 61.5 ft. to 73.0 ft.

(Use reverse side of Well Owner's copy, if necessary)

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
4	N	SMI 40 PVC	0	63	
4	N	SMI 40 PVC	63	73	0.01
6	N	SMI 40 STEEL	0	57.5	

14) TYPE PUMP: N/A
 Turbine Jet Submersible Cylinder Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

9) CEMENTING DATA
Cemented from 0 ft. to 53 ft. No. of sacks used 33
Method used TREMBLE No. of sacks used _____
Cemented by KEITH BARGE
Distance to septic system field lines or other concentrated contamination N/A
Method of verification of above distance _____

15) WELL TESTS: N/A
Type test: Pump Bailor Jetted Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

10) SURFACE COMPLETION
 Specified Surface Slab Installed Specified Steel Sleeve Installed Pitless Adapter Used Approved Alternative Procedure Used

16) WATER QUALITY:
Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? Yes No

11) WATER LEVEL:
Static level 29.34 ft. below land surface Date 11/10/98
Artesian flow _____ gpm. Date _____

12) PACKERS:

Type	Depth
Bentonite	59 to 61

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.
Best Drilling Services, Inc. 4786-M

COMPANY NAME _____ WELL DRILLER'S LICENSE NO. _____
ADDRESS P.O. Box 845 Friendswood Texas 77546
(Street or RFD) (City) (State) (Zip)
(Signed) [Signature] (Signed) _____
(Type or print) (Registered Driller Trainee)

ATTENTION OWNER: Confidentiality
 Privilege Notice on reverse side
 of Well Owner's copy (pink)

State of Texas WELL REPORT

MW-20A

Texas Department of Licensing &
 Regulation
 P.O. Box 12157
 Austin, TX 78711
 512-463-7880

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4910 LIBERTY RD, HOUSTON TX
County (Street, RFD or other) (City) (State) (Zip) Grid # 05-14-8

3) TYPE OF WORK (Check): New Well Deepening Reconditioning Plugging

4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic Industrial Irrigation Injection Public Supply De-watering Testwell
 If Public Supply well, were plans submitted to the TNRCC? Yes No

6) WELL LOG:
 Date Drilling: _____
 Started 09-28 19 98
 Completed 09-28 19 98

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
	Surface	
10		30

7) DRILLING METHOD (Check): Driven Air Rotary Mud Rotary Bored Air Hammer Cable Tool Jetted Other HOLLOW STEM

From (ft.)	To (ft.)	Description and color of formation material
0-01'		SANDY GRAVEL, WHITE
01-06'		CLAYEY SILT, GRAY
06-15'		SILTY CLAY, GRAY
15-25'		CLAYEY SAND, GRAY
25-30'		SILTY CLAY, GRAY

8) Borehole Completion (Check): Open Hole Straight Wall Underreamed Gravel Packed Other _____
 If Gravel Packed give interval from 13.0 ft. to 25.0 ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
2	N	SCN1 40 PVC	0	15	
2	N	SCN1 40 PVC	15	25	0.01

9) CEMENTING DATA
 Cemented from 0 ft. to 11 ft. No. of sacks used 2
 Method used GRAVITY AND TREMIE No. of sacks used _____
 Cemented by LAWRENCE TOBOLA
 Distance to septic system field lines or other concentrated contamination N/A
 Method of verification of above distance _____

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

14) TYPE PUMP: N/A
 Turbine Jet Submersible Cylinder
 Other _____
 Depth to pump bowls, cylinder, jet, etc., _____ ft.

15) WELL TESTS: N/A
 Type test: Pump Bailer Jetted Estimated
 Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

16) WATER QUALITY:
 Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
 Type of water? _____ Depth of strata _____
 Was a chemical analysis made? Yes No

10) SURFACE COMPLETION
 Specified Surface Slab Installed
 Specified Steel Sleeve Installed
 Pitless Adapter Used
 Approved Alternative Procedure Used

11) WATER LEVEL:
 Static level 8.54 ft. below land surface Date 11-16-98
 Artesian flow _____ gpm. Date _____

12) PACKERS:

	Type	Depth
Bentonite		11 to 13
" "		25 to 30

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.

Best Drilling Services, Inc. 3026-M

COMPANY NAME _____ WELL DRILLER'S LICENSE NO. _____
(Type or print)

ADDRESS P.O. Box 845 Friendswood Texas 77546
(Street or RFD) (City) (State) (Zip)

(Signed) [Signature] (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

ATTENTION OWNER: Confidentiality
 Privilege Notice on reverse side
 of Well Owner's copy (pink)

State of Texas WELL REPORT

MW-210

Texas Department of Licensing & Regulation
 P.O. Box 12157
 Austin, TX 78711
 512-463-7880

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4901 LIBERTY RD, HOUSTON TX Long. Lat.
County (Street, RFD or other) (City) (State) (Zip) Grid # 65-14.8

3) TYPE OF WORK (Check):
 New Well Deepening
 Reconditioning Plugging

4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic
 Industrial Irrigation Injection Public Supply De-watering Testwell
 If Public Supply well, were plans submitted to the TNRC? Yes No

6) WELL LOG:

Date Drilling: Started <u>10-26</u> 19 <u>98</u> Completed <u>10-30</u> <u>98</u>	DIAMETER OF HOLE		
	Dia. (in.)	From (ft.)	To (ft.)
	16	Surface	22
	12	22	46
	6	46	72.5

7) DRILLING METHOD (Check): Driven
 Air Rotary Mud Rotary Bored
 Air Hammer Cable Tool Jetted
 Other HOLLOW STEM & MUD ROTARY

From (ft.)	To (ft.)	Description and color of formation material
0	5	Sandy silty clay brown
		Silty sand / Silty clay gray
5	12	Silty clay gray
12	14	Sandy clay gray
14	18	Layered sand gray
18	22	Silty clay gray
22	24	NOT SAMPLED
24	31	Silty clay red
31	32	Sandy clay gray
32	36	Layered sand brown
36	37	Silty sand brown
36	37	Silty sandy clay brown

(Use reverse side of Well Owner's copy, if necessary)

8) Borehole Completion (Check): Open Hole Straight Wall
 Underreamed Gravel Packed Other _____
 If Gravel Packed give interval from 50.5 ft. to 72.5 ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
2	N	SEMI 40 PVL	0	10	
2	N	SEMI 40 PVL	10	20	0.01
2	N	SEMI 40 STEEL	0	22	
6	N	SEMI 40 STEEL	0	46	

