RCRA Part B Permit Renewal Application
Compliance Plan Attachment XI.D - Vol I
Response Action Plan
Union Pacific Railroad Company
Houston Wood Preserving Works
SWR No. 31547 / Permit No. HW-50343
Houston, Texas

December 2014

Prepared for:
Union Pacific Railroad Co.

24125 Aldine Westfield Road
Spring, Texas 77373

Pastor, Behling & Wheeler, LLC
consulting engineers and scientists

RCRA PART B APPLICATION
COMPLIANCE PLAN ATTACHMENT XI.D – VOL I

RESPONSE ACTION PLAN

UNION PACIFIC RAILROAD
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TEXAS

NOVEMBER 21, 2014

Prepared for:

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UNION PACIFIC RAILROAD COMPANY

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Spring, Texas 77373

Prepared by:

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Texas Geoscience Firm No. 50248

PBW Project No. 1358

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Response Action Plan

Cover Page

Regulatory ID number (Solid waste registration number, VCP ID number, etc) SWR No. 31547
check one: X Initial submittal for this on-site property ___ Subsequent submittal for this on-site property
Report date: November 21, 2014 TCEQ Region No.: 12

TCEQ Program (check one)

- [X] Corrective Action (Mail Code 127)
- [ ] Voluntary Cleanup Program (Mail Code 221)
- [ ] RPR Section (Mail Code 137)
- [ ] Superfund PRP Lead (Mail Code 143)
- [ ] Municipal Solid Waste Permits (Mail Code 124)

On-Site Property Information

On-Site Property Name: Union Pacific Railroad Houston Wood Preserving Works Site
Street no. 4910 Pre dir: Street name Liberty Street type: Road Post dir:
City: Houston County: Harris County Code: 101 Zip: 77007
Nearest street intersection or location description: Site is located south of Liberty Rd. between Kashmere St. and Lockwood St, and north of Lee St.

Latitude: Decimal Degrees (circle one) North 29.787413
Longitude: Decimal Degrees (circle one) West 95.321062

Off-Site Affected Property Information

Off-Site Affected Property Name: See Appendix 5 for Off-Site Affected Property information
Physical Address: NA
Street no. Pre dir: Street name Street type: Post dir:
City: County: County Code: Zip:

[ ] Check if no off-site properties affected

Contact Person Information and Acknowledgement

Person (or company) Name: Union Pacific Railroad
Contact Person: Geoffrey Reeder Title: Manager, Site Remediation
Mailing Address: 24125 Aldine Westfield
City: Spring State: TX Zip: 77373 E-mail address gbreeder@up.com
Phone: 281-350-7197 Fax: 402-233-2351

By my signature below, I acknowledge the requirement of §350.2(a) that no person shall submit information to the executive director or to parties who are required to be provided information under this chapter which they know or reasonably should have known to be false or intentionally misleading, or fail to submit available information which is critical to the understanding of the matter at hand or to the basis of critical decisions which reasonably would have been influenced by that information. Violation of this rule may subject a person to the imposition of civil, criminal, or administrative penalties.

Signature of Person Geoffrey Reeder Digitally signed by Geoffrey Reeder DN: cn=Geoffrey Reeder, o=Union Pacific Railroad, ou=Environmental Site Remediation, email=gbreeder@up.com, c=US Date: 2014.12.03 15:11:45 -06'00' Name, print: Geoffrey Reeder Date: 120314

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Use this worksheet to summarize the report. Be sure to complete and submit the Checklist for Report Completeness. **Attach a chronology of activities associated with the affected property.**

Briefly describe the affected property and PCLE zones, the conclusions from the assessment activities, identify any affected or threatened receptors, and describe any other major considerations taken into account when developing this response action plan. If any portion of the response action is necessitated due to an aesthetic or nuisance condition, identify the nature of that condition and identify that portion of the response action proposed to address it. If any media that contains a PCLE zone is not addressed in this RAP, provide justification.

Property Location, Land Use, and Operations

The Union Pacific Railroad (UPRR) Houston Wood Preserving Works (HWPW) Facility at 4910 Liberty Road, Houston, Harris County, Texas (the Site) is located within unoccupied industrial land and also includes the Englewood Intermodal Yard, which is to the south of the former HWPW facilities. The Englewood Intermodal Yard is used for the transfer of box containers from rail cars to truck trailers and vice-versa. UPRR mainline rail and siding rails lie between the former HWPW and the Englewood Intermodal Yard. The Site will remain commercial/industrial for the foreseeable future. The Site was first developed for creosoting operations in 1899, and operated various creosoting operations until 1984 when operations ceased. The facility was dismantled in the early 1990s. Details of the history and previous operations at the Site have been discussed in detail in the previously submitted Affected Property Assessment Report (APAR) (ERM, 2000) and Revised APAR (ERM, 2004), as well as the RCRA Facility Assessment (RFA) Report (PRC, 1993).

The surrounding properties within a 500-foot radius of the Site, including the Englewood Intermodal Yard, consist of residential to the northwest, north, southeast, and south. The UPRR Englewood Classification Yard, commercial/industrial property, is located to the east of the Site. An area of undeveloped land and abandoned houses are located west of the Site. The 500-foot radius field survey demonstrated no current potential groundwater receptors within the residential neighborhood. No water wells, water tanks, cisterns, or windmills, or surface water bodies were encountered. The nearest surface water body is Buffalo Bayou, located approximately 1.6 miles southwest of the Site. The potential for lateral migration of groundwater from the Site to the southwest approximately 8,500 feet to Buffalo Bayou is not likely.

Assessment Results

The initial APAR prepared for the Site was submitted to the TCEQ dated June10, 2000 (ERM, 2000). A revised APAR was submitted to the TCEQ dated June 10, 2004. Pastor, Behling & Wheeler, LLC (PBW) prepared the APAR Addendum dated July 2009 (PBW, 2009). Following comments from the TCEQ, PBW submitted the Updated APAR Addendum dated October 2010, with response to comments dated March 29, 2011. The TCEQ approved the APAR in a letter dated April 13, 2011.

As detailed in the APARs and subsequent submittal, the Affected Property consists of surface soils, subsurface soils, and groundwater affected by chemical of concern (COC) at the Site: The soil and groundwater exposure pathways were evaluated as part of the Site assessments are considered to be complete and/or anticipated to be complete.

Site stratigraphy from the ground surface to a depth of approximately 135 feet is separated into the following units: Fill Material (0 to5 feet thick), A-Cohesive Zone (A-CZ) (8 to 15 feet thick); A-Transmissive Zone (A-TZ) (4 to 21 feet thick); B-Cohesive Zone (B-CZ) (6 to 19 feet thick); B-Transmissive Zone (B-TZ) (discontinuous, where present, 3 to 10 feet thick); C-Cohesive Zone (C-CZ) (8 to 20 feet thick); C-Transmissive Zone (C-TZ) (10 to 13 feet thick); D-Cohesive Zone (D-CZ) (17 to 36 feet thick); and D-Transmissive Zone (D-TZ).

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As detailed in the Updated APAR Addendum (PBW, 2010), target COCs in soil and groundwater media were evaluated using the March 2010 TCEQ TRRP Residential PCLs, or Residential Assessment Levels (RALs) to establish the Affected Property. Surface and subsurface soil data collected from 1997 through June 2010, with subsequent sampling in 2013 and 2014, were evaluated to assess the Affected Property and Protective Concentration Level (PCL) Exceedance (PCLE) Zone in surface and subsurface soils. Groundwater data from the most recent sampling event (July/August 2014) were evaluated to assess COC exceedances in groundwater.

PCLE Zones

Soils

The soil critical PCLs were established for the Site by using the lower commercial/industrial PCLs for on-site soils and residential PCLs for off-site soils for the following pathways:

- $^{Tot}Soil_{Comb}$ (Tier 1);
- $^{Air}Soil_{Inh\text{-}V}$ (Tier 1); and
- $^{GW}Soil_{Ing}$ (Tier 1 or 2).

Although the former wood preserving works portion of the Site is partially covered with crushed gravel and soil, the $^{Tot}Soil_{Comb}$ pathway was evaluated as potentially complete since potential future construction activities could occur at the Site. Most of the Englewood Intermodal Yard has a concrete pavement cover, and the rail area between the HWPW and the Englewood Intermodal Yard is covered with railroad ballast, which both prevents exposure to surface and subsurface soils in the area.

Comparing the surface and subsurface soil analytical data to the appropriate critical PCLs, concentrations of 15 COCs exceeded their respective critical PCLs:

Surface Soils

- 1,2-Diphenylhydrazine
- 2,4-Dinitrotoluene
- 2-Methylnaphthalene
- Benzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Dibenzofuran
- Naphthalene
- Pentachlorophenol
- Arsenic
- Lead

Subsurface Soils

- 2-Methylnaphthalene
- Benzene
- Naphthalene
- Pentachlorophenol

The surface soil PCLE zone extends across the Original Process Area (SWMU 5) and Recent Process Area (SWMU 4), down the South Drainage Ditch (SDD) (SWMU 2), and across the Former Inactive Wastewater Lagoon (AOC 6). The PCLE zone was primarily defined by the concentrations of benzo(a)anthracene, benzo(a)pyrene, naphthalene, and pentachlorophenol in surface soils. Additional soil sampling conducted in 2013 indicates that the surface soil PCLE Zone extends into the Englewood Intermodal Yard. Additional soil sampling in 2014 indicated that the surface soil PCLE Zone (benzo(a)pyrene and pentachlorophenol) extended north beyond the fence to the edge of Liberty Road, but was delineated along the northeast side of the Site. Arsenic and lead were detected at concentrations greater than cPCLs in surface soil in the Englewood Intermodal Yard.

For subsurface soils, the PCLE zones for 2-methylnaphthalene, naphthalene (more mobile COCs in soils), and pentachlorophenol were extrapolated using available subsurface soil data and applying the surface PCLE zone for those two COCs to the subsurface. By using the surface PCLE zone, this assumes the PCLE zone extends from the surface to the top of the uppermost GWBU (i.e. A-TZ). However for pentachlorophenol, none of the groundwater samples from A-TZ wells collected during the July/August 2014 groundwater monitoring event had detected pentachlorophenol concentrations above the RAL, suggesting the concentrations in surface and subsurface soils are protective of groundwater. The subsurface PCLE zone is confined to the area around the Original and Recent Process Areas (SWMUs 4 and 5), with a small area of naphthalene subsoil PCLE Zone in the Englewood Intermodal Yard area.

Groundwater

A total of 106 groundwater monitoring wells have been installed on and off-site in the GWBUs A-TZ, B-CZ/B-TZ, C-TZ, and D-TZ. Groundwater in A-TZ and B-TZ generally flows across the Site to the east; groundwater flow in the C-TZ flows from northeast to southwest, and groundwater flow in the D-TZ appears to flow to the northwest.

Based on the maximum groundwater analytical data from the July/August 2014 groundwater sampling event, concentrations of the following 23 target COCs exceeded their respective RALs where detected or had a SDL greater than the cPCL (>SDL) for COCs with no detections:

<u>VOCs</u>

- Benzene (A-TZ, B-TZ, C-TZ)
- Ethylbenzene (B-CZ only)
- Methylene Chloride (A-TZ, B-TZ/B-CZ, & C-TZ)
- Toluene (B-CZ only)
- Vinyl Chloride (A-TZ and B-TZ)

<u>SVOCs</u>

- 2,4-Dimethylphenol (A-TZ, B-TZ, C-TZ)
- 2,6-Dinitrotoluene (B-TZ & C-TZ)
- 2-Methylnaphthalene (A-TZ, B-CZ/B-TZ, & C-TZ)
- Acenaphthene (C-TZ only, one well*)
- Anthracene (C-TZ only, one well*)
- Benzo(a)anthracene (A-TZ, B-CZ, & C-TZ)
- Benzo(a)pyrene (A-TZ, C-TZ, and D-TZ)
- Bis(2-chloroethoxy)methane (A-TZ & C-TZ*)
- Chlorobenzene (A-TZ only, one well)
- Chrysene (C-TZ only, one well*)
- Dibenzofuran (A-TZ, B-CZ/B-TZ, & C-TZ)
- Fluoranthene (C-TZ only, one well*)
- Fluorene (C-TZ only, one well*)
- Naphthalene (A-TZ, B-CZ/B-TZ, & C-TZ)
- Pentachlorophenol (C-TZ)
- Phenanthrene (C-TZ only, one well*)
- Phenol (A-TZ, B-CZ, & C-TZ)
- Pyrene (C-TZ only, one well*)

* - COC only detected in wells with DNAPL present

As noted above, SVOCs acenaphthalene, anthracene, chrysene, fluoranthene, fluorene, phenanthrene, and pyrene were detected above cPCLs in only one well, MW-23C, which contained dense nonaqueous phase liquids (DNAPL) during the sampling event. These concentrations may overestimate the dissolved fraction in the groundwater; however, these COCs were included in the PCLE COC list.

The location and extent of the groundwater PCLE zones were determined by COCs present in

groundwater at concentrations that exceed the critical PCL ($^{GW}GW_{ing}$) using the most recent groundwater data. Groundwater PCLE Zones were mapped for the three upper GWBUs: A-TZ, B-CZ/B-TZ, and C-TZ. One COC benzo(a)pyrene has been detected in the D-TZ GWBU during the most recent groundwater sampling event. A resample from the well confirmed the initial result. UPRR will evaluate further investigation of the D-TZ following the next sampling event.

No affected or threatened receptors are associated with the groundwater PCLE zone. Groundwater supply wells are not located in the affected area and drinking water in the area is provided by a municipal water supply (City of Houston).

Creosote DNAPL has been detected in the GWBUs A-TZ, B-CZ, B-TZ, and C-TZ as noted in soil borings and monitoring wells. The sources of DNAPL observed at the Site are likely from spills and drippings at the Site over the 80+ years of wood treating operations, with most of the releases likely occurring prior to 1984. The wood treating facility was shut down and dismantled in the early 1990s; thus, the DNAPL sources were removed over 20 years ago. UPRR is currently conducting a DNAPL Recovery Pilot Study to evaluate the effectiveness of DNAPL recovery through monthly DNAPL pumping events for 24 months. The pilot study will conclude following the January 2015 recovery event.

Response Action Plan

The objective of this RAP is to develop responses to protect current and future pathways from exposure to the PCLE Zones in surface soil, subsurface soil, and groundwater. The following response actions are proposed at the Site to achieve this objective:

- Surface/subsurface soil – The surface/subsurface soil PCLE Zones at the Site will be addressed as follows:
  1. Former HWPW Area: Remedy Standard B closure through consolidating impacted soils within the Area of Contamination (AOC) and implementing Physical Control through an engineered soil cap. Periodic inspections and maintenance of the cap will be implemented;
  2. Englewood Intermodal Yard: Remedy Standard B closure by implementing Physical Control using the existing concrete pavement as a cap. Periodic inspections and maintenance of the cap will be implemented; and
  3. Railroad mainlines and siding tracks: The response action for the operational area between the Former HWPW area and the Englewood Intermodal Yard will be Remedy Standard B closure using the existing railroad ballast as a protective barrier.

- Groundwater – Remedy Standard B closure using a Plume Management Zone (PMZ) with monitored natural attenuation (MNA) for control as the response action for the groundwater PCLE Zones within the Affected Property. For the purposes of this RAP submittal, there will be two PMZ areas:
  1. On-Site PMZ – The on-site PMZ will include the cumulative groundwater PCLE Zone within the UPRR-owned property and adjacent City of Houston ROWs.
  2. Off-Site PMZ – The off-site PMZ includes the cumulative groundwater PCLE Zone that extends off-site to the north of the Site. The proposed off-site PMZ will require institutional controls for up to 101 individual properties. The timeframe to acquire the necessary landowner consent for the PMZ will be two years.

  In addition, areas where DNAPL was noted will be proposed for control under a Technical Impracticability (TI) Demonstration per 30 TAC §350.33(f). Groundwater monitoring is proposed to be performed as part of the PMZ to confirm that the lateral extent of COC concentrations greater than their respective cPCLs continue to remain within the boundaries of the PMZ. Groundwater monitoring will be initiated for both the on-site PMZ and off-site PMZ

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following approval of the RAP. During the acquisition of landowner consent for the off-site PMZ, groundwater monitoring will be conducted concurrently with the on-site PMZ monitoring requirements. DNAPL will be recovered from wells on a periodic basis through pumping to recover the readily recoverable NAPL for the GWBUs to satisfy requirements of the "no growth" PMZ and TI Zone.

What is the selected remedy standard for this affected property? ___ A **X** B

List all media that contains a PCLE zone and specify the proposed response action for each media. Indicate the type of removal, decontamination, physical control and/or institutional control action that is proposed.

Media	COCs[1]	Removal	Decontamination	Control			
				Physical Control	Modified Groundwater Response Objective[2]		
					PMZ	WCU	TI
Surface Soil	**Benzene, SVOCs, metals**			**X**			
Subsurface Soil	**SVOCs**			**X**			
Groundwater	**Benzene, SVOCs**				**X**		**X**

Is there a media that contains a PCLE zone that is not addressed in this RAP? ____ yes **X** no
If yes, provide justification for not addressing the PCLE zone in this RAP.

On-site land use: [ ] Residential [X] Commercial/Industrial
Off-site land use: [X] Residential [X] Commercial/Industrial (check all that apply)

Is this a re-submittal or revision of a previous RAP? ___ Yes **X** No
If yes, explain why the RAP is being revised or resubmitted.

Were all the appropriate notifications made in accordance with §350.55? **X** Yes ___ No
If no, explain why notifications were not made:

With the submittal in this RAP of the additional groundwater data collected from the Site since the Updated APAR Addendum (PBW, 2010), UPRR will submit proof of notifications to the potentially affected off-site landowners within 30 days of submitting the RAP to the TCEQ.

[1] Specify either a specific COC or, if the response action is the same for all COCs in one type, specify the type of COC (for example, VOCs, SVOCs, metals).
[2] If a modified groundwater response objective is proposed, check the type(s) of proposed modifications.

CHRONOLOGY

Below is a summary of the site investigation and regulatory chronology at the UPRR Former Houston Wood Preserving Works facility (listed in reverse order).

Date	Description
September 2014	UPRR holds public meeting with residents near the Site to detail institutional controls for off-site groundwater Plume Management Zone (PMZ).
July/August 2014	PBW conducts site-wide groundwater sampling event.
May 2014	PBW oversees installation of seven new monitoring wells (MW-51C, MW-76C, MW-77A, MW-78A, MW-79A, MW-80B, and MW-81B) in the Englewood Intermodal Yard to evaluate DNAPL extent and extent of chemicals of concern (COCs) in the B-CZ unit to the southeast, and one replacement well MW-34CR to replace MW-34C. Soil samples also collected from City of Houston right of way (ROW) along north perimeter of the Site.
January 2014	PBW conducts site-wide groundwater sampling event.
July 2013	PBW conducts site-wide groundwater sampling event.
February/March 2013	PBW conducts cone penetrometer testing (CPT)/rapid optical screening tool (ROST) and soil investigation at the Englewood Intermodal Yard adjacent to the UPRR Houston Wood Preserving Works (HWPW) site.
January/February 2013	PBW conducts site-wide groundwater sampling event (95 wells). PBW submits Proposed DNAPL Recovery Pilot Test letter to TCEQ dated February 5, 2013, and initiates monthly DNAPL recovery from on-site and off-site wells (10-12 wells) (planned for 24 months).
November 2012	Meet with TCEQ regarding proposed CPT/ROST investigation of Englewood Intermodal Yard based on DNAPL detected from the December 2011 investigation.
July 2012	PBW conducts site-wide groundwater sampling event.
January 2012	PBW conducts site-wide groundwater sampling event.
July 2012	PBW conducts site-wide groundwater sampling event.
December 2011	PBW installs additional monitoring wells in the cohesive zone B-CZ to evaluate extent of DNAPL in the B-CZ.
July 2011	PBW conducts site-wide groundwater sampling event.

Date	Description
April 2011	TCEQ approves the Affected Property Assessment Report (APAR) (including updates and addendums).
March 2011	PBW submits the Revised Updated APAR Addendum to the TCEQ. UPRR repairs fence around site.
January 2011	PBW conducts site-wide groundwater sampling event.
December 2010/ January 2011	UPRR/PBW submits Off-Site Notification Letters to off-site properties indicating Notice of Information Availability for the site, as required with the submittal of the Updated APAR Addendum (Oct 2012) .
October 22, 2010	PBW submits the Updated APAR Addendum to the TCEQ.
June/July 2010	PBW conducts additional soil (along northeast portion of Site) and groundwater investigation (A-TZ, B-CZ, C-TZ and D-TZ wells); including site-wide groundwater monitoring event.
February 16, 2010	UPRR Response to TCEQ Comment Letter dated November 18, 2009.
January 2010	PBW conducts site-wide groundwater sampling event; selected wells are analyzed for Volatile Organic Compounds (VOCs) by EPA Method 8620.
November 18, 2009	TCEQ Comment Letter on Revised APAR.
July 2009	PBW submits APAR Addendum to TCEQ.
January 2009	PBW conducts additional soil and groundwater investigation.
July 2008	PBW conducts additional CPT-ROST and groundwater investigation
January 2007	PBW conducts additional soil and groundwater investigation
August 2006	ERM-Southwest, Inc. (ERM) conducted additional soil and groundwater investigation
April 2006	ERM conducted additional soil and groundwater investigation
September 6, 2005	UPRR Response to TCEQ Response Letter dated August 1, 2005
August 2005	TCEQ Response to UPRR Response Letter dated June 9, 2005
June 9, 2005	UPRR Response to TCEQ Letter dated April 15, 2005
April 15, 2005	TCEQ Response to UPRR Response Letter dated November 19, 2004
November 19, 2004	UPRR Response to October 8, 2004 TCEQ Letter

Date	Description
October 8, 2004	TCEQ Comment Letter on Revised APAR
June 10, 2004	Revised APAR submitted to the TCEQ by ERM, Inc. on behalf of UPRR
November 7, 2001	Texas Natural Resources Conservation Commission (TNRCC) provides comments to July 5, 2001 response letter.
July 5, 2001	Follow-up response to November 6, 2000 TNRCC comment letter on the On-Site APAR submitted to TNRCC on behalf of UPRR.
January 9, 2001	Initial response to November 6, 2000 TNRCC comments.
November 6, 2000	TNRCC provides comments to On-Site APAR.
July 10, 2000	Affected Property Assessment Report for On-Site Property (On-Site APAR) submitted to TNRCC on behalf of UPRR by ERM.
February 20, 2000	Letter submitted to the TNRCC regarding proposed Phase 2-C investigation for further delineation of off-site areas
September 10, 1999	Phase 2-B RFI/EOC Investigation Report submitted to TNRCC on behalf of UPRR by ERM
April 27, 1998	Interim Stabilization Measures Report – Southern Drainage Ditch, submitted to TNRCC on behalf of UPRR by ERM.
February 13, 1998	Phase 2-A RFI/EOC Investigation Report submitted to TNRCC on behalf of UPRR by ERM.
January 13, 1997	RFI portion of the Phase 1 RFI/EOC Investigation Report approved by TNRCC
November 26, 1996	EOC portion of the Phase 1 RFI/EOC Investigation Report approved by TNRCC
May 23, 1996	Phase 1 RFI/EOC Report submitted on behalf of Southern Pacific Transportation Company (SPTCo) by Terranext
October 16, 1995	RFI Work Plan approved by TNRCC
September 29, 1995	EOC Work Plan approved by TNRCC
January 10, 1995	Operation and Maintenance Plan approved by TNRCC
November 3, 1994	Revised Compliance Schedule approved by TNRCC
October 14, 1994	RCRA Facility Investigation (RFI) Work Plan submitted on behalf of SPTCo
September 16, 1994	Extent of Contamination (EOC) Work Plan submitted on behalf of SPTCo
September 7, 1994	Revised Compliance Schedule submitted on behalf of SPTCo

Date	Description
August 19, 1994	Operation and Maintenance Plan and Compliance Schedule submitted on behalf of SPTCo
June 20, 1994	Permit No. HW-50343-000 and Compliance Plan CP-50343-000 issued by TNRCC.
October 1993	RCRA Facility Assessment completed on behalf of U.S. EPA by PRC Environmental Management, Inc.
May 13, 1991	RCRA Permit Application submitted by SPTCo

Note: Not all groundwater sampling events are listed in the chronology

Checklist for Report Completeness	ID No.: SWR ID 31547
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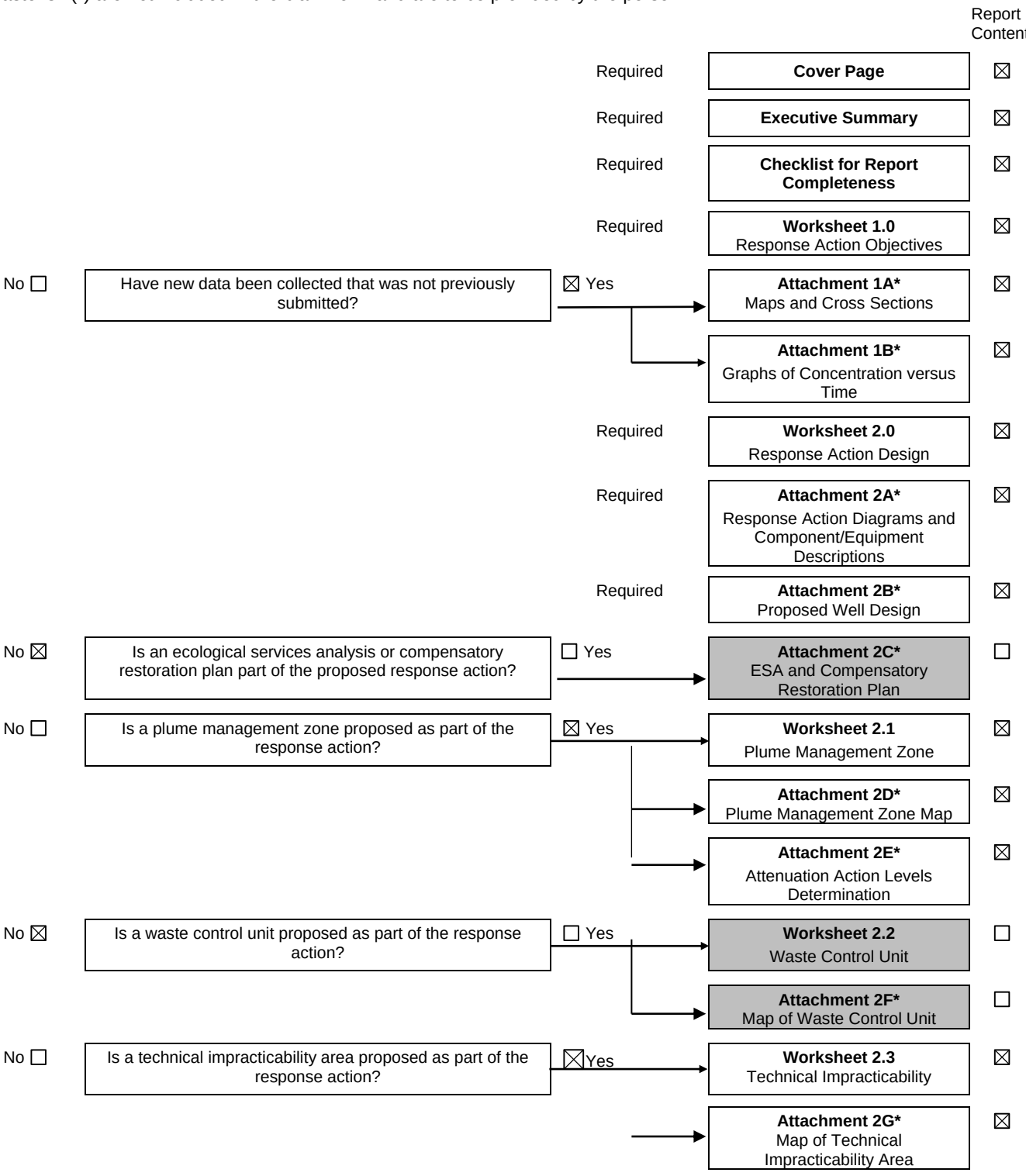
Use this checklist to determine the portions of the form that must be submitted for this report. Answer all questions by checking Yes or No. If the answer is Yes include that portion of the report. If the answer is No, do not complete or submit that portion of the report. All form contents that are marked "Required" must be submitted. Form contents marked with an asterisk (*) are not included in the blank form and are to be provided by the person.



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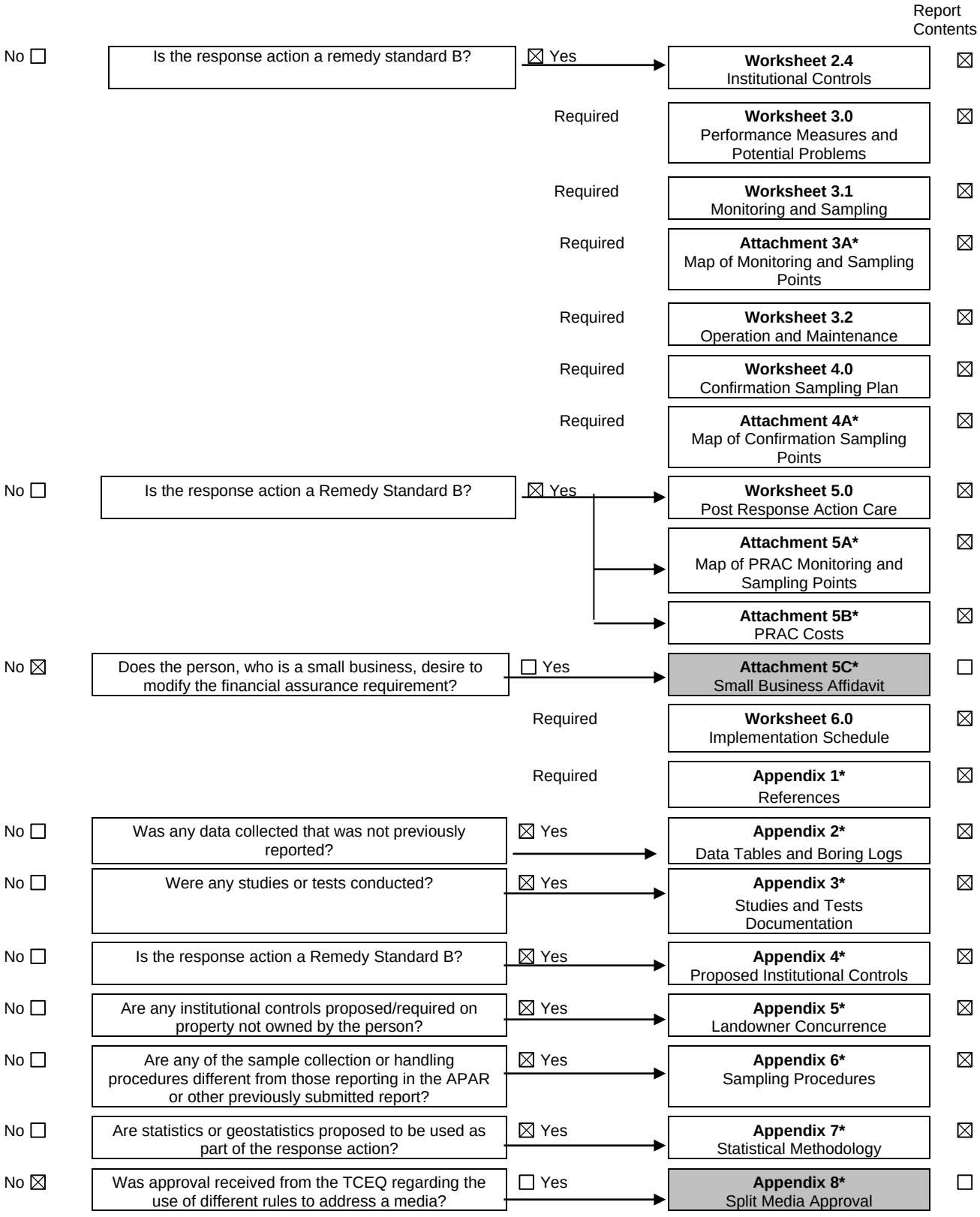

Form contents marked with an asterisk (*) are not included in the blank form.

Response Action Objectives Associated Information: Attachment 1A, 1B	RAP Worksheet 1.0 Page 1 of 8	
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Use this worksheet to describe the objectives for the response action in each media.

Response Action Objectives

List the environmental media to which this applies **Surface Soils (0 – 5 feet bgs)/Subsurface Soils (>5 feet bgs)**

Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

The Response Action Objectives (RAO) for the surface and subsurface soil PCLE Zones is to control exposure through physical barriers such that commercial/industrial workers will not be exposed to concentrations of COCs in excess of the critical human health PCLs (§350.33(a)(1)). The surface soil PCLE zone extends across the Recent Process Area (SWMU 4), Original Process Area (SWMU 5), Water Treatment and Boiler System (SWMU 6), Aboveground Storage Tank Area (SWMU 8), Oil/Water Separators (SWMU 11), down the Southern Drainage Ditch (SDD) (SWMU 2), and across the Former Inactive Wastewater Lagoon (Area of Concern (AOC) 6). The surface soil PCLE Zone also extends across the UPRR main lines and into the Englewood Intermodal Yard (Attachment 1A-Figure 4A) area.

Three key approaches will be implemented to protect commercial/industrial workers from exposure to COCs in surface and subsurface soils:

- Former HWPW area: Using the Area of Contamination (AOC) approach, surface soils with cPCL exceedances in the SDD (SWMU No. 2), Inactive Wastewater Lagoon (AOC 6), and areas north of the AST Area (SWMU No. 8) will be consolidated in the area of SWMUs 4, 5, and 8. This area will then be covered with a vegetated soil cap to prevent human exposure to the impacted soils.

- Englewood Intermodal Yard area: The surface soil PCLE zone in the Intermodal Yard area is currently covered with a physical barrier (concrete pavement), preventing contact and exposure.

- UPRR Main Lines Ballast Area: UPRR proposes to use the existing railroad ballast as an engineering control for preventing on-site worker exposure to impacted surface soils in this area.

The Affected Property (including the entire Site (HWPW and Englewood Intermodal Yard)) will also be deed restricted for commercial-industrial land use, for the use of physical controls on surface and subsurface soil, and restrictions on soil excavation within the surface and subsurface soil PCLE Zone in accordance with §350.31(g).

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

Surface soils from parts of SWMU 2 and AOC 6 will be excavated and consolidated within the Area of Contamination (Affected Property) within the former HWPW area. During consolidation activities, Site workers will operate under a site-specific health and safety plan (HASP) and impacted soils will be consolidated within the surface soil Affected Property. Any equipment and tooling that comes in contact

with impacted soils will be decontaminated and managed within the AOC. Storm water protection (i.e., Storm Water Pollution Prevention Plan (SWPPP), silt fencing) and fugitive dust monitoring will be conducted during remediation activities to ensure the activities will not result in additional exposure conditions. Verification sampling will be performed at the excavation areas following excavation of soils to ensure that the affected soils containing COCs at concentrations in excess of the applicable cPCLs have been removed. Upon completion of verification sampling, the excavation area will be restored by backfilling with clean fill and/or grading.

During construction of the cap, storm water management and dust monitoring will also be conducted to minimize impacting soils outside of the Affected Property during the response action.

For areas outside of the proposed excavation, COCs in soil will be left in place at the Site and exposure will be controlled by the use of institutional controls (commercial/industrial land use) and the use of physical barriers (engineered soil cap for the former HWPW area and concrete and railroad ballast for the Englewood Intermodal Yard).

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

Once the RAP has been approved by the TCEQ, UPRR will begin the bidding process for identifying the contractor to conduct the proposed response action, including the consolidation within the Area of Contamination. It is anticipated that the completion of the consolidation and capping of the soil PCLE Zone would be completed within 180 days of TCEQ approval of the RAP.

For the Englewood Intermodal Yard, soils will be left in place. A physical barrier (concrete and railroad ballast/ties/rail) is already in place to prevent exposure to surface soil in that area.

For the entire Affected Property, deed restriction of the Site to commercial-industrial use will also be implemented to prevent future exposure risk. The deed notice will be filed with the Harris County Clerk upon approval of the RAP. In accordance with the TCEQ regulatory guidance document *Institutional Controls Under TRRP* (RG-366/TRRP-16), proof of filing would be submitted to the TCEQ within 120 days of approval of the RAP. An example deed notice for the UPRR property is included in Appendix 4.

List the environmental media to which this applies **Groundwater**
Repeat this section for each medium that has a different response action objective.

State the property-specific response objectives for the PCLE zone in each media in the context of the response objectives set forth in §350.32 or §350.33 as applicable. Explain how the response action is appropriate based on the hydrogeologic characteristics, COC characteristics, and potential unprotective conditions that could continue or result during the remedial period.

The RAO to address the PCLE Zone in groundwater will be through control using a modified groundwater response objective through a plume management zone (PMZ) and Technical Impracticability (TI) Zone. Per §350.33, a PMZ is proposed for the Site for the three GWBUs: A-TZ, B-CZ/B-TZ, and C-TZ, with monitored natural attenuation (MNA) as the groundwater control to meet PCLs at points of exposure (POEs) for all three GWBUs. For the purposes of this RAP submittal, there will be two overall PMZ areas:

1. On-Site PMZ – The on-site PMZ will include the cumulative groundwater PCLE Zone within the UPRR-owned property and adjacent City of Houston ROW.
2. Off-Site PMZ – The off-site PMZ includes the cumulative groundwater PCLE Zone that extends off-site to the north of the Site. The proposed off-site PMZ will require institutional controls for up to 101 individual properties. Given the large number of off-site properties, and issues with property ownership in the area, the proposed timeframe to acquire the necessary landowner consent for the PMZ will be two years following approval of the RAP.

The on-site PMZ (including the former HWPW, Englewood Intermodal Yard, and adjacent City of Houston ROW) will be deed restricted to commercial-industrial land use and to restrict future use of groundwater on-site, as well as restrictions on soil excavation activities within the surface soil PCLE Zone on the UPRR-owned property. For the off-site PMZ, UPRR is currently acquiring the necessary landowner consent to establish the PMZ on properties not owned by UPRR or City of Houston ROW. UPRR has proposed to file restrictive covenants with the Harris County Clerk for the off-site properties (101 off-site properties) within the proposed cumulative PMZ (includes the three individual PMZs for the A-TZ, B-CZ.B-TZ, and C-TZ GWBUs).

UPRR proposes a TI demonstration (Worksheet 2.3) for GWBUs where DNAPL has been observed (i.e., in soil borings and/or monitoring wells in the A-TZ, B-CZ/B-TZ, and C-TZ) per §350.33 (f) for both the on-site property and off-site properties.

To address the NAPL, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be addressed through control via TI. For areas where either creosote NAPL was noted in the soil boring log in the saturated zone or is detected in monitoring wells, the TI demonstration details the difficulty of achieving groundwater PCLs in these areas because of complex hydrogeology and physical nature of creosote (discussed in Worksheet 2.3). The control endpoint will be to control the soluble NAPL fraction sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical recovery (recover readily recoverable creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based "no growth" PMZ can be met.

Therefore, the current response objective per the TCEQ Guidance is to ensure compliance of NAPL zone

in the overall PMZ. With the PMZ and TI established, the response objectives will include compliance with PMZ performance criteria at the NAPL zone and control via TI through institutional controls (UPRR-owned property and off-site properties) on groundwater use to protect exposure to residual NAPL and COCs in the GWBUs. As part of the evaluation for compliance with PMZ performance criteria, the on-going DNAPL Recovery Pilot Test will be used to assess if the DNAPL in the GWBUs is considered readily recoverable using the NAPL Management Tool A detailed in Appendix A of the TCEQ TRRP-32 Risk-Based NAPL Management guidance document.

Explain how the COCs will be handled, treated, disposed, or transferred to another media and document that the response action will not result in any additional potential exposure conditions due to response action activities.

Groundwater will be sampled from the selected monitoring wells on a semi-annual basis, and purge water from sampling events will be drummed for proper disposal (waste stream currently on the Notice of Registration (NOR)), stored within the Container Storage Area (CSA) (Unit 4 on the NOR), and disposed of in accordance with state and federal regulations and requirements.

Recovered creosote DNAPL from the monitoring wells will be managed at the Site in containers (i.e. drums) within the CSA. In accordance with the RCRA Permit and Compliance Plan, recovered DNAPL will be stored in the CSA, then transported and disposed of in accordance with state and federal requirements within the required timeframes.

State the proposed "reasonable time frame" and provide the justification for that time frame in the context of any potential for unprotective exposures to exist or develop, COC characteristics, hydrogeologic and affected property characteristics. If the reasonable time frame is different for the different affected media or for particular tracts of land, be sure to discuss that. Provide how the proposed response action will meet the objectives in a reasonable timeframe.

For the groundwater Remedy Standard B, the proposed response action (MNA) is currently occurring at the Site. There are no potential or unprotected exposures at the Site for groundwater since none of the properties in the area use groundwater for drinking; and the properties are provided drinking water by the City of Houston. None of the City of Houston groundwater supply wells are in the area of the Site. In addition, no groundwater drinking wells have been identified in the area and anticipated future use of the shallow groundwater as resource is unlikely.

A review of groundwater data for the Site indicates that COC concentrations in the three GWBUs are mostly stable or decreasing at the downgradient edges at the Site (Mann-Kendall trend analysis – Attachment 2E), supporting the use of the PMZ for the groundwater PCLE Zones. With the complex hydrogeology and the nature of the creosote contamination where DNAPL has been observed, groundwater PCLE Zones are proposed to be technically impracticable for groundwater restoration (Worksheet 2.3, Attachment 2G). Therefore, with the PMZ and TI Zone, no exposures to groundwater above cPCLs are expected, and furthermore, groundwater in the area will be restricted through institutional controls.

Institutional controls through deed recordation (UPRR-owned property – on-site PMZ) and restrictive covenants (off-site properties – off-site PMZ) within the PMZ and restricting the use of groundwater will

be used at the Site to prevent future exposure risk until groundwater concentrations achieve critical PCLs. The deed notice for the UPRR-owned property and restrictive covenants for off-site properties will be filed with the Harris County Clerk upon approval of the RAP. Examples of the deed restriction and restrictive covenant are included in Appendix 4. In accordance with the TCEQ regulatory guidance document *Institutional Controls Under TRRP* (RG-366/TRRP-16), proof of filing for the on-site PMZ will be submitted to the TCEQ within 120 days of approval of the RAP.

For properties that restrictive covenants are still being acquired beyond the 120 days following RAP approval, it is anticipated that either landowner consent or deed recordation will be completed for the targeted off-site properties within two years of approval of the RAP. UPRR will provide quarterly updates to the TCEQ on the status of those restrictive covenants and will request an extension for additional time for landowner consent submittal if not all of the targeted properties have either consented or have placed the institutional control on the property following the two year period.

Soil Response Action Objectives

When using removal and/or decontamination with controls or controls only, demonstrate how that physical control or combination of measures will reliably contain COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.

As previously discussed, the RAOs for surface and subsurface soil PCLE Zones is to control exposure through Remedy Standard B using physical barriers such that commercial/industrial workers will not be exposed to concentrations of COCs in excess of the critical human health PCLs (§350.33(a)(1)). In addition, COC concentrations in the surface and subsurface soils will not create a leachate that will lead to cPCL exceedances at the point of exposure wells within the proposed PMZ. Soil responses will be implemented differently depending on the location within the Site, with controls placed in the following areas:

- Former HWPW area: Once the surface soils with cPCL exceedances in the SDD (SWMU 2), Inactive Wastewater Lagoon (AOC 6), and areas north of the AST Area (SWMU 8) are consolidated within the area of SWMUs 4, 5, and 8 under the Area of Contamination policy, a vapor barrier with geotextile fabric, and an engineered soil cap will be constructed to cover the consolidated soil and remaining surface soil PCLE Zone on the former wood treating works area to contain and prevent exposure to COCs within the soil PCLE Zone at the Site. The soil cap will be vegetated and sloped to minimize infiltration to control potential leachate migration from the surface and subsurface soils to the GWBUs. The cap will be maintained under the post-response action care period. In these areas where surface soils will be removed, subsurface soils do not appear to be impacted above cPCLs. The subsurface soil PCLE Zone is within the areas where the proposed engineered soil cap will be constructed. Therefore, there will be no exposure to subsurface soils as well.

- Englewood Intermodal Yard area: The surface soil PCLE zone in the Intermodal Yard area is currently covered with a physical barrier (concrete pavement), preventing contact and infiltration. As part of the post-response action care, the concrete pavement in the area of the surface soil PCLE Zone will be inspected to ensure continued on-site worker protection.

- UPRR Main Lines Ballast Area: The area between the former wood treating works area and the Englewood Intermodal Yard (approximately 100 feet width) is covered with railroad ballast, ties, and rail. UPRR proposes to use the existing railroad ballast as an engineering control for

preventing on-site worker exposure to impacted surface soils in this area. Since this area is owned and controlled by UPRR, UPRR will implement a health and safety program to restrict any construction activity in the area of the railroad lines. In the event construction activities are necessary, a health and safety plan will be implemented to ensure worker protection from COCs in the surface soils.