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

9) CEMENTING DATA

Cemented from 0 ft. to 54.5 ft. No. of sacks used 20
 Method used GRAVITY AND TREMIE
 Cemented by KEITH BARGE
 Distance to septic system field lines or other concentrated contamination N/A
 Method of verification of above distance _____

14) TYPE PUMP: N/A

Turbine Jet Submersible Cylinder
 Other _____
 Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) SURFACE COMPLETION

Specified Surface Slab Installed
 Specified Steel Sleeve Installed
 Pitless Adapter Used
 Approved Alternative Procedure Used

15) WELL TESTS: N/A

Type test: Pump Bailer Jetted Estimated
 Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) WATER LEVEL:

Static level 26.38 ft. below land surface Date 11/11/98
 Artesian flow _____ gpm. Date _____

16) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
 Type of water? _____ Depth of strata _____
 Was a chemical analysis made? Yes No

12) PACKERS:

Type	Depth
Bentonite	54.5 to 60.5

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Best Drilling Services, Inc. WELL DRILLER'S LICENSE NO. 4786-M

ADDRESS P.O. Box 245 Friendswood Texas 77546
(Street or RFD) (City) (State) (Zip)

(Signed) [Signature] (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

ATTENTION OWNER: Confidentiality
Privilege Notice on reverse side
of Well Owner's copy (pink)

State of Texas WELL REPORT

Texas Department of Licensing &
Regulation
P.O. Box 12157
Austin, TX 78711
512-463-7880

MW-22A

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4901 LIBERTY RD, HOUSTON TX Long. 95.148 Lat. _____
County _____ (Street, RFD or other) (City) (State) (Zip) Grid #

3) TYPE OF WORK (Check):
 New Well Deepening
 Reconditioning Plugging

4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic
 Industrial Irrigation Injection Public Supply De-watering Testwell
If Public Supply well, were plans submitted to the TNRCC? Yes No

6) WELL LOG:
Date Drilling:
Started 10-01 1998
Completed 10-01 1998

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
	Surface	
<u>8.25</u>		<u>25</u>

7) DRILLING METHOD (Check): Driven
 Air Rotary Mud Rotary Bored
 Air Hammer Cable Tool Jetted
 Other HOLLOW STEM

From (ft.)	To (ft.)	Description and color of formation material
<u>0-01</u>		<u>SILTY SAND, BROWN</u>
<u>01-03</u>		<u>SILTY SANDY CLAY, GRAYISH BROWN</u>
<u>03-14</u>		<u>SILTY CLAY, GRAY</u>
<u>14-15</u>		<u>SANDY CLAY, GRAY</u>
<u>15-18</u>		<u>CLAYEY SAND, GRAY</u>
<u>18-25</u>		<u>SILTY CLAY, GRAY</u>

8) Borehole Completion (Check): Open Hole Straight Wall
 Underreamed Gravel Packed Other _____
If Gravel Packed give interval from 8.0 ft. to 20.0 ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
<u>2</u>	<u>N</u>	<u>SEMI 40 PVC</u>	<u>0</u>	<u>10</u>	
<u>2</u>	<u>N</u>	<u>SEMI 40 PVC</u>	<u>10</u>	<u>20</u>	<u>0.01</u>

(Use reverse side of Well Owner's copy, if necessary)

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

9) CEMENTING DATA
Cemented from 0 ft. to 8 ft. No. of sacks used 2
Method used GRAVITY AND TREMIE
Cemented by LAWRENCE TOBOLA
Distance to septic system field lines or other concentrated contamination N/A
Method of verification of above distance _____

14) TYPE PUMP: N/A
 Turbine Jet Submersible Cylinder
 Other _____
Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) SURFACE COMPLETION
 Specified Surface Slab Installed
 Specified Steel Sleeve Installed
 Pitless Adapter Used
 Approved Alternative Procedure Used

15) WELL TESTS: N/A
Type test: Pump Bailor Jetted Estimated
Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) WATER LEVEL:
Static level 4.13 ft. below land surface Date 11/10/98
Artesian flow _____ gpm. Date _____

16) WATER QUALITY:
Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
Type of water? _____ Depth of strata _____
Was a chemical analysis made? Yes No

12) PACKERS:

Type	Depth
<u>Bentonite</u>	<u>6 to 8</u>
" "	<u>20 to 25</u>

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Best Drilling Services, Inc. WELL DRILLER'S LICENSE NO. 3026-M
ADDRESS P.O. Box 945 Friendswood Texas 77546
(Street or RFD) (City) (State) (Zip)
(Signed) [Signature] (Signed) _____
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

ATTENTION OWNER: Confidentiality
Privilege Notice on reverse side
of Well Owner's copy (pink)

State of Texas WELL REPORT

MW-22B

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
512-463-7880

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4910 LIBERTY RD, HOUSTON TX
County (Street, RFD or other) (City) (State) (Zip) Grid # 65-14-8

3) TYPE OF WORK (Check):
 New Well Deepening
 Reconditioning Plugging

4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic
 Industrial Irrigation Injection Public Supply De-watering Testwell
 If Public Supply well, were plans submitted to the TNRCC? Yes No

6) WELL LOG:

Date Drilling:	DIAMETER OF HOLE		
	Dia. (in.)	From (ft.)	To (ft.)
Started <u>10-27</u> 19 <u>98</u>	10	Surface	24
Completed <u>10-29</u> 19 <u>98</u>	6	24	38

7) DRILLING METHOD (Check): Driven
 Air Rotary Mud Rotary Bored
 Air Hammer Cable Tool Jetted
 Other HOLLOW STEM & MUD ROTARY

From (ft.)	To (ft.)	Description and color of formation material
0-1'	1'	SILTY SAND, BROWN
01-03'	3'	SILTY SANDY CLAY, GRAYISH BROWN
03-14'	14'	SILTY CLAY, GRAY
14-15'	15'	SANDY CLAY, GRAY
15-18'	18'	CLAYEY SAND, GRAY
18-25'	25'	SILTY CLAY, GRAY
25-28'	28'	SANDY SILTY CLAY, GRAY
28-38'	38'	CLAYEY SAND, BROWN
38-42'	42'	SILTY CLAY, YELLOWISH RED