For the approaches, the soil cap will be maintained and appropriate maintenance, repair of the concrete area in the Englewood Intermodal Yard will be performed as needed, and the railroad ballast will be maintained as part of the railroad operations.

The affected property will also be deed restricted to commercial-industrial land use and for the use of a physical control on surface soils in accordance with §350.31(g).

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical surface soil and subsurface soil PCL throughout the soil PCLE zone and prevent COC concentrations above the critical soil PCLs from migrating beyond the existing boundary of the soil PCLE zone.

Groundwater Response Action Objectives

Name of groundwater-bearing unit to which this information applies: **A-TZ, B-TZ/B-CZ, C-TZ – Uppermost Groundwater-Bearing Units**

Repeat this section for each groundwater-bearing unit for which a different response action is proposed.

Groundwater classification ____ 1 **X** 2 ___ 3

Is a modified groundwater response action being proposed for any part of the groundwater PCLE zone (§350.33(f)(2), (3), or (4))? **X** Yes ___ No

If yes, does the affected property meet the qualifying criteria for a modified groundwater response action using a waste control unit, plume management zone, or technical impracticability? **X** Yes ___ No

If yes, complete the appropriate portions of this report.

If no to either question, complete the following:

Explain how the removal or decontamination action will reduce the concentration of COCs to the critical groundwater PCL throughout the groundwater PCLE zone and prevent COC concentrations above the critical groundwater PCL from migrating beyond the existing boundary of the groundwater PCLE zone.

A modified Remedy Standard B groundwater RAO will be conducted at the Site through control using a PMZ and TI Zone. MNA is proposed as a control response to address the PCLE Zones within the PMZs. Within the PMZ and TI Zone, the NAPL response endpoint for the creosote DNAPL will be through the control (via TI) endpoint. The response objective will be to control the creosote DNAPL by physical (recovery from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based "no growth" PMZ can be met.

Explain how the response action will prevent COCs from migrating to air at concentrations above the PCLs for air if the groundwater-to-air PCLs ($^{Air}GW_{Inh-V}$) is exceeded.

The groundwater-to-air PCLs ($^{Air}GW_{Inh-V}$) were not exceeded in any representative groundwater samples collected at the Site. Groundwater samples from wells with DNAPL present have had naphthalene concentrations detected at concentrations greater than the $^{Air}GW_{Inh-V}$ PCL; however, the samples were collected in the deeper GWBUs (i.e., B-TZ/B-CZ) where the overlying groundwater in the A-TZ had naphthalene concentrations below the $^{Air}GW_{Inh-V}$ PCL. Therefore, potential for vapor migration from groundwater is low.

Explain how the response action will prevent COCs from migrating to surface water at concentrations above the PCLs for groundwater discharges to surface water if surface water is a factor.

Groundwater discharges to surface water are not a concern at the Site and no further action is required.

Explain how the response action will prevent human and ecological receptor exposure to the groundwater PCLE zone.

There are no potential or unprotective human health exposures at the Site for groundwater since none of the properties in the area use groundwater for drinking; and the properties are provided drinking water by

the City of Houston. For the proposed response action, implementation of the PMZ and TI, and associated application of institutional controls, will also limit future use of shallow groundwater found within the PMZ.

In regards to ecological receptors, groundwater does not discharge to ground surface nor discharges to surface water. Therefore, there is not a complete or potentially complete pathway for ecological receptors.

ATTACHMENT 1A

ATTACHMENT 1A-1 – ADDITIONAL SITE INVESTIGATION RESULTS (see CP Attachment XI.D – Volume II)

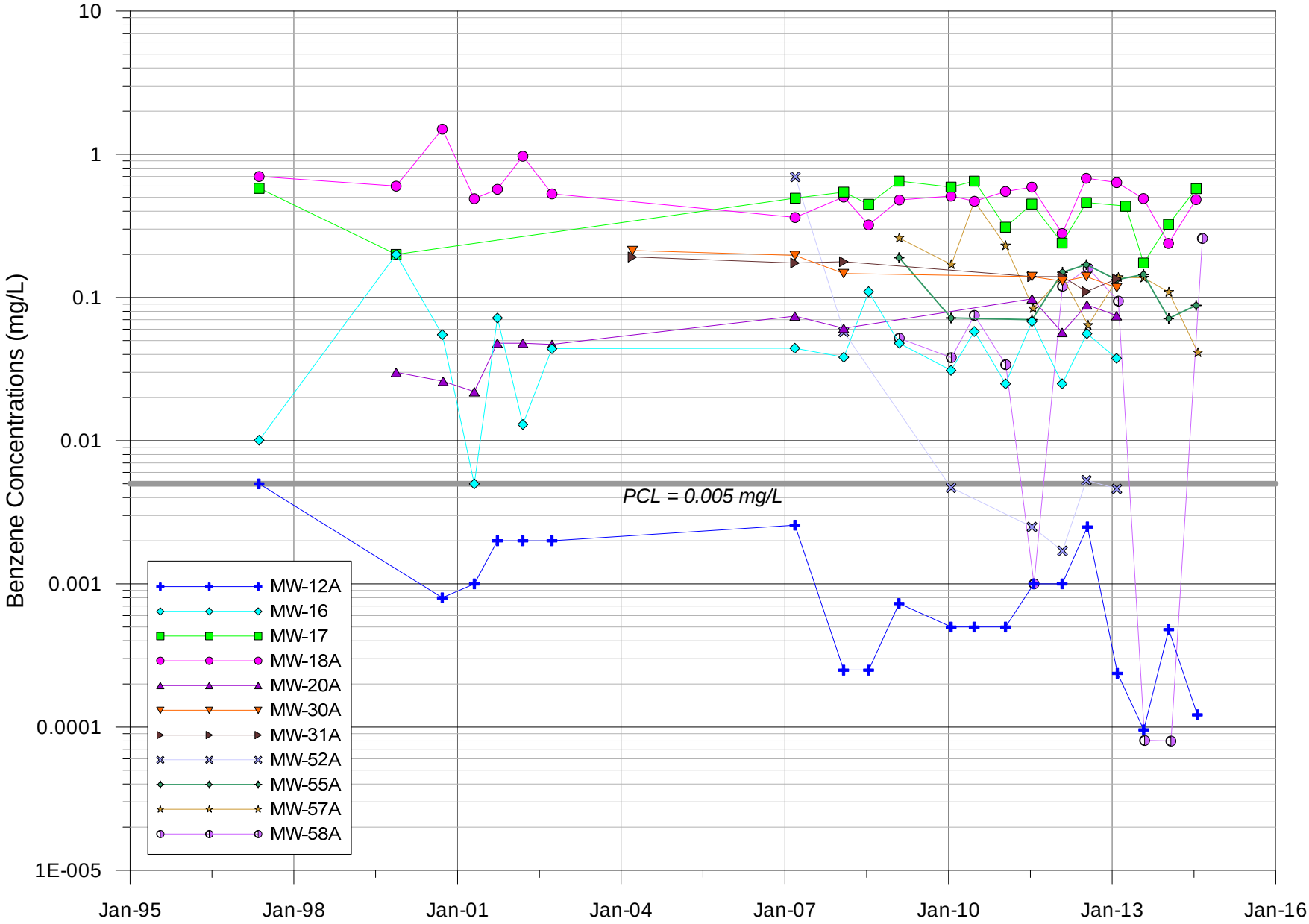
ATTACHMENT 1B

GRAPHS OF CONCENTRATION VERSUS TIME

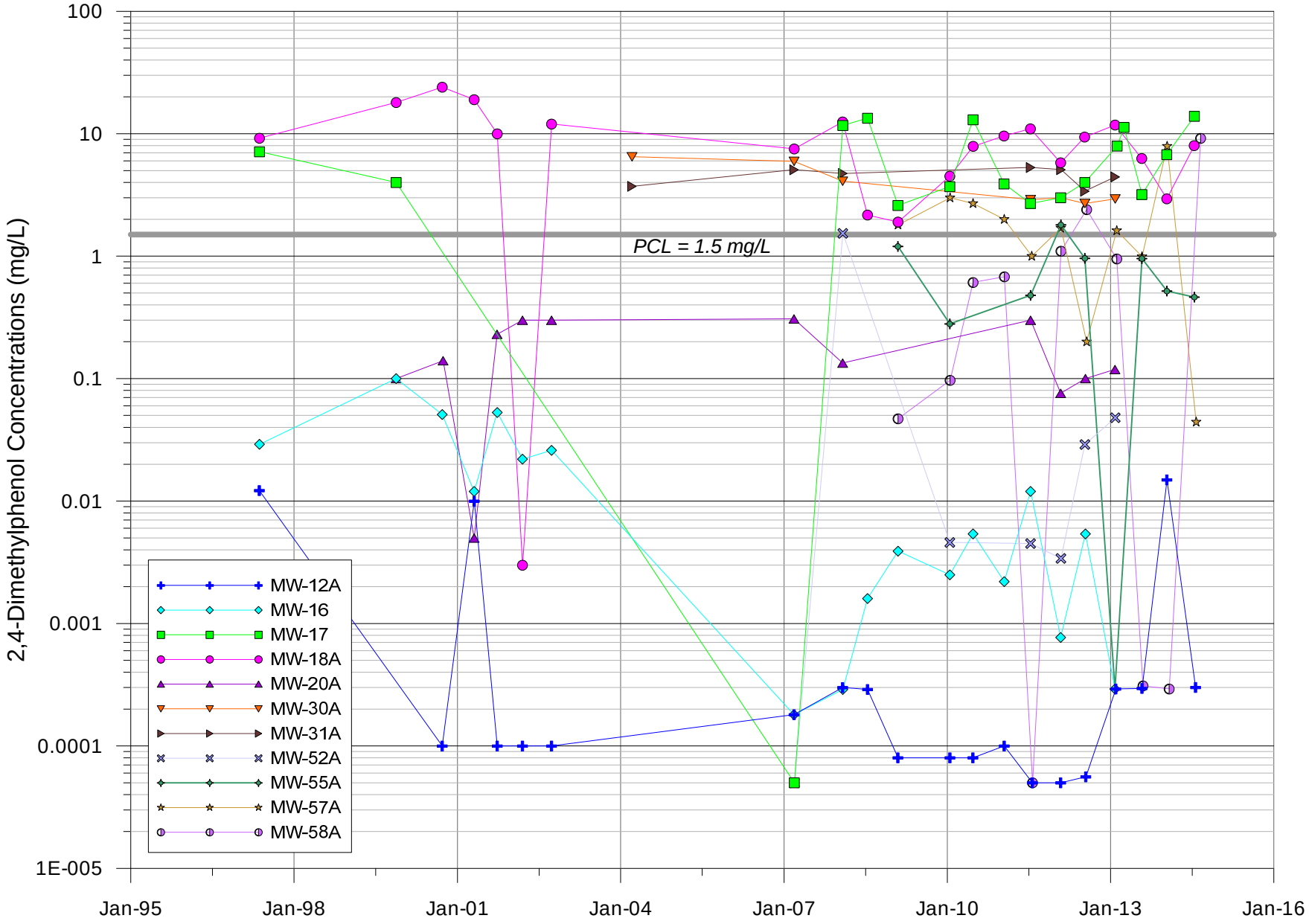
ATTACHMENT 1B-1 – 1B-45 – CHEMICAL OF CONCENTRATIONS VS. TIME GRAPHS – BY COC

ATTACHMENT 1B-46 – 1B-74 – CHEMICAL OF CONCENTRATIONS VS. TIME GRAPHS – BY MONITORING WELL

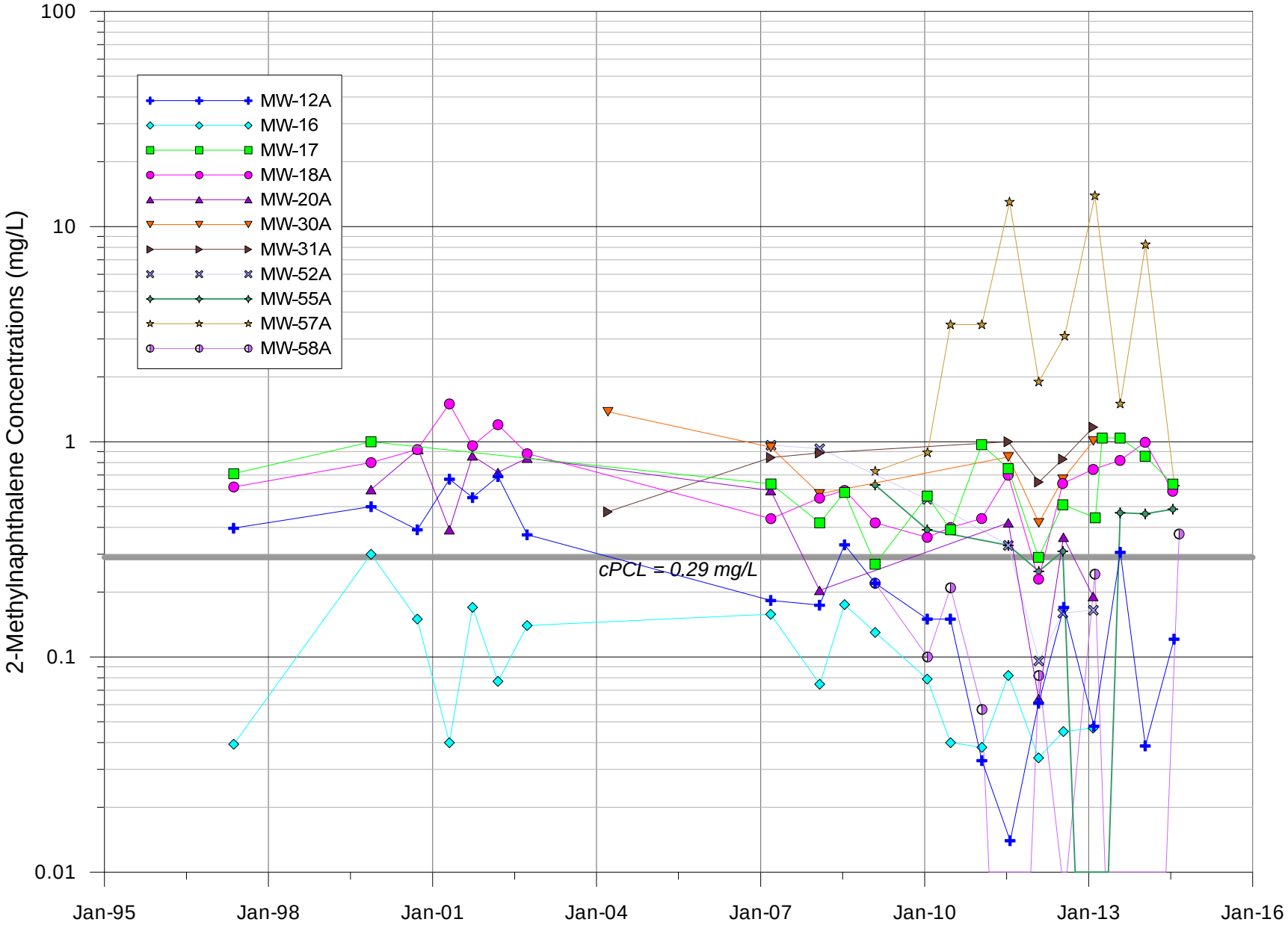
ATTACHMENT 1B-1
Benzene Concentrations at Source Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



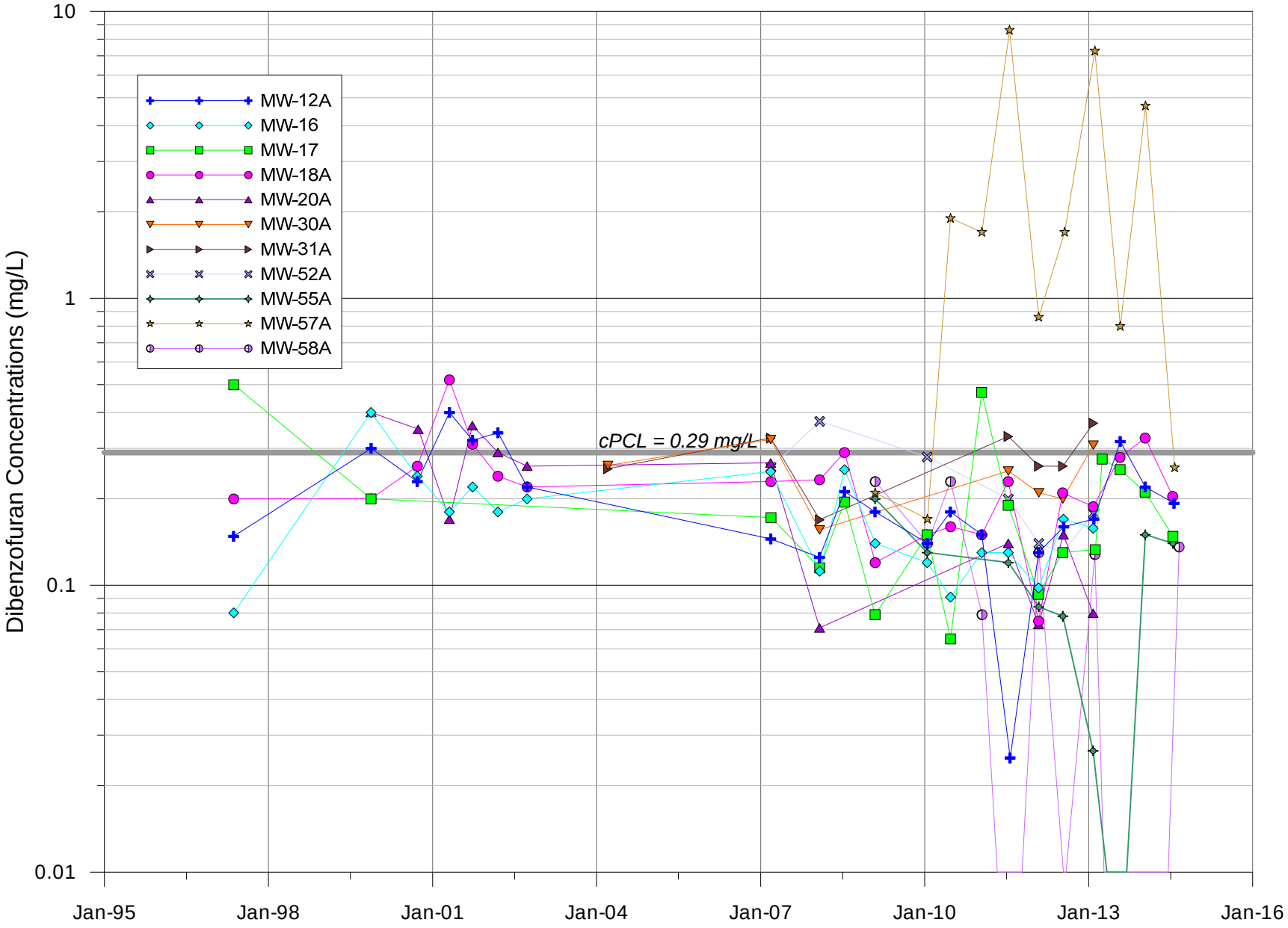
ATTACHMENT 1B-2
2,4-Dimethylphenol Concentrations at Source Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



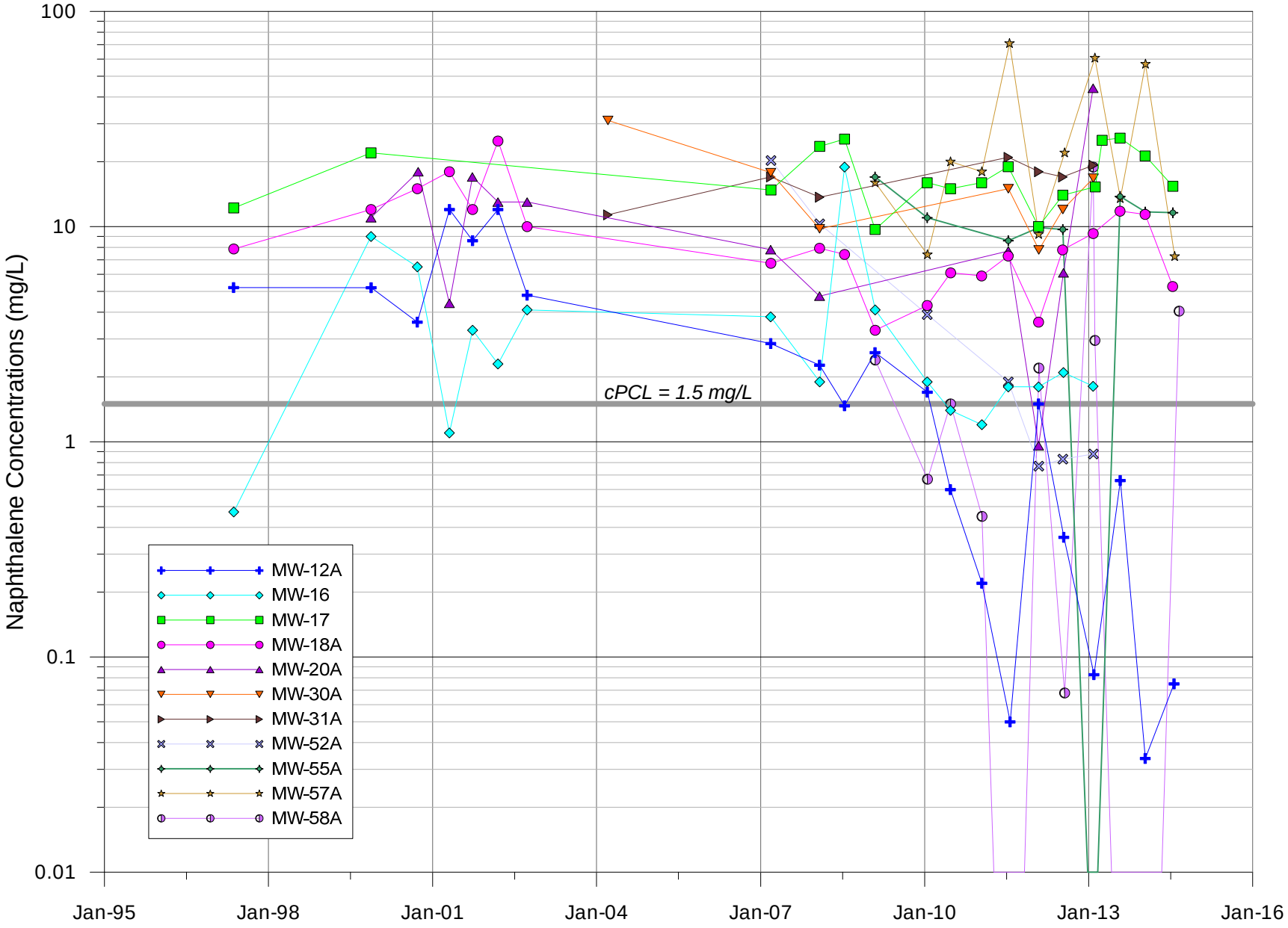
ATTACHMENT 1B-3
2-Methylnaphthalene Concentrations at Source Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



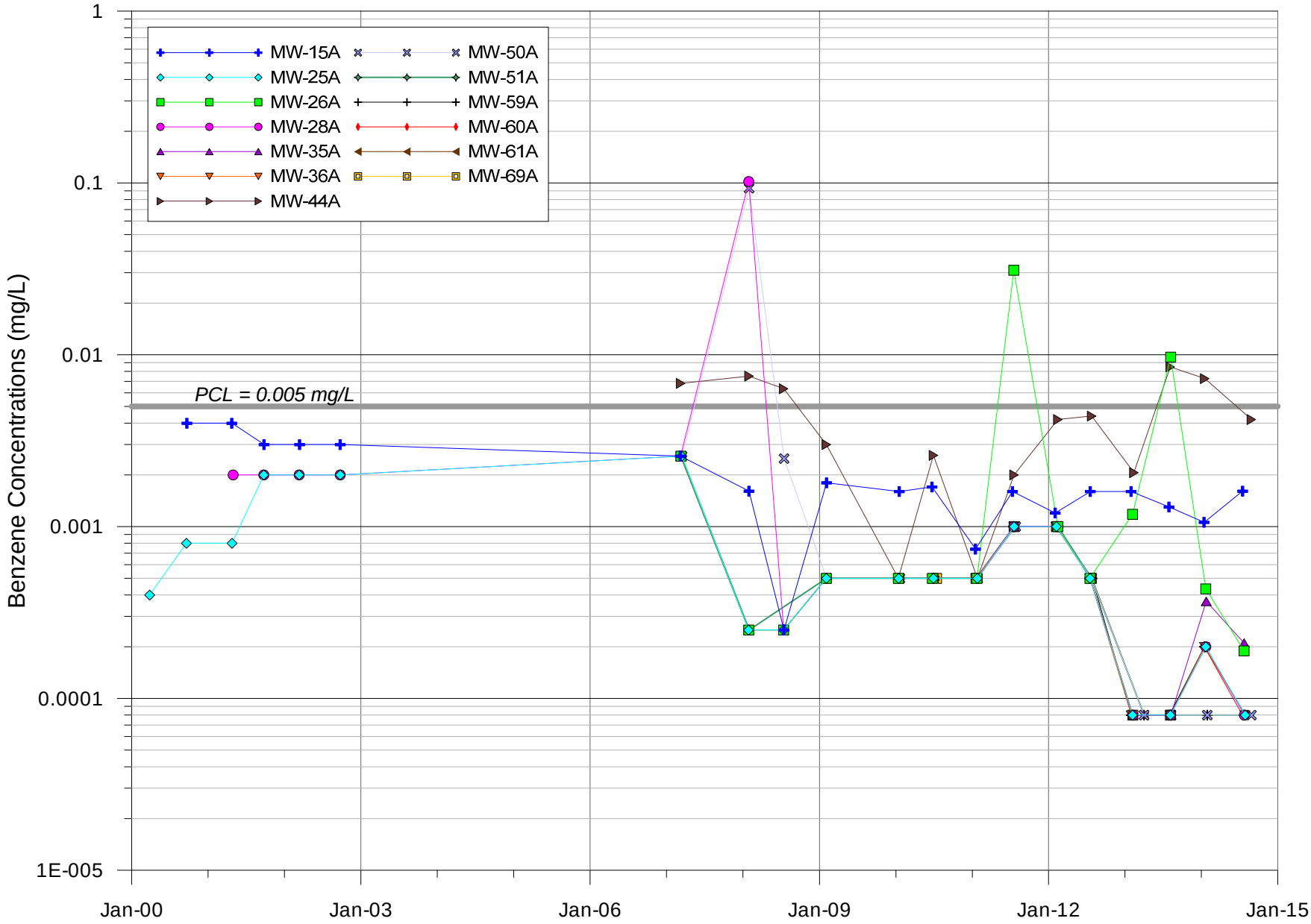
ATTACHMENT 1B-4
Dibenzofuran Concentrations at Source Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



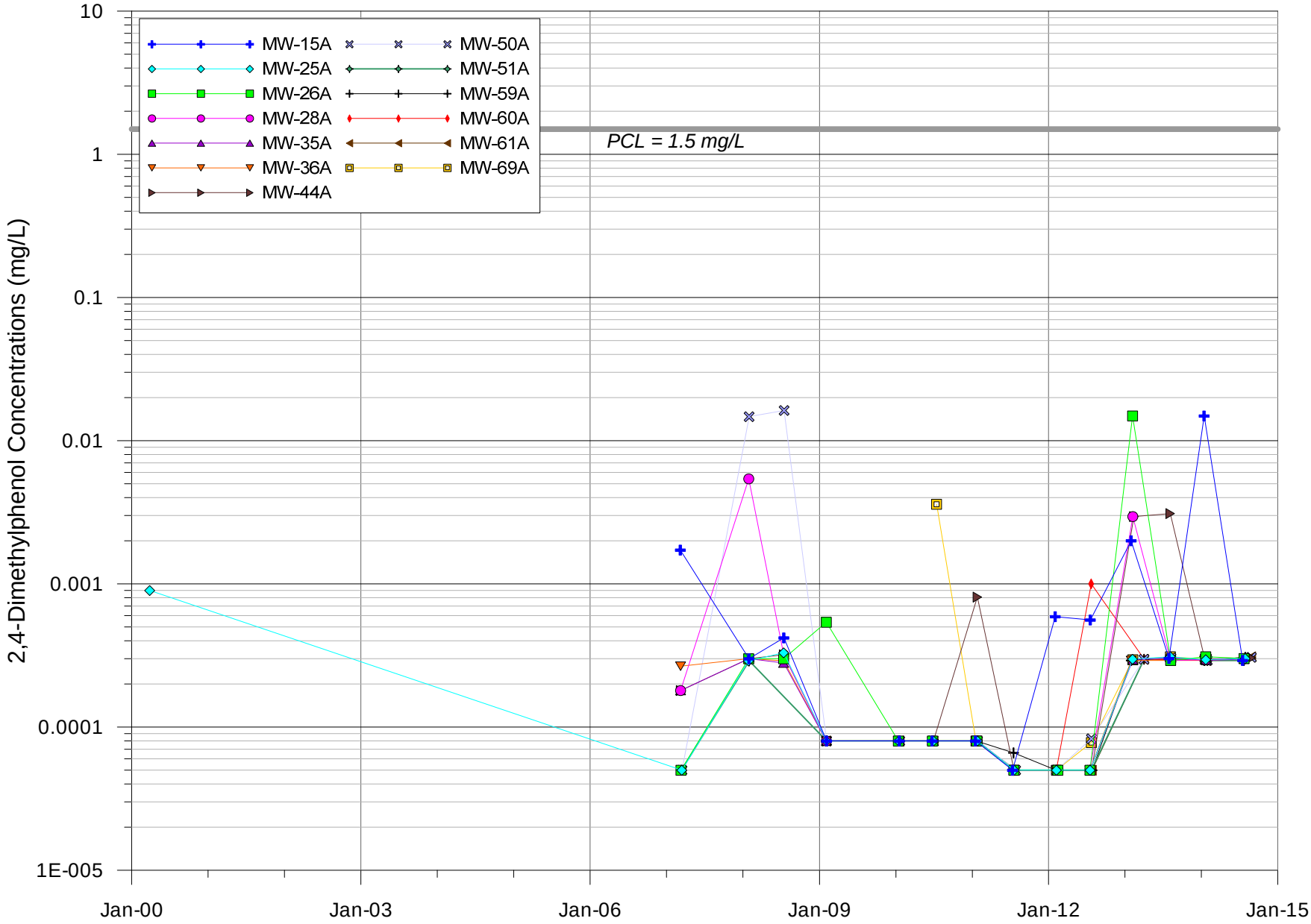
ATTACHMENT 1B-5
Naphthalene Concentrations at Source Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



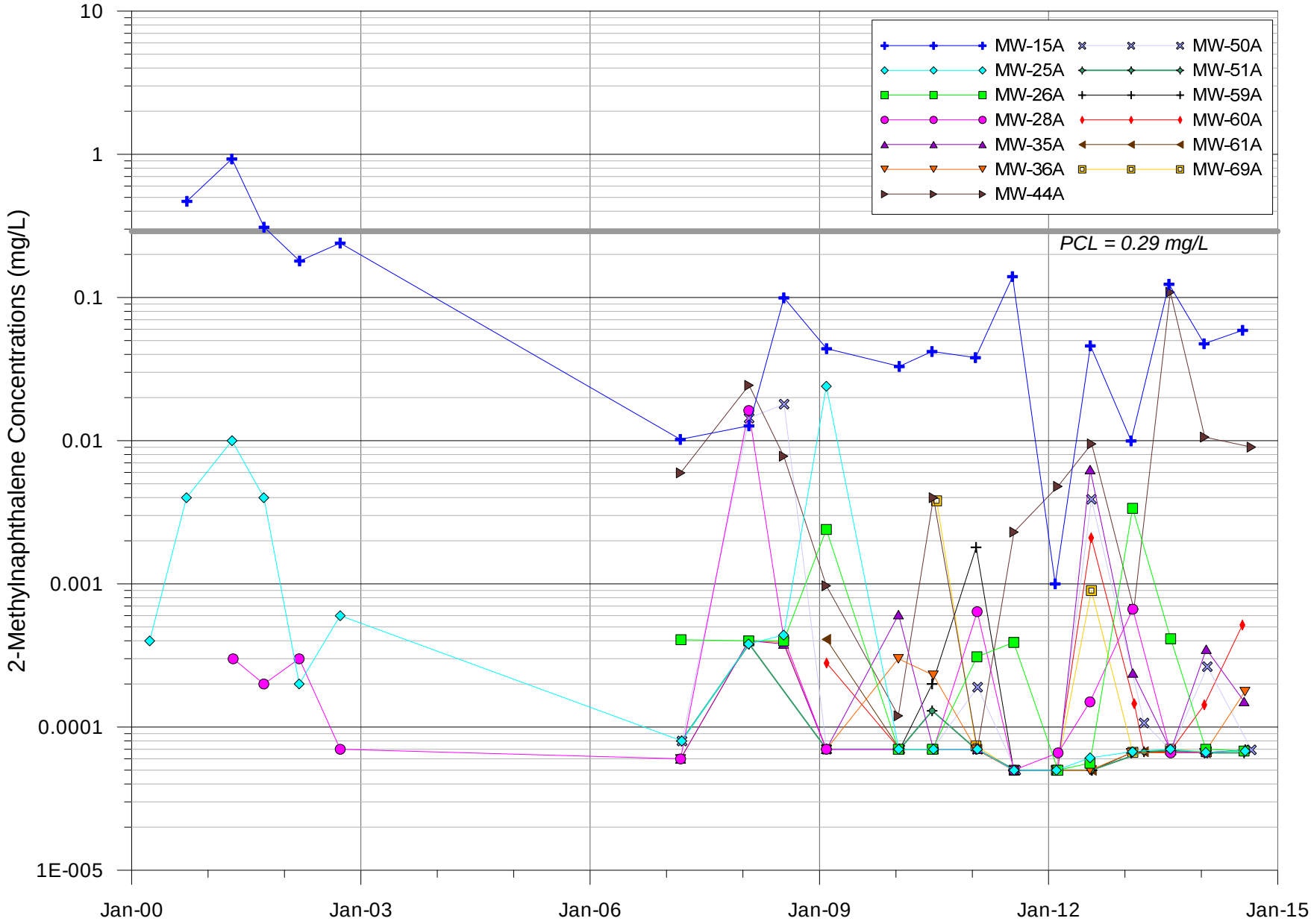
ATTACHMENT 1B-6
Benzene Concentrations at Perimeter Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



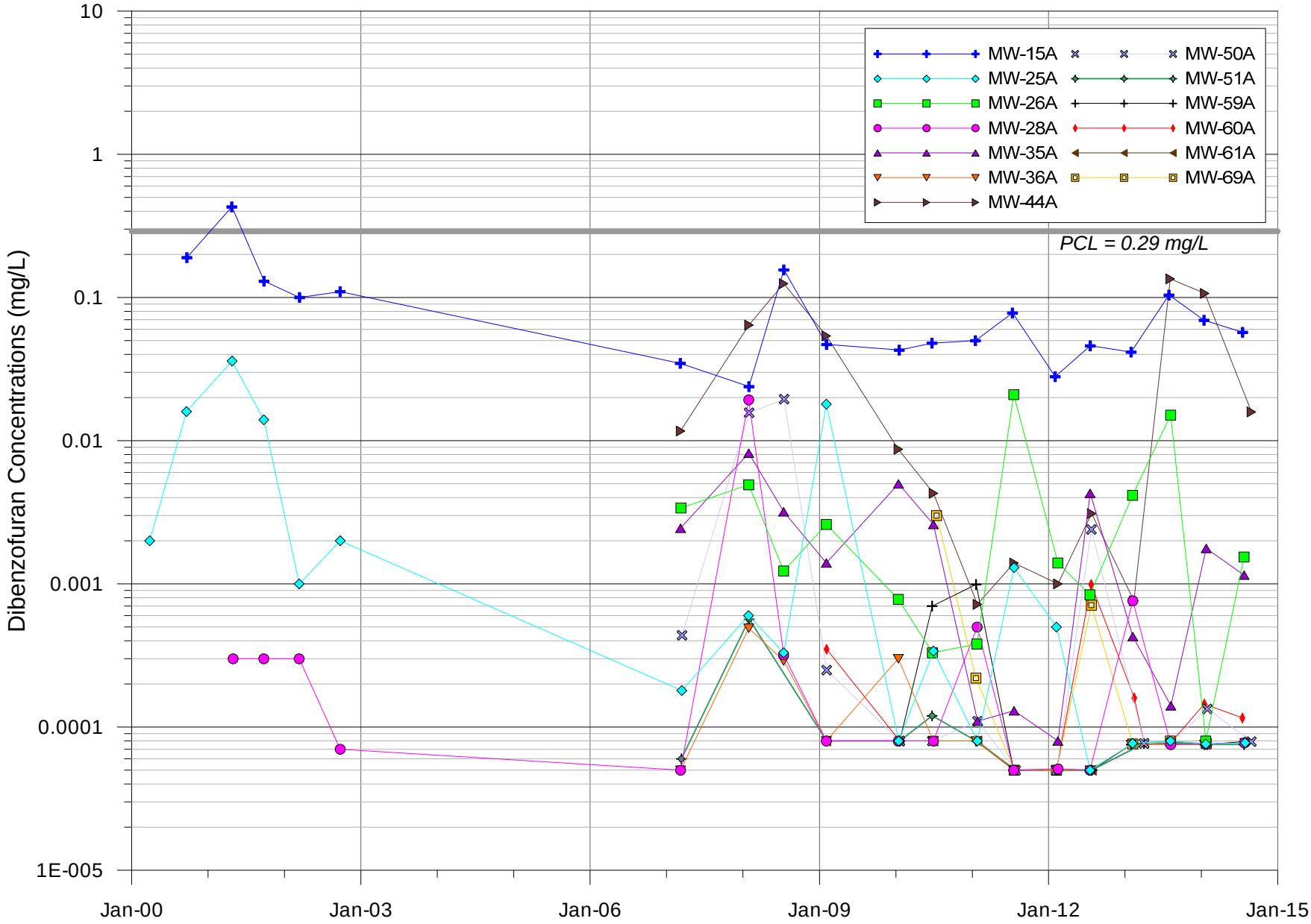
ATTACHMENT 1B-7
2,4-Dimethylphenol Concentrations at Perimeter Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



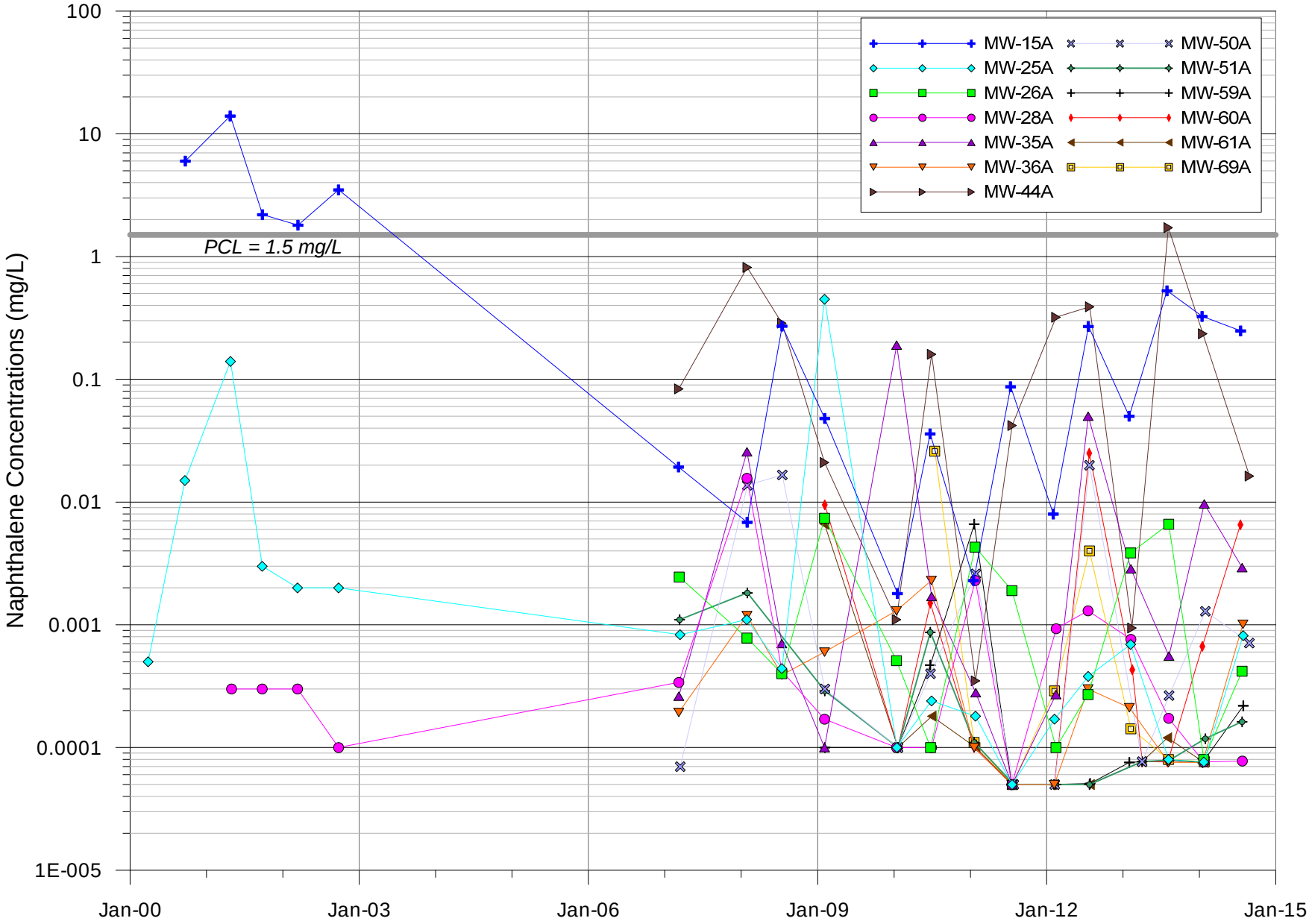
ATTACHMENT 1B-8
2-Methylnapthalene Concentrations at Perimeter Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



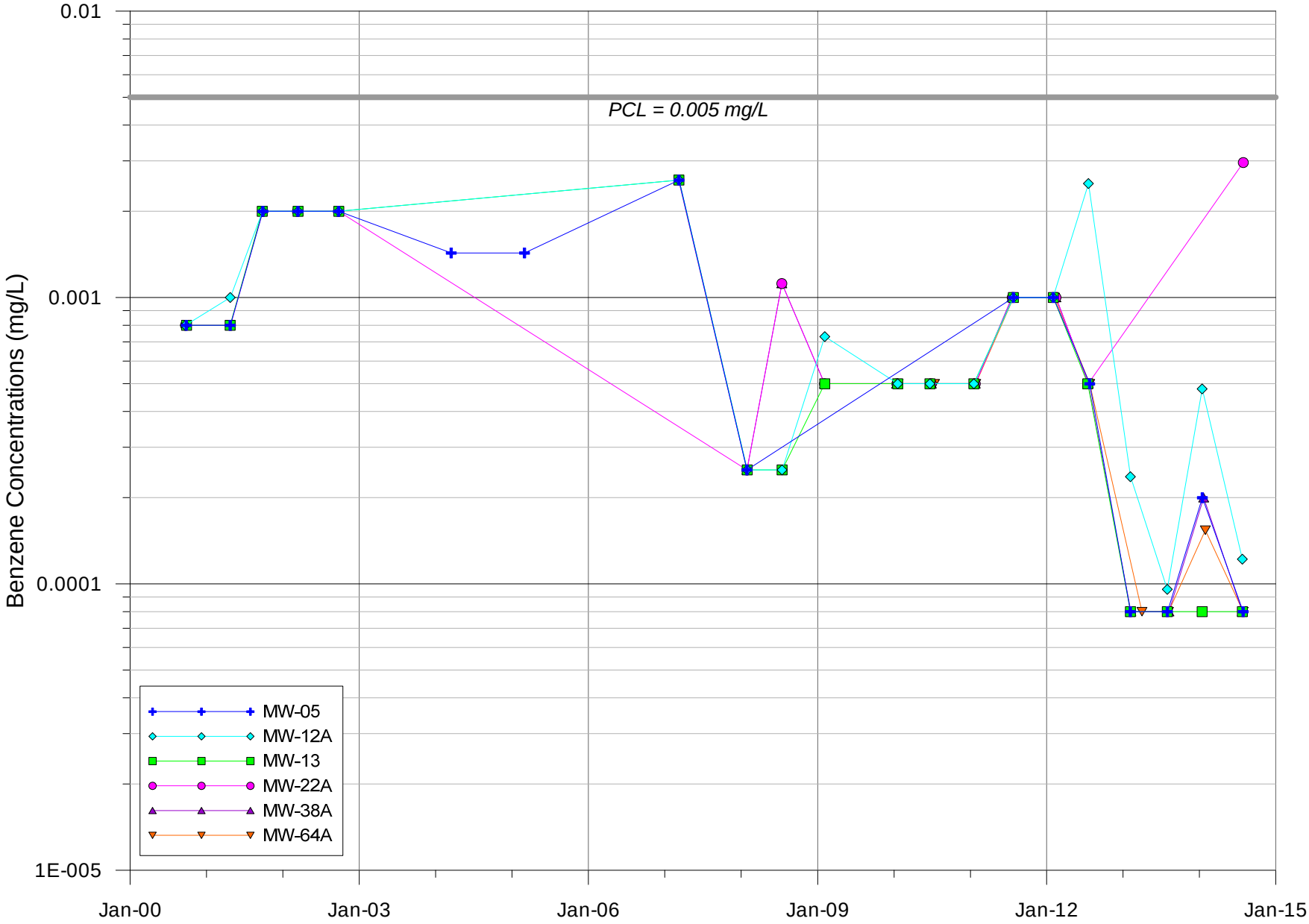
ATTACHMENT 1B-9
Dibenzofuran Concentrations at Perimeter Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