8) Borehole Completion (Check): Open Hole Straight Wall
 Underreamed Gravel Packed Other _____
 If Gravel Packed give interval from 25.5 ft. to 38.0 ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
2	N	SCH 40 PVC	0	21.5	
2	N	SCH 40 PVC	21.5	38	

(Use reverse side of Well Owner's copy, if necessary)

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

9) CEMENTING DATA

Cemented from 6 ft. to 23.5 ft. No. of sacks used 9
 Method used GRAVITY AND TREMIE
 Cemented by KEITH BARGE
 Distance to septic system field lines or other concentrated contamination N/A
 Method of verification of above distance _____

14) TYPE PUMP: N/A

Turbine Jet Submersible Cylinder
 Other _____
 Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) SURFACE COMPLETION

Specified Surface Slab Installed
 Specified Steel Sleeve Installed
 Pileless Adapter Used
 Approved Alternative Procedure Used

15) WELL TESTS: N/A

Type test: Pump Bailor Jetted Estimated
 Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

11) WATER LEVEL:

Static level 3.70 ft. below land surface Date 11/10/98
 Artesian flow _____ gpm. Date _____

16) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
 Type of water? _____ Depth of strata _____
 Was a chemical analysis made? Yes No

12) PACKERS:

Type	Depth
Bentonite	23 to 25.5

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Best Drilling Services, Inc. WELL DRILLER'S LICENSE NO. 4786-M
 ADDRESS P.O. Box 845 (Type or print) Friendswood Texas 77546
(Street or RFD) (City) (State) (Zip)

(Signed) [Signature] (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

ATTENTION OWNER: Confidentiality
Privilege Notice on reverse side
of Well Owner's copy (pink)

State of Texas WELL REPORT

MW-23C

Texas Department of Licensing & Regulation
P.O. Box 12157
Austin, TX 78711
512-463-7880

1) OWNER SOUTHER PACIFIC TRANSP. CO. ADDRESS 1416 DODGE ST., OMAHA NE 68179
(Name) (Street or RFD) (City) (State) (Zip)

2) ADDRESS OF WELL'S LOCATION: 4910 LIBERTY RD, HOUSTON Long. Lat.
County (Street, RFD or other) (City) (State) (Zip) Grid # 105-14-8

3) TYPE OF WORK (Check): New Well Deepening Reconditioning Plugging

4) PROPOSED USE (Check): Monitor Environmental Soil Boring Domestic Industrial Irrigation Injection Public Supply De-watering Testwell
 If Public Supply well, were plans submitted to the TNRCC? Yes No

6) WELL LOG: Date Drilling: Started 10-14 1998 Completed 10-14 1998

Dia. (in.)	DIAMETER OF HOLE	
	From (ft.)	To (ft.)
10	Surface	57
6	57	72

7) DRILLING METHOD (Check): Driven Air Rotary Mud Rotary Bored Air Hammer Cable Tool Jetted Other

From (ft.)	To (ft.)	Description and color of formation material
0	2	Silty sand, brown
2	5	Clayey sandy silt, brown
5	7	Scarcely clay, gray
7	11	Silty clay, gray
11	15	Sandy clay, gray
15	25	Clayey sand, gray to brown
25	26	Clay, yellowish red
26	33	Silty clay, gray
33	37	Clay, brown
37	45	Clay, yellowish red
45	47	Clay, red

8) Borehole Completion (Check): Open Hole Straight Wall Underreamed Gravel Packed Other
 If Gravel Packed give interval from 60.5 ft. to 72.0 ft.

CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
2	N	SCN1 40 PVC	0	52.5	
2	N	SCN1 40 PVC	52.5	72	0.01
6	N	STEEL	0	57	

9) CEMENTING DATA
 Cemented from 0 ft. to 58 ft. No. of sacks used 20
 Method used GRAVITY AND TREMIE
 Cemented by KEITH BARGE
 Distance to septic system field lines or other concentrated contamination N/A
 Method of verification of above distance N/A

13) Well plugged within 48 hours

Casing left in well:		Cement/bentonite placed in well:		Sacks used:
From (ft)	To (ft)	From (ft)	To (ft)	

14) TYPE PUMP: N/A
 Turbine Jet Submersible Cylinder Other
 Depth to pump bowls, cylinder, jet, etc., _____ ft.

10) SURFACE COMPLETION
 Specified Surface Slab Installed
 Specified Steel Sleeve Installed
 Pitless Adapter Used
 Approved Alternative Procedure Used

11) WATER LEVEL:
 Static level _____ ft. below land surface Date _____
 Artesian flow _____ gpm. Date _____

15) WELL TESTS: N/A
 Type test: Pump Bailor Jetted Estimated
 Yield: _____ gpm with _____ ft. drawdown after _____ hrs.

16) WATER QUALITY:
 Did you knowingly penetrate any strata which contained undesirable constituents?
 Yes No If yes, submit "REPORT OF UNDESIRABLE WATER"
 Type of water? _____ Depth of strata _____
 Was a chemical analysis made? Yes No

I certify that I drilled this well (or the well was drilled under my direct supervision) and that each and all of the statements herein are true and correct. I understand that failure to complete items 1 thru 16 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Best Drilling Services, Inc. WELL DRILLER'S LICENSE NO. 4786M

ADDRESS P.O. Box 845 Friendswood Texas 77546
(Type or print) (City) (State) (Zip)

(Signed) [Signature] (Licensed Well Driller) (Signed) _____ (Registered Driller Trainee)

Data Summary Tables
Appendix C

September 10, 1999
W.O. #422-09

Environmental Resources Management
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 579-8999

TABLE: C-1

Surface Soil Analytical Results (a, b)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID	MW-21C MW21C-00		MW-22A MW22A-00		MW-23C SB23-00		SB-21 SB21-00		SB-22 SB22-00		SB-26 SB26-00		SB-27 SB27-00		SB-28 SB28-00	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds																
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
TOLUENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Semivolatile Compounds																
1,2-DIPHENYLHYDRAZINE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
2,4-DINITROTOLUENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
2,6-DINITROTOLUENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
2-CHLORONAPHTHALENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
2-METHYLNAPHTHALENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
4,6-DINITRO-O-CRESOL	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
4-NITROPHENOL	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
ACENAPHTHENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
ACENAPHTHYLENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
ANTHRACENE	ND	3.8	ND	3.6	ND	0.55	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
BENZO(A)ANTHRACENE	ND	3.8	ND	3.6	0.49	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
BENZO(A)PYRENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
BIS(2-CHLOROETHOXYMETHANE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
BIS(2-ETHYL HEXYL)PHTHALATE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
CHRYSENE	ND	3.8	ND	3.6	ND	0.83	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
DI-N-BUTYL PHTHALATE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
DIBENZOFURAN	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
DIMETHYLPHENOL	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
FLUORANTHENE	ND	3.8	ND	3.6	1.32	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
FLUORENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
N-NITROSODIPHENYLAMINE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
NAPHTHALENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
NITROBENZENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
PENTACHLOROPHENOL	ND	19	ND	18	ND	1.7	ND	18	ND	1.9	ND	17	ND	1.8	ND	19
PHENANTHRENE	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
PHENOL	ND	3.8	ND	3.6	ND	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7
PYRENE	ND	3.8	ND	3.6	1.68	0.34	ND	3.7	ND	0.39	ND	3.5	ND	0.36	ND	3.7

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.
(b) Surface soil samples were collected at a depth of 0 to 1 feet below ground surface.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-1 (Cont'd)

Surface Soil Analytical Results (a, b)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

ANALYTICAL RESULT (mg/kg)	SB-29		SB-31		SB-32		SB-33		SB-34		SB-35		SB-36		SB-37	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds																
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
TOLUENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	0.001	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Semivolatile Compounds																
1,2-DIPHENYLHYDRAZINE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
2,4-DINITROTOLUENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
2,6-DINITROTOLUENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
2-CHLORONAPHTHALENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
2-METHYLNAPHTHALENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
4,6-DINITRO-O-CRESOL	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
4-NITROPHENOL	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
ACENAPHTHENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
ACENAPHTHYLENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
ANTHRACENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
BENZO(A)ANTHRACENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
BENZO(A)PYRENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
BIS(2-CHLOROETHOXY)METHANE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
BIS(2-ETHYL HEXYL)PHTHALATE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
CHRYSENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
DI-N-BUTYL PHTHALATE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
DIBENZOFURAN	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
DIMETHYLPHENOL	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
FLUORANTHENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
FLUORENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
N-NITROSODIPHENYLAMINE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
NAPHTHALENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
NITROBENZENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
PENTACHLOROPHENOL	ND	20	ND	2.0	ND	1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.9
PHENANTHRENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
PHENOL	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37
PYRENE	ND	3.9	ND	0.4	ND	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.37

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

(b) Surface soil samples were collected at a depth of 0 to 1 feet below ground surface.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-1 (Cont'd)

Surface Soil Analytical Results (a, b)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

ANALYTICAL RESULT (mg/kg)	SB-38 SB38-00		SB-39 SB39-00		SB-40 SB40-00		SB-43 SB43-00		SB-44 SB44-00	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
<u>Volatile Compounds</u>										
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
TOLUENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
<u>Semivolatile Compounds</u>										
1,2-DIPHENYLDIAZINE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
2,4-DINITROTOLUENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
2,6-DINITROTOLUENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
2-CHLORONAPHTHALENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
2-METHYLNAPHTHALENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
4,6-DINITRO-O-CRESOL	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
4-NITROPHENOL	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
ACENAPHTHENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
ACENAPHTHYLENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
ANTHRACENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
BENZO(A)ANTHRACENE	0.45	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
BENZO(A)PYRENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
BIS(2-CHLOROETHOXY)METHANE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
CHRYSENE	0.51	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
DI-N-BUTYL PHTHALATE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
DIBENZOFURAN	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
DIMETHYLPHENOL	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
FLUORANTHENE	1.60	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
FLUORENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
N-NITROSODIPHENYLAMINE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
NAPHTHALENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
NITROBENZENE	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
PENTACHLOROPHENOL	ND	1.9	ND	1.9	ND	2.0	ND	1.9	ND	1.9
PHENANTHRENE	0.50	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
PHENOL	ND	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37
PYRENE	1.63	0.37	ND	0.38	ND	0.39	ND	0.37	ND	0.37

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

(b) Surface soil samples were collected at a depth of 0 to 1 feet below ground surface.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-2

Subsurface Soil Analytical Results (a)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/kg)	MW-19C		MW-21C-08		MW-21C-20		MW-21C-44		MW-21C-44 D		MW-21C-72		MW-21C-72 D	
	MW19C-38	MW19C-55	MW19C-60	MW19C-73	MW21C-08	MW21C-20	MW21C-44	MW21C-44 D	MW21C-72	MW21C-72 D	MW21C-44 D	MW21C-72	MW21C-72 D	MW21C-72 D
	38 - 40 Conc. LOQ	55 - 57 Conc. LOQ	60 - 62 Conc. LOQ	73 - 75 Conc. LOQ	8 - 10 Conc. LOQ	20 - 22 Conc. LOQ	44 - 46 Conc. LOQ	44 - 46 Conc. LOQ	72 - 74 Conc. LOQ	72 - 74 Conc. LOQ	44 - 46 Conc. LOQ	72 - 74 Conc. LOQ	72 - 74 Conc. LOQ	72 - 74 Conc. LOQ
Volatiles Compounds														
1,2-DICHLOROETHANE	ND	ND	0.007	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	0.050	ND	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
CHLOROBENZENE	ND	ND	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
DICHLOROMETHANE	ND	ND	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
ETHYLBENZENE	0.133	ND	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
TOLUENE	0.175	ND	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
XYLENES	0.448	0.001	ND	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND
Semivolatile Compounds														
1,2-DIPHENYLHYDRAZINE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
2,4-DINITROTOLUENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
2,6-DINITROTOLUENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
2-CHLORONAPHTHALENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
2-METHYLNAPHTHALENE	6.46	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
4,6-DINITRO-O-CRESOL	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
4-NITROPHENOL	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
ACENAPHTHENE	1.56	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
ACENAPHTHYLENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
ANTHRACENE	2.29	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
BENZO(A)ANTHRACENE	0.64	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
BENZO(A)PYRENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
BIS(2-CHLOROETHOXY)METHANE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
CHRYSENE	0.60	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
DI-N-BUTYL PHTHALATE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
DIBENZOFURAN	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
DIMETHYLPHENOL	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
FLUORANTHENE	4.97	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
FLUORENE	1.39	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
N-NITROSODIPIENTYLAMINE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
NAPHTHALENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
NITROBENZENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
PENTACHLOROPHENOL	ND	2.1	ND	ND	2.1	ND	2.1	ND	2.0	ND	2.0	ND	2.0	2.2
PHENANTHRENE	ND	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
PHENOL	0.65	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND
PYRENE	3.68	0.41	ND	ND	0.42	ND	0.41	ND	0.4	ND	0.38	ND	0.41	ND