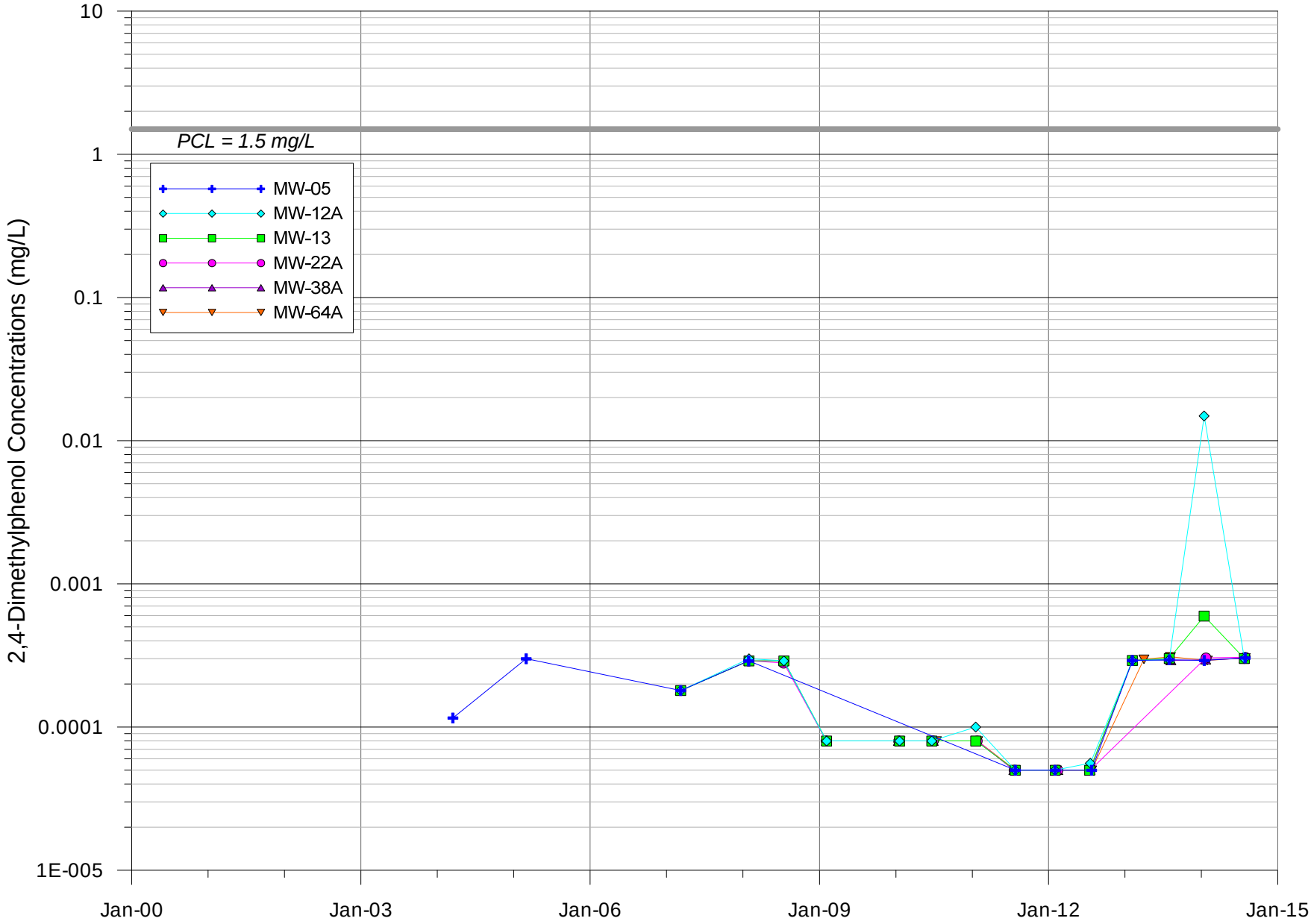
ATTACHMENT 1B-10
Naphthalene Concentrations at Perimeter Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



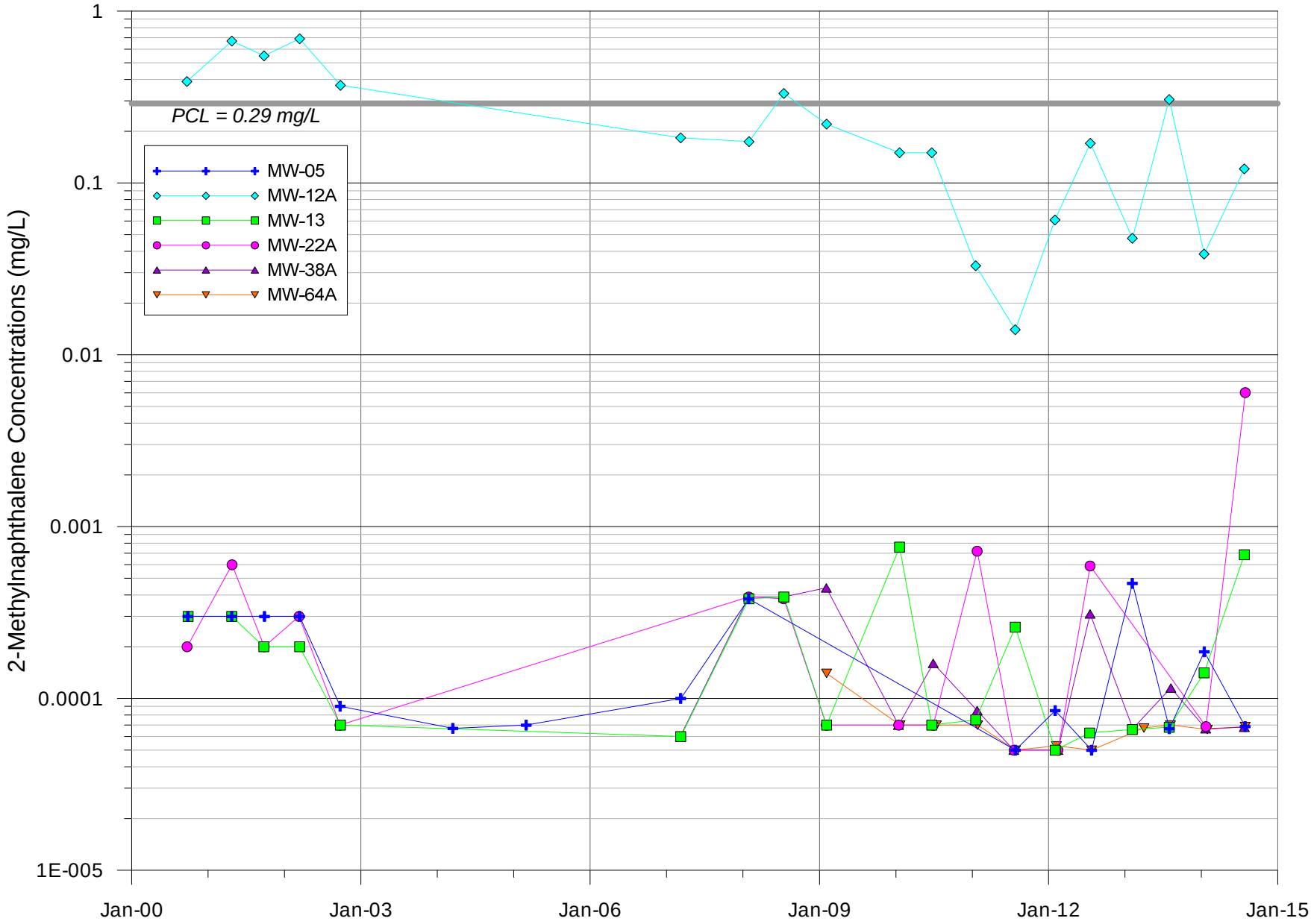
ATTACHMENT 1B-11
Benzene Concentrations at West End Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



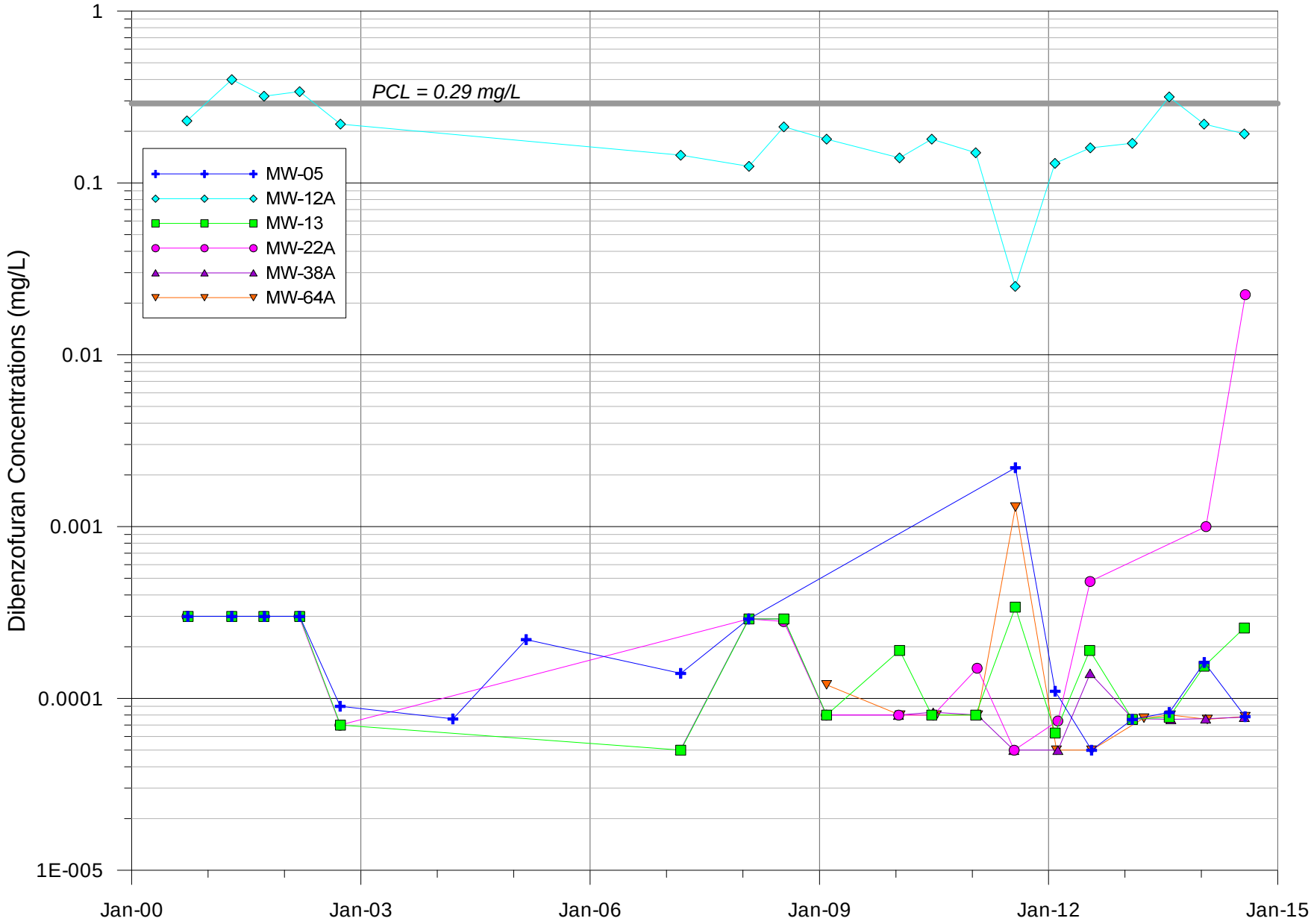
ATTACHMENT 1B-12
2,4-Dimethylphenol Concentrations at West End Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



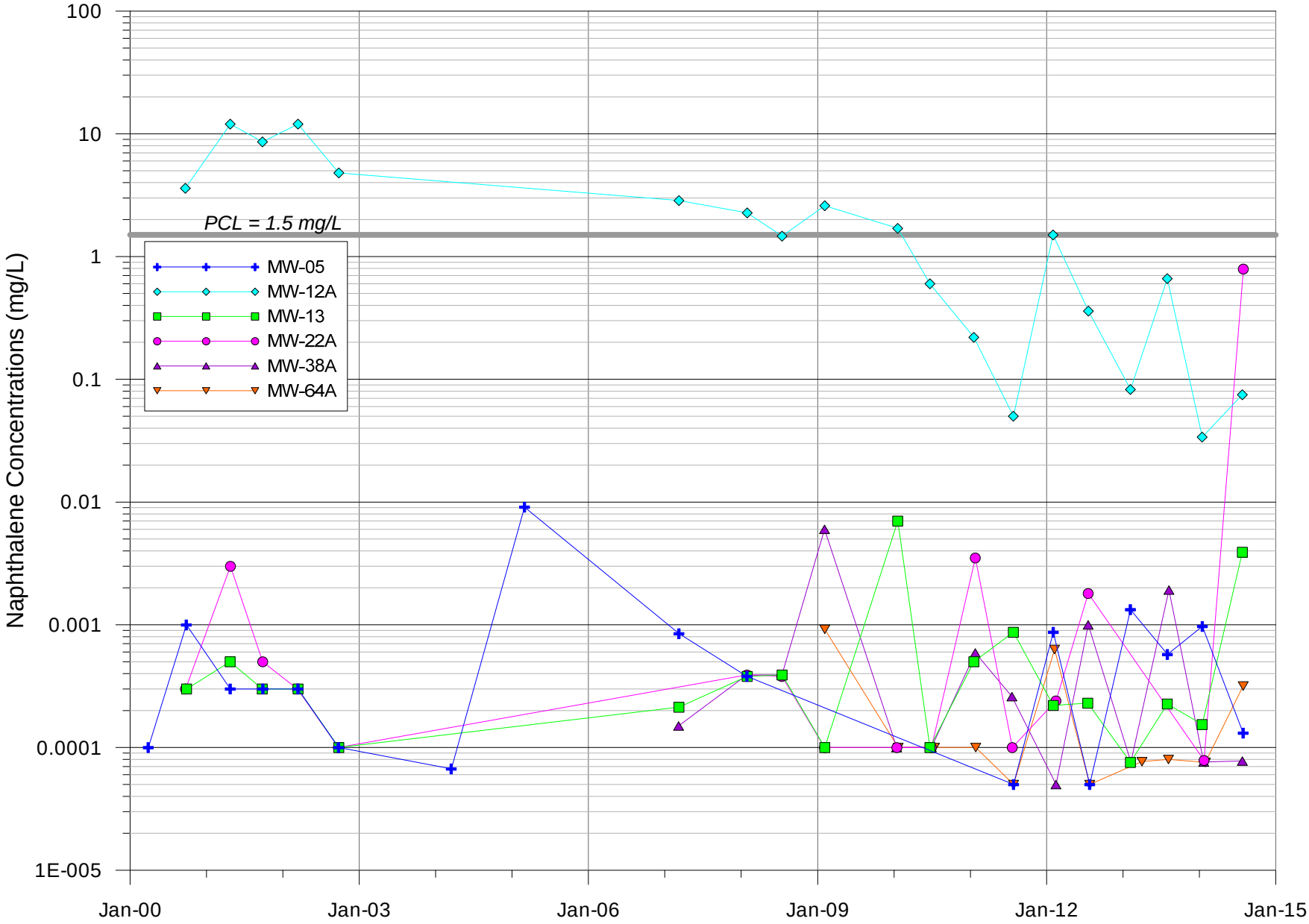
ATTACHMENT 1B-13
2-Methylnaphthalene Concentrations at West End Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



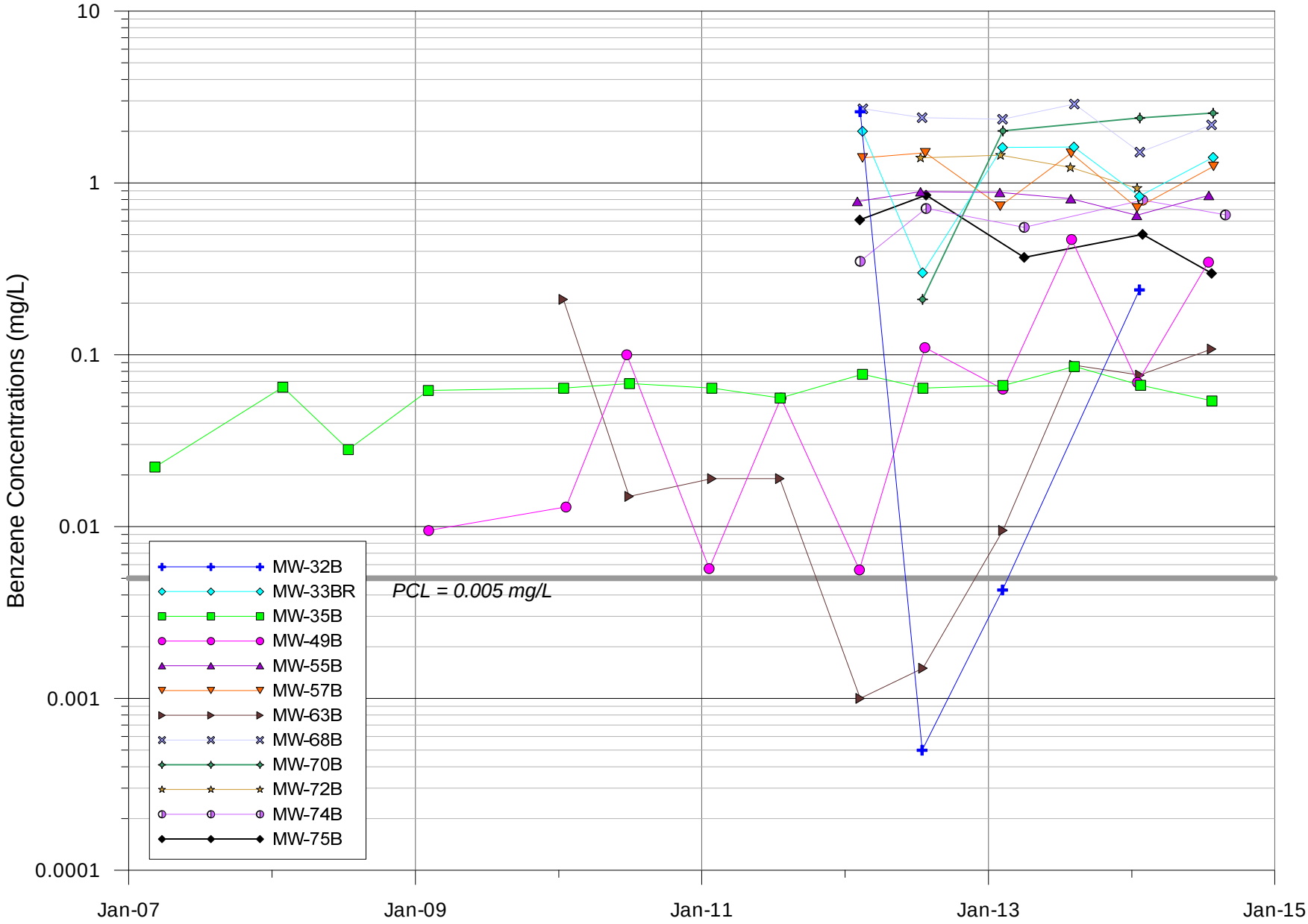
ATTACHMENT 1B-14
Dibenzofuran Concentrations at West End Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



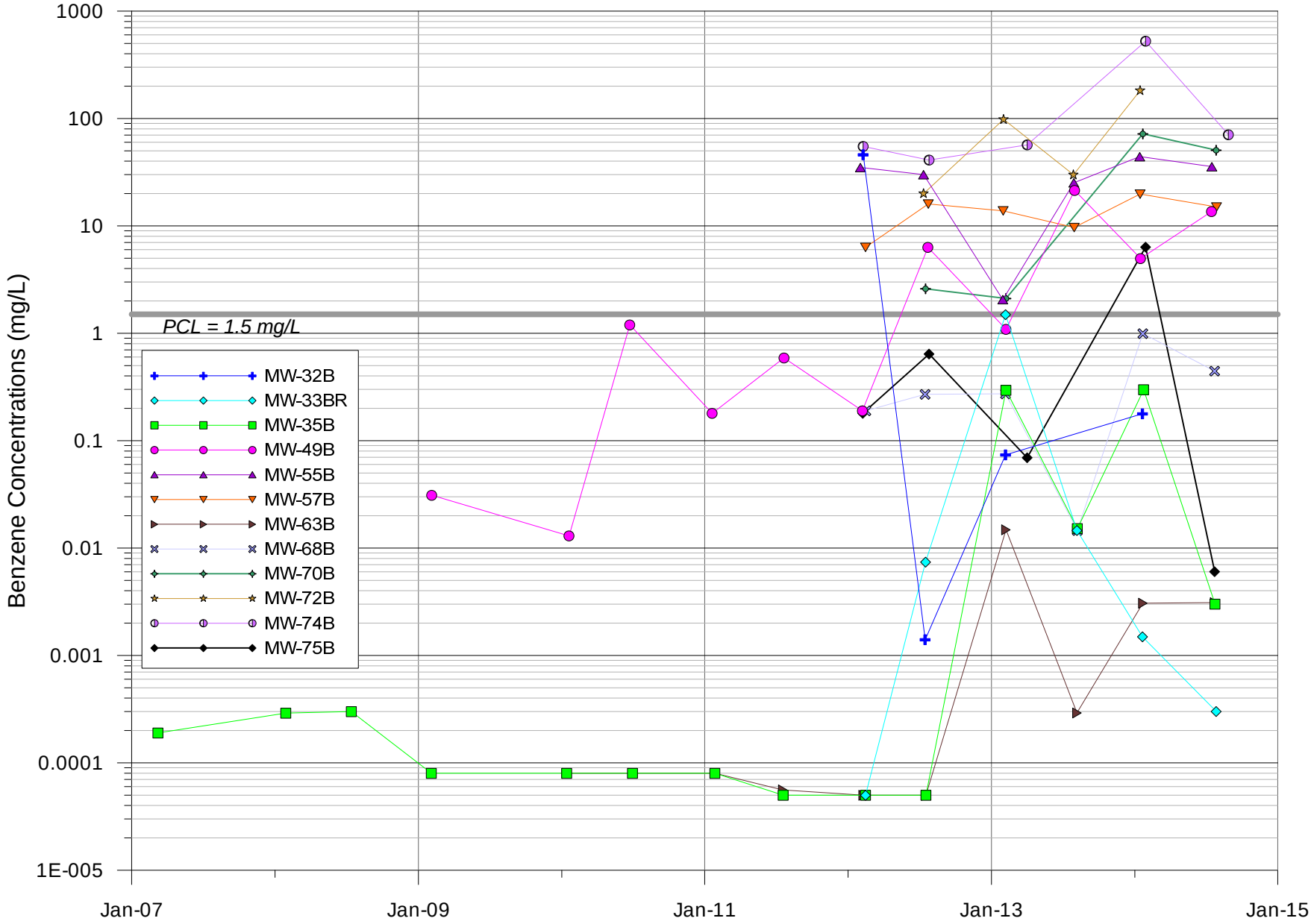
ATTACHMENT 1B-15
Naphthalene Concentrations at West End Area Wells - A-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



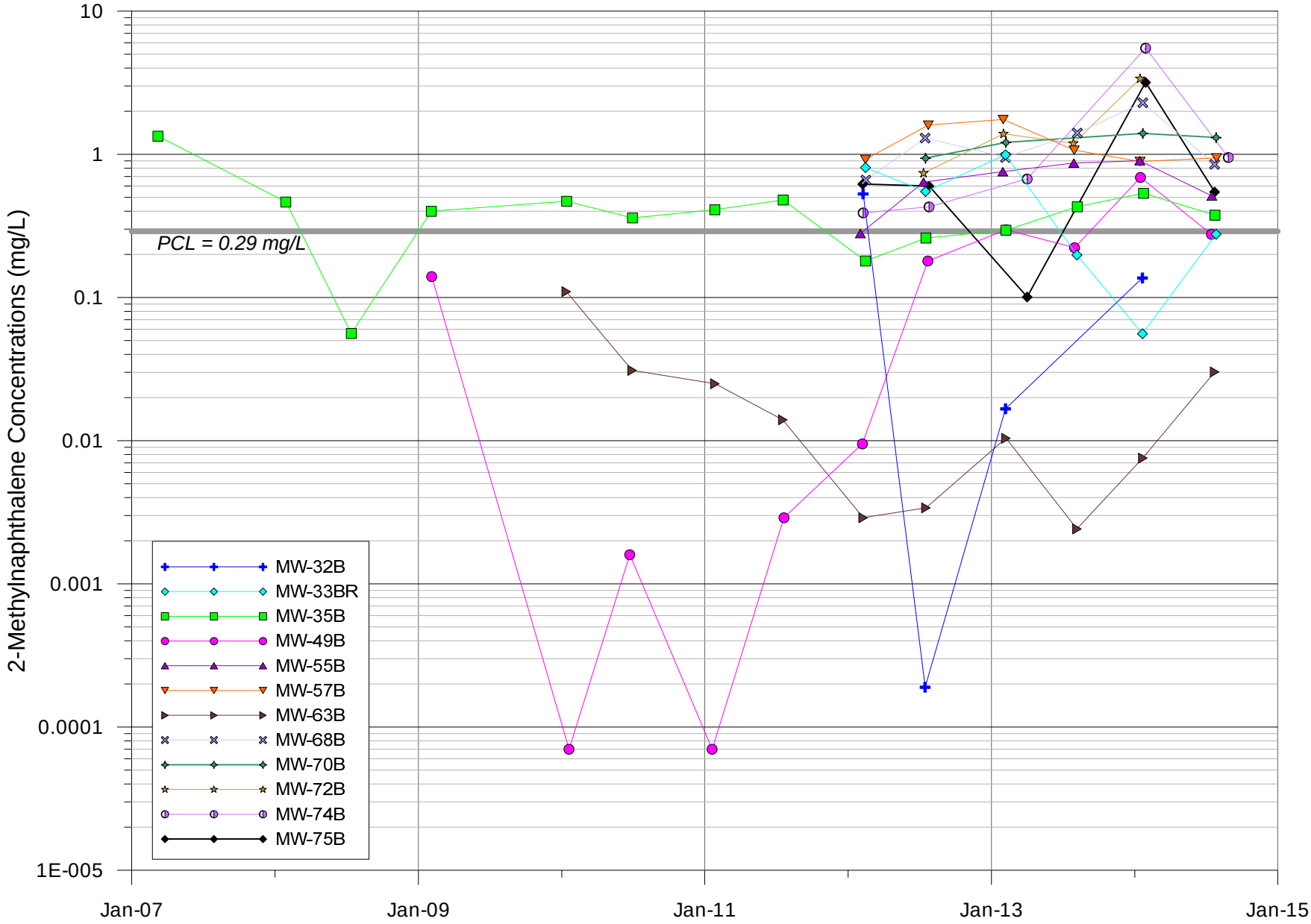
ATTACHMENT 1B-16
Benzene Concentrations at Source Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



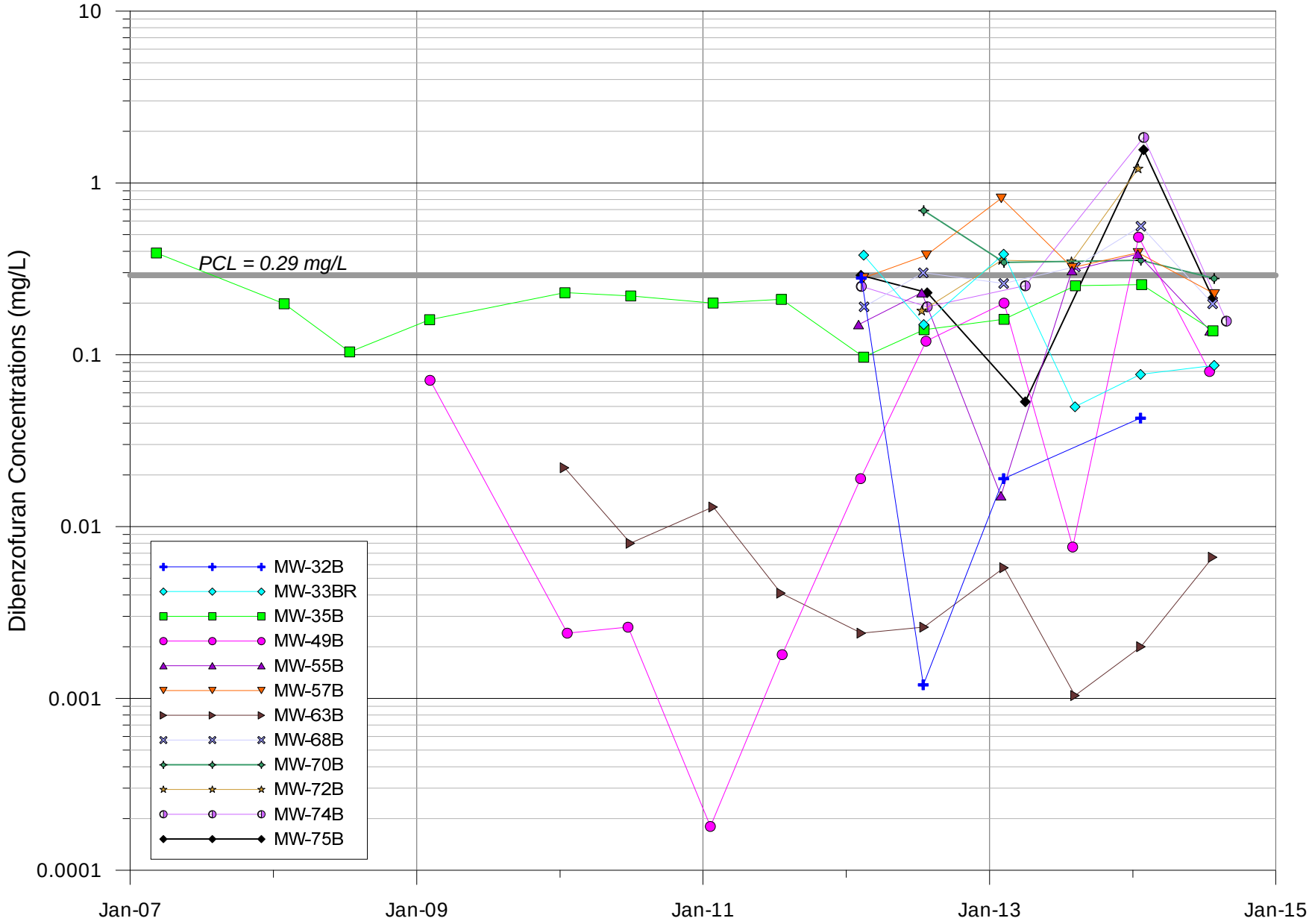
ATTACHMENT 1B-17
2,4-Dimethylphenol Concentrations at Source Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



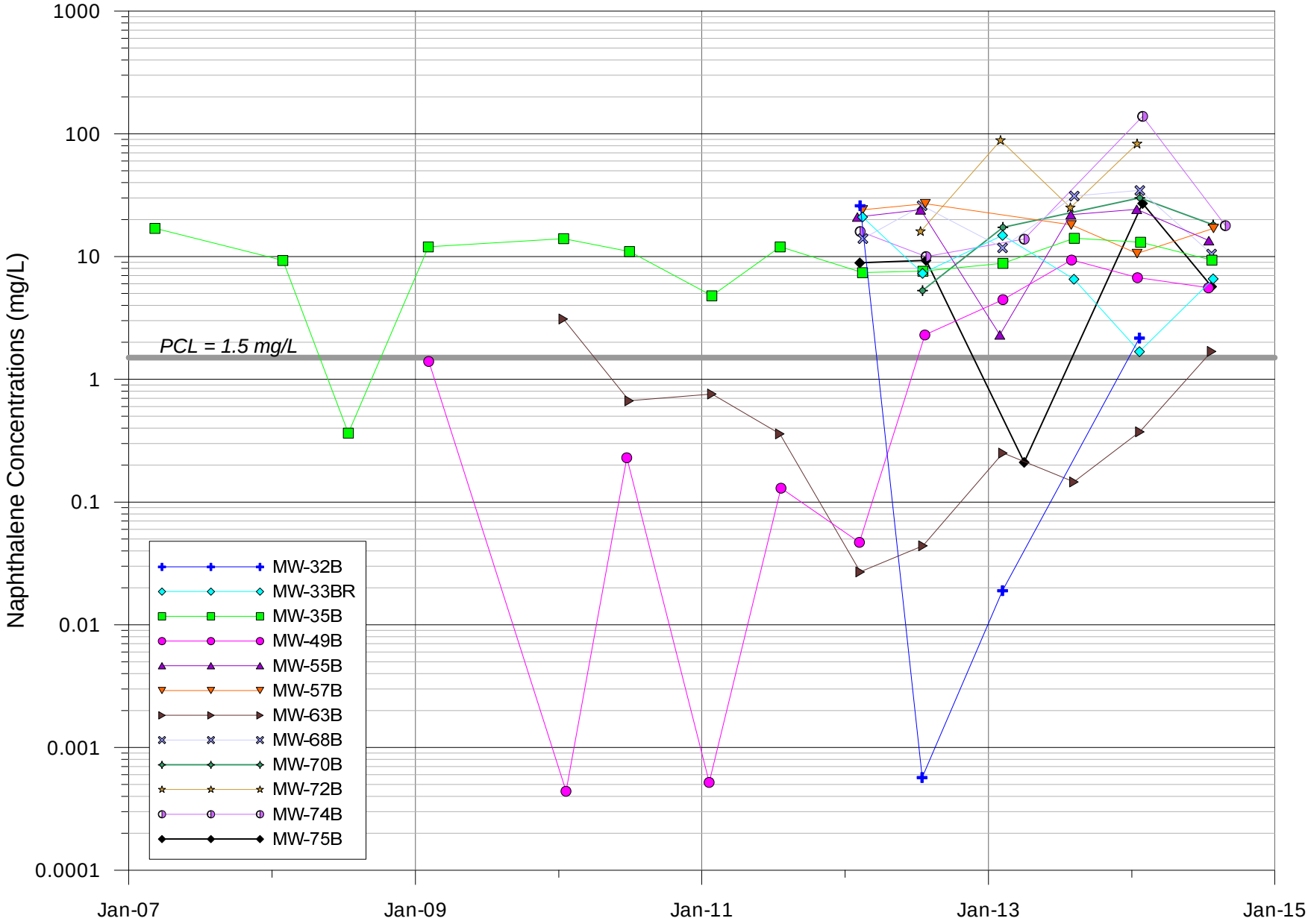
ATTACHMENT 1B-18
2-Methylnaphthalene Concentrations at Source Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



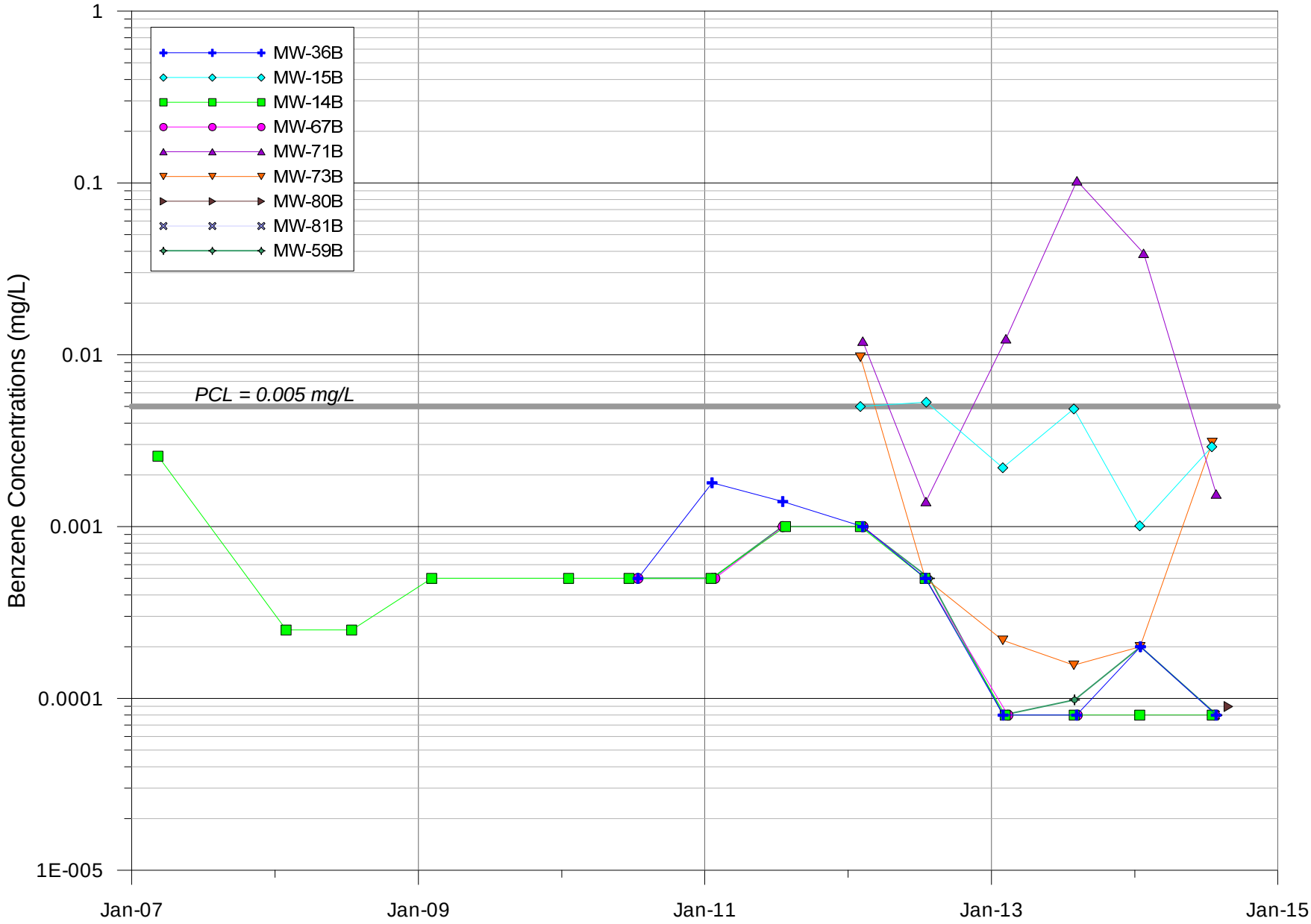
ATTACHMENT 1B-19
Dibenzofuran Concentrations at Source Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



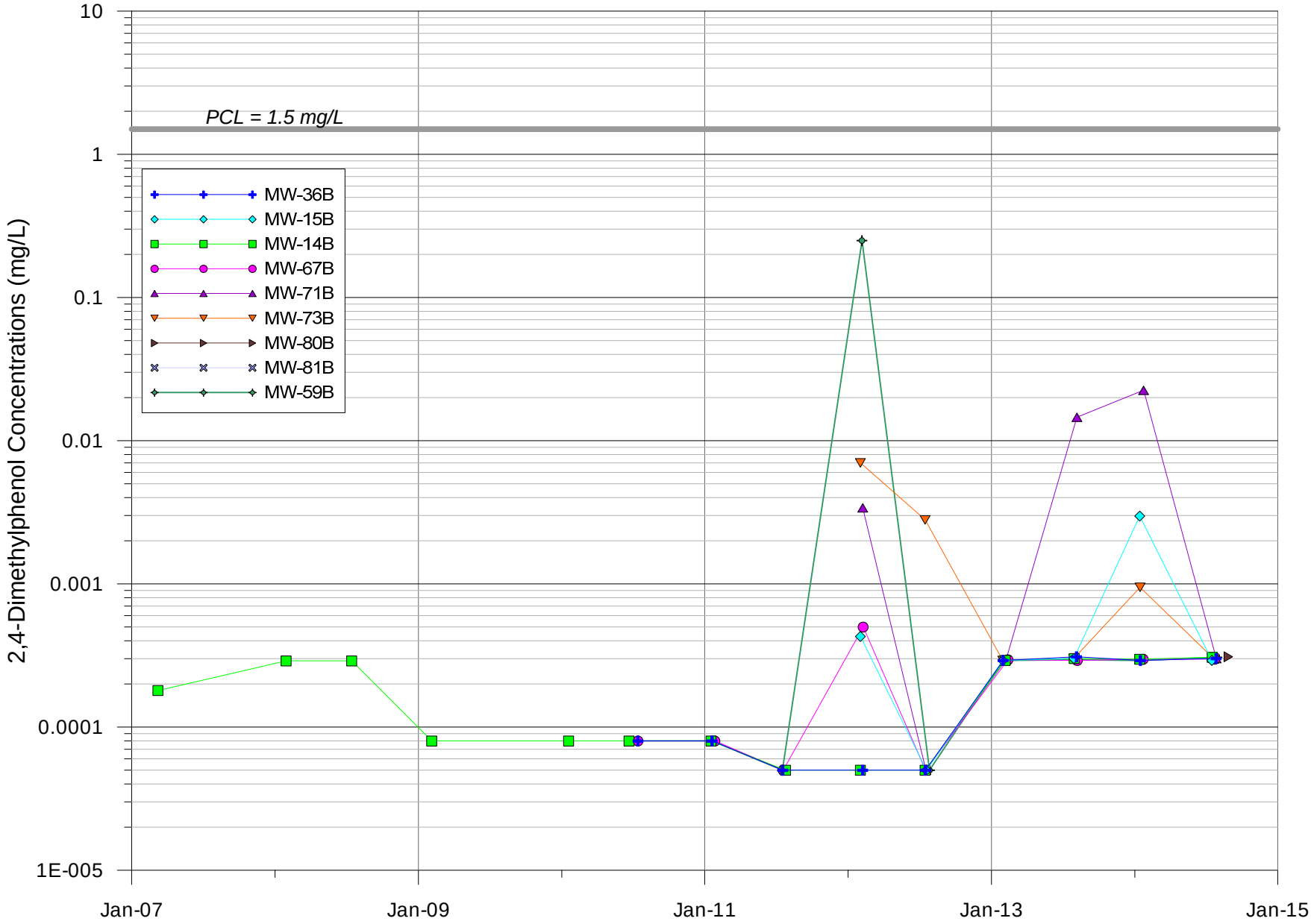
ATTACHMENT 1B-20
Naphthalene Concentrations at Source Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