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-2 (Cont'd)

Subsurface Soil Analytical Results (a)
Phase 2B RI/IEOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/kg)	MW-22B		SB-22		MW-23C		SB23-73			
	MW22B-22		SB22-44		SB23-55		SB23-60			
	22 - 24 Conc.	22 - 24 LOQ	44 - 46 Conc.	44 - 46 LOQ	55 - 57 Conc.	55 - 57 LOQ	60 - 62 Conc.	60 - 62 LOQ	73 - 75 Conc.	73 - 75 LOQ
Volatile Compounds										
1,2-DICHLOROETHANE	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
BENZENE	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001
TOLUENE	ND	0.001	ND	0.164	ND	0.001	ND	0.001	ND	0.001
XYLENES	ND	0.001	ND	0.417	ND	0.001	ND	0.001	ND	0.001
Semivolatile Compounds										
1,2-DIPHENYLDRAZINE	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
2,4-DINITROTOLUENE	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
2,6-DINITROTOLUENE	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
2-CHLORONAPHTHALENE	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
2-METHYLNAPHTHALENE	NA	NA	NA	3.98	ND	0.42	45.13	0.39	ND	0.43
4,6-DINITRO-O-CRESOL	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
4-NITROPHENOL	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
ACENAPHTHENE	NA	NA	NA	3.54	ND	0.42	37.45	0.39	ND	0.43
ACENAPHTHYLENE	NA	NA	NA	0.38	ND	0.42	ND	0.42	ND	0.43
ANTHRACENE	NA	NA	NA	2.16	ND	0.42	40.95	0.39	ND	0.43
BENZO(A)ANTHRACENE	NA	NA	NA	ND	ND	0.42	4.56	0.39	ND	0.43
BENZO(A)PYRENE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
BIS(2-CHLOROETHOXY)METHANE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
BIS(2-ETHYL HEXYL)PHTHALATE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
CHRYSENE	NA	NA	NA	ND	ND	0.42	4.54	0.39	ND	0.43
DI-N-BUTYL PHTHALATE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
DIBENZOFURAN	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
DIMETHYLPHENOL	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
FLUORANTHENE	NA	NA	NA	3.58	ND	0.42	37.34	0.39	ND	0.43
FLUORENE	NA	NA	NA	3.08	ND	0.42	37.58	0.39	ND	0.43
N-NITROSODIPHENYLAMINE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
NAPHTHALENE	NA	NA	NA	14.81	ND	0.42	534.98	0.39	ND	0.43
NITROBENZENE	NA	NA	NA	ND	ND	0.42	ND	0.39	ND	0.43
PENTACHLOROPHENOL	NA	NA	NA	1.9	ND	2.1	ND	2.0	ND	2.2
PHENANTHRENE	NA	NA	NA	8.69	ND	0.42	117.94	0.39	ND	0.43
PHENOL	NA	NA	NA	ND	ND	0.42	0.67	0.39	ND	0.43
PYRENE	NA	NA	NA	2.73	ND	0.42	26.77	0.39	ND	0.43

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-2 (Cont'd)
 Subsurface Soil Analytical Results (a)
 Phase 2B RIH/EOC Investigation

Houston Wood Preserving Works
 Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/kg)	SB-24		SB-25		SB-28		SB-37		SB37-22.5 D			
	SB24-34 34 - 36		SB25-35 35-36		SB28-40 40 - 42		SB28-49 49 - 50		SB37-12 12 - 14		SB37-22.5 D 22.5 - 24	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds												
1,2-DICHLOROETHANE	ND	0.006	ND	0.006	ND	0.006	ND	0.006	ND	0.001	ND	0.001
BENZENE	0.553	0.006	ND	0.001	0.340	0.006	0.012	0.006	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.006	ND	0.001	ND	0.006	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.006	ND	0.001	ND	0.006	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	1.12	0.006	ND	0.001	0.412	0.006	0.028	0.006	ND	0.001	ND	0.001
TOLUENE	1.48	0.006	ND	0.001	0.700	0.006	0.035	0.006	ND	0.001	ND	0.001
XYLENES	3.15	0.006	ND	0.001	1.161	0.006	0.087	0.006	ND	0.001	ND	0.001
Semivolatile Compounds												
1,2-DIPIENYLHYDRAZINE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
2,4-DINITROTOLUENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
2,6-DINITROTOLUENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
2-CHLORONAPHTHALENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
2-METHYLNAPHTHALENE	12.5	4.0	ND	0.39	1.68	0.41	ND	0.41	ND	0.42	ND	0.4
4,6-DINITRO-O-CRESOL	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
4-NITROPHENOL	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
ACENAPHTHENE	8.60	4.0	ND	0.39	0.60	0.41	ND	0.41	ND	0.42	ND	0.4
ACENAPHTHYLENE	8.8	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
ANTHRACENE	5.75	4.0	ND	0.39	0.48	0.41	ND	0.41	ND	0.42	ND	0.4
BENZO(A)ANTHRACENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
BENZO(A)PYRENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
BIS(2-CHLOROETHOXY)METHANE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
BIS(2-ETHYL HEXYL)PHTHALATE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
CHRYSENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
DI-N-BUTYL PHTHALATE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
DIBENZOFURAN	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
DIMETHYLPHENOL	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
FLUORANTHENE	8.6	4.0	ND	0.39	0.64	0.41	ND	0.41	ND	0.42	ND	0.4
FLUORENE	7.4	4.0	ND	0.39	0.49	0.41	ND	0.41	ND	0.42	ND	0.4
N-NITROSODIPHENYLAMINE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
NAPHTHALENE	68.80	4.0	ND	0.39	8.33	0.41	ND	0.41	ND	0.42	ND	0.4
NITROBENZENE	ND	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
PENTACHLOROPHENOL	ND	20	ND	1.9	ND	2.0	ND	2.0	ND	2.1	ND	2.0
PHENANTHRENE	29.4	4.0	ND	0.39	2.41	0.41	ND	0.41	ND	0.42	ND	0.4
PHENOL	4.0	4.0	ND	0.39	ND	0.41	ND	0.41	ND	0.42	ND	0.4
PYRENE	6.3	4.0	ND	0.39	0.46	0.41	ND	0.41	ND	0.42	ND	0.4