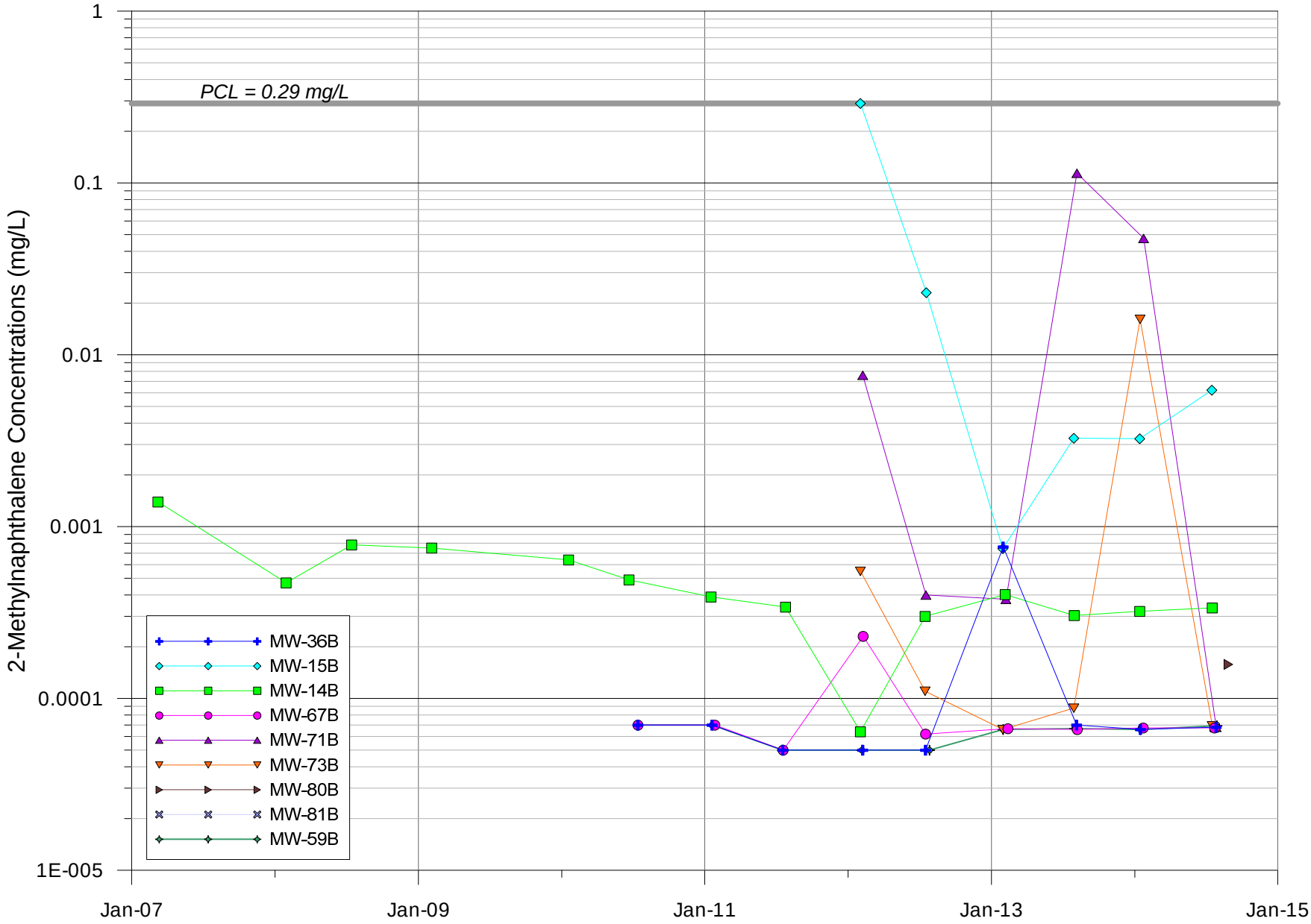
ATTACHMENT 1B-21
Benzene Concentrations at Perimeter Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



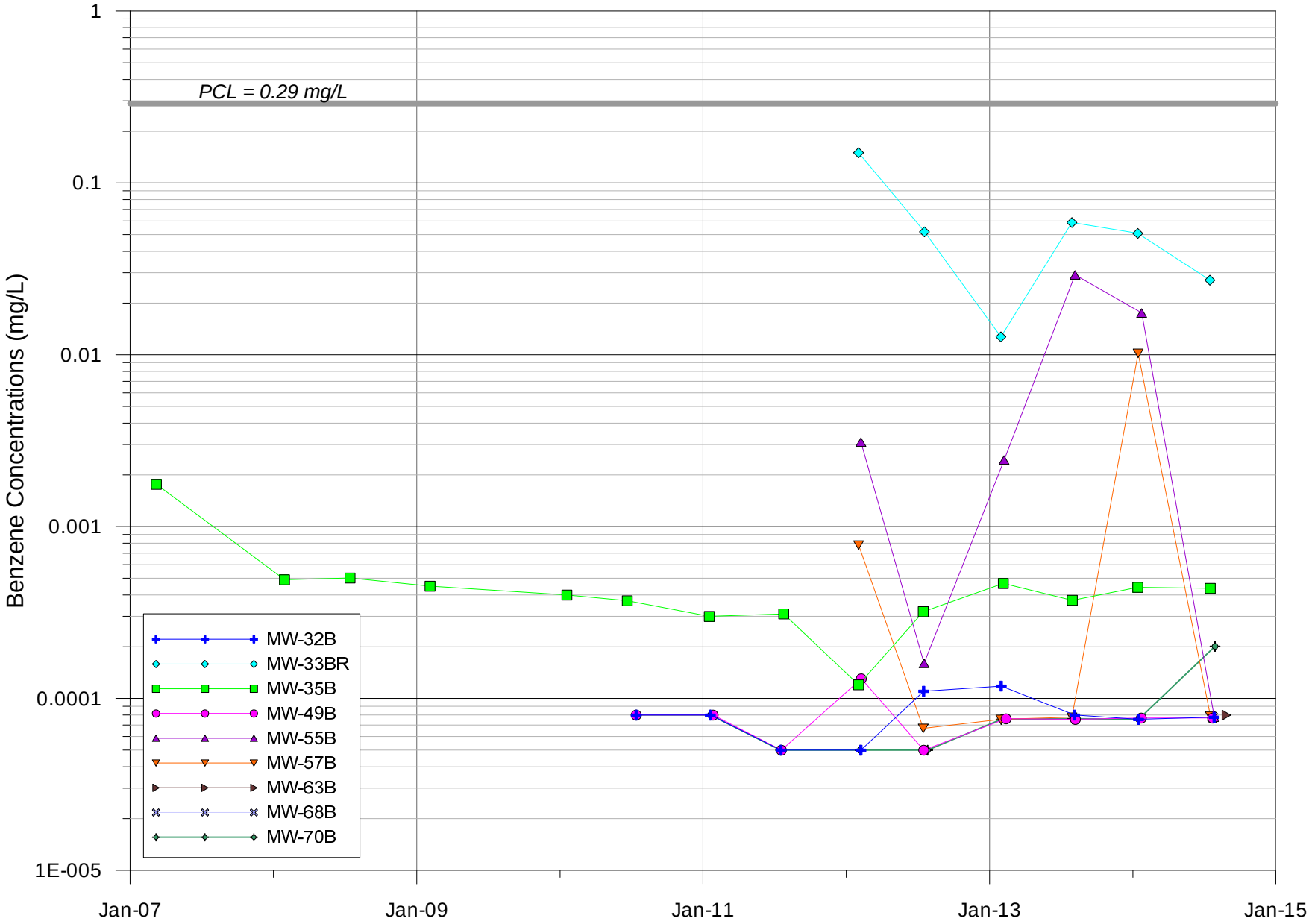
ATTACHMENT 1B-22
2,4-Dimethylphenol Concentrations at Perimeter Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



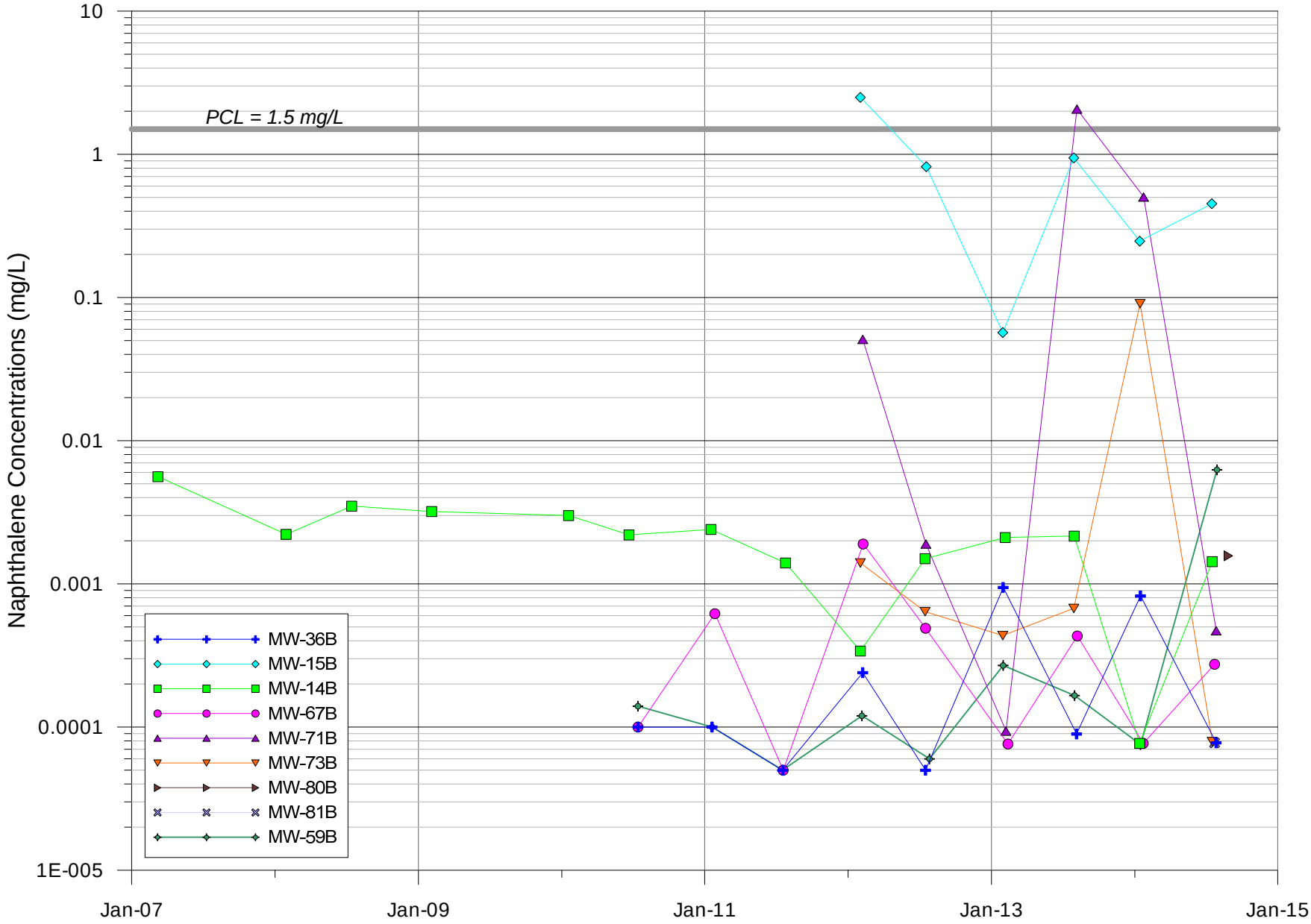
ATTACHMENT 1B-23
2-Methylnaphthalene Concentrations at Perimeter Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



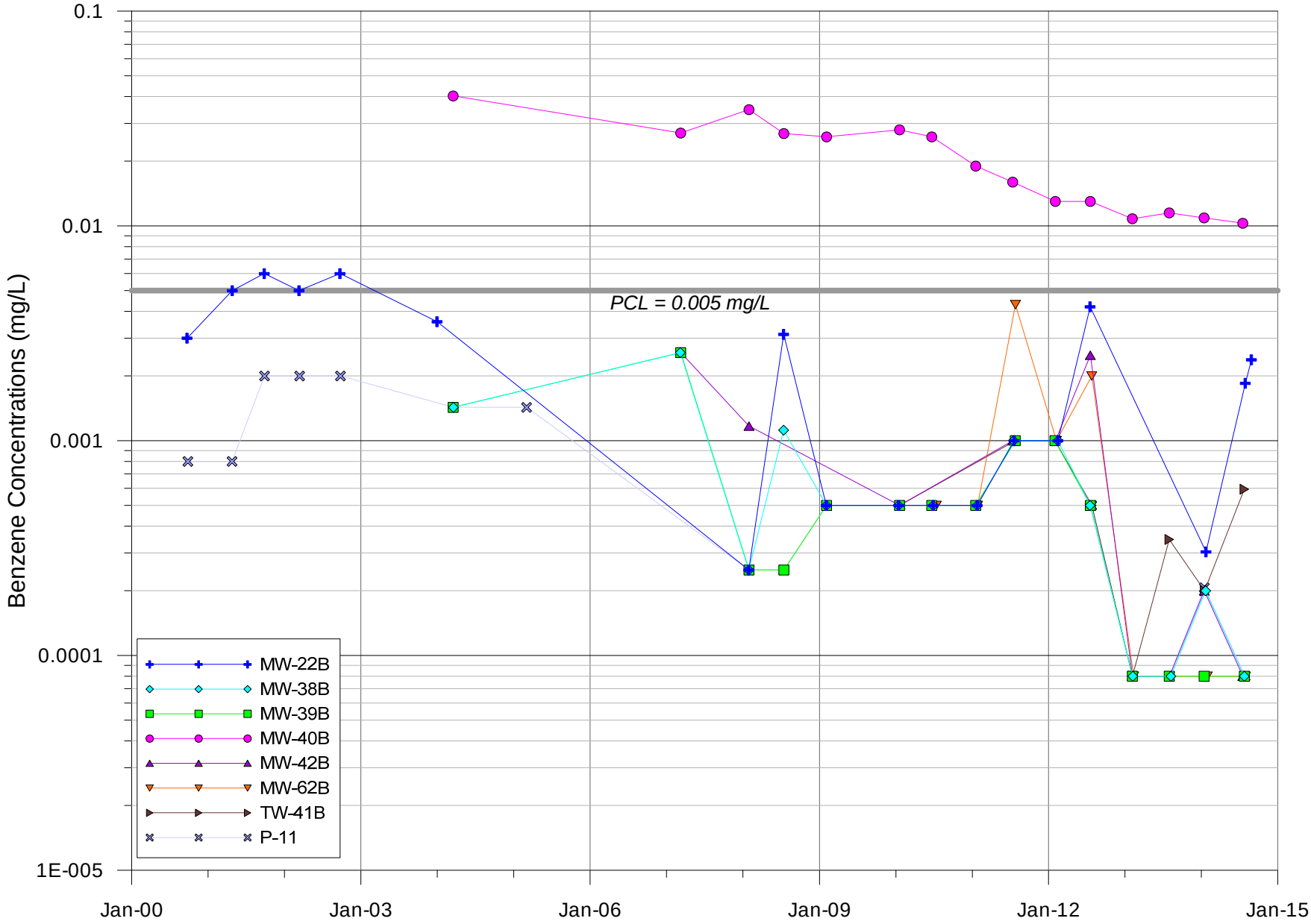
ATTACHMENT 1B-24
Dibenzofuran Concentrations at Perimeter Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



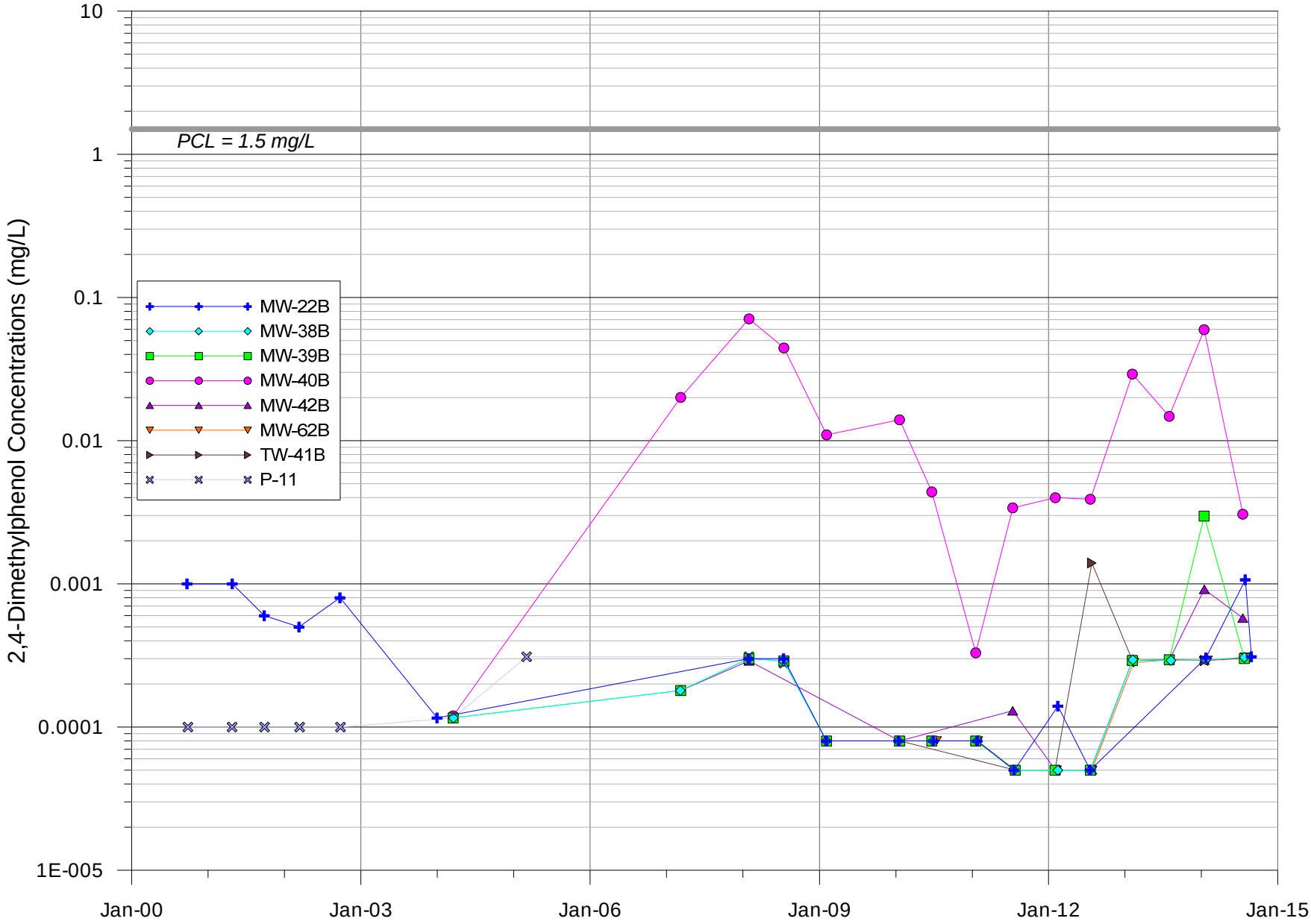
ATTACHMENT 1B-25
Naphthalene Concentrations at Perimeter Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



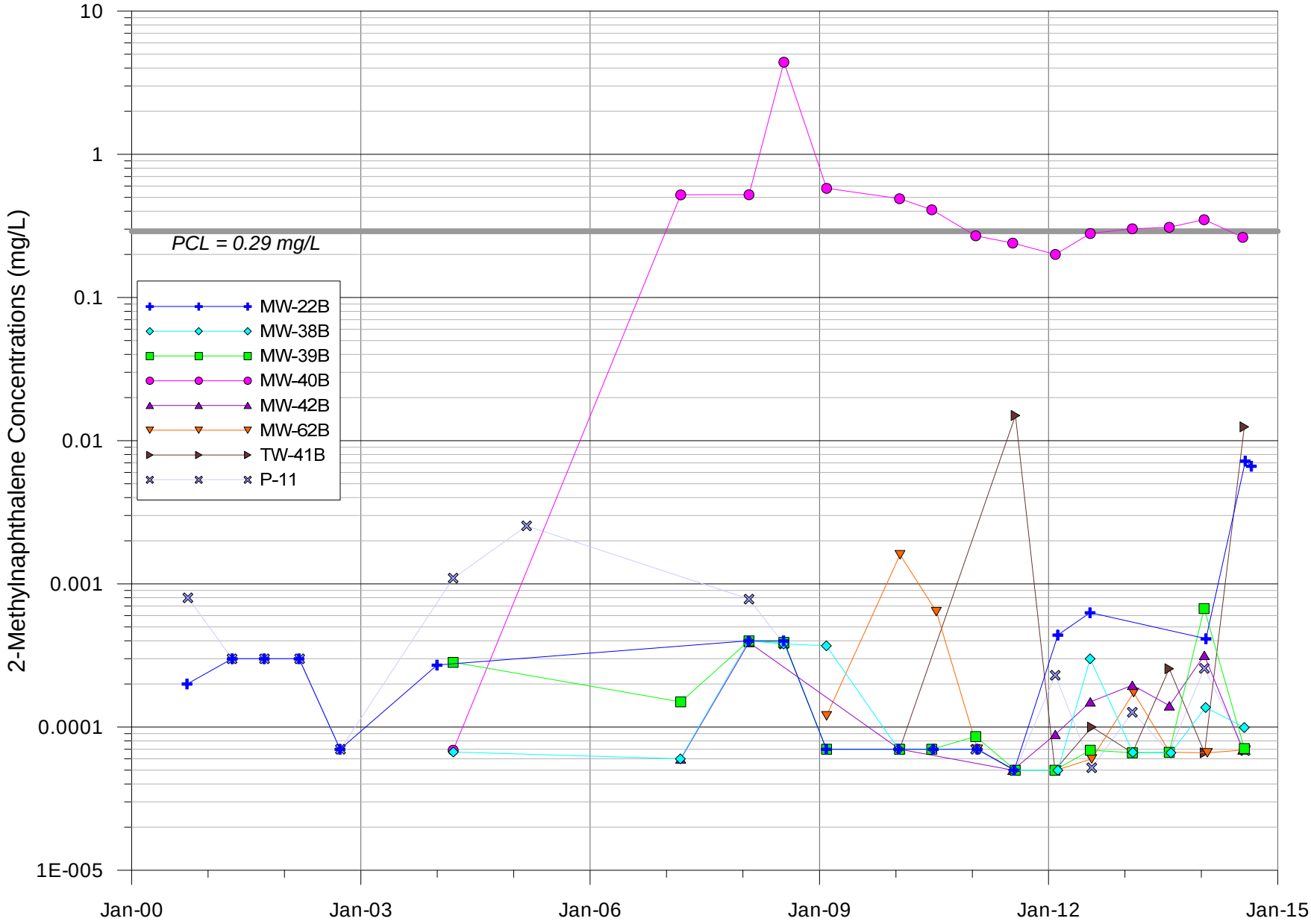
ATTACHMENT 1B-26
Benzene Concentrations at West End Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



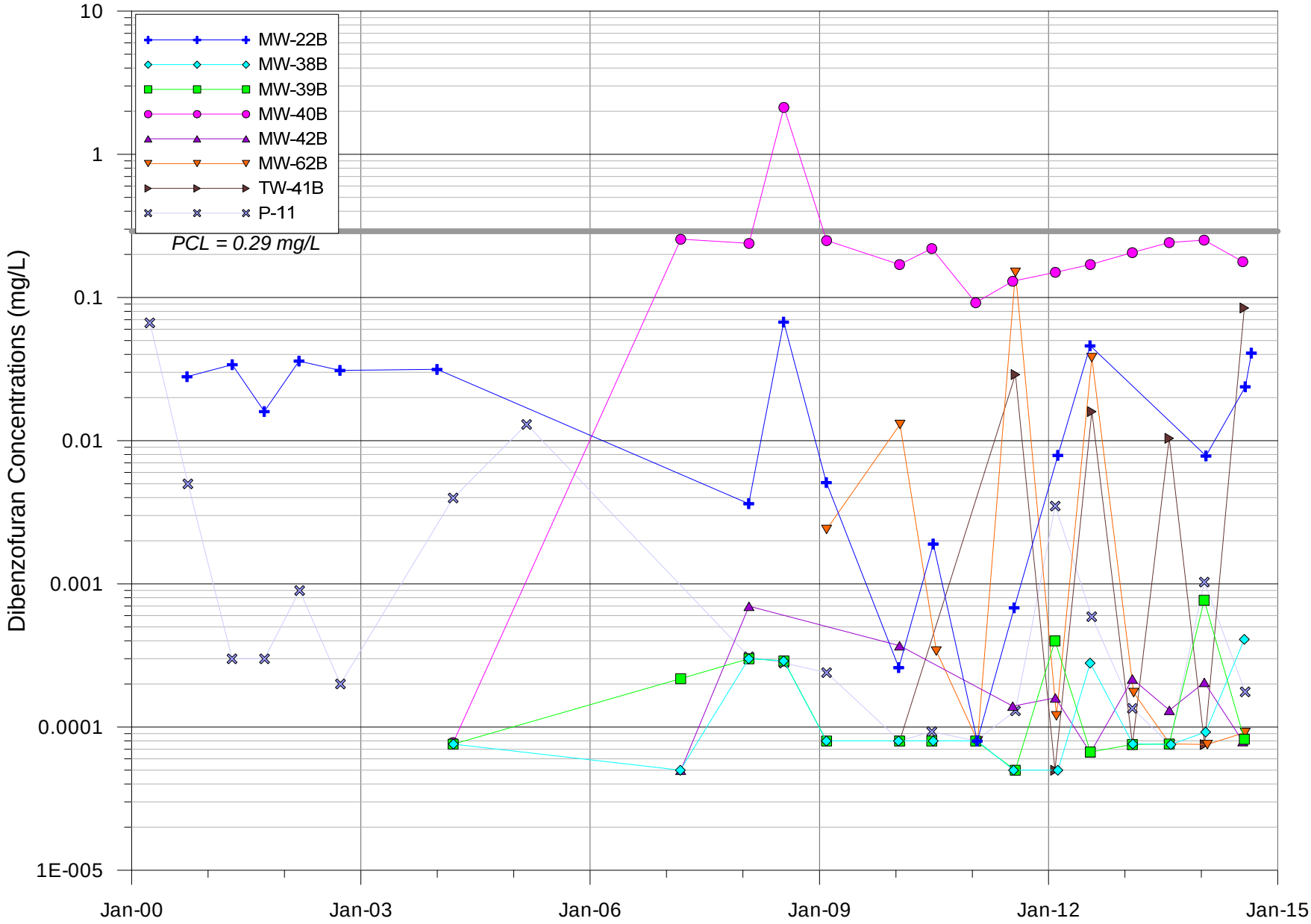
ATTACHMENT 1B-27
2,4-Dimethylphenol Concentrations at West End Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



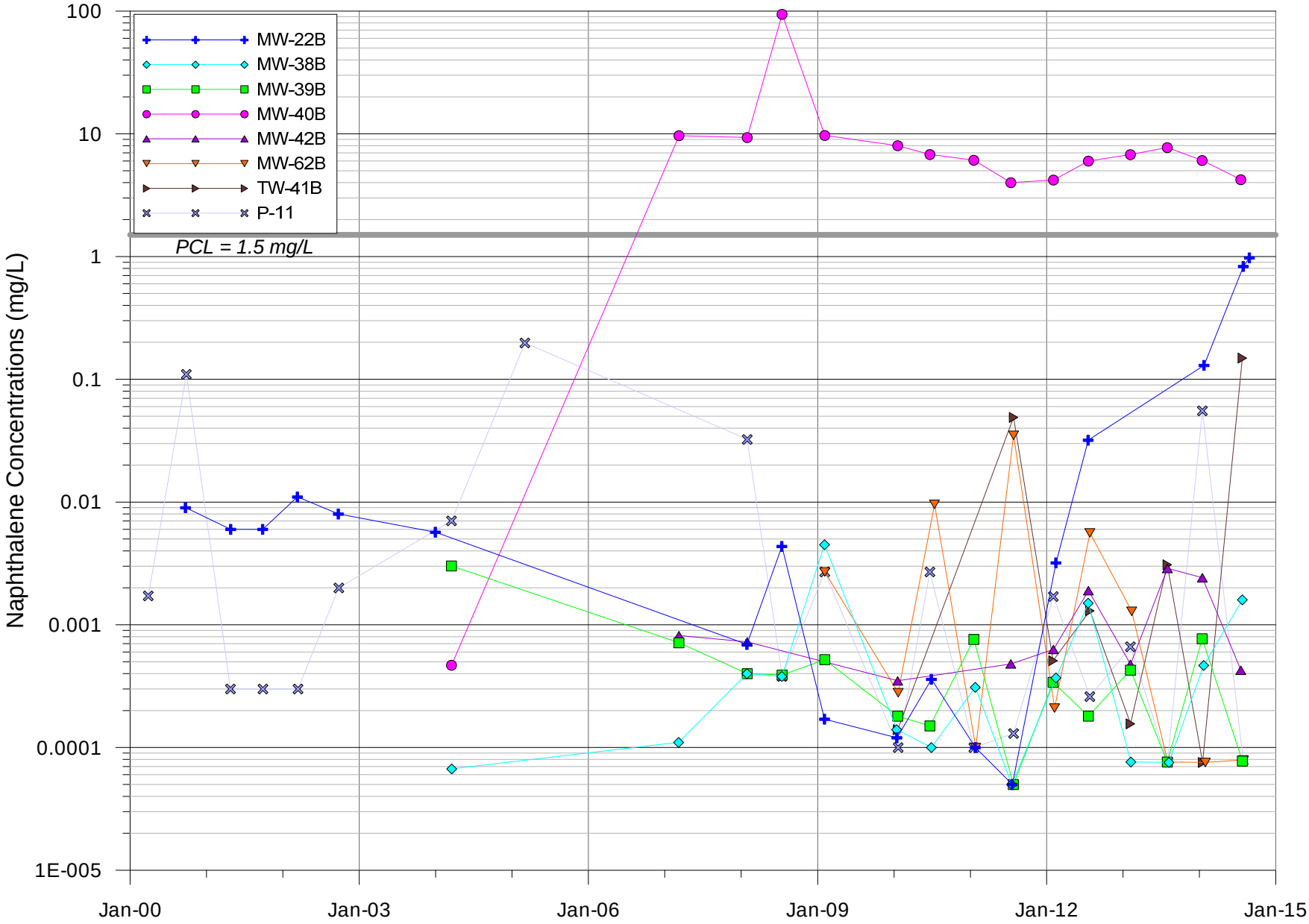
ATTACHMENT 1B-28
2-Methylnaphthalene Concentrations at West End Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



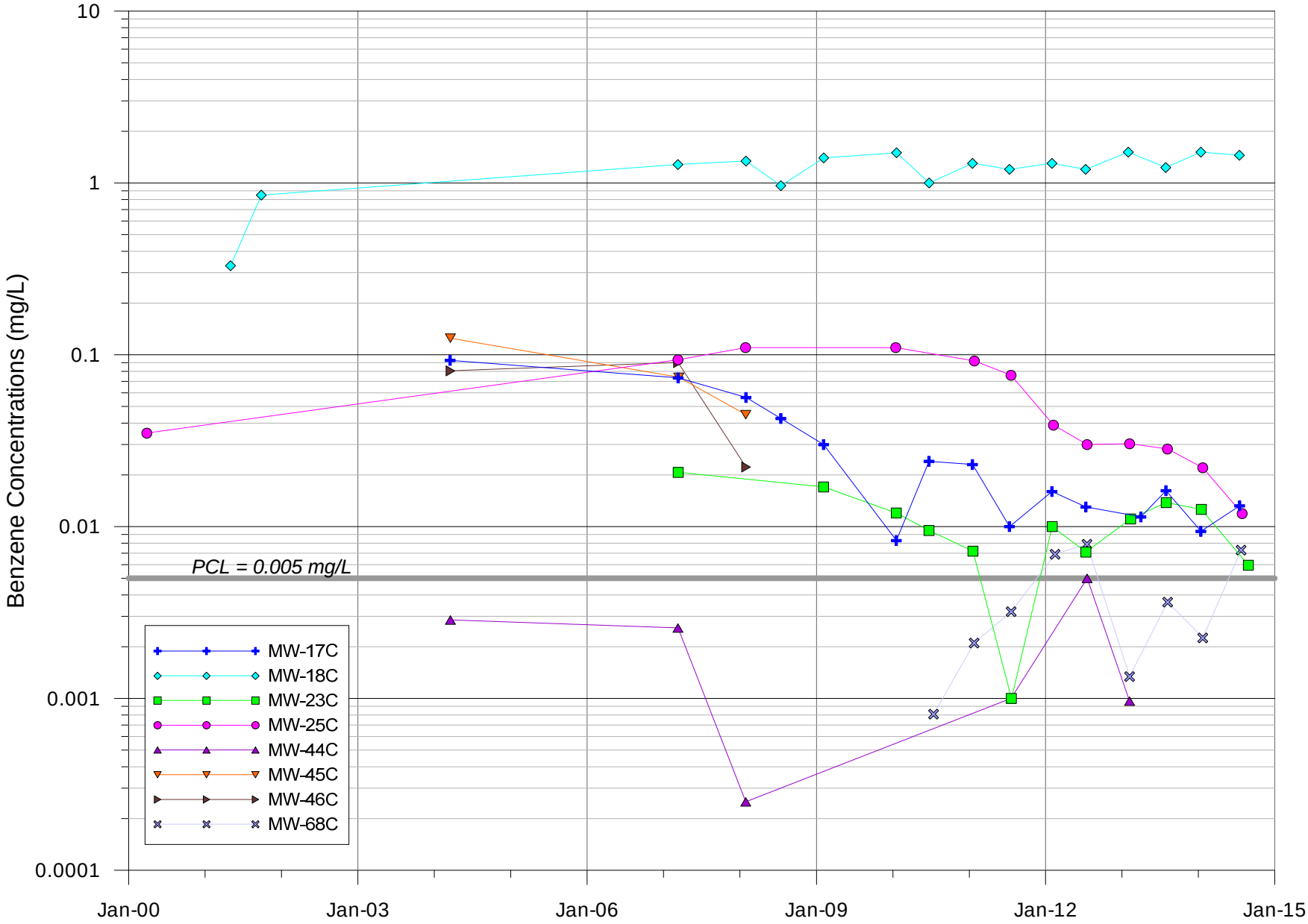
ATTACHMENT 1B-29
Dibenzofuran Concentrations at West End Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



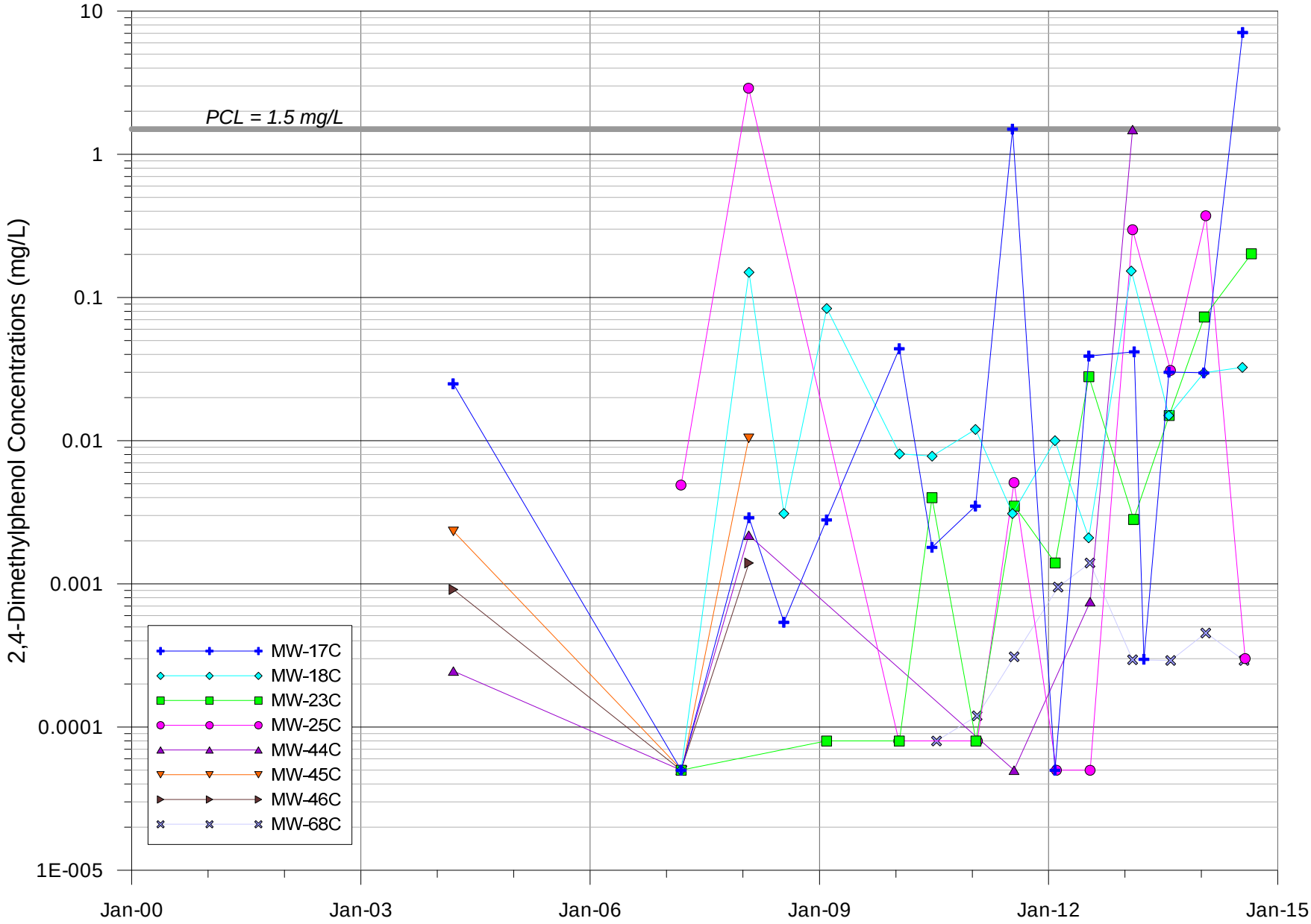
ATTACHMENT 1B-30
Naphthalene Concentrations at West End Area Wells - B-CZ/B-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



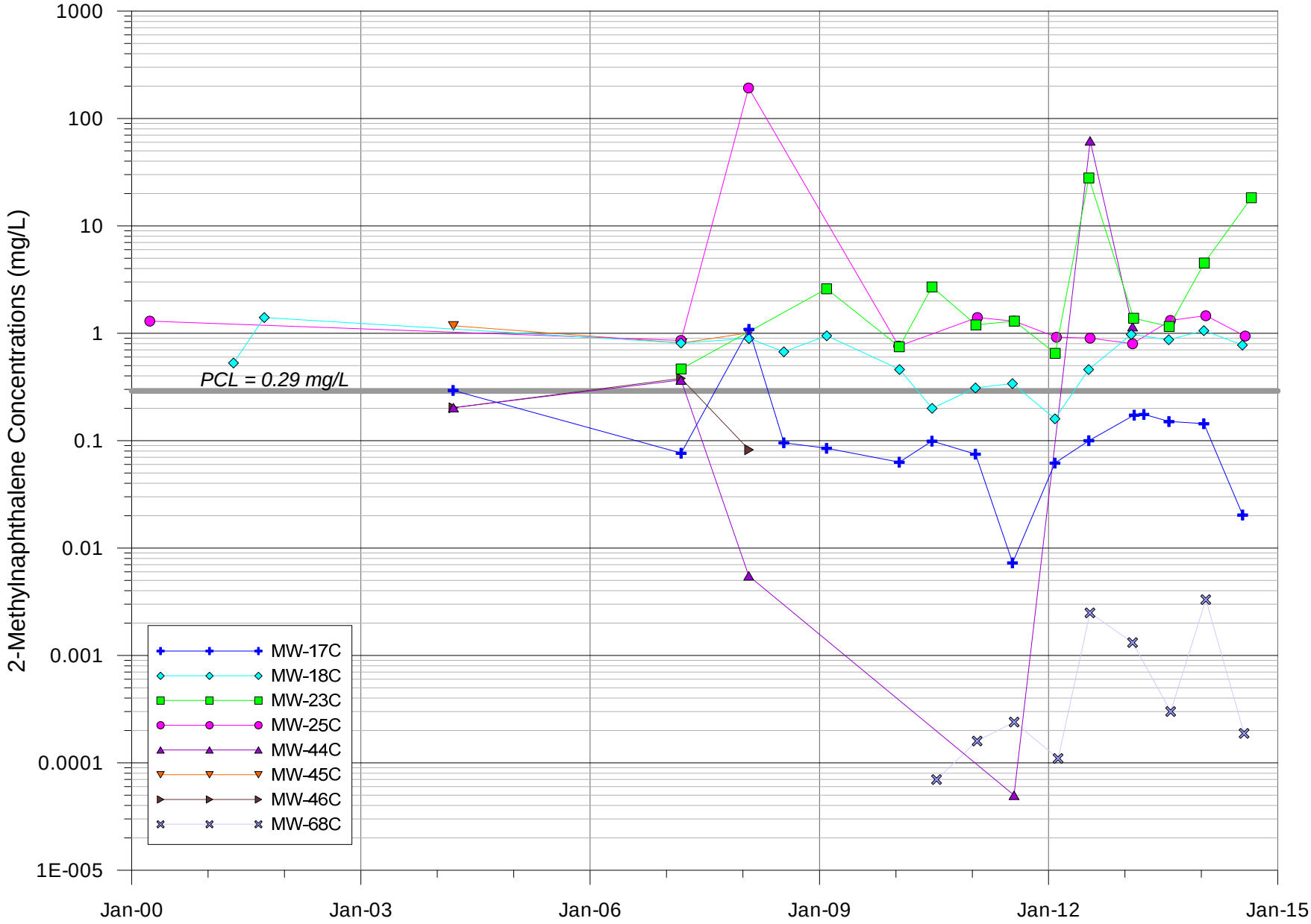
ATTACHMENT 1B-31
Benzene Concentrations at Source Area Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



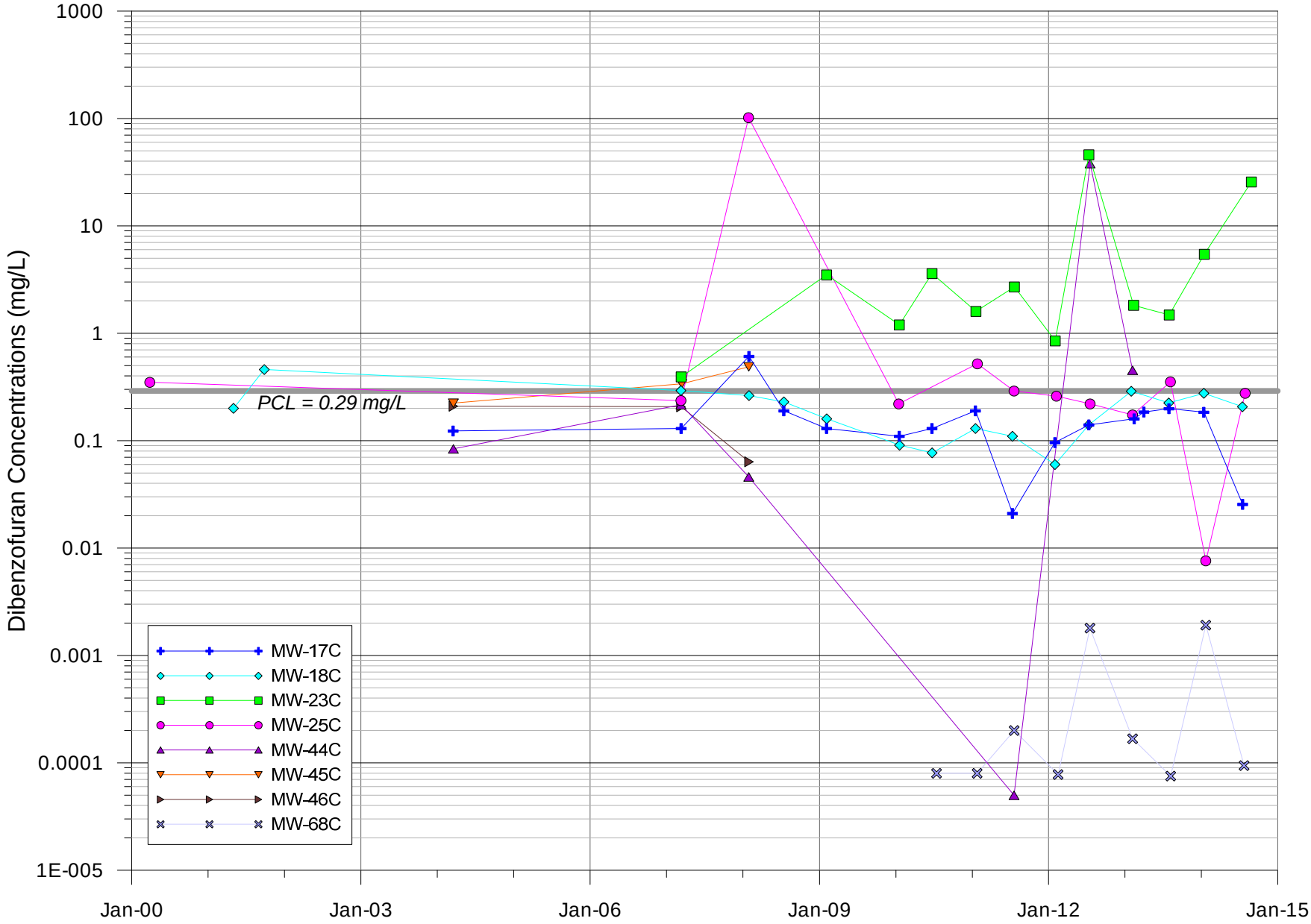
ATTACHMENT 1B-32
2,4-Dimethylphenol Concentrations at Source Area Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