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-2 (Cont'd)

Subsurface Soil Analytical Results (a)
Phase 2B RI/IEC Investigation

Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (fct) ANALYTICAL RESULT (mg/kg)	SB38-10		SB38-31		SB38-31-D		SB39-12		SB39-12-D		SB39-27		SB40-33		SB40-33D		SB40-53		
	10 - 12	LOQ	31 - 33	LOQ	31 - 33	LOQ	12 - 14	LOQ	12 - 14	LOQ	27 - 30	LOQ	33 - 34	LOQ	33 - 34	LOQ	53 - 54	LOQ	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	
Volatiles Compounds																			
1,2-DICHLOROETHANE	ND	0.006	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
BENZENE	0.009	0.006	ND	0.001	ND	0.001	0.034	0.001	0.028	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
CHLOROBENZENE	ND	0.006	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
DICHLOROMETHANE	ND	0.006	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
ETHYLBENZENE	0.836	0.006	ND	0.001	ND	0.001	0.205	0.001	0.061	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
TOLUENE	0.519	0.006	ND	0.001	ND	0.001	0.136	0.001	0.039	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
XYLENES	2.818	0.006	ND	0.001	ND	0.001	0.603	0.001	0.165	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND
Semivolatile Compounds																			
1,2-DIPHENYLHYDRAZINE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
2,4-DINITROTOLUENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
2,6-DINITROTOLUENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
2-CHLORONAPHTHALENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
2-METHYLNAPHTHALENE	25.1	4.1	ND	0.41	ND	0.41	5.2	4.1	12.2	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
4,6-DINITRO-O-CRESOL	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
4-NITROPHENOL	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
ACENAPHTHENE	24.3	4.1	ND	0.41	ND	0.41	4.8	4.1	13.6	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
ACENAPHTHYLENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
ANTHRACENE	18.8	4.1	ND	0.41	ND	0.41	5.9	4.1	11.9	3.9	0.39	0.38	ND	0.41	ND	0.41	ND	0.43	ND
BENZO(A)ANTHRACENE	4.9	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
BENZO(A)PYRENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
BIS(2-CHLOROETHOXY)METHANE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
BIS(2-ETHYL-HEXYL)PHTHALATE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
CHRYSENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
DI-N-BUTYL-PHTHALATE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
DIBENZOFURAN	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
DIMETHYLPHENOL	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
FLUORANTHENE	33.4	4.1	ND	0.41	ND	0.41	10.5	4.1	24.3	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
FLUORENE	30.1	4.1	ND	0.41	ND	0.41	6.5	4.1	16.5	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
N-NITROSODIPHENYLAMINE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
NAPHTHALENE	84.3	4.1	ND	0.41	ND	0.41	18.0	4.1	33.9	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
NITROBENZENE	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
PENTACHLOROPHENOL	ND	20	ND	2.1	ND	2.1	ND	21	ND	20	ND	1.9	ND	2.0	ND	2.1	ND	2.2	ND
PHENANTHRENE	98.6	4.1	ND	0.41	ND	0.41	41.2	4.1	82.4	3.9	0.40	0.38	ND	0.41	ND	0.41	ND	0.43	ND
PHENOL	ND	4.1	ND	0.41	ND	0.41	ND	4.1	ND	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND
PYRENE	19.7	4.1	ND	0.41	ND	0.41	7.0	4.1	15.5	3.9	ND	0.38	ND	0.41	ND	0.41	ND	0.43	ND

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-2 (Cont'd)

Subsurface Soil Analytical Results (a)
Phase 2B RFI/EOC Investigation

Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/kg)	SB43-07 7 - 9		SB43-13 13 - 15		SB43-21 21 - 24		SB44-15 15 - 17		SB44-22 22 - 44	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatiles Compounds										
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	0.008	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	0.082	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
TOLUENE	0.036	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	0.217	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
Semivolatile Compounds										
1,2-DIPHENYLDIAZINE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
2,4-DINITROTOLUENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
2,6-DINITROTOLUENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
2-CHLORONAPHTHALENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
2-METHYLNAPHTHALENE	7.89	0.40	1.67	0.39	ND	0.39	ND	0.44	ND	0.39
4,6-DINITRO-O-CRESOL	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
4-NITROPHENOL	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
ACENAPHTHENE	8.81	0.40	3.10	0.39	ND	0.39	ND	0.44	ND	0.39
ACENAPHTHYLENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
ANTHRACENE	4.81	0.40	2.16	0.39	ND	0.39	ND	0.44	ND	0.39
BENZO(A)ANTHRACENE	1.56	0.40	0.79	0.39	ND	0.39	ND	0.44	ND	0.39
BENZO(A)PYRENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
BIS(2-CHLOROETHOXY)METHANE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
CHRYSENE	1.37	0.40	0.73	0.39	ND	0.39	ND	0.44	ND	0.39
DI-N-BUTYL PHTHALATE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
DIBENZOFURAN	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
DIMETHYLPHENOL	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
FLUORANTHENE	10.16	0.40	4.40	0.39	ND	0.39	ND	0.44	ND	0.39
FLUORENE	9.26	0.40	3.98	0.39	ND	0.39	ND	0.44	ND	0.39
N-NITROSODIPHENYLAMINE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
NAPHTHALENE	30.96	0.40	3.39	0.39	ND	0.39	ND	0.44	ND	0.39
NITROBENZENE	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
PENTACHLOROPHENOL	ND	2.0	ND	2.0	ND	2.0	ND	2.2	ND	2.0
PHENANTHRENE	32.06	0.40	10.24	0.39	ND	0.39	ND	0.44	ND	0.39
PHENOL	ND	0.40	ND	0.39	ND	0.39	ND	0.44	ND	0.39
PYRENE	7.05	0.40	3.33	0.39	ND	0.39	ND	0.44	ND	0.39