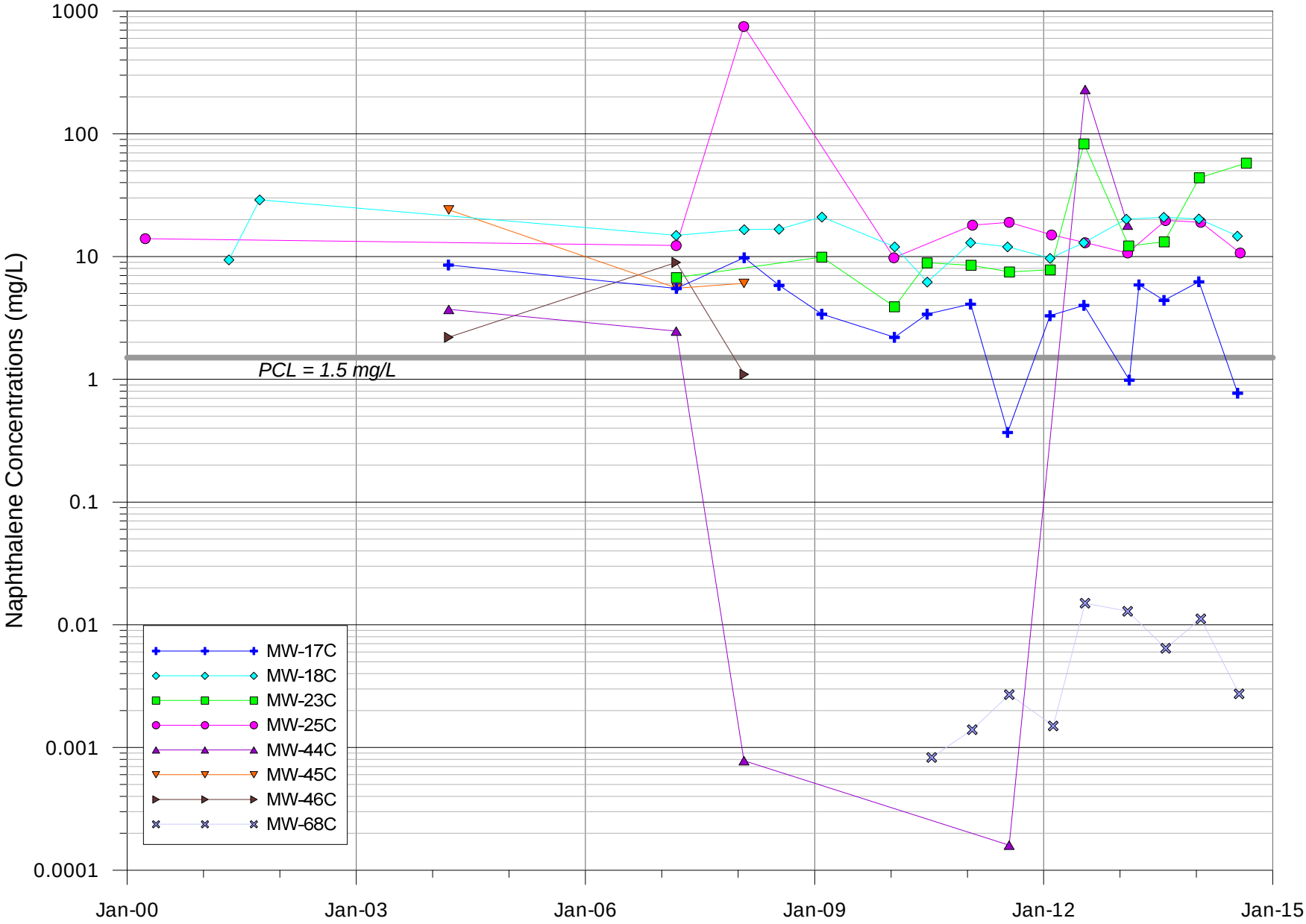
ATTACHMENT 1B-33
2-Methylnaphthalene Concentrations at Source Area Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



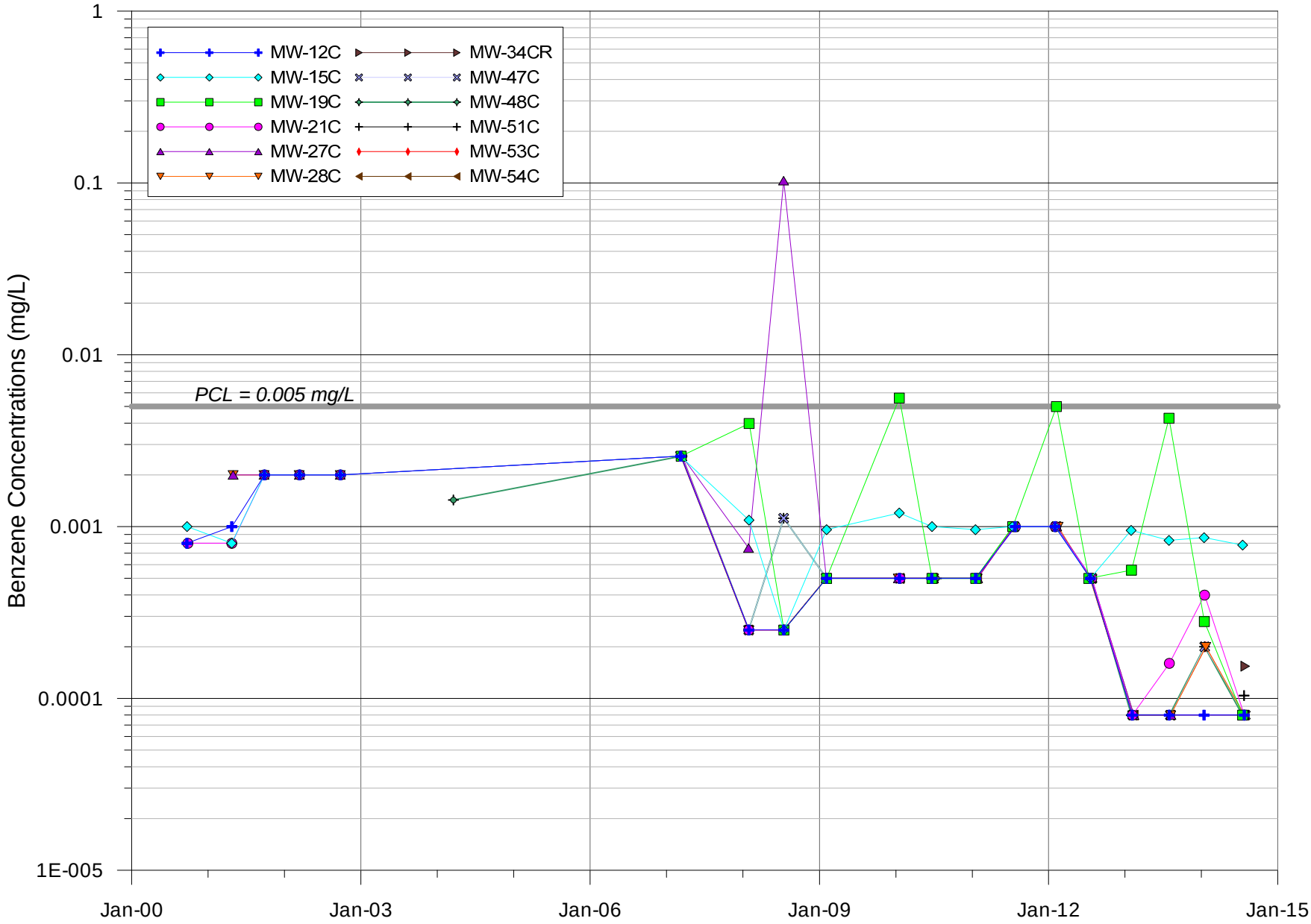
ATTACHMENT 1B-34
Dibenzofuran Concentrations at Source Area Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



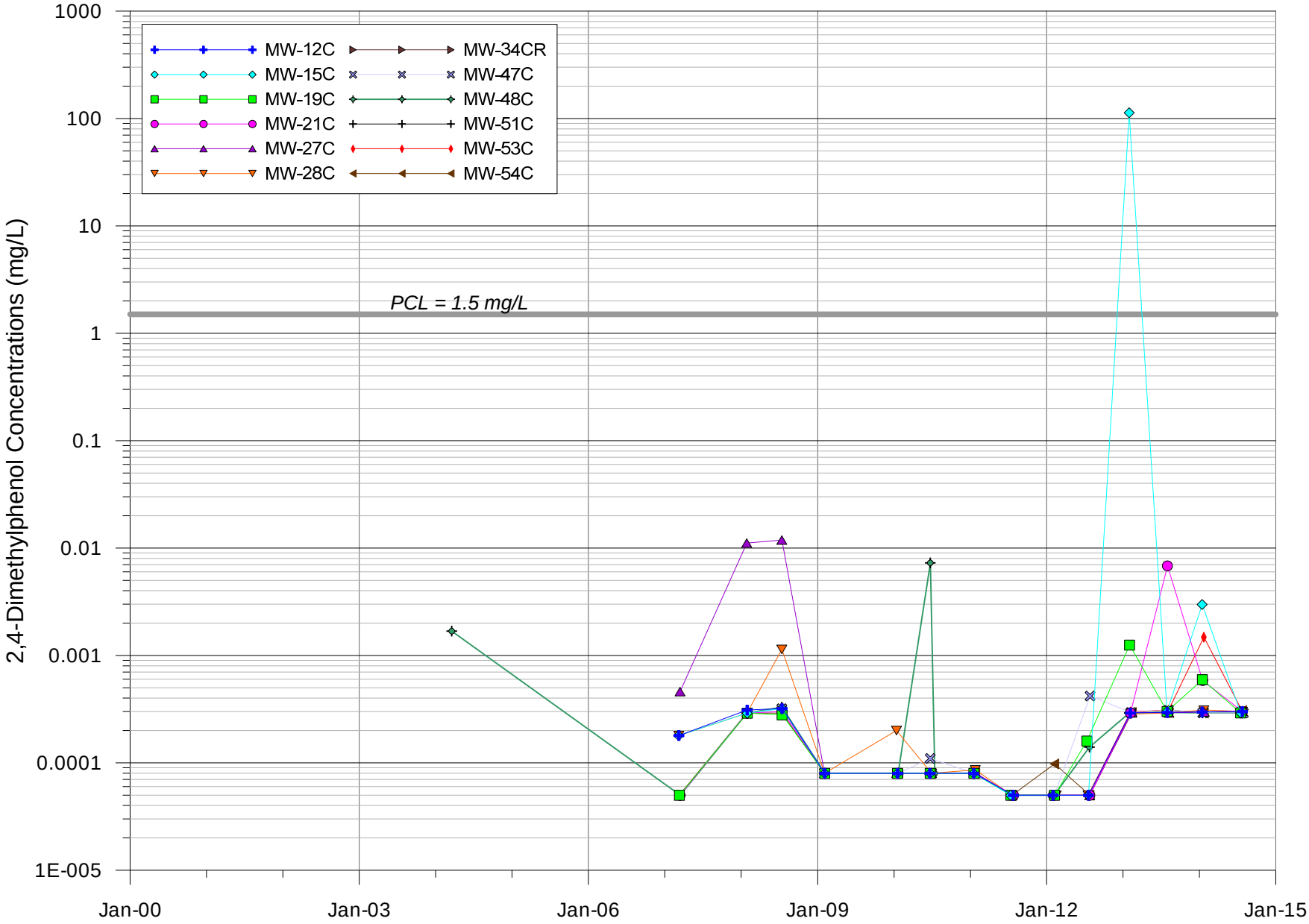
ATTACHMENT 1B-35
Naphthalene Concentrations at Source Area Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



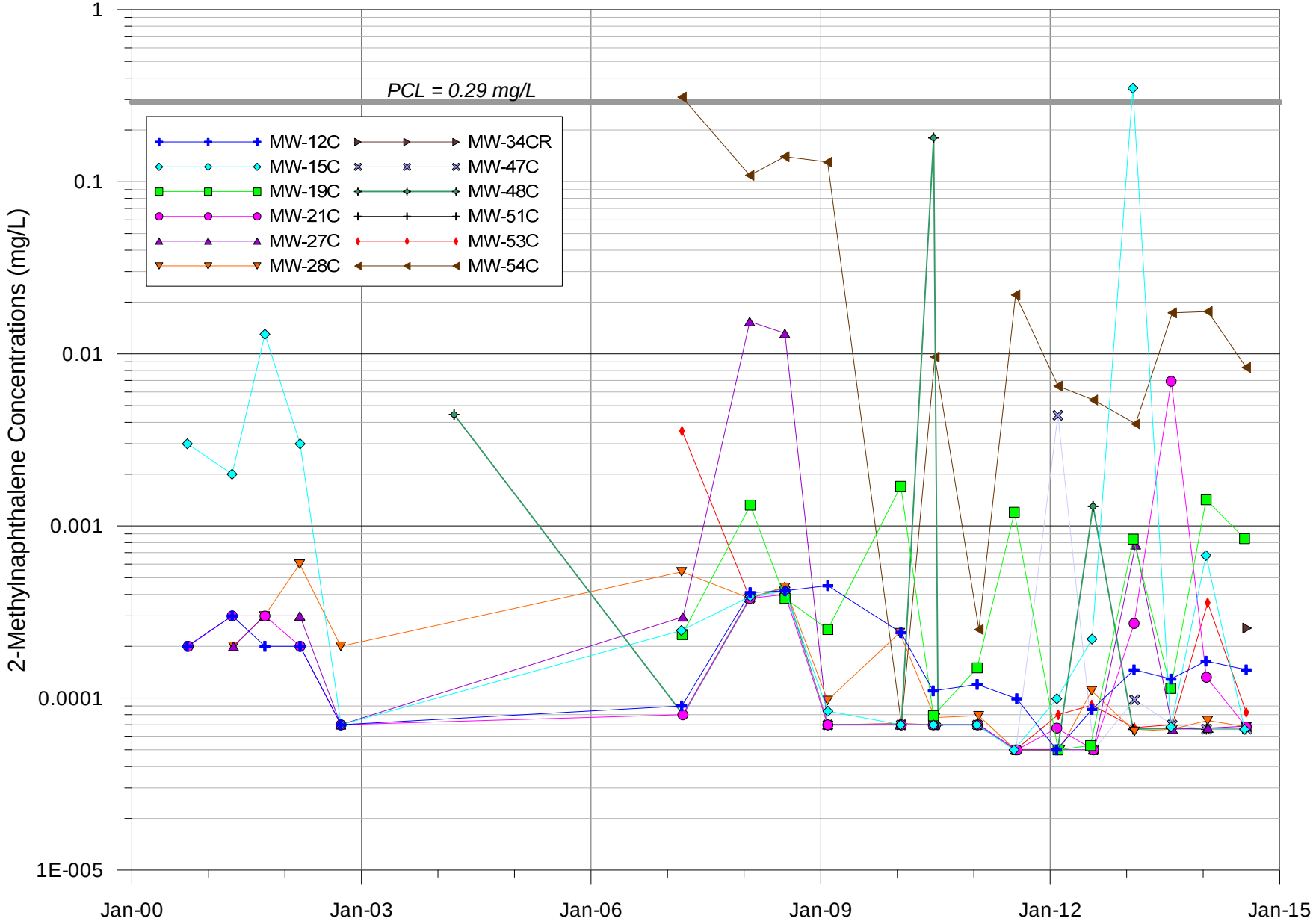
ATTACHMENT 1B-36
Benzene Concentrations at Perimeter Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



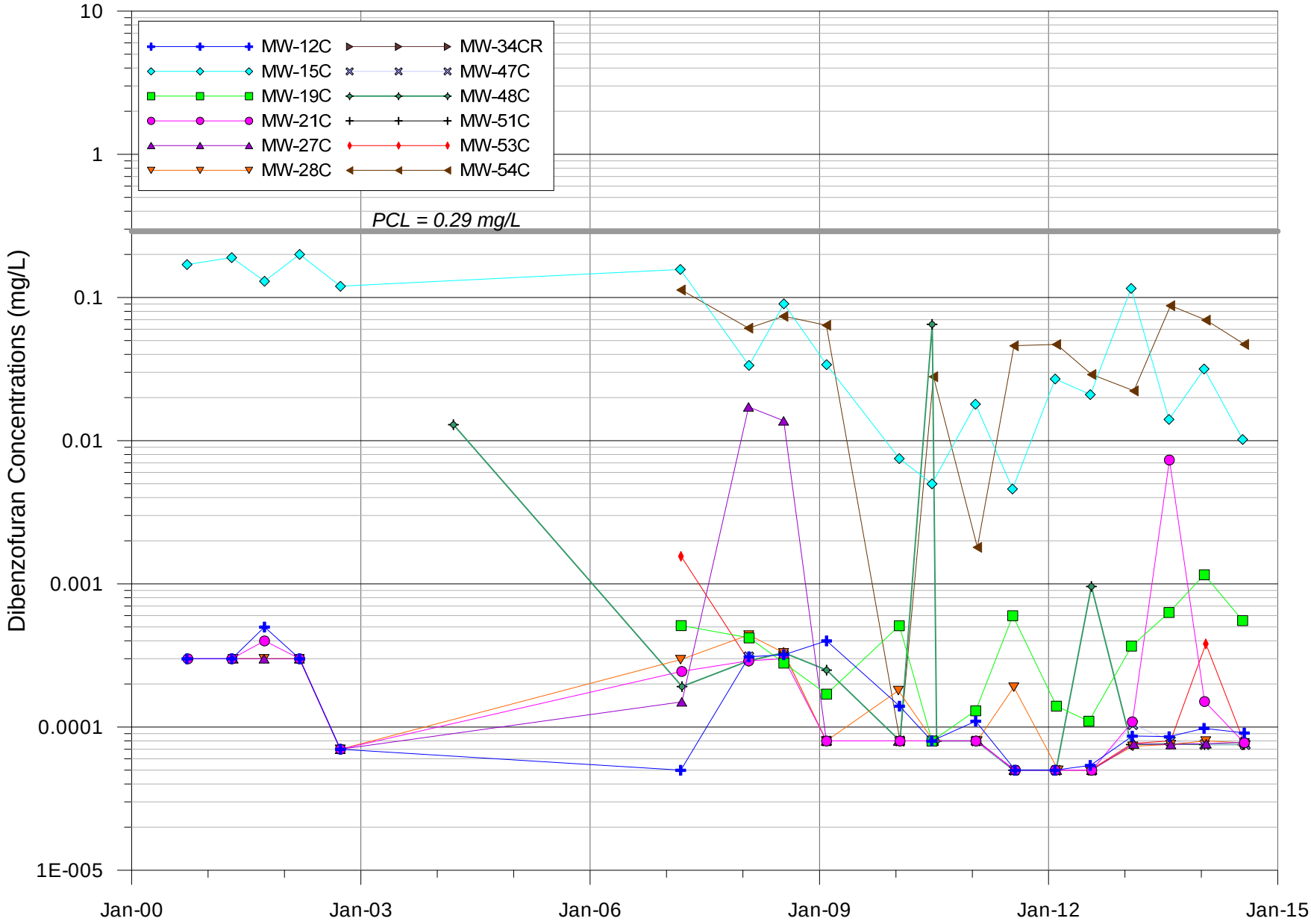
ATTACHMENT 1B-37
2,4-Dimethylphenol Concentrations at Perimeter Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



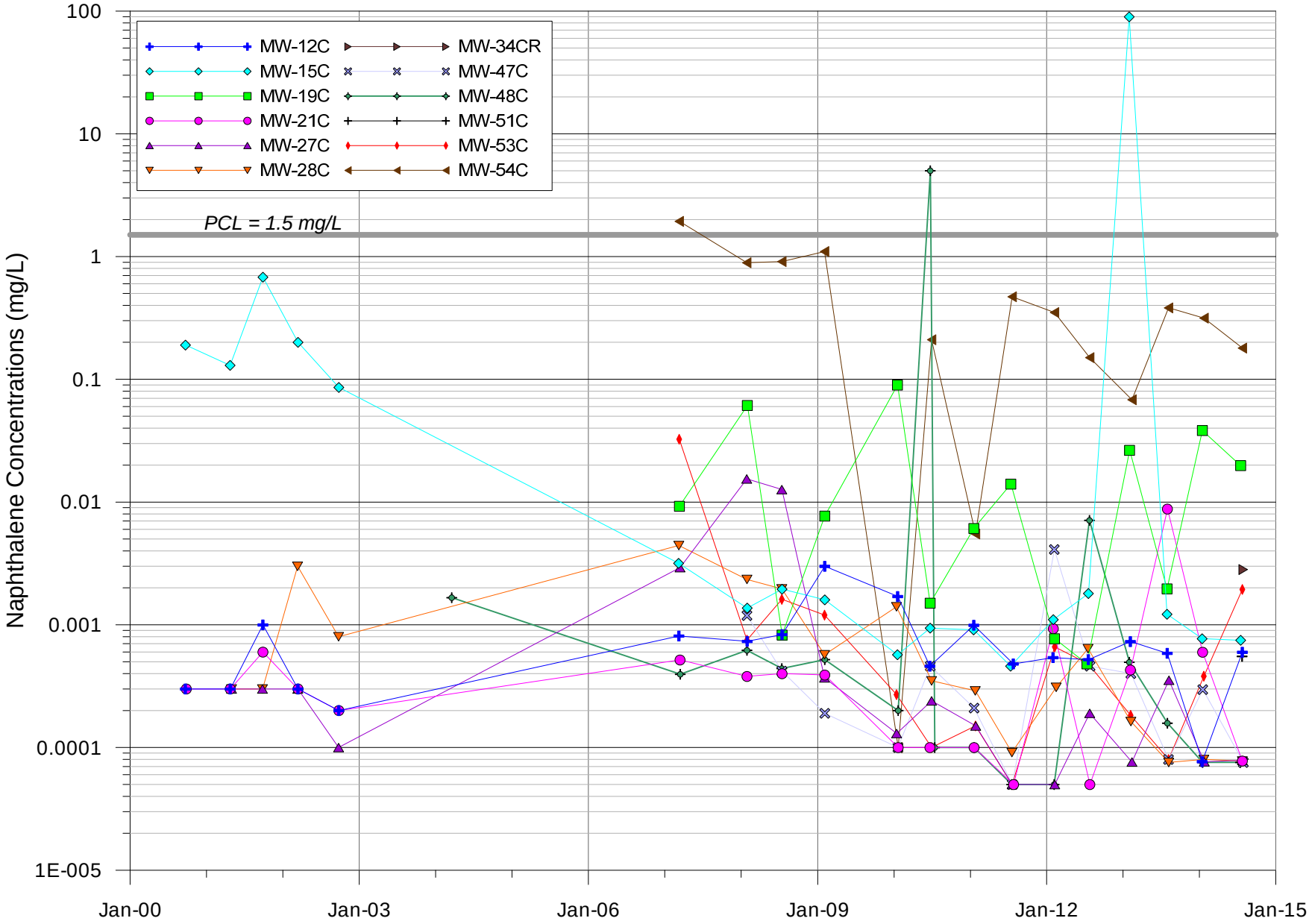
ATTACHMENT 1B-38
2-Methylnaphthalene Concentrations at Perimeter Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



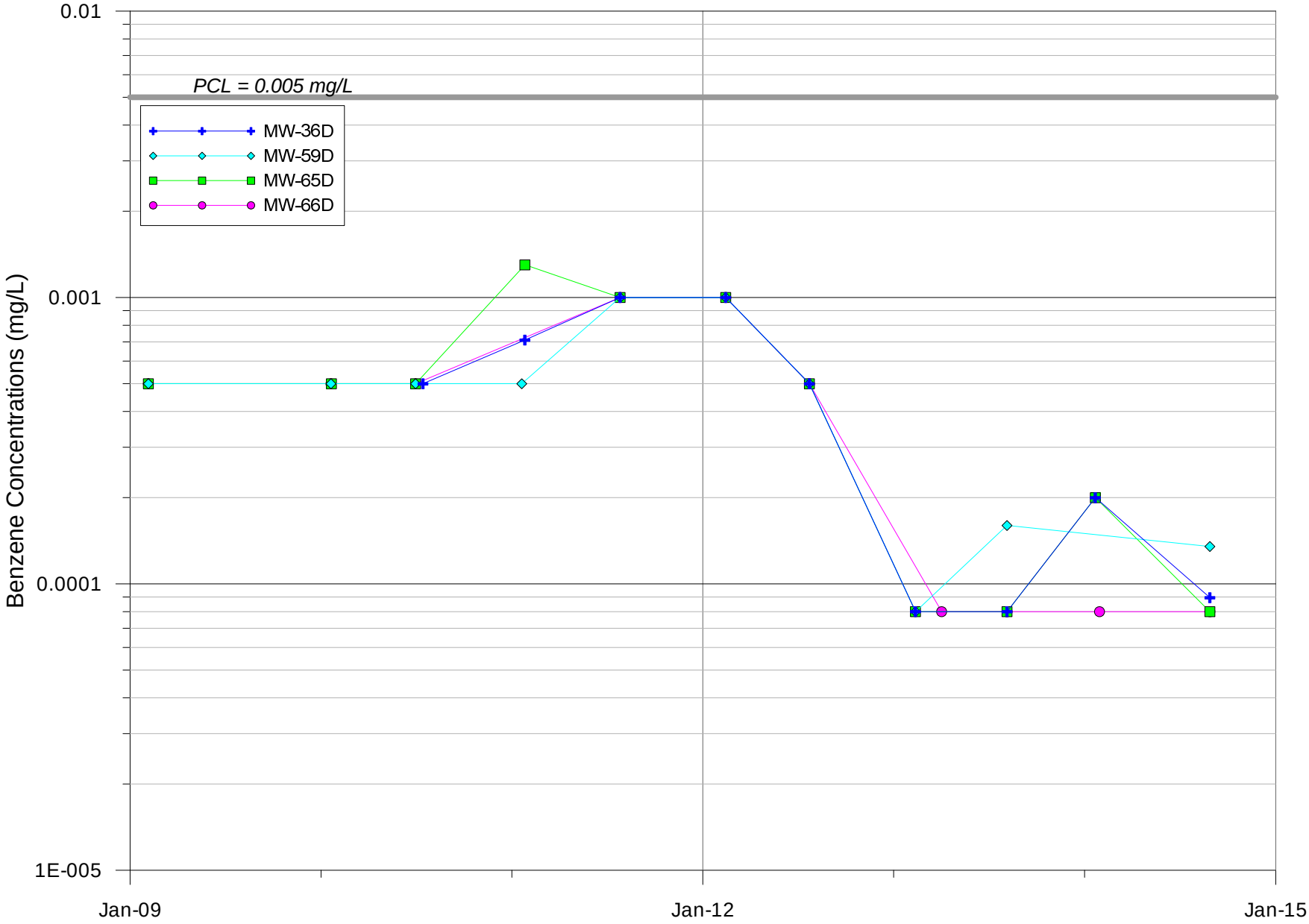
ATTACHMENT 1B-39
Dibenzofuran Concentrations at Perimeter Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



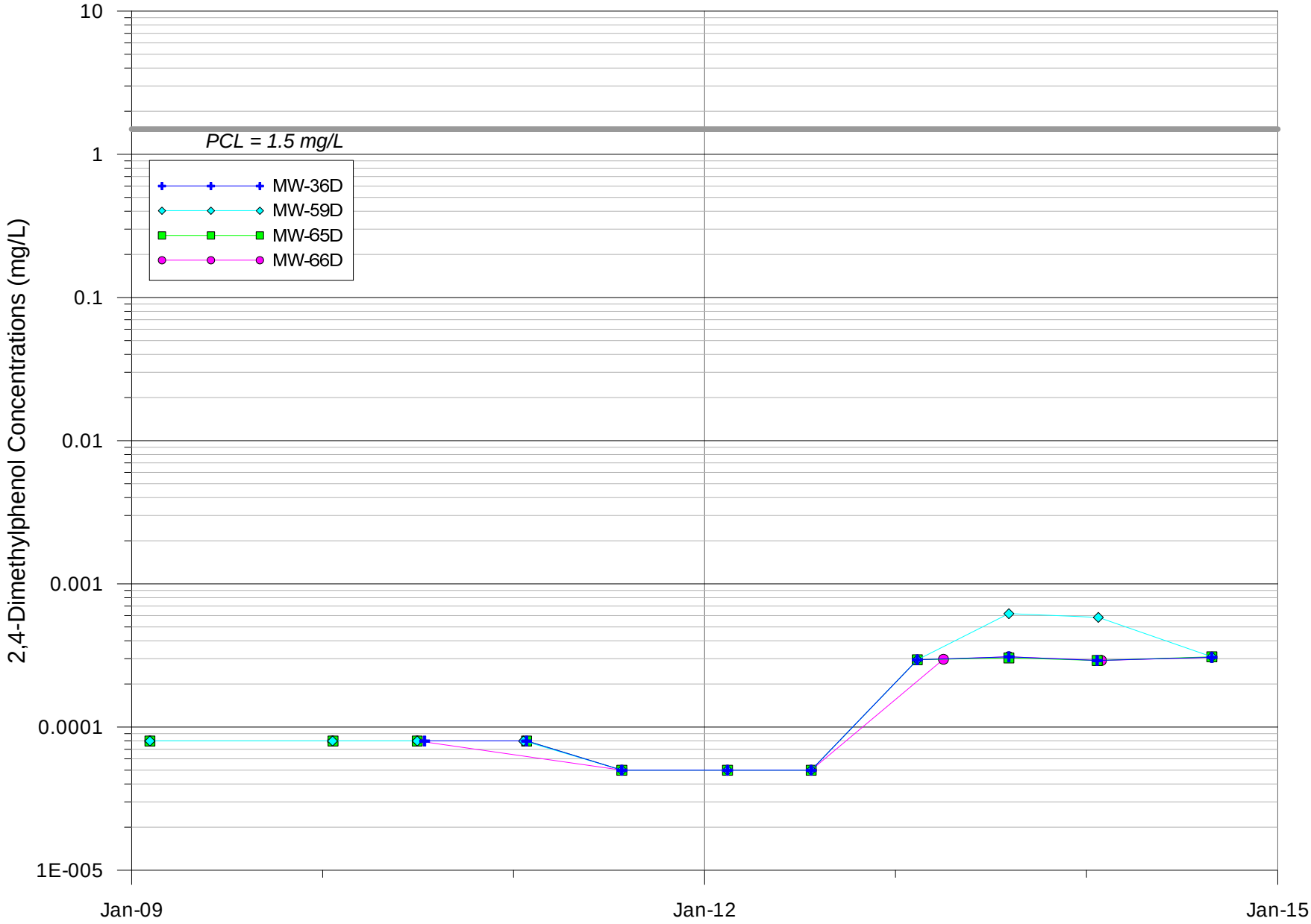
ATTACHMENT 1B-40
Naphthalene Concentrations at Perimeter Wells - C-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



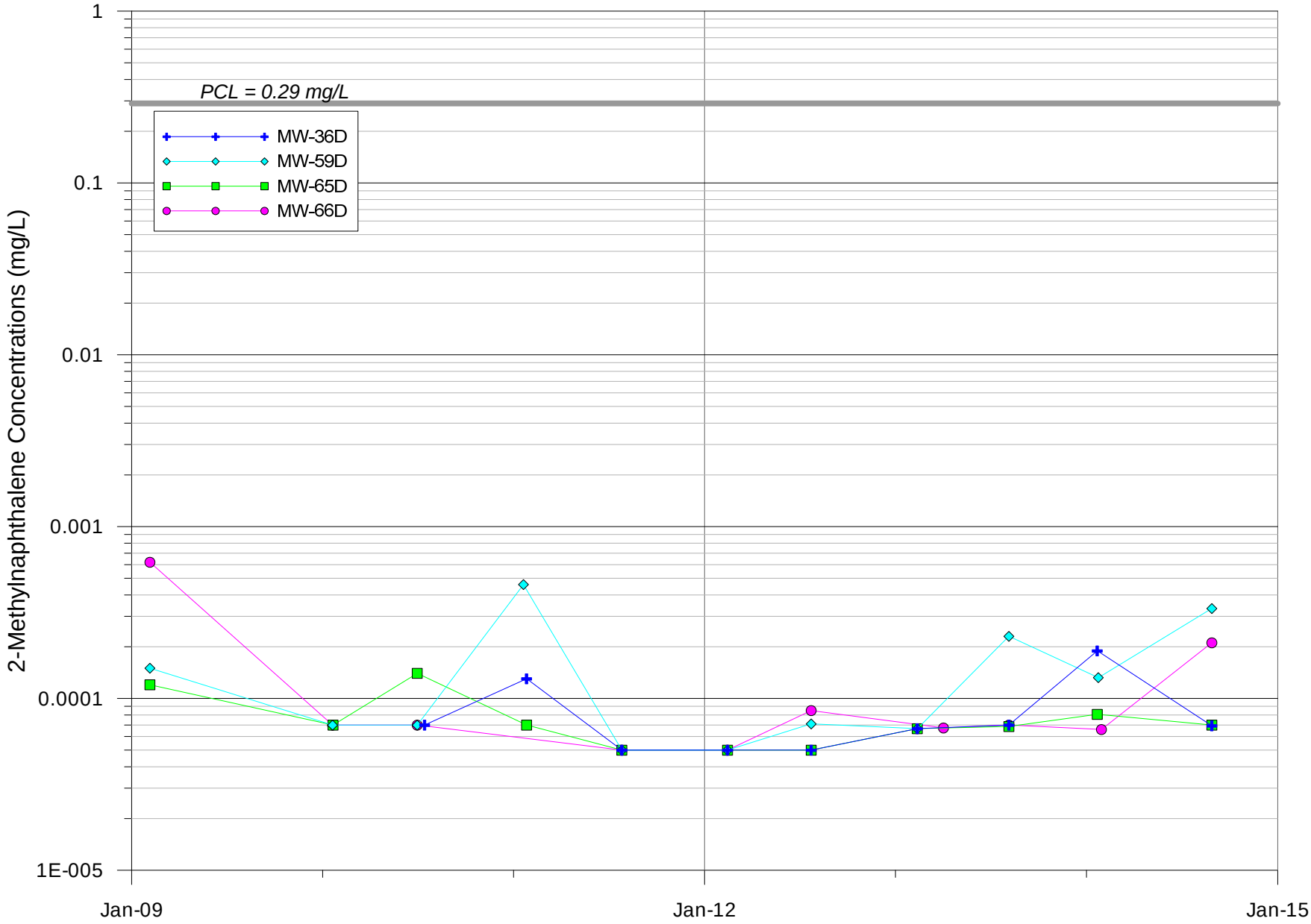
ATTACHMENT 1B-41
Benzene Concentrations at Source Area Wells - D-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



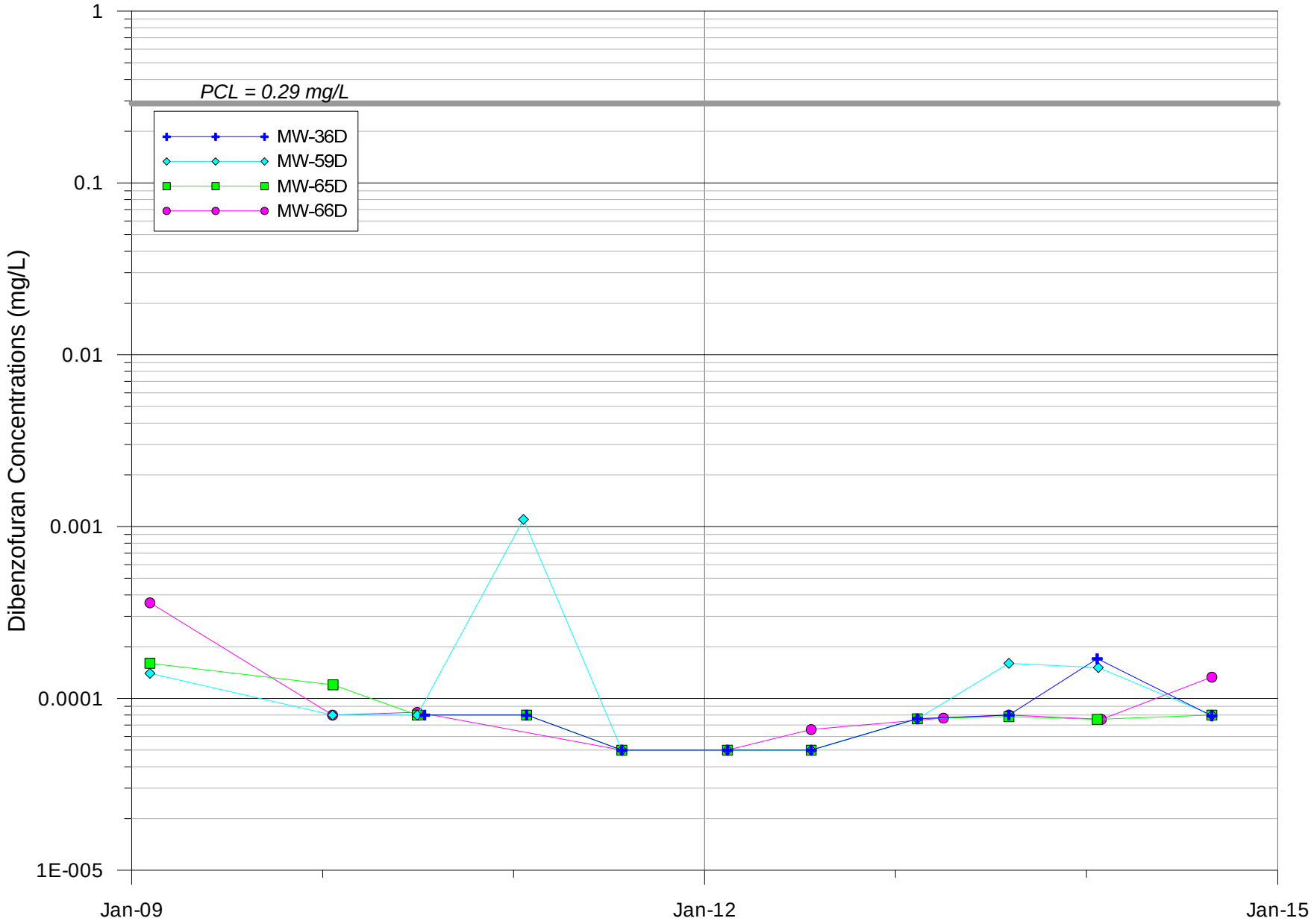
ATTACHMENT 1B-42
2,4-Dimethylphenol Concentrations at Source Area Wells - D-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



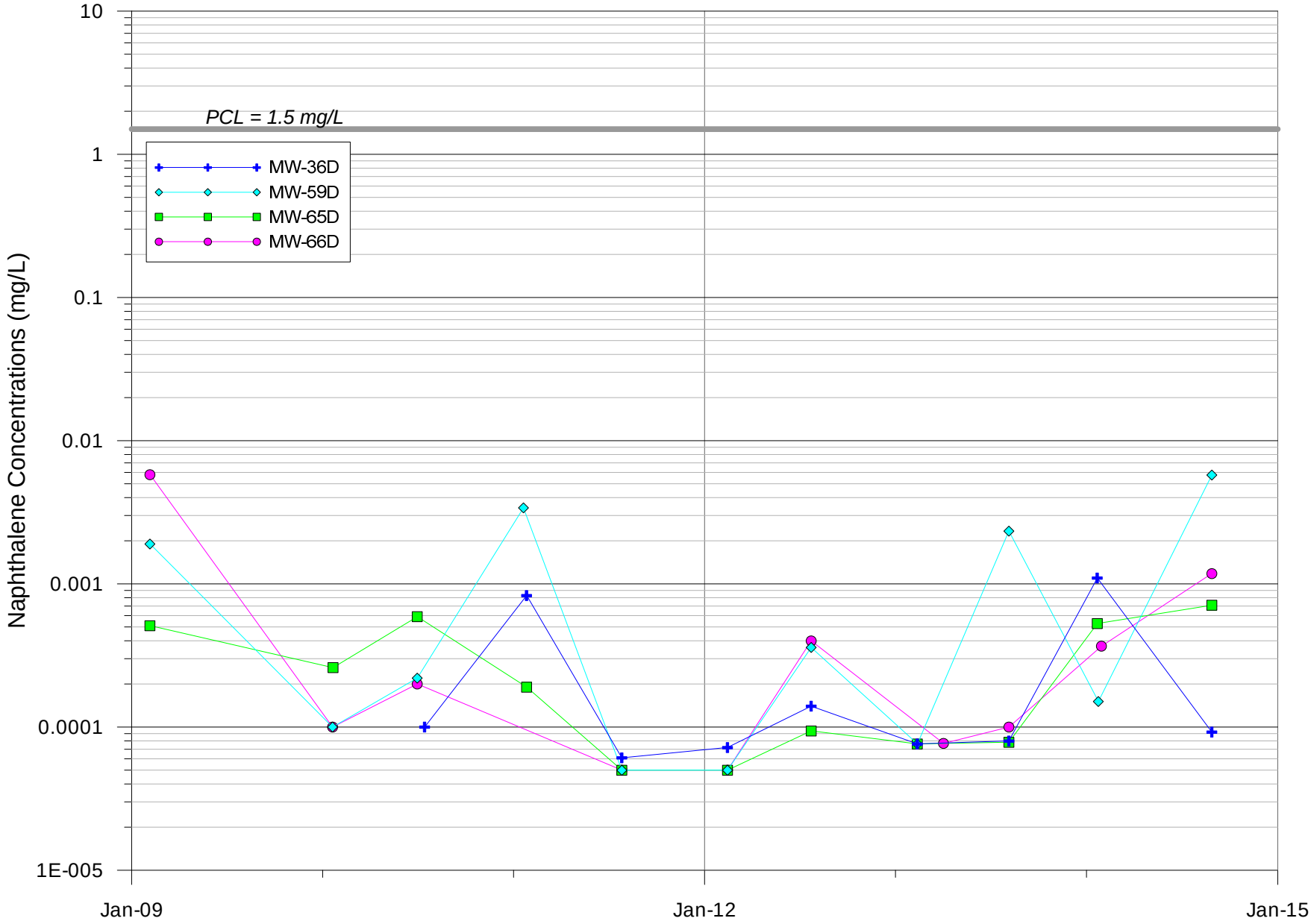
ATTACHMENT 1B-43
2-Methylnaphthatlene Concentrations at Source Area Wells - D-TZ
UPRR Houston Wood Preserving Works, Houston, Texas



ATTACHMENT 1B-44
Dibenzofuran Concentrations at Source Area Wells - D-TZ
UPRR Houston Wood Preserving Works, Houston, Texas

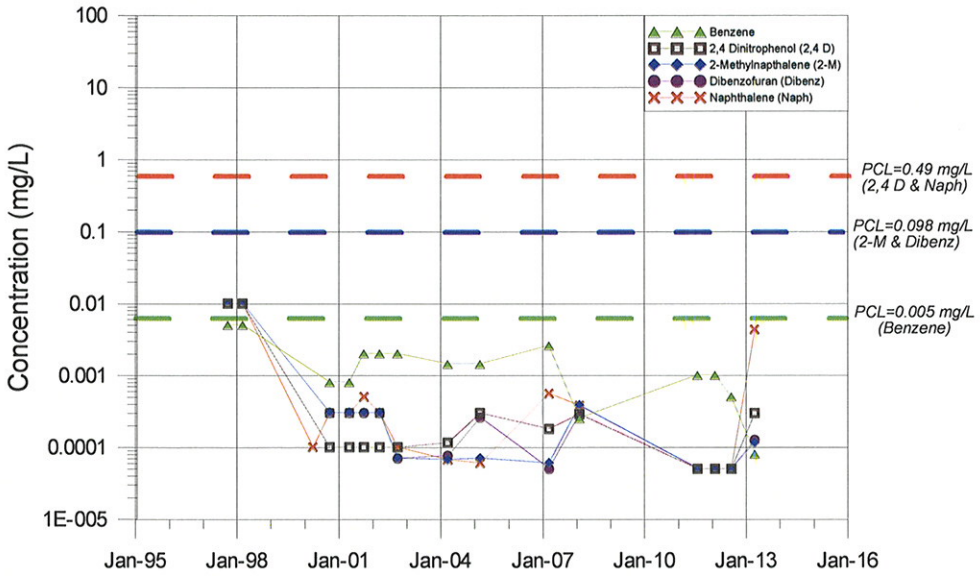


ATTACHMENT 1B-45
Naphthalene Concentrations at Source Area Wells - D-TZ
UPRR Houston Wood Preserving Works, Houston, Texas

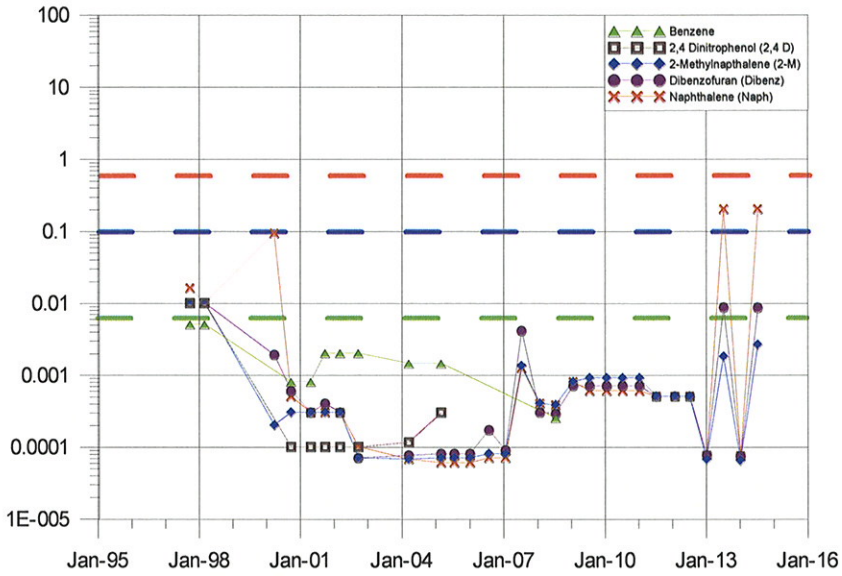


Attachment 1B-46
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

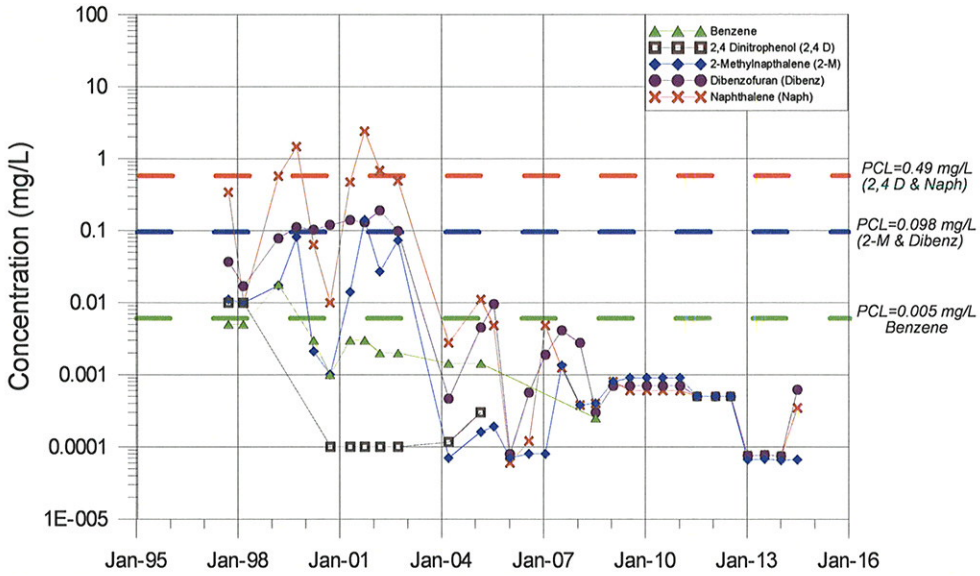
MW-09



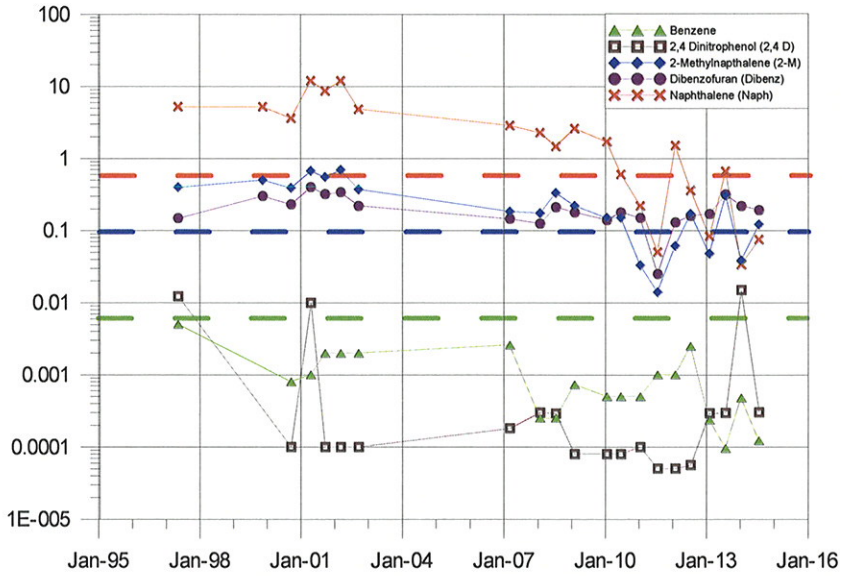
MW-10A



MW-11A

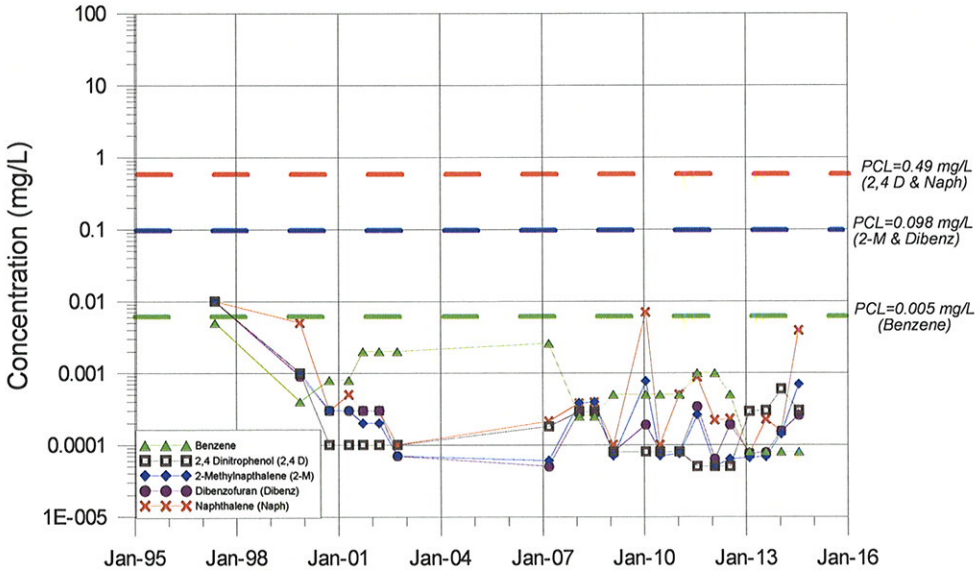


MW-12A

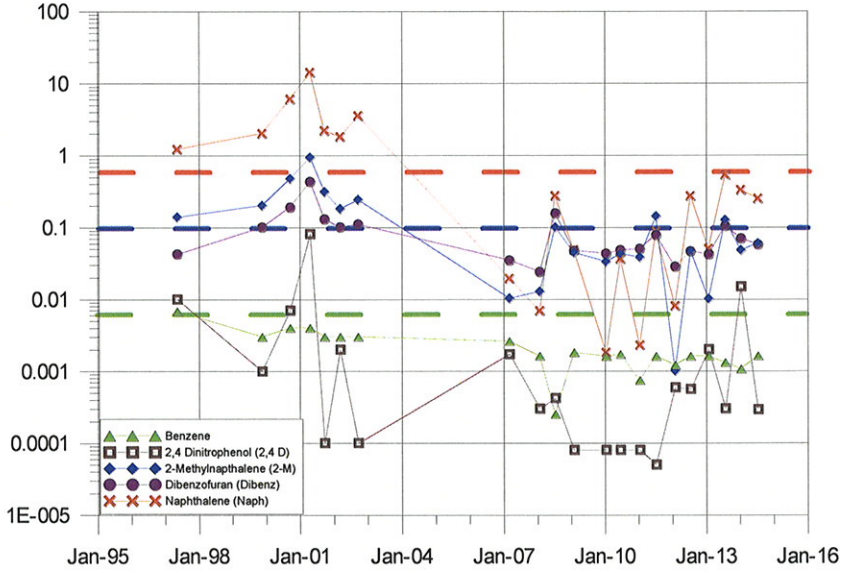


Attachment 1B-47
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

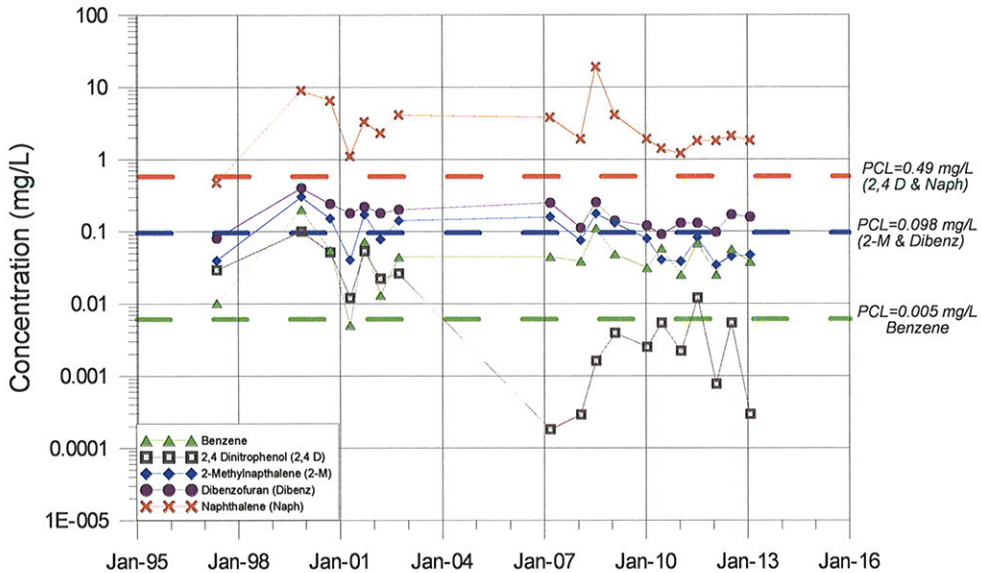
MW-13



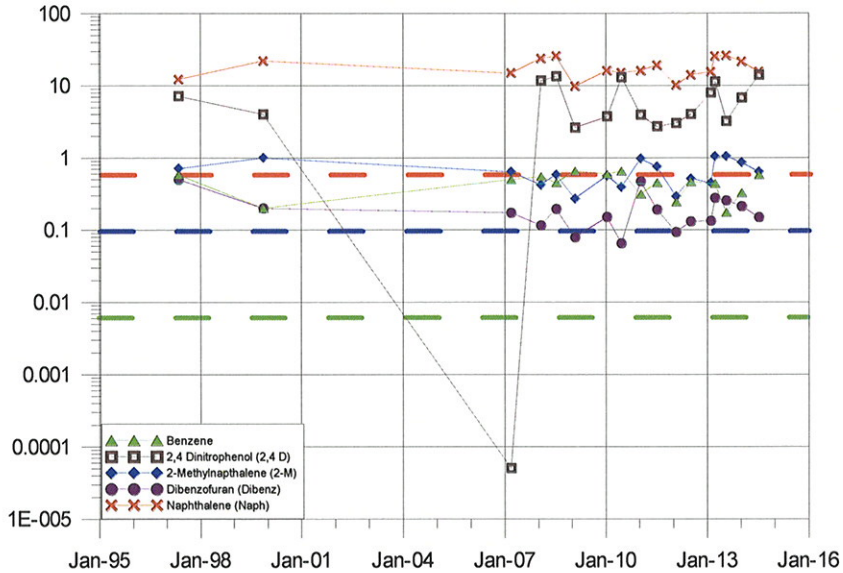
MW-15A



MW-16

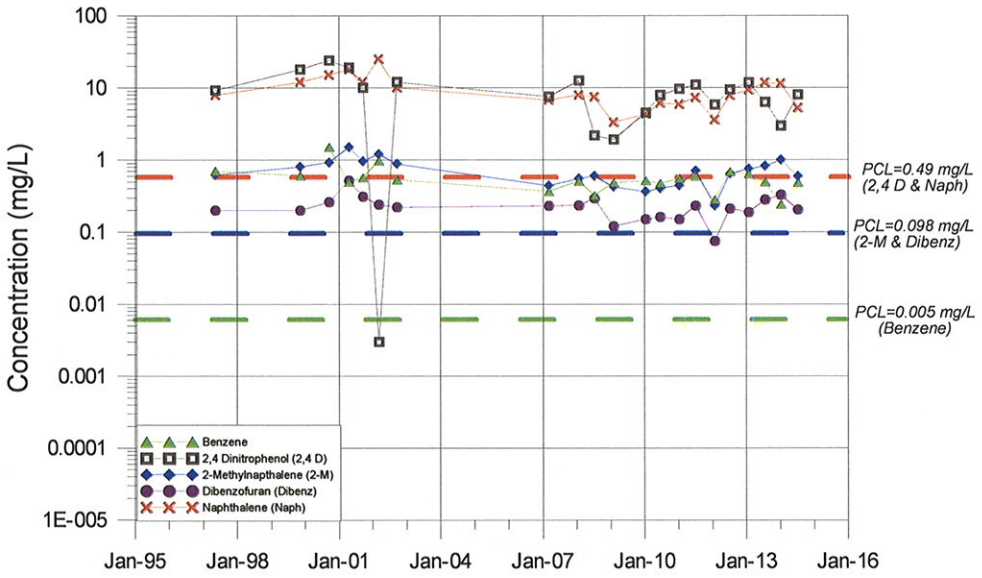


MW-17

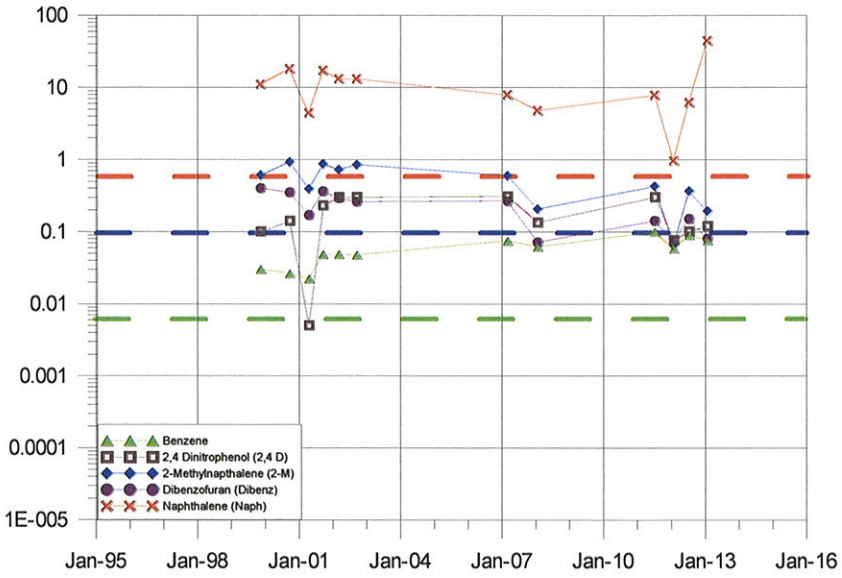


Attachment 1B-48
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

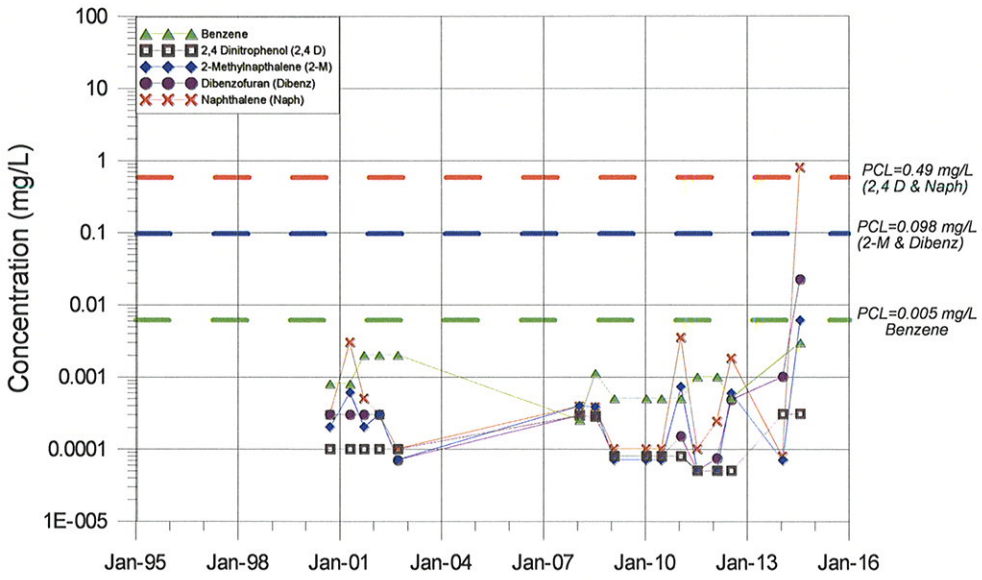
MW-18A



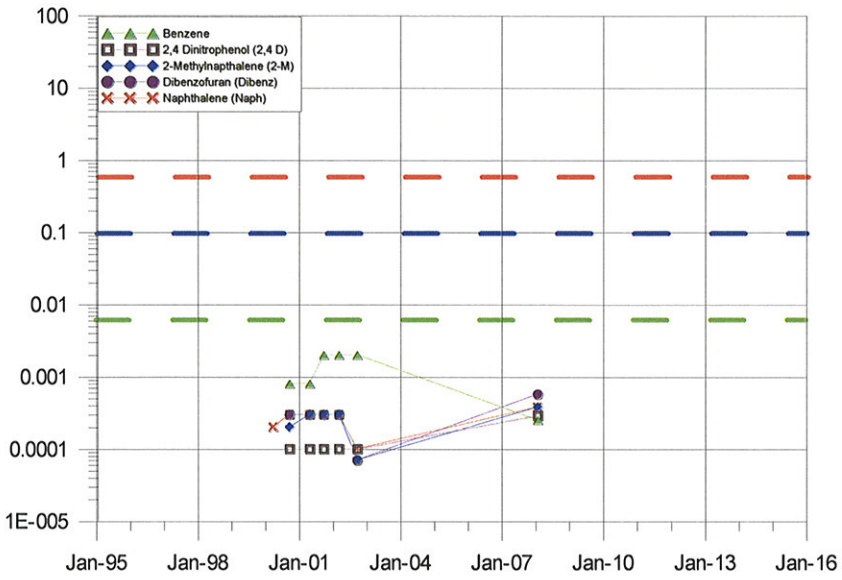
MW-20A



MW-22A

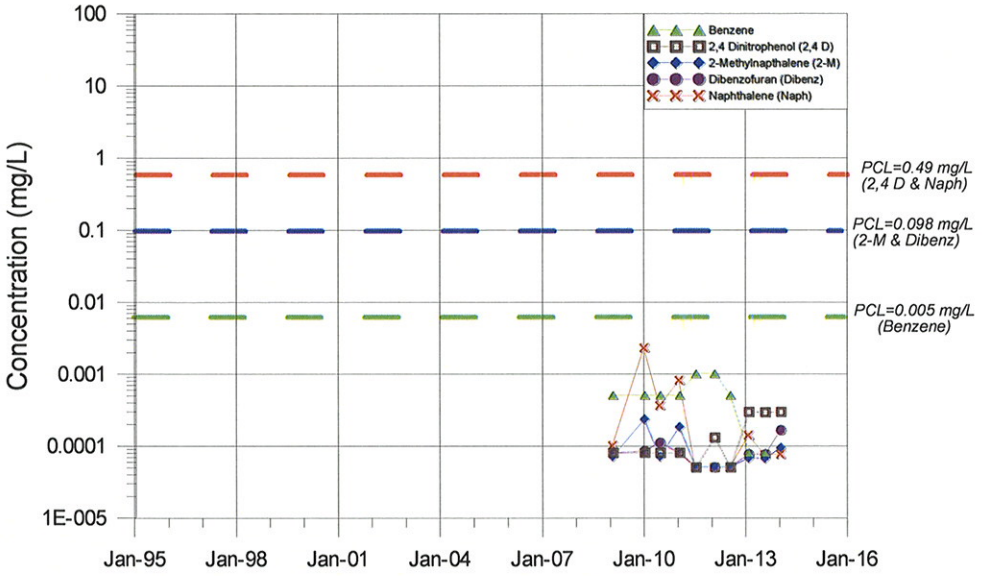


MW-24A

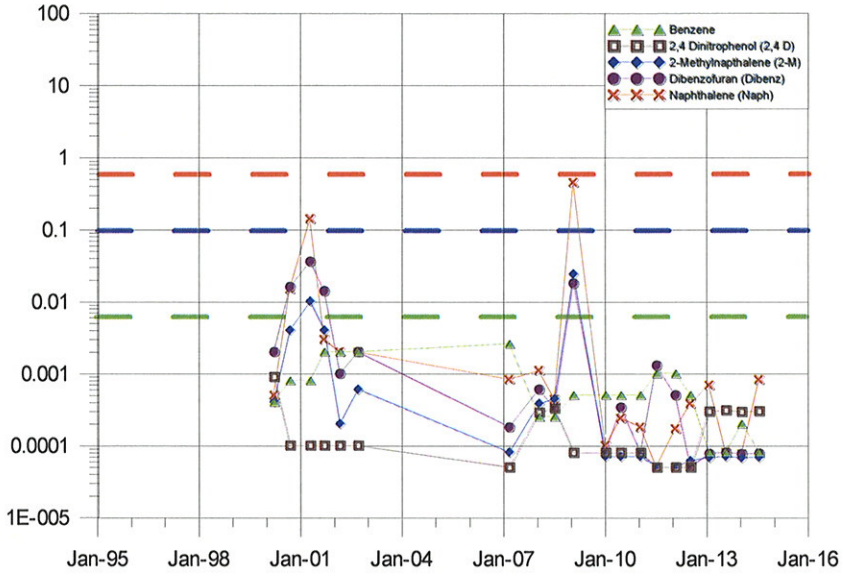


Attachment 1B-49
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

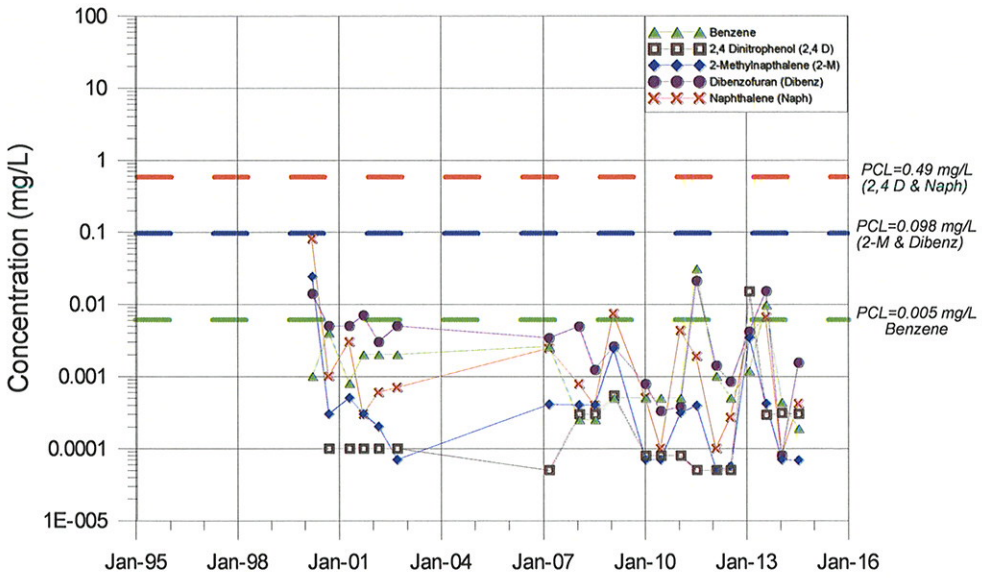
MW-24AR



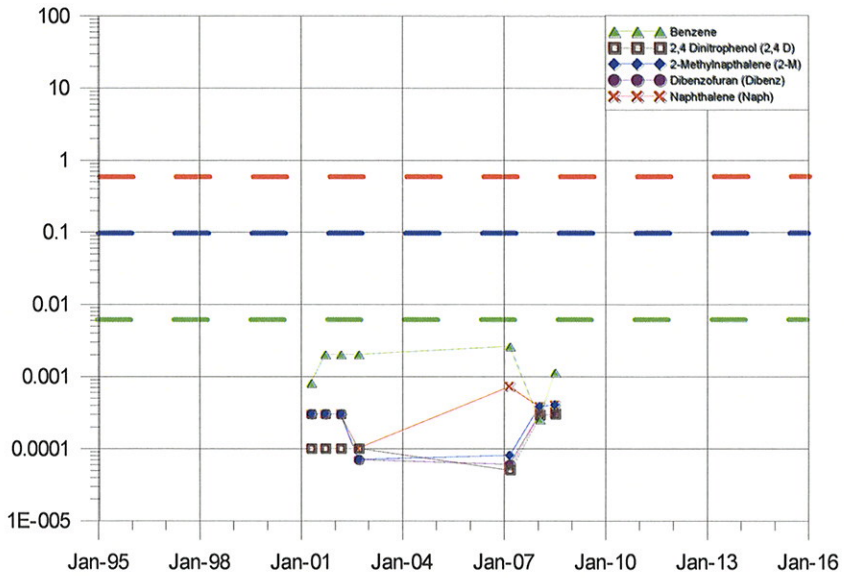
MW-25A



MW-26A

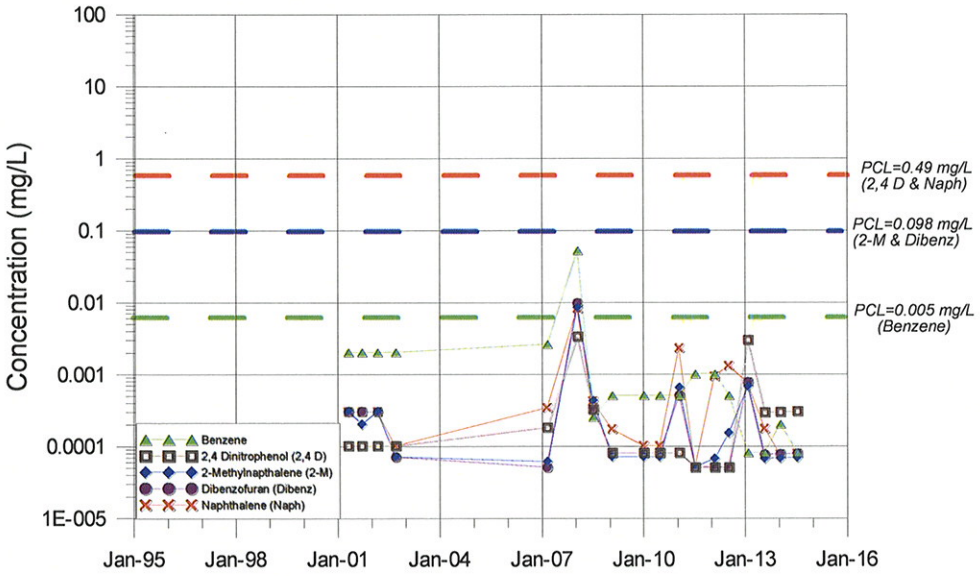


MW-27A

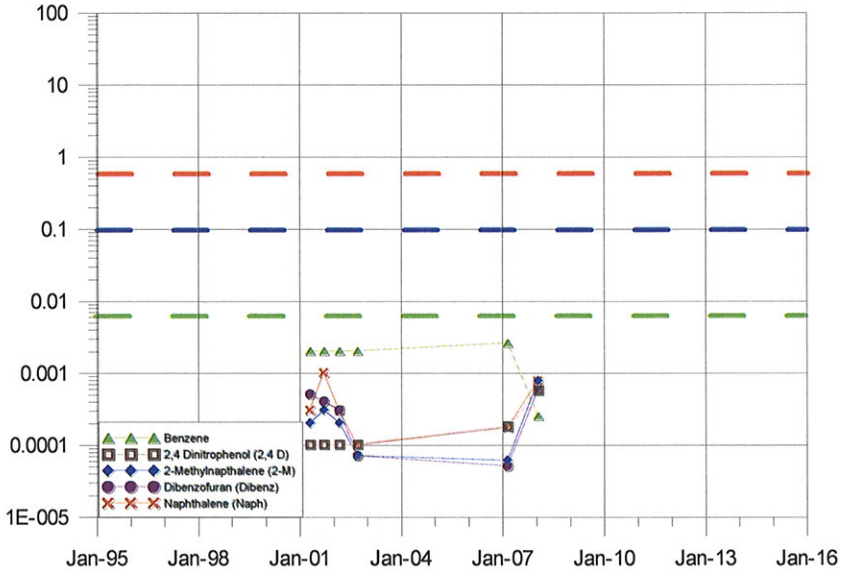


Attachment 1B-50
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

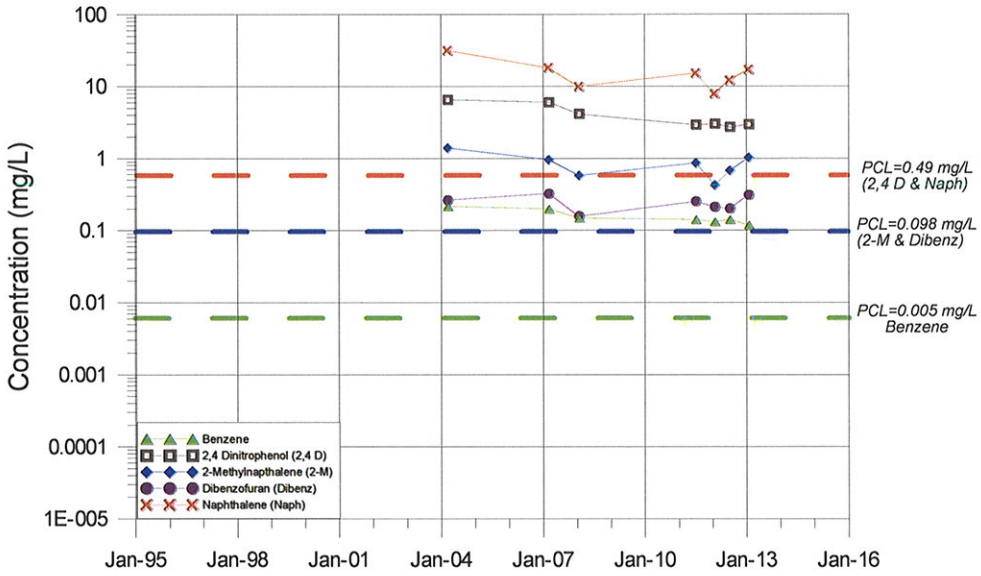
MW-28A



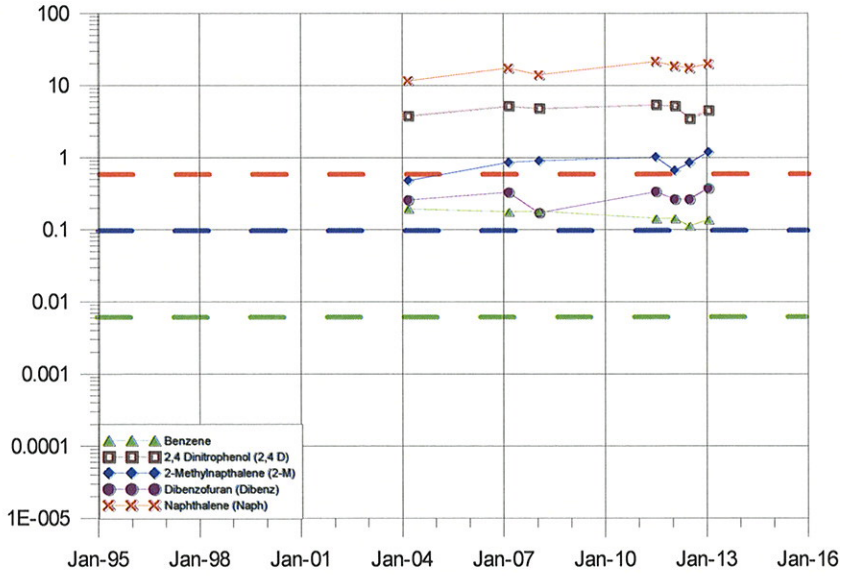
MW-29A



MW-30A

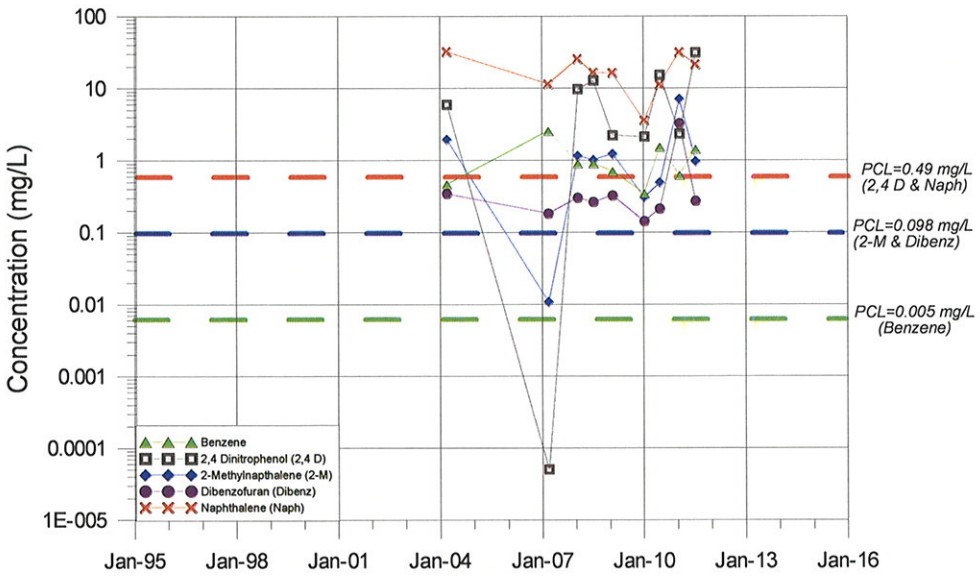


MW-31A

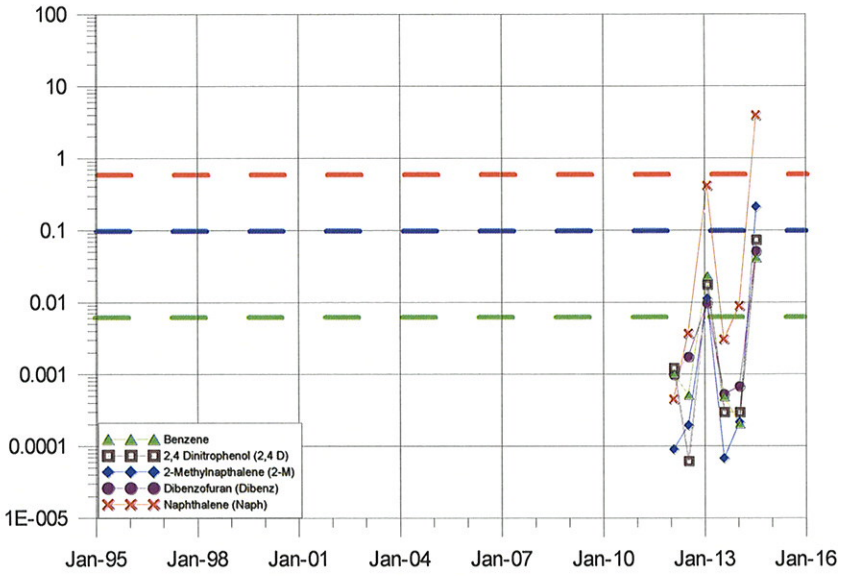


Attachment 1B-51
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

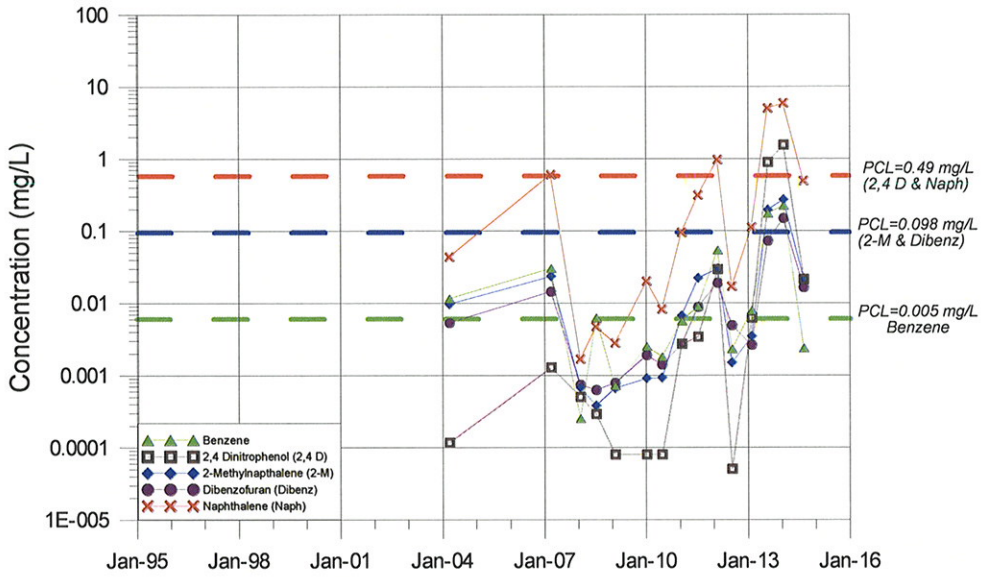
MW-32A



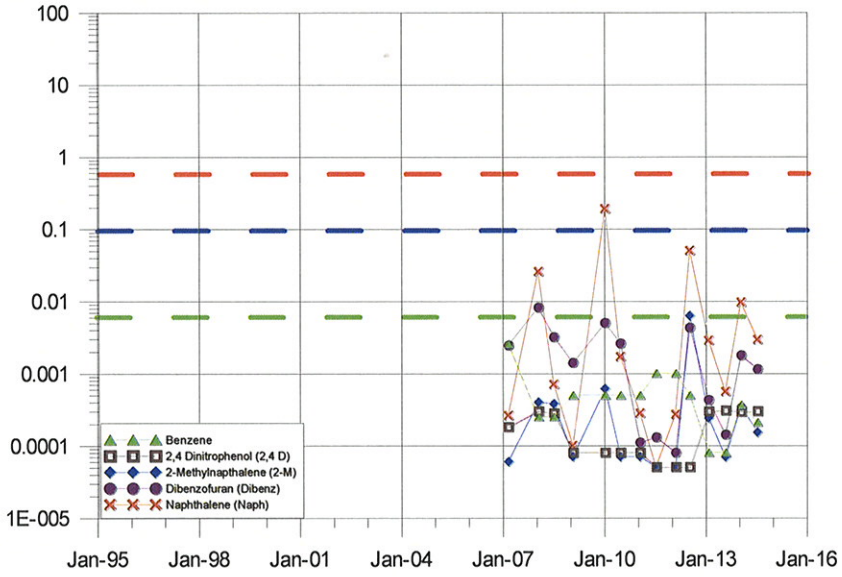
MW-32AR



MW-33A

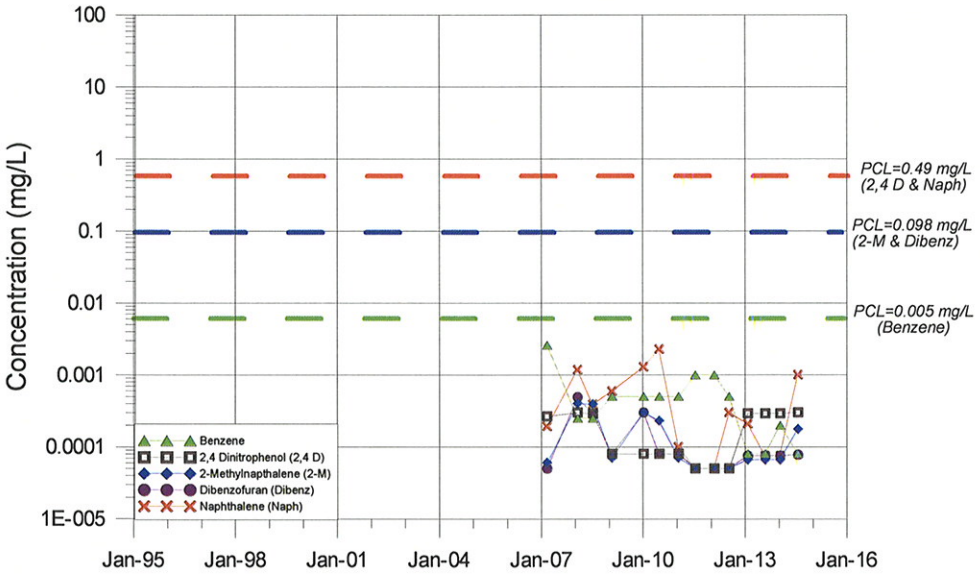


MW-35A

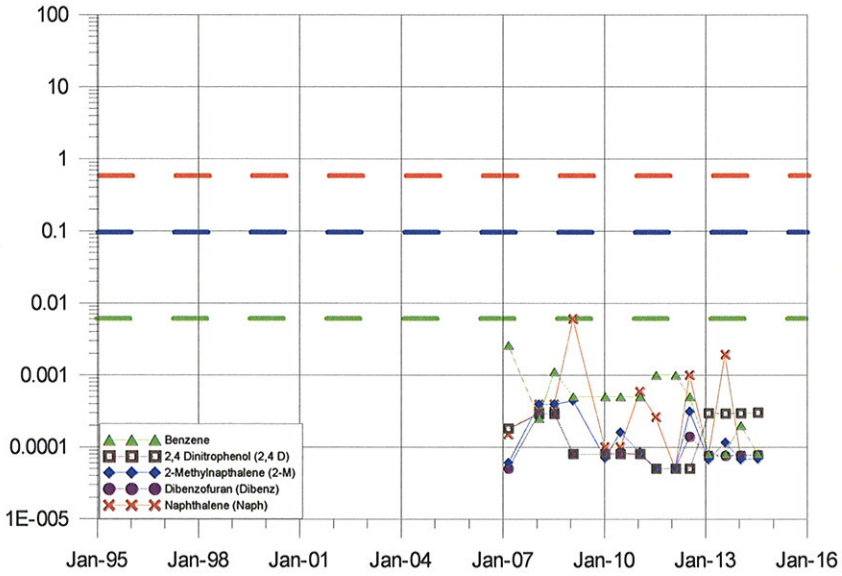


Attachment 1B-52
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

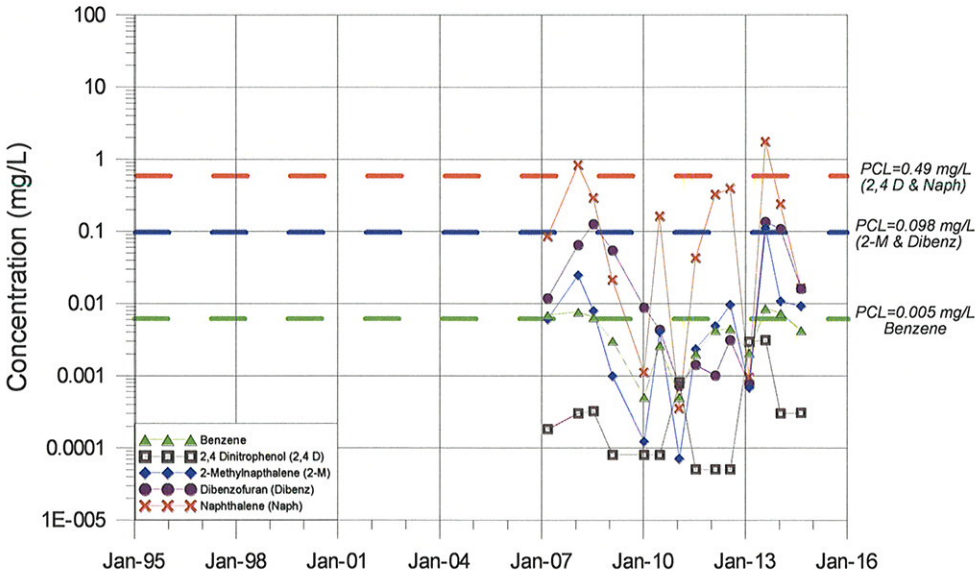
MW-36A