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-3

Ground Water Analytical Results (a)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID TRANSMISSIVE ZONE ANALYTICAL RESULT (mg/L)	MW-19C		MW-20A		MW-21C		MW-22A		MW-22B		MW-23C	
	MW19C-RF12B		MW20A-RF12B		MW21C-RF12B		MW22A-RF12B		MW22B-RF12B		MW23C-RF12B	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds												
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
BENZENE	0.002	0.001	0.033	0.001	0.004	0.001	ND	0.001	0.010	0.001	0.002	0.005
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
ETHYLBENZENE	0.003	0.001	0.045	0.001	ND	0.001	ND	0.001	0.016	0.001	0.019	0.112
TOLUENE	0.004	0.001	0.067	0.001	ND	0.001	ND	0.001	0.005	0.001	0.006	0.005
XYLENES	0.012	0.001	0.196	0.001	ND	0.001	ND	0.001	0.027	0.001	0.028	0.072
Semivolatile Compounds												
1,2-DIPIHENYLHYDRAZINE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
2,4-DINITROTOLUENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
2,6-DINITROTOLUENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
2-CHLORONAPHTHALENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
2-METHYLNAPHTHALENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
4,6-DINITRO-O-CRESOL	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
4-NITROPHENOL	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
ACENAPHTHENE	0.02	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
ACENAPHTHYLENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
ANTHRACENE	0.01	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
BENZO(A)ANTHRACENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
BENZO(A)PYRENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
BIS(2-CHLOROETHOXY)METHANE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
CHRYSENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
DI-N-BUTYL PHTHALATE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
DIBENZOFURAN	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
DIMETHYLPHENOL	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
FLUORANTHENE	0.01	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
FLUORENE	0.02	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
N-NITROSODIPHENYLAMINE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
NAPHTHALENE	ND	0.01	2.3	1.0	ND	0.01	ND	0.33	1.0	0.50	1.74	0.20
NITROBENZENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
PENTACHLOROPHENOL	ND	0.05	ND	0.20	ND	0.05	ND	1.7	ND	0.20	ND	1.0
PHENANTHRENE	0.04	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
PHENOL	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20
PYRENE	ND	0.01	ND	0.20	ND	0.01	ND	0.33	ND	0.20	ND	0.20

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-3 (Cont'd)

Ground Water Analytical Results (a)
Phase 2B RFI/EOC Investigation

Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID TRANSMISSIVE ZONE ANALYTICAL RESULT (mg/L)	SB-21		SB-22		SB-25		SB-28		SB-29	
	SB21-A		SB22-A		SB25-A		SB28-A		SB29-A	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds										
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	0.006	0.001	ND	0.001	0.002	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	0.069	0.001	0.008	0.001	ND	0.001	ND	0.001	ND	0.002
TOLUENE	0.005	0.001	0.005	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	0.010	0.001	0.010	0.001	ND	0.001	ND	0.001	ND	0.004
Semivolatile Compounds										
1,2-DIPIHENYLHYDRAZINE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
2,4-DINITROTOLUENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
2,6-DINITROTOLUENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
2-CHLORONAPHTHALENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
2-METHYLNAPHTHALENE	0.02	0.01	0.01	0.01	ND	0.33	ND	0.33	ND	0.33
4,6-DINITRO-O-CRESOL	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
4-NITROPHENOL	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
ACENAPHTHYLENE	0.07	0.01	0.06	0.01	ND	0.33	ND	0.33	ND	0.33
ACENAPHTHENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
ANTHRACENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
BENZO(A)ANTHRACENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
BENZO(A)PYRENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
BIS(2-CHLOROETHOXY)METHANE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
CHRYSENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
DI-N-BUTYL PHTHALATE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
DIBENZOFURAN	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
DIMETHYLPHENOL	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
FLUORANTHENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
FLUORENE	0.03	0.01	0.02	0.01	ND	0.33	ND	0.33	ND	0.33
N-NITROSODIPHENYLAMINE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
NAPHTHALENE	0.40	0.01	0.32	0.01	ND	0.33	ND	0.33	ND	0.33
NITROBENZENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
PENTACHLOROPHENOL	ND	0.05	ND	0.05	ND	1.7	ND	1.7	ND	1.7
PHENANTHRENE	0.03	0.01	0.01	0.01	ND	0.33	ND	0.33	ND	0.33
PHENOL	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33
PYRENE	ND	0.01	ND	0.01	ND	0.33	ND	0.33	ND	0.33

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

Conc. = Reported Concentration

LOQ = Limit of Quantization

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-3 (Cont'd)

Ground Water Analytical Results (a)
Phase 2B RFI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID TRANSMISSIVE ZONE ANALYTICAL RESULT (mg/L)	SB30-B		SB30-B-D		SB37-A		SB37-A-D		SB40-A	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds										
1,2-DICHLOROETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
BENZENE	0.004	0.001	0.005	0.001	ND	0.001	ND	0.001	ND	0.001
CHLOROBENZENE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
DICHLOROMETHANE	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.001
ETHYLBENZENE	0.005	0.001	0.006	0.001	ND	0.001	ND	0.001	ND	0.001
TOLUENE	0.013	0.001	0.015	0.001	ND	0.001	ND	0.001	ND	0.001
XYLENES	0.013	0.001	0.015	0.001	ND	0.001	ND	0.001	ND	0.001
Semivolatile Compounds										
1,2-DIPHENYLHYDRAZINE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
2,4-DINITROTOLUENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
2,6-DINITROTOLUENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
2-CHLORONAPHTHALENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
2-METHYLNAPHTHALENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
4,6-DINITRO-O-CRESOL	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
4-NITROPHENOL	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
ACENAPHTHENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
ACENAPHTHYLENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
ANTHRACENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
BENZO(A)ANTHRACENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
BENZO(A)PYRENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
BIS(2-CHLOROETHOXY)METHANE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
CHRYSENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
DI-N-BUTYL PHTHALATE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
DIBENZOFURAN	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
DIMETHYLPHENOL	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
FLUORANTHENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
FLUORENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
N-NITRODIPHENYLAMINE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
NAPHTHALENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
NITROBENZENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
PENTACHLOROPHENOL	ND	1.7	ND	1.7	ND	0.05	ND	0.05	ND	1.7
PHENANTHRENE	ND	0.33	ND	0.33	0.04	0.01	0.02	0.01	ND	0.33
PHENOL	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33
PYRENE	ND	0.33	ND	0.33	ND	0.01	ND	0.01	ND	0.33