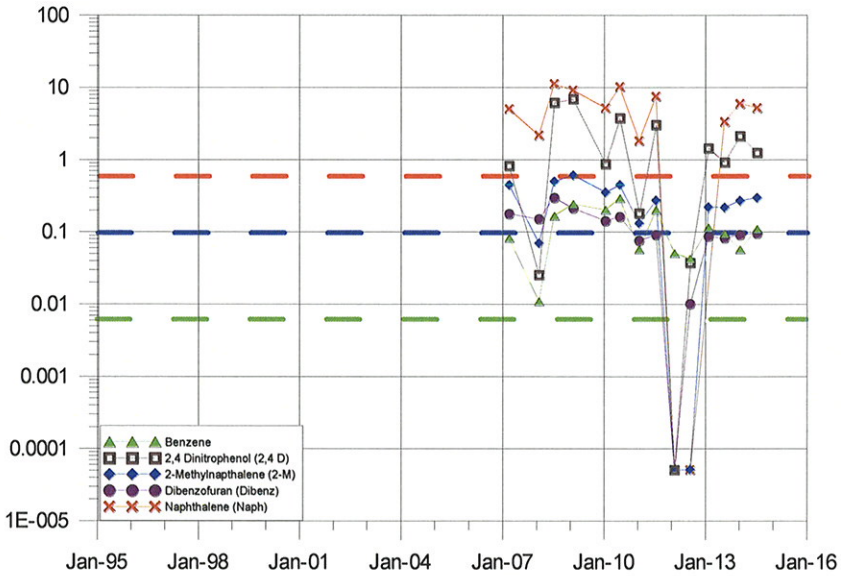
MW-38A



MW-44A

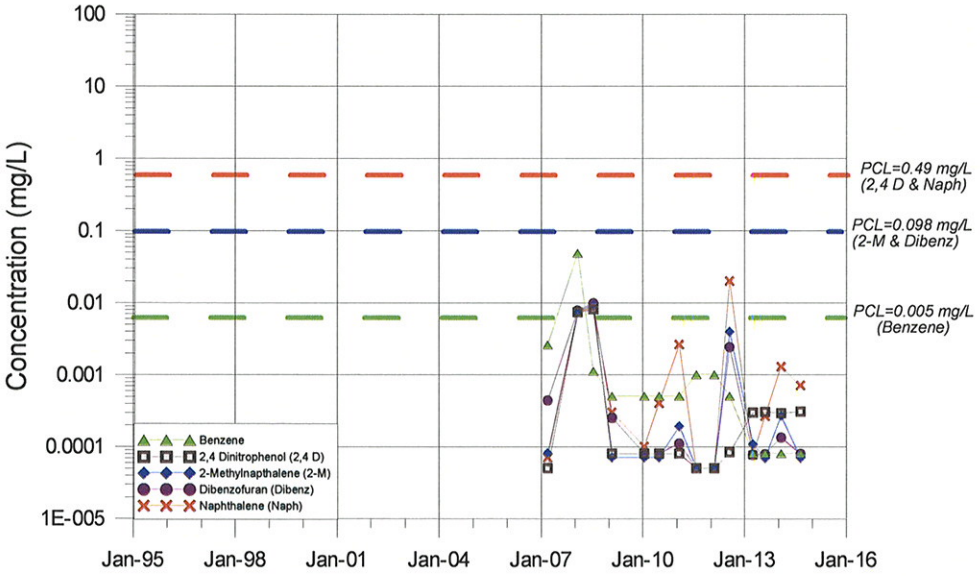


MW-49A

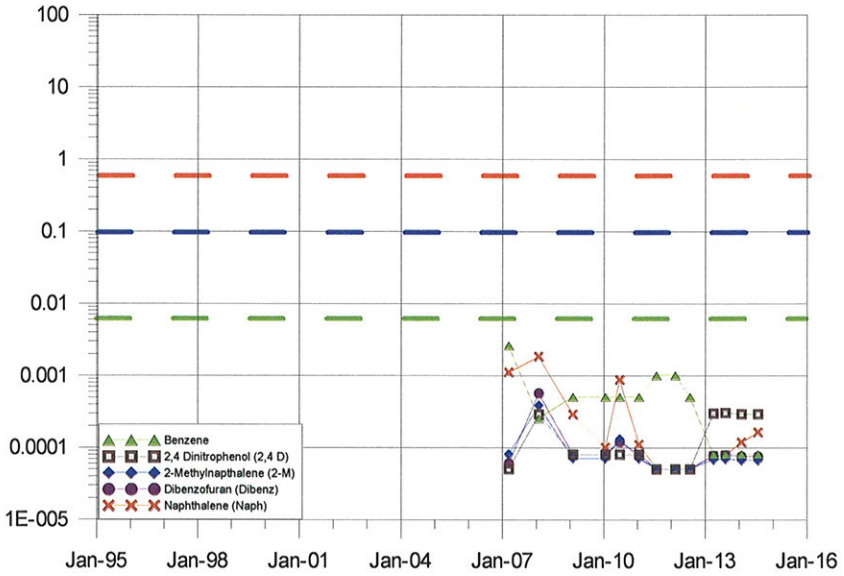


Attachment 1B-53
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

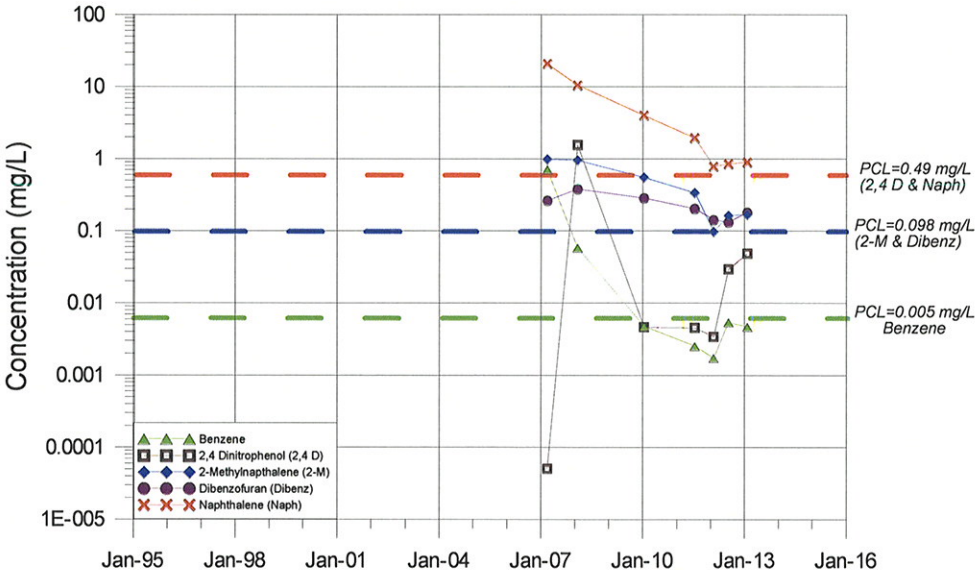
MW-50A



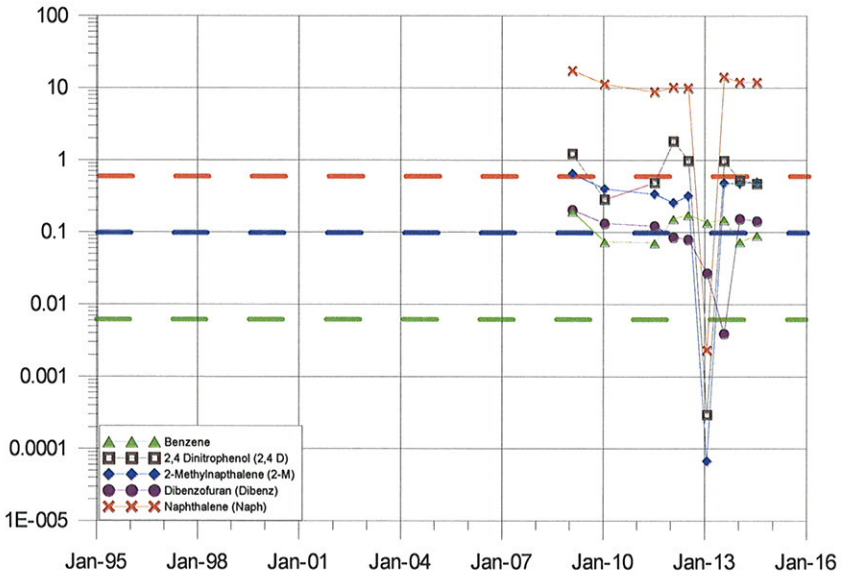
MW-51A



MW-52A

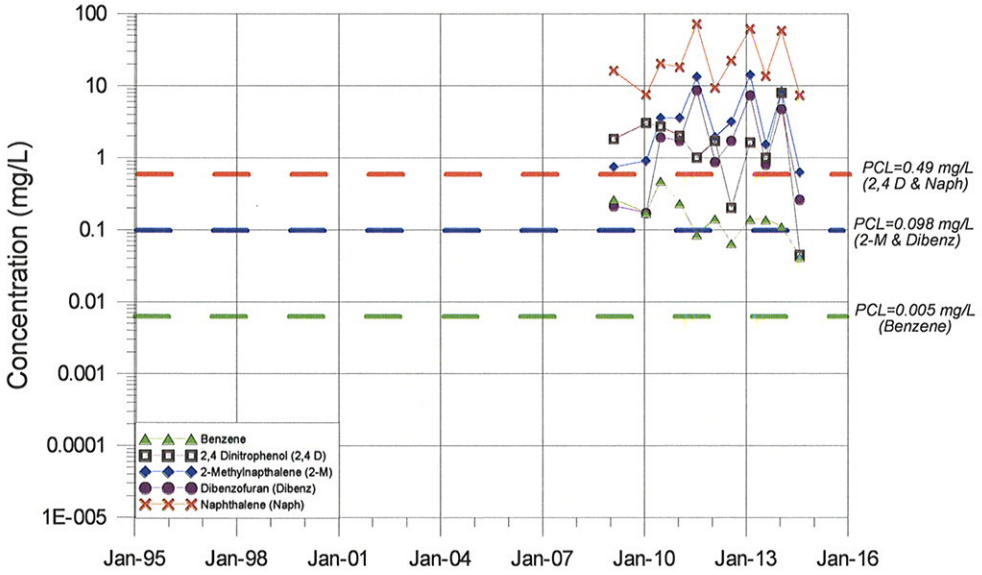


MW-55A

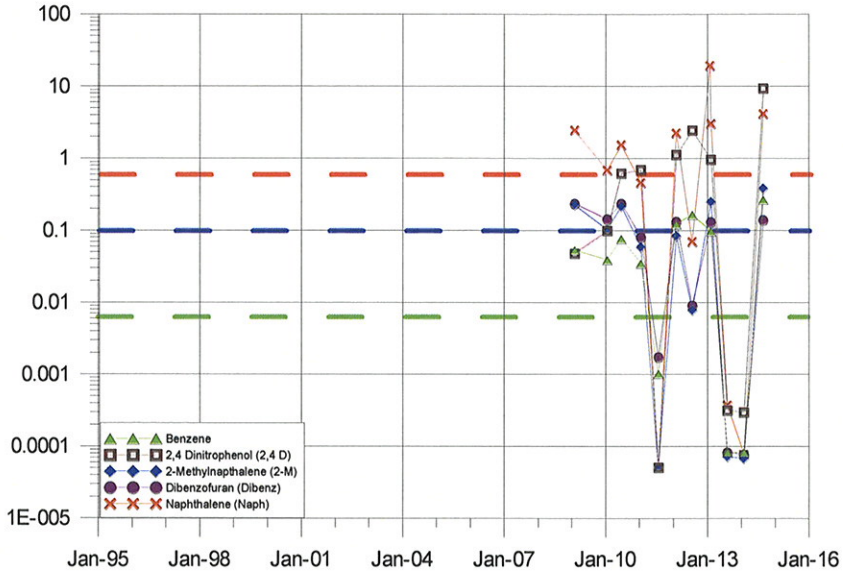


Attachment 1B-54
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

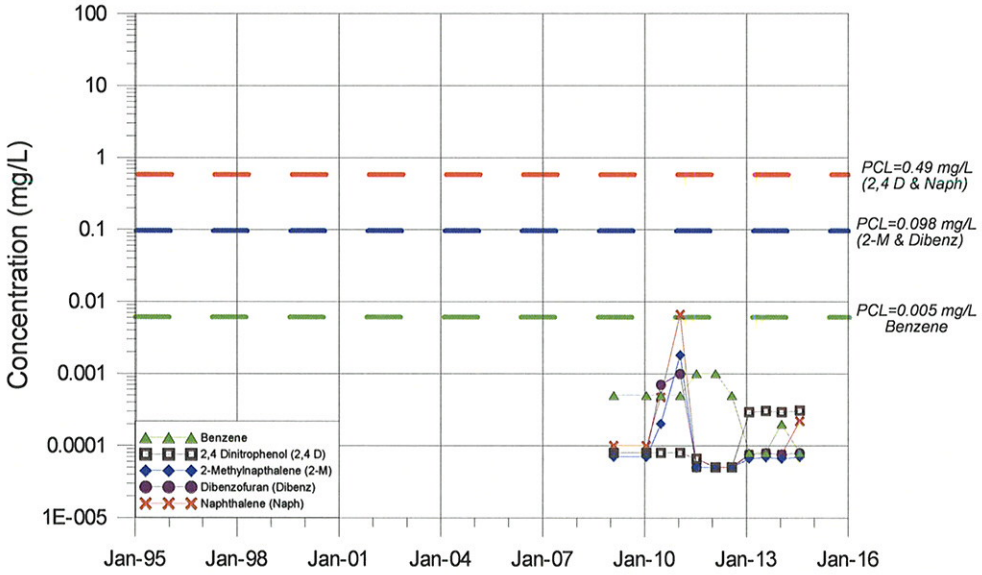
MW-57A



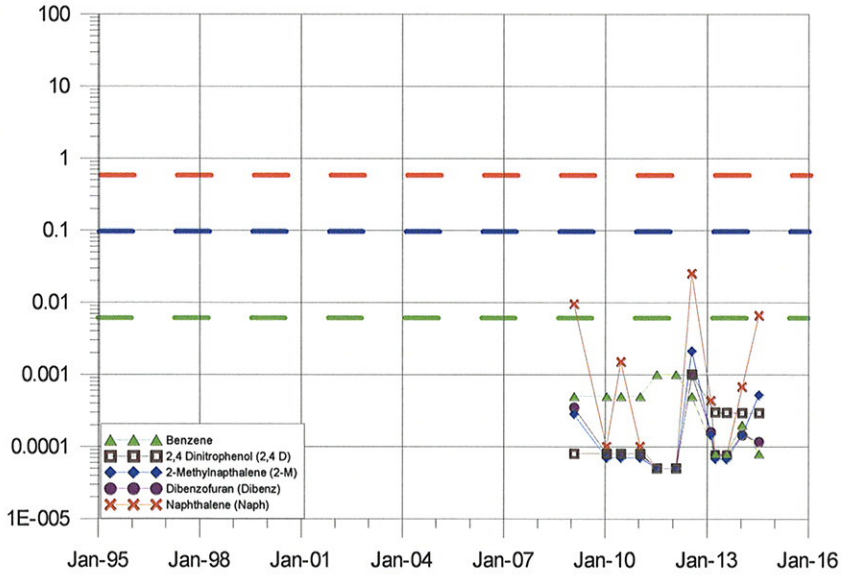
MW-58A



MW-59A

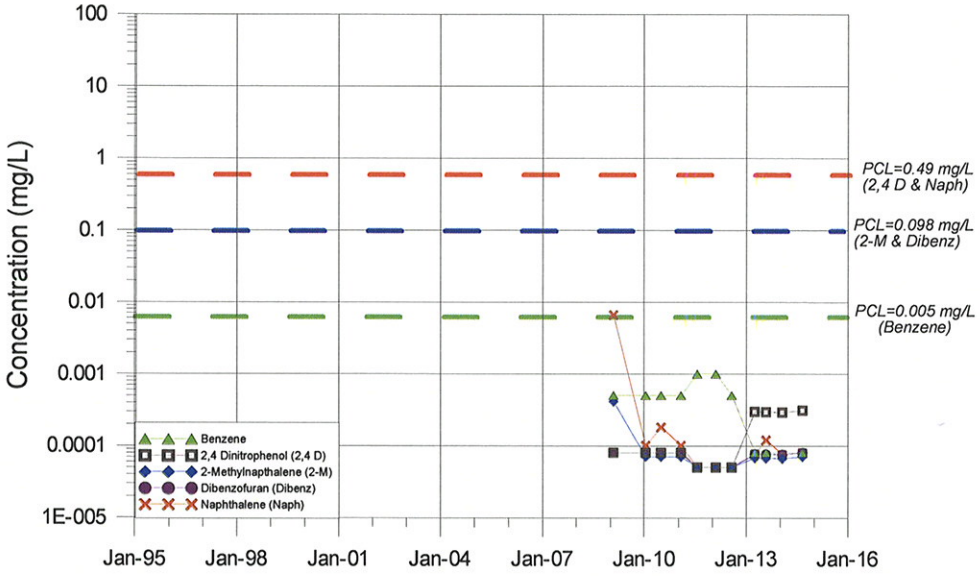


MW-60A

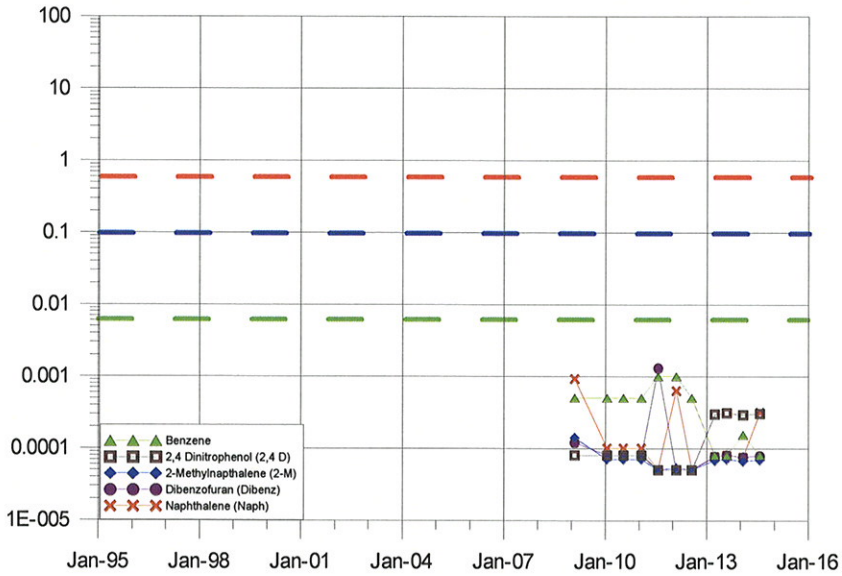


Attachment 1B-55
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

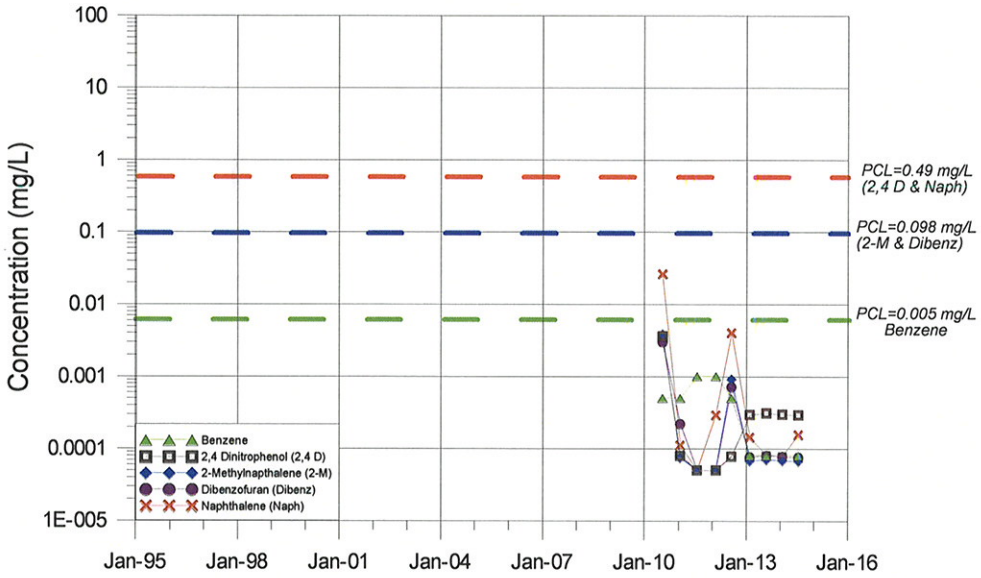
MW-61A



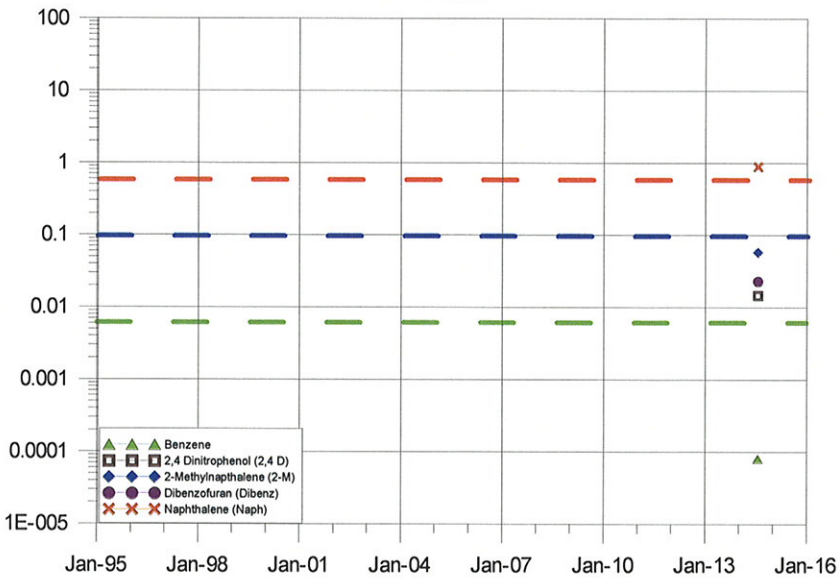
MW-64A



MW-69A

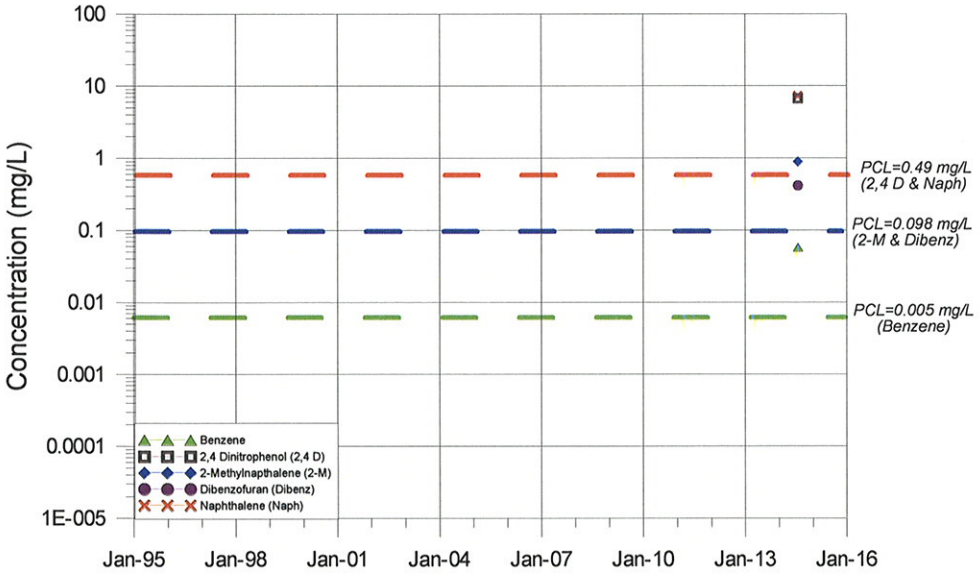


MW-77A

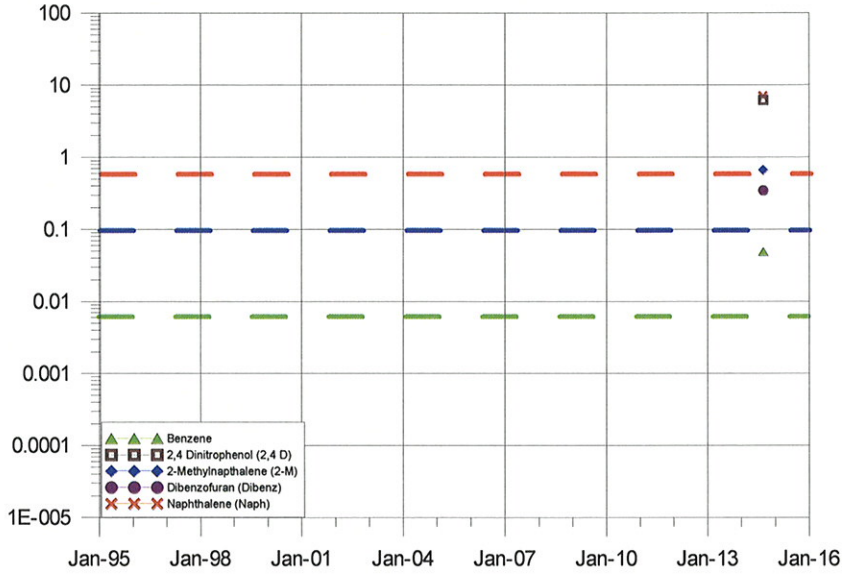


Attachment 1B-56
A-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

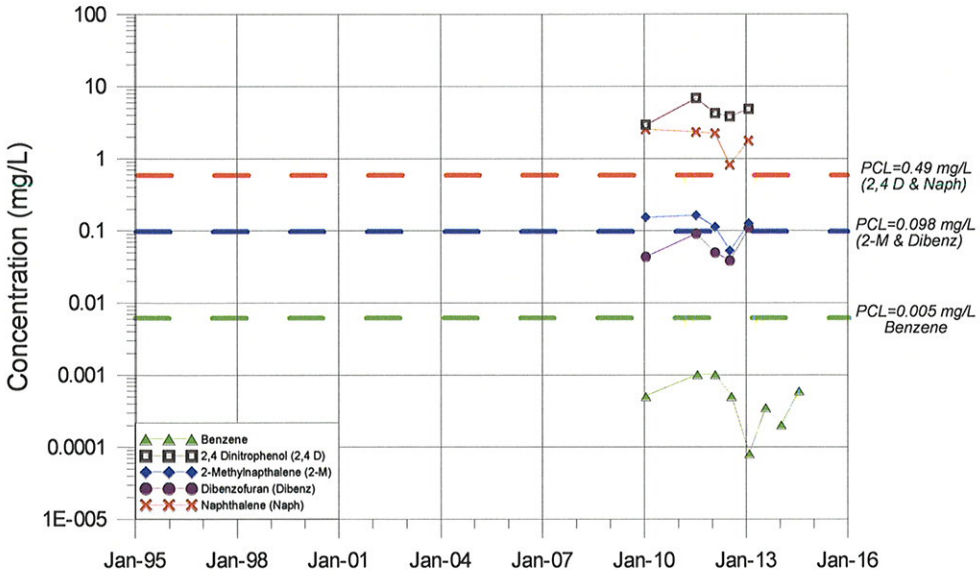
MW-78A



MW-79A

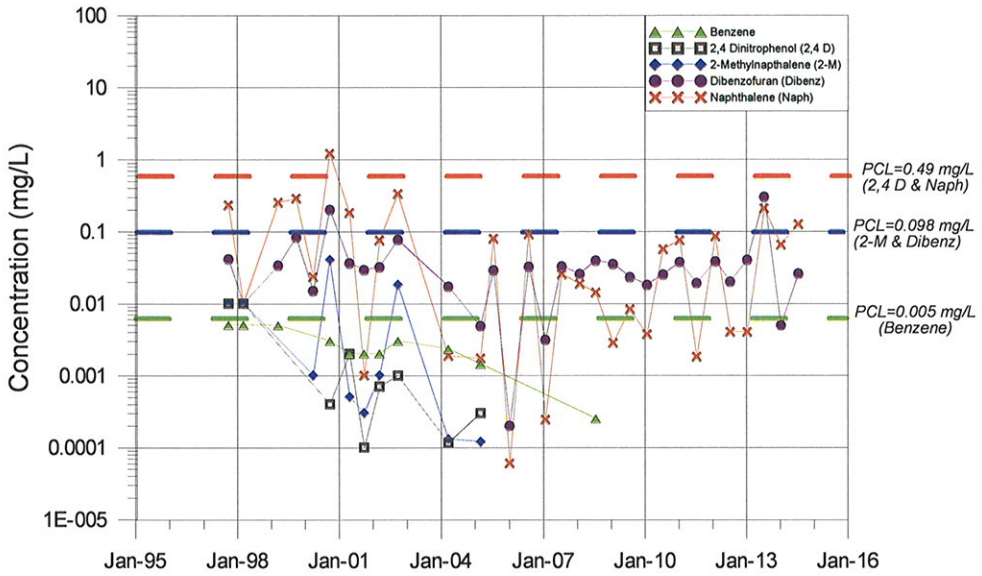


TW-56A

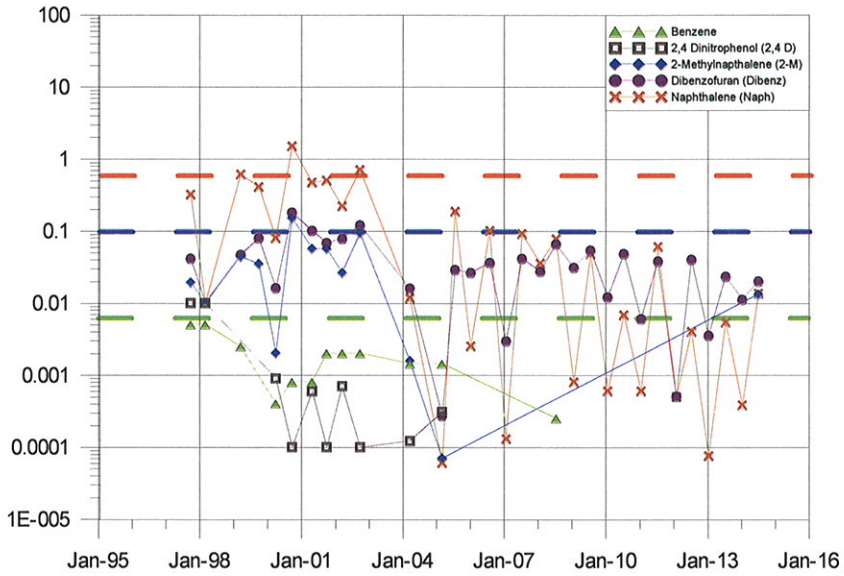


Attachment 1B-57
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

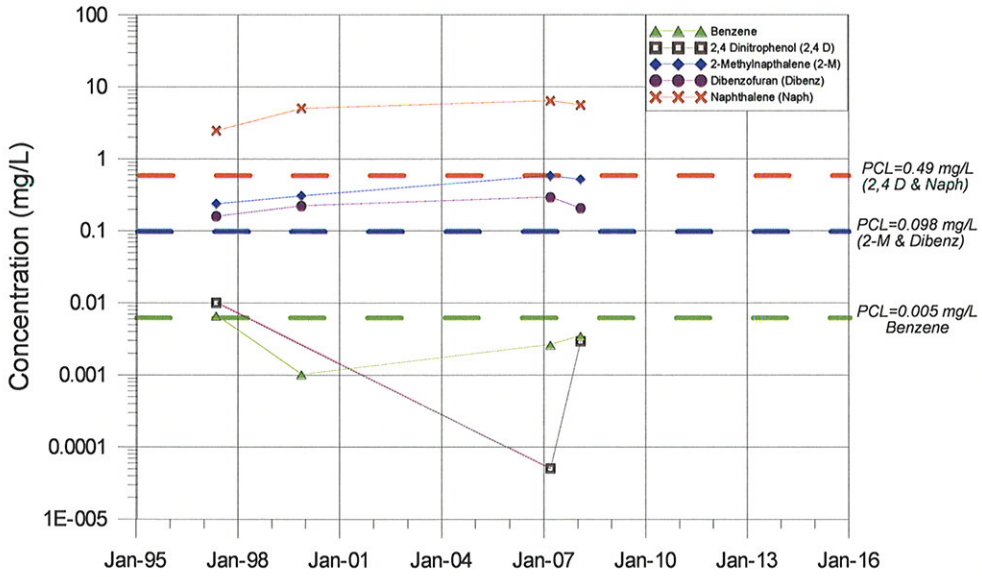
MW-10B



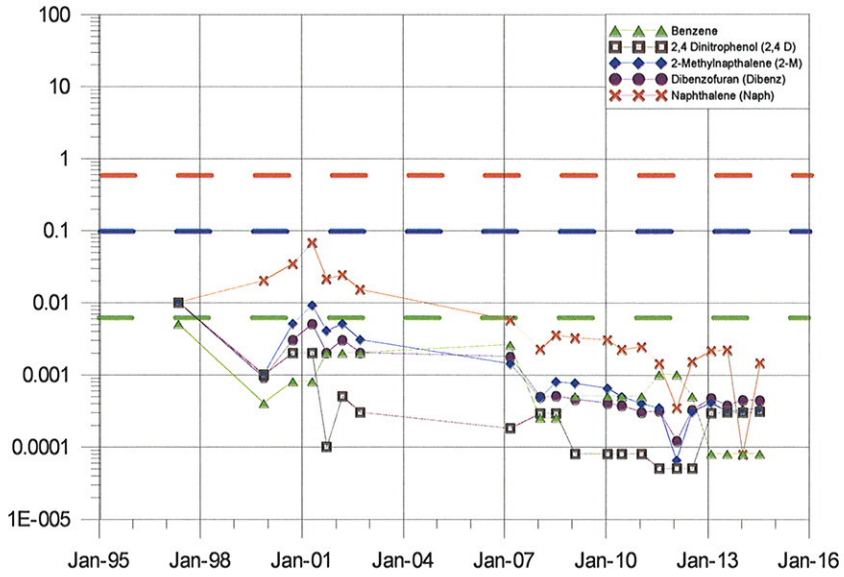
MW-11B



MW-12B

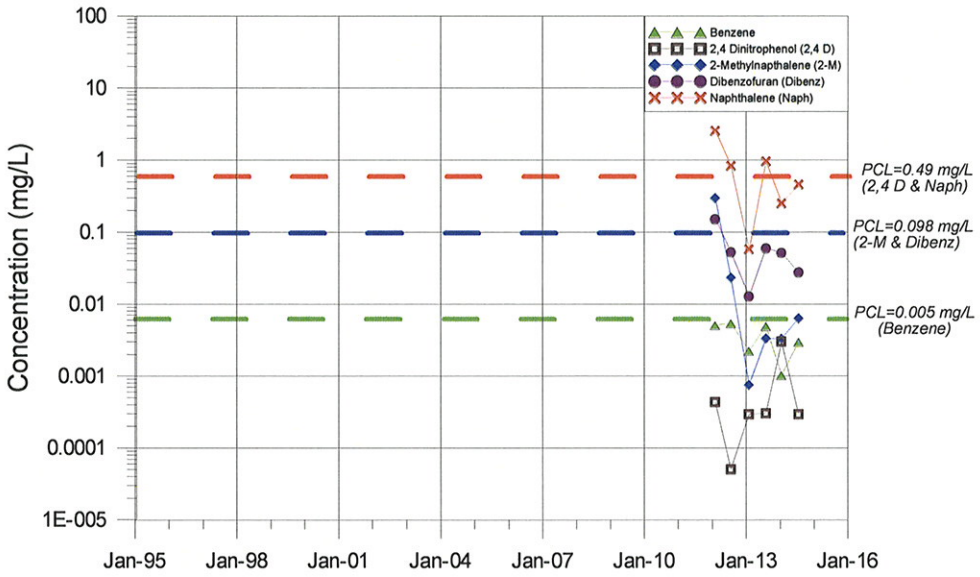


MW-14

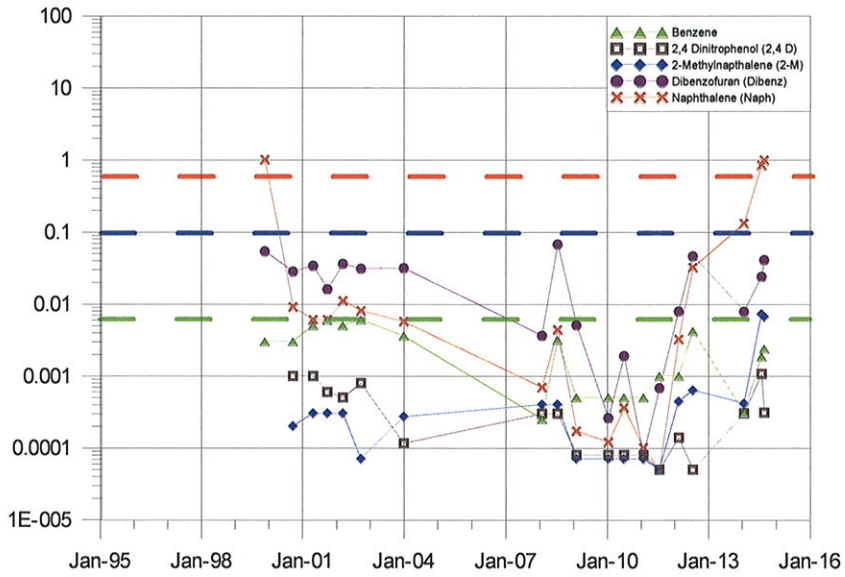


Attachment 1B-58
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

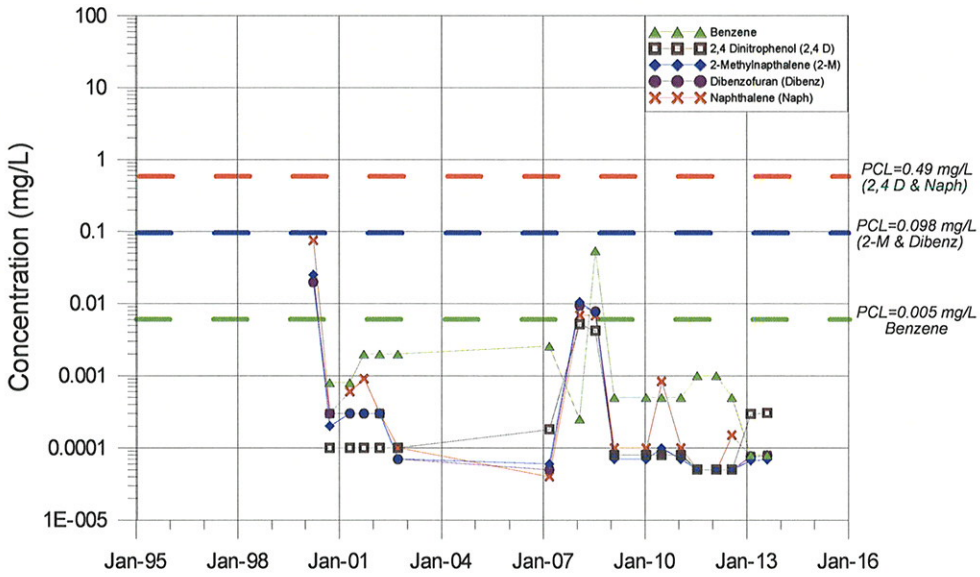
MW-15B



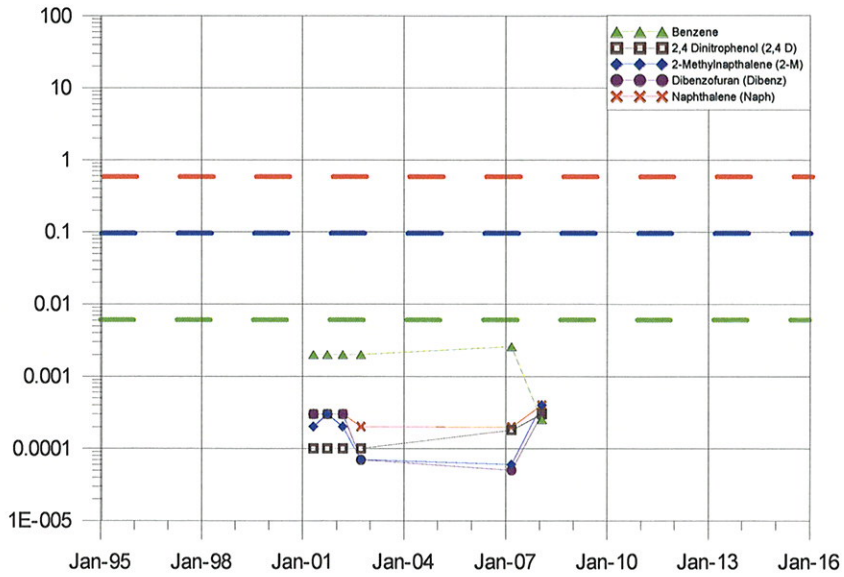
MW-22B



MW-24B

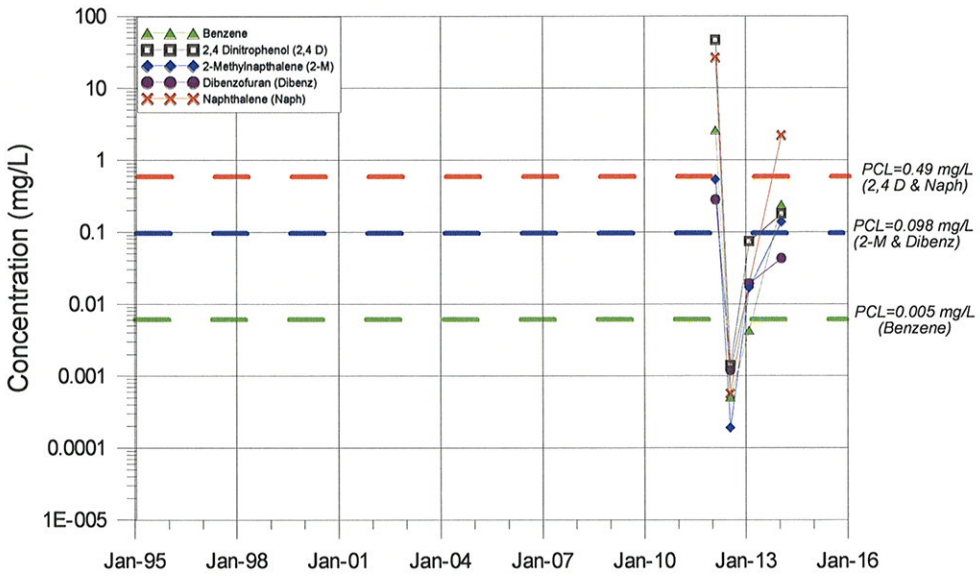


MW-29B

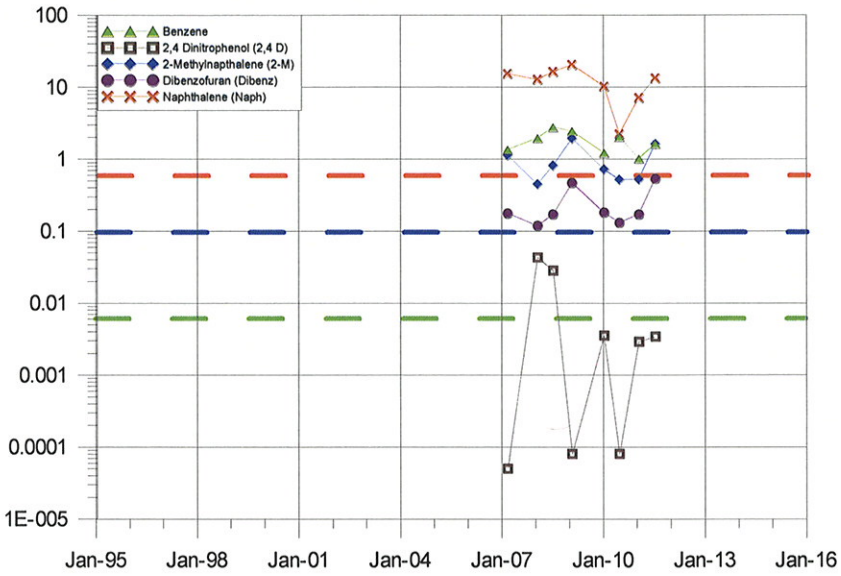


Attachment 1B-59
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