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.
Conc. = Reported Concentration
LOQ = Limit of Quantitation
ND = Not detected above the laboratory LOQ

TABLE C-4

SPLP Soil Analytical Results (a, b)
Phase 2B RI/EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/L)	MW19C-38 38 - 40		MW19C-55 55 - 57		MW19C-60 60 - 62		MW19C-73 73 - 75		MW21C-00 0-1		MW21C-08 8 - 10		SB-21 SB21-00 0-1		SSB-22 SB22-44 44 - 46		
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	
Volatile Compounds																	
1,2-DICHLOROETHANE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	
BENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	
CHLOROBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	
DICHLOROMETHANE	ND	0.015	ND	0.015	3.15	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	
ETHYLBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	
TOLUENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	0.018	0.015	
XYLENES	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	0.021	0.015	
Semivolatile Compounds																	
1,2-DIPHENYLHYDRAZINE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
2,4-DINITROTOLUENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
2,6-DINITROTOLUENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
2-CHLORONAPHTHALENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
2-METHYLNAPHTHALENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
4,6-DINITRO-O-CRESOL	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
4-NITROPHENOL	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
ACENAPHTHENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
ACENAPHTHYLENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
ANTHRACENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
BENZO(A)ANTHRACENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
BENZO(A)PYRENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
BIS(2-CHLOROETHOXY)METHANE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
CHRYSENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
DI-N-BUTYL PHTHALATE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
DIBENZOFURAN	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
DIMETHYLPHENOL	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
FLUORANTHENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
FLUORENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
N-NITROSODIPHENYLAMINE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
NAPHTHALENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
NITROBENZENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
PENTACHLOROPHENOL	ND	0.10	ND	0.50	ND	0.50	ND	0.50	ND	0.50	ND	0.50	ND	0.50	ND	0.085	
PHENANTHRENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
PHENOL	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	
PYRENE	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.10	ND	0.17	

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

(b) Soil samples not analyzed by SPLP are not included in this table.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-4 (Cont'd)

SPLP Soil Analytical Results (a, b)
Phase 2B RFI / EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID SAMPLE DEPTH (feet) ANALYTICAL RESULT (mg/L)	SB23-00		SB23-31		SB23-55		SB23-73		SB26-00		SB32-00		SB33-00		SB34-00	
	0-1		31-33		55-57		73-75		0-1		0-1		0-1		0-1	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
Volatile Compounds																
1,2-DICHLOROETHANE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
BENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
CHLOROBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
DICHLOROMETHANE	ND	0.015	ND	0.015	ND	0.015	0.243	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
ETHYLBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
TOLUENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
XYLENES	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
Semivolatile Compounds																
1,2-DIPHENYLDRAZINE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
2,4-DINITROTOLUENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
2,6-DINITROTOLUENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
2-CHLORONAPHTHALENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
2-METHYLNAPHTHALENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
4,6-DINITRO-O-CRESOL	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
4-NITROPHENOL	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
ACENAPHTHENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
ACENAPHTHYLENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
ANTHRACENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
BENZO(A)ANTHRACENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
BENZO(A)PYRENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
BIS(2-CHLOROETHOXY)METHANE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
CHRYSENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
DI-N-BUTYL PHTHALATE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
DIBENZOFURAN	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
DIMETHYLPHENOL	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
FLUORANTHENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
FLUORENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
N-NITROSODIPHENYLAMINE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
NAPHTHALENE	ND	0.020	0.085	0.020	ND	0.020	0.023	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
NITROBENZENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
PENTACHLOROPHENOL	ND	0.10	ND	0.10	ND	0.10	ND	0.50	ND	0.50	ND	0.50	ND	0.50	NA	NA
PHENANTHRENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
PHENOL	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA
PYRENE	ND	0.020	ND	0.020	ND	0.020	ND	0.10	ND	0.10	ND	0.10	ND	0.10	NA	NA

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.
(b) Soil samples not analyzed by SPLP are not included in this table.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

TABLE C-4 (Cont'd)

SPLP Soil Analytical Results (a, b)
Phase 2B RFI / EOC Investigation
Houston Wood Preserving Works
Houston, Texas

SAMPLE LOCATION SAMPLE ID	SB-35		SB-36		SB-37		SB-39		SB-43		SB-44	
	SB35-00		SB36-00		SB37-00		SB39-00		SB43-00		SB44-00	
	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ	Conc.	LOQ
1,2-DICHLOROETHANE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
BENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
CHLOROBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
DICHLOROMETHANE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
ETHYLBENZENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
TOLUENE	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
XYLENES	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015	ND	0.015
Semivolatile Compounds												
1,2-DIPHENYLHYDRAZINE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
2,4-DINITROTOLUENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
2,6-DINITROTOLUENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
2-CHLORONAPHTHALENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
2-METHYLNAPHTHALENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
4,6-DINITRO-O-CRESOL	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
4-NITROPHENOL	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
ACENAPHTHENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
ANTHRACENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
BENZO(A)ANTHRACENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
BENZO(A)PYRENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
BIS(2-CHLOROETHOXY)METHANE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
BIS(2-ETHYL HEXYL)PHTHALATE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
CHRYSENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
DI-N-BUTYL PHTHALATE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
DIBENZOFURAN	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
DIMETHYLPHENOL	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
FLUORANTHENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
FLUORENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
N-NITROSODIPHENYLAMINE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
NAPHTHALENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
NITROBENZENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
PENTACHLOROPHENOL	ND	0.10	NA	NA	ND	0.10	ND	0.10	ND	0.10	ND	0.10
PHENANTHRENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
PHENOL	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020
PYRENE	ND	0.020	NA	NA	ND	0.020	ND	0.020	ND	0.020	ND	0.020

NOTES:

(a) The analytical results summarized herein have been truncated to reflect either precision to the part-per-billion level or the number of significant figures reported for the sample-specific LOQ.

(b) Soil samples not analyzed by SPLP are not included in this table.

Conc. = Reported Concentration

LOQ = Limit of Quantitation

ND = Not detected above the laboratory LOQ

NA = Not Analyzed

Laboratory Reports
Appendix D

September 10, 1999
W.O. #422-09

Environmental Resources Management
16300 Katy Freeway, Suite 300
Houston, Texas 77094-1611
(281) 579-8999