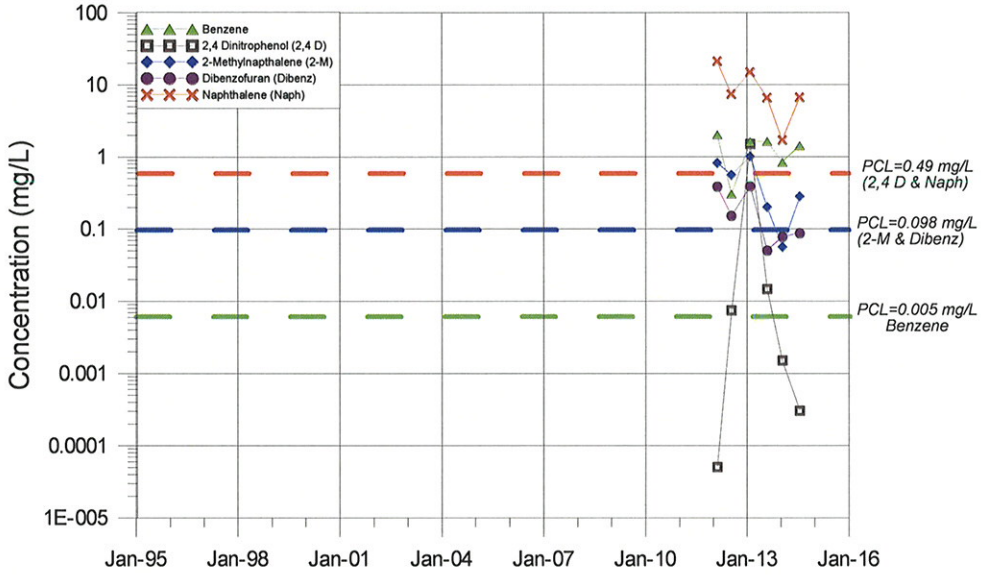
MW-32B



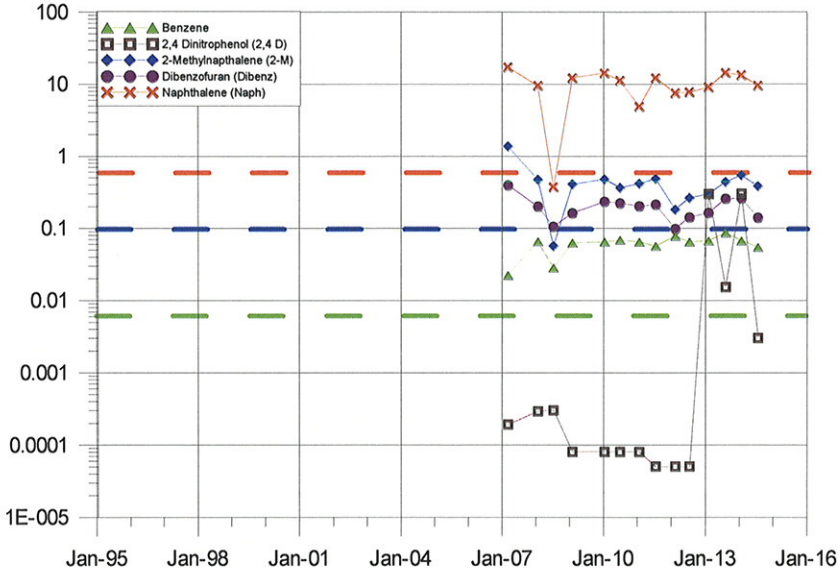
MW-33B



MW-33BR

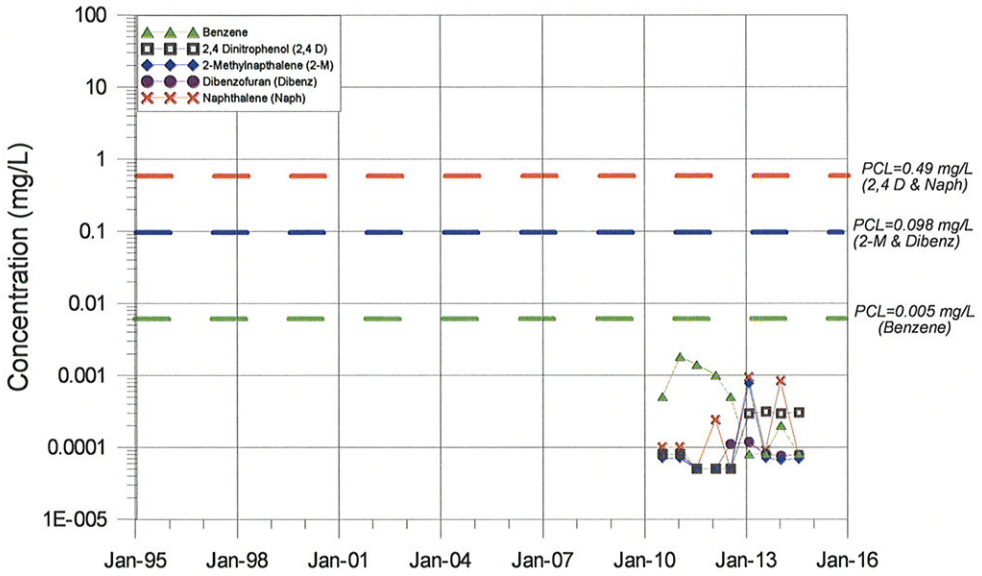


MW-35B

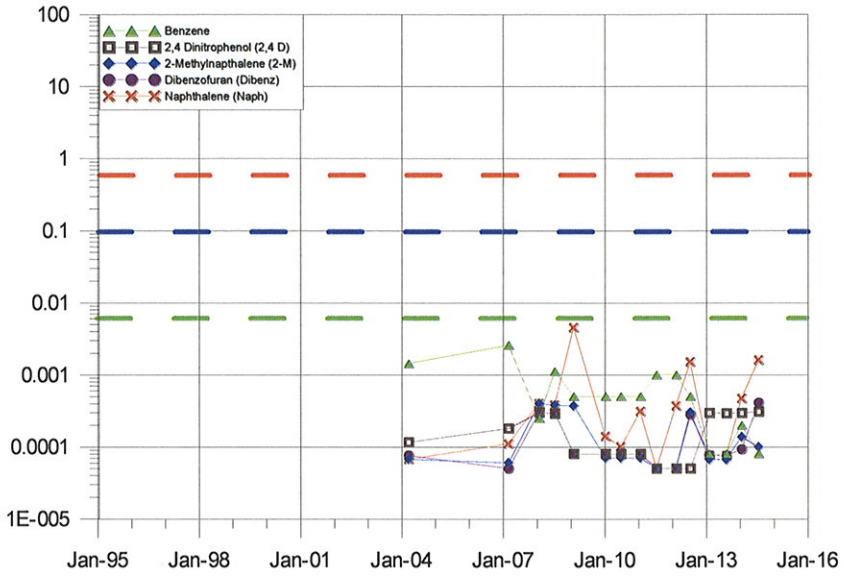


Attachment 1B-60
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

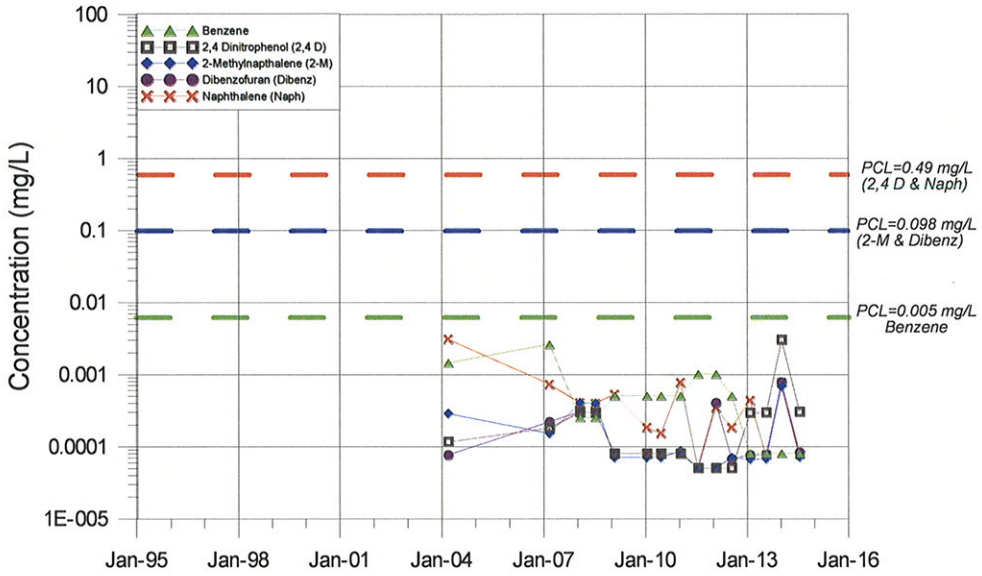
MW-36B



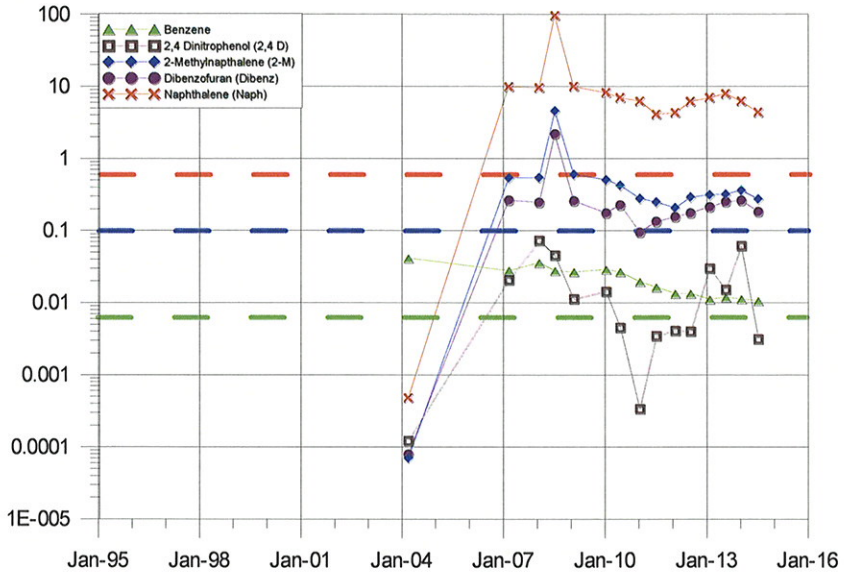
MW-38B



MW-39B

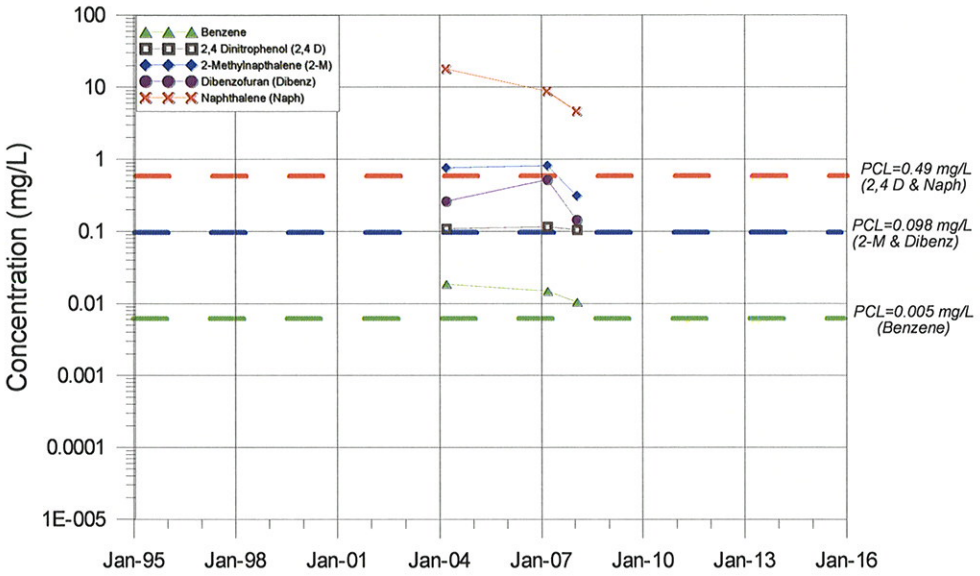


MW-40B

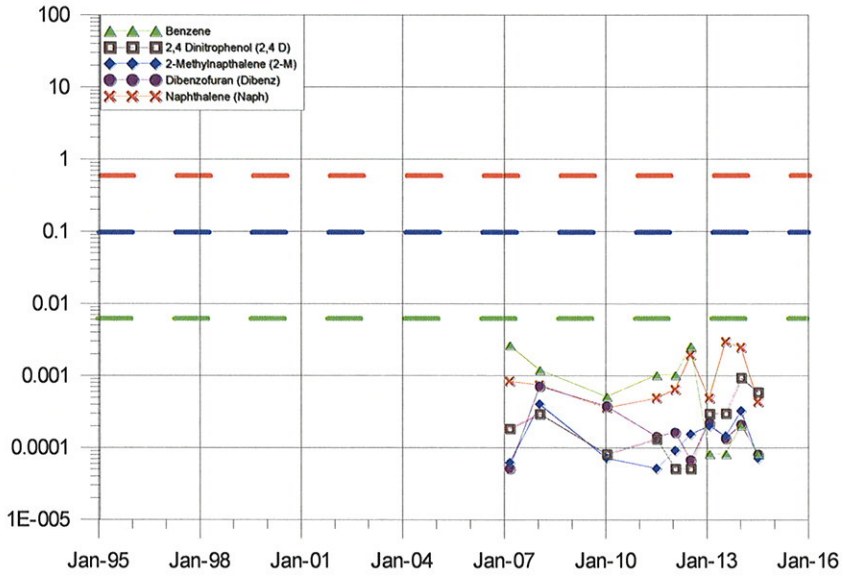


Attachment 1B-61
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

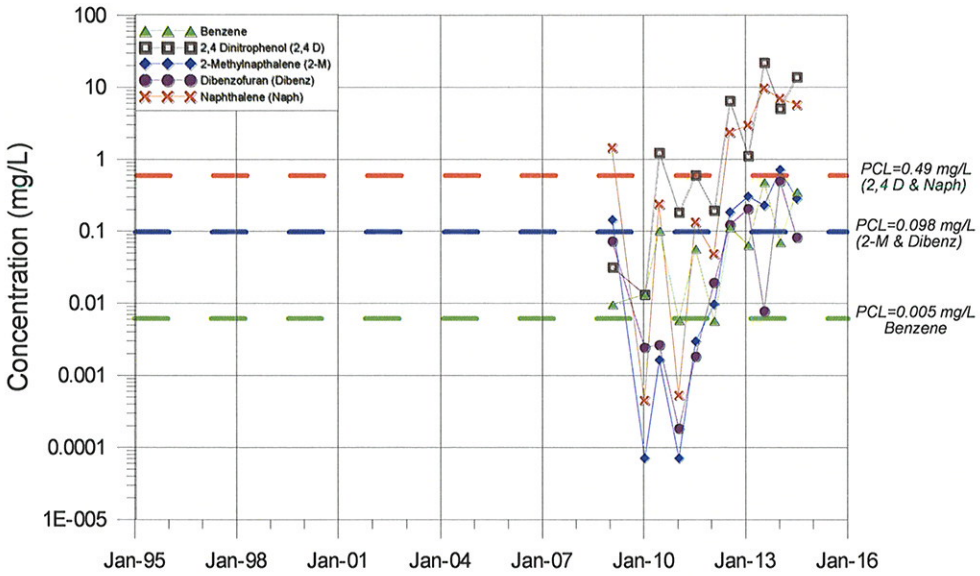
MW-41B



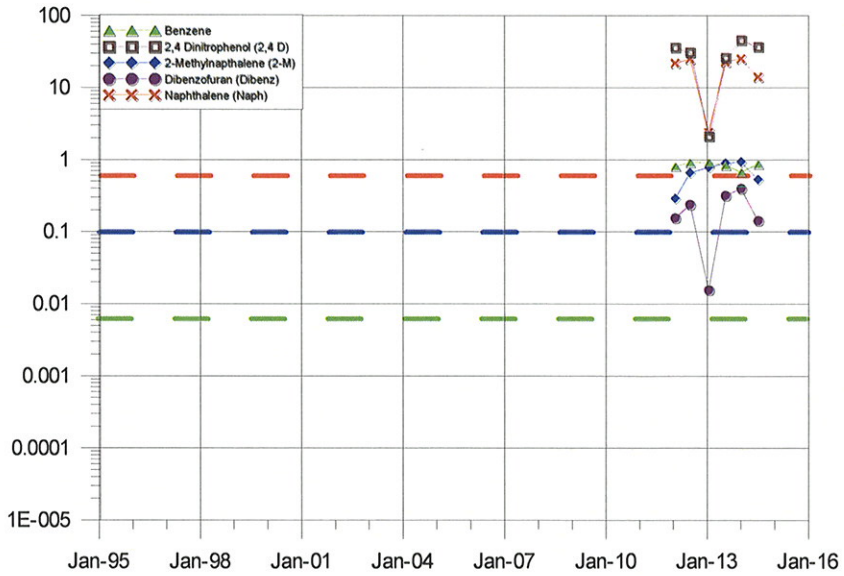
MW-42B



MW-49B

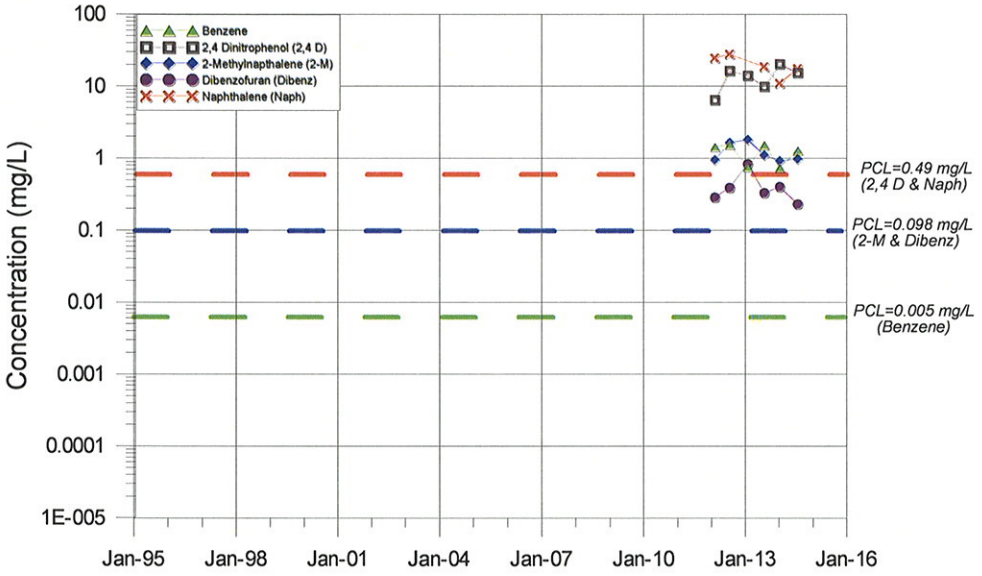


MW-55B

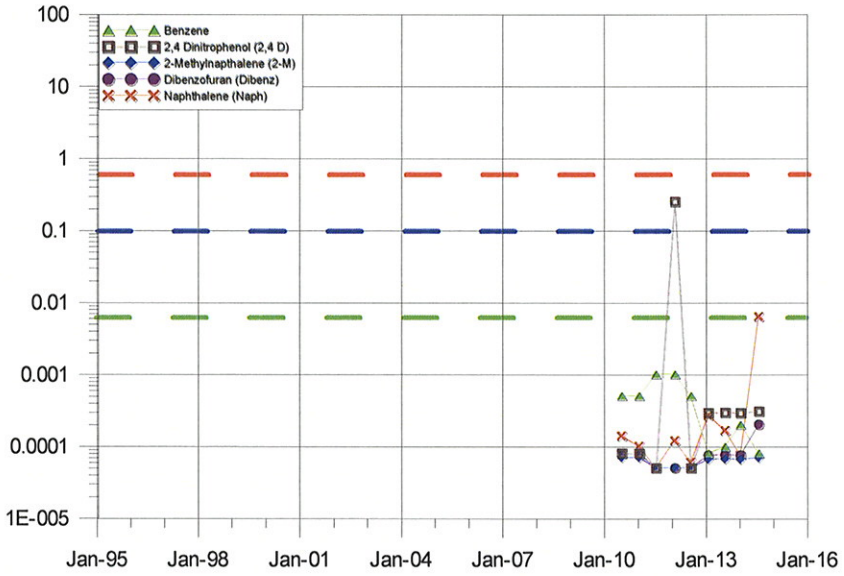


Attachment 1B-62
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

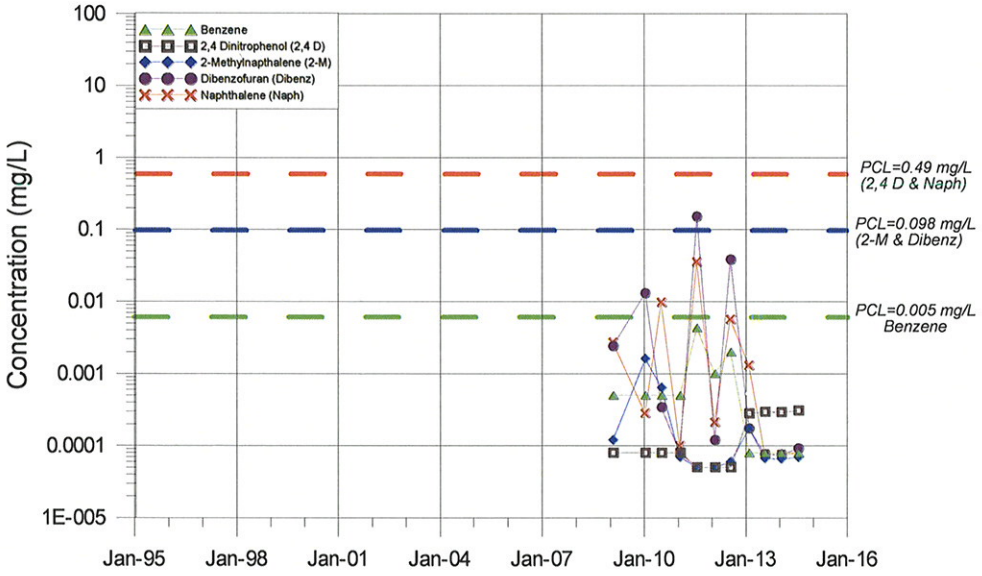
MW-57B



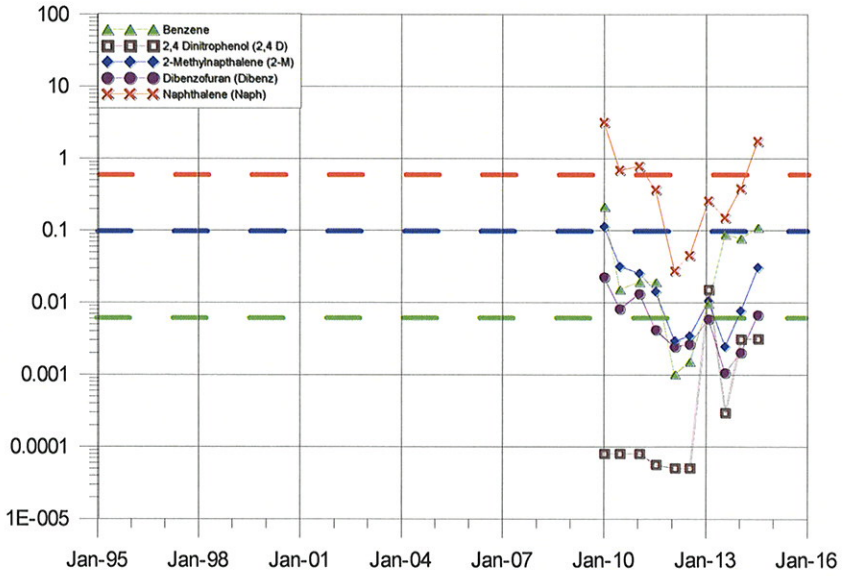
MW-59B



MW-62B

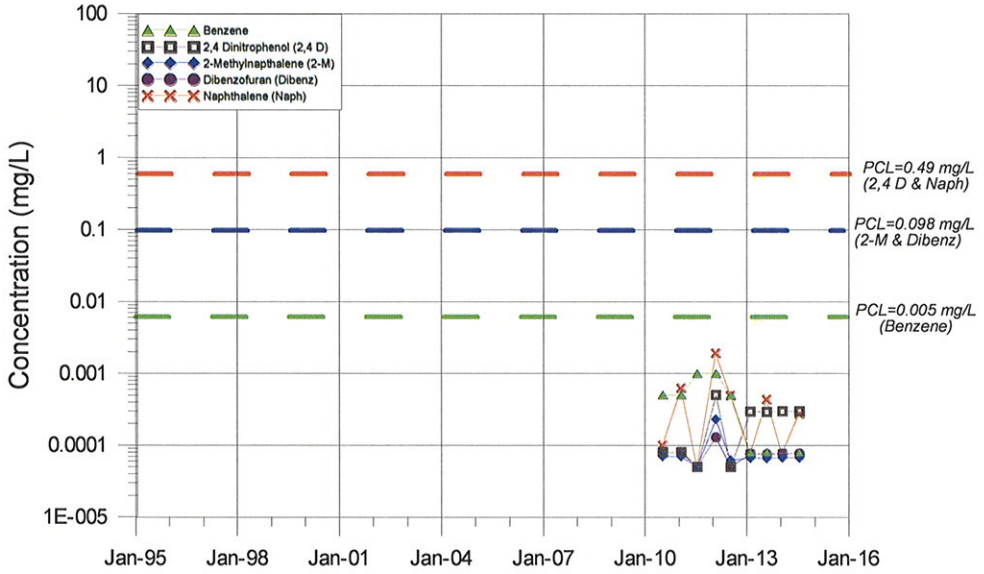


MW-63B

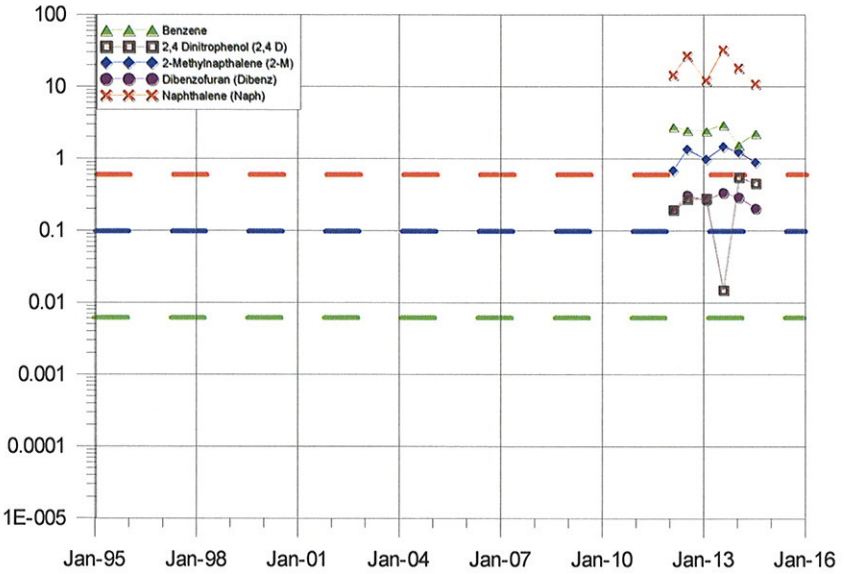


Attachment 1B-63
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

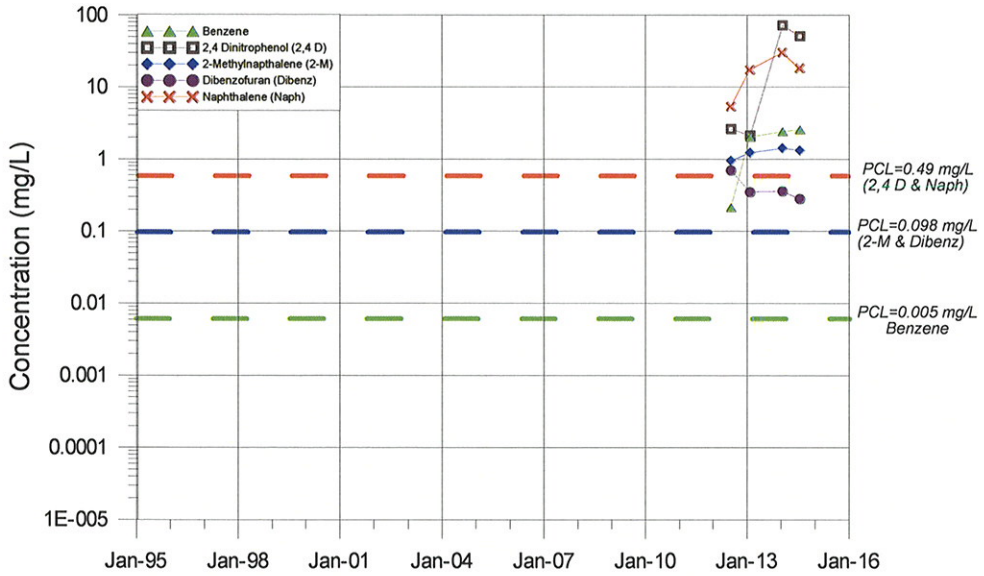
MW-67B



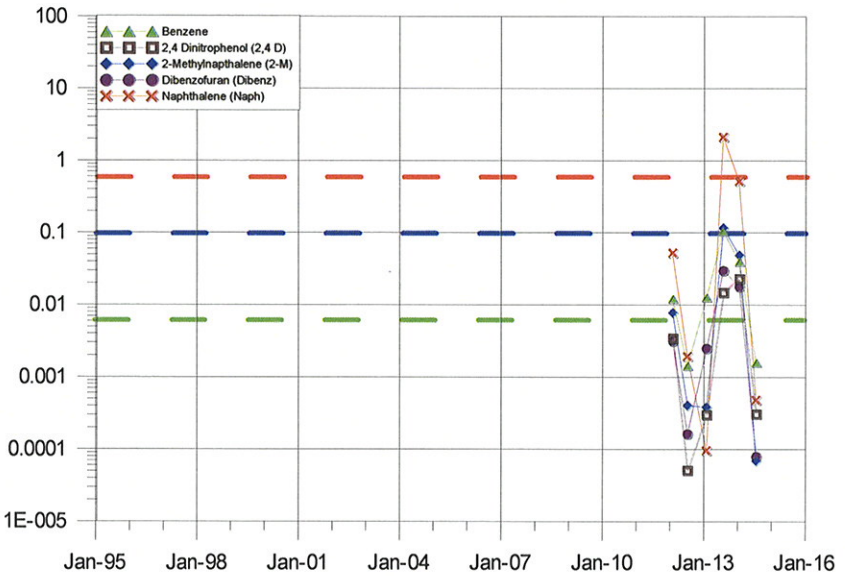
MW-68B



MW-70B

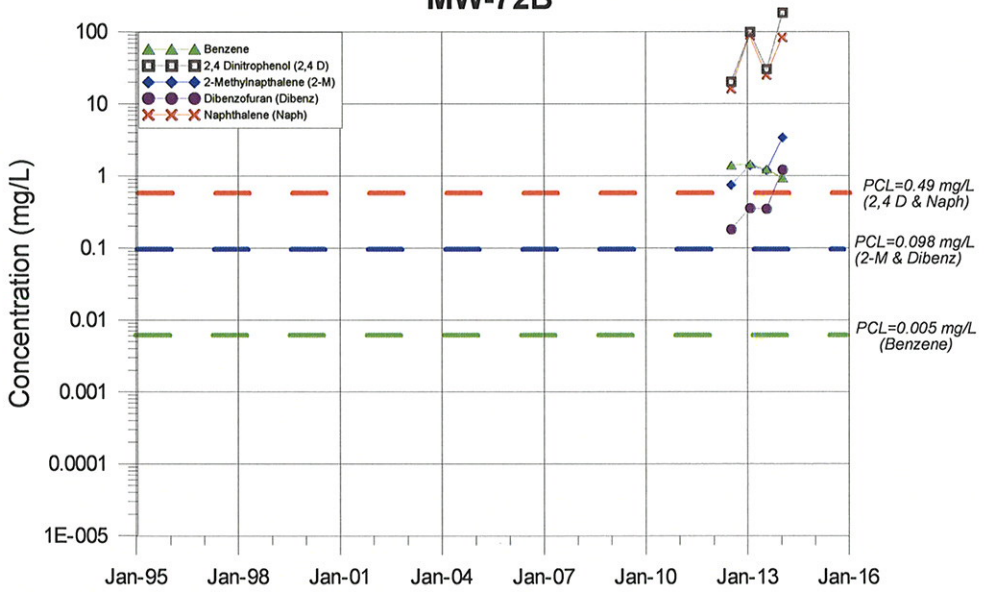


MW-71B

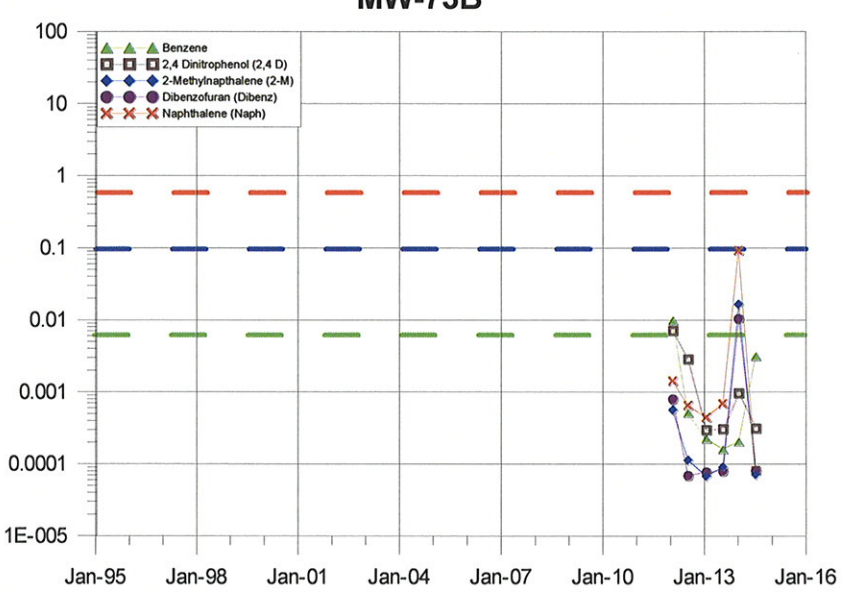


Attachment 1B-64
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

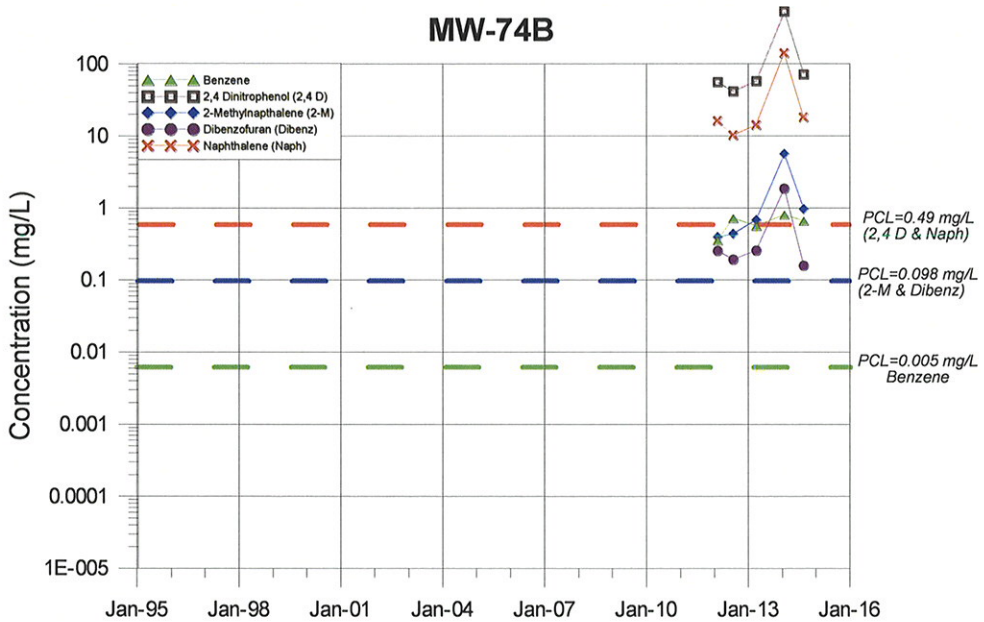
MW-72B



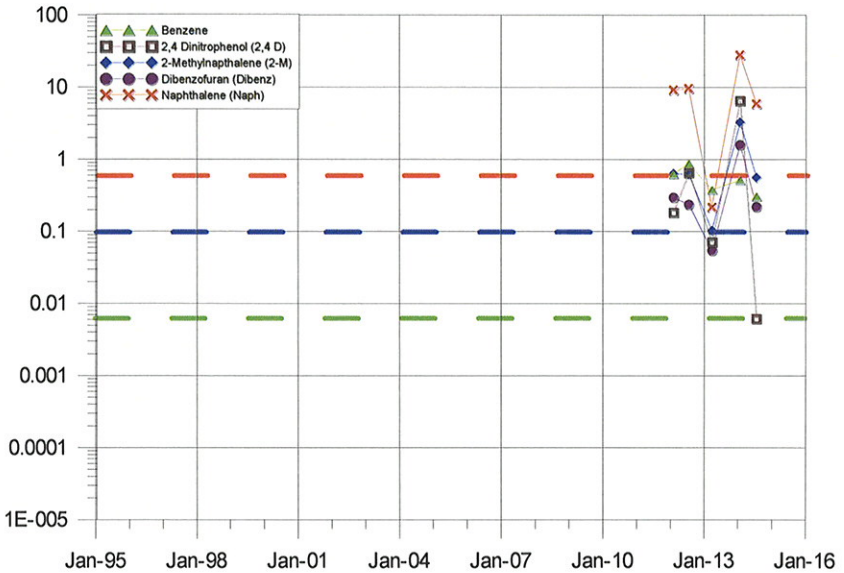
MW-73B



MW-74B

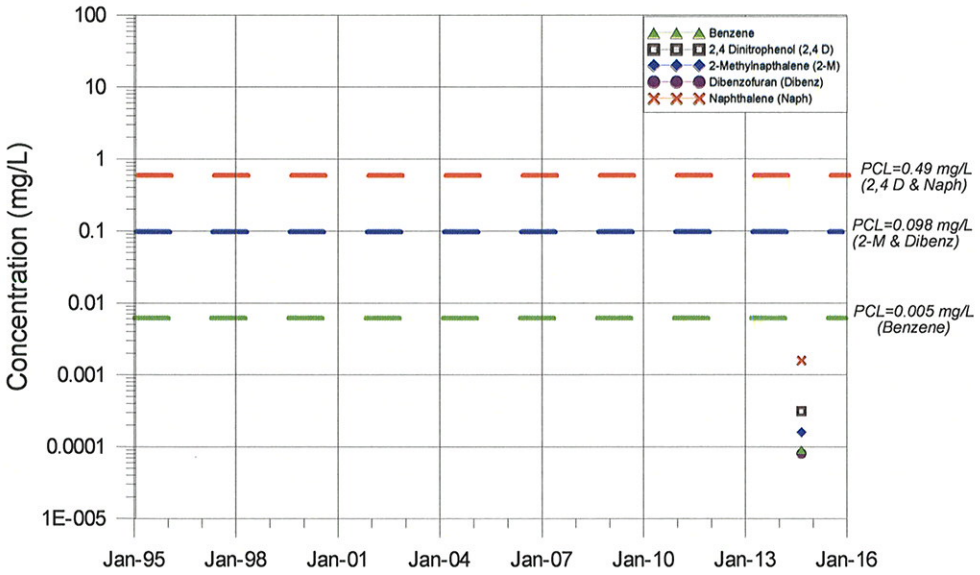


MW-75B

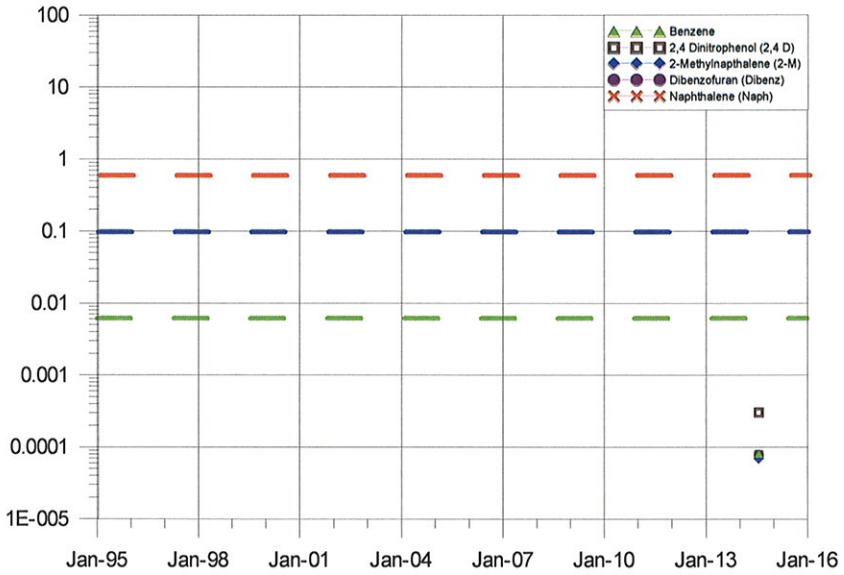


Attachment 1B-65
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

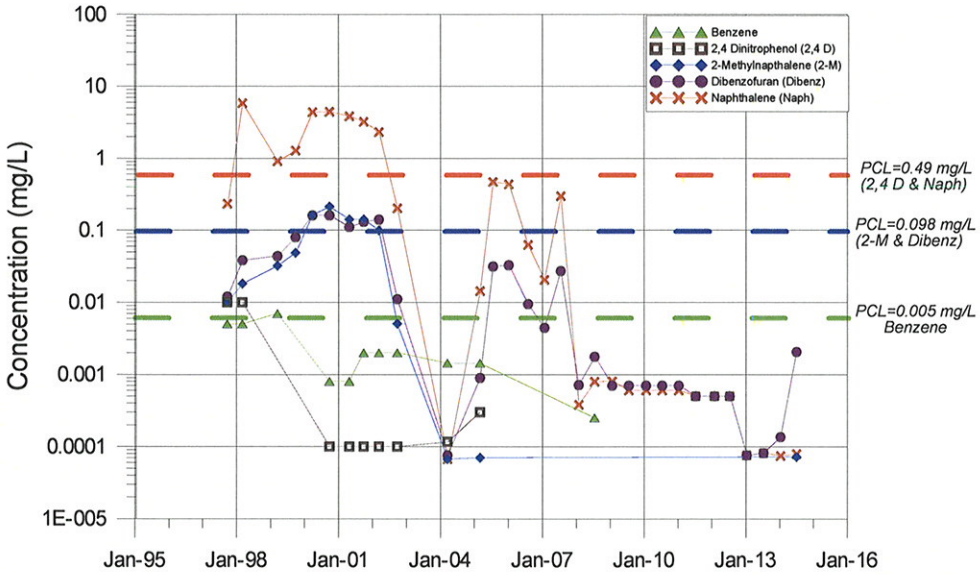
MW-80B



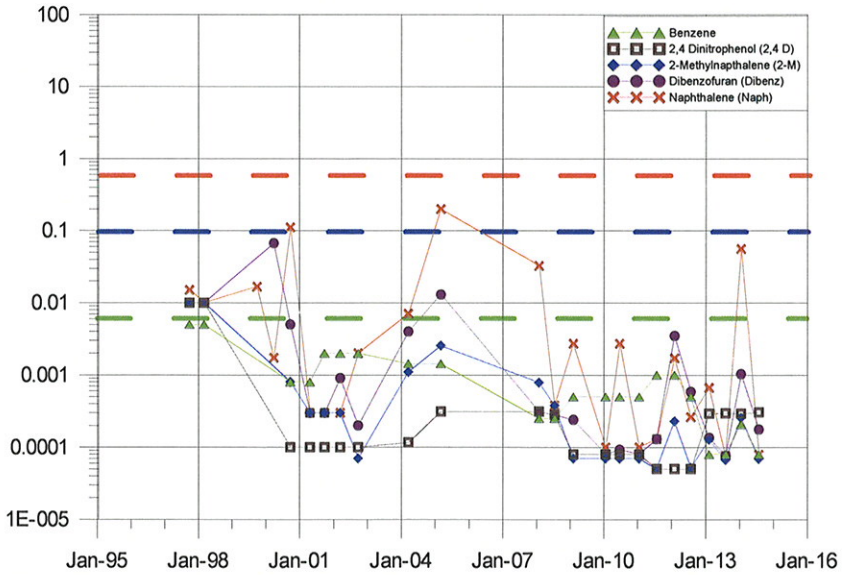
MW-81B



P-10

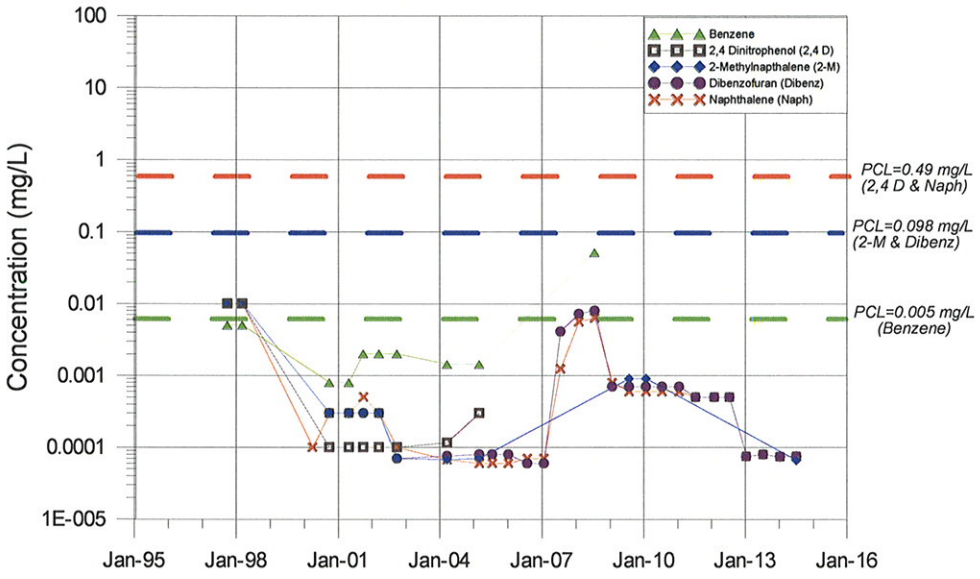


P-11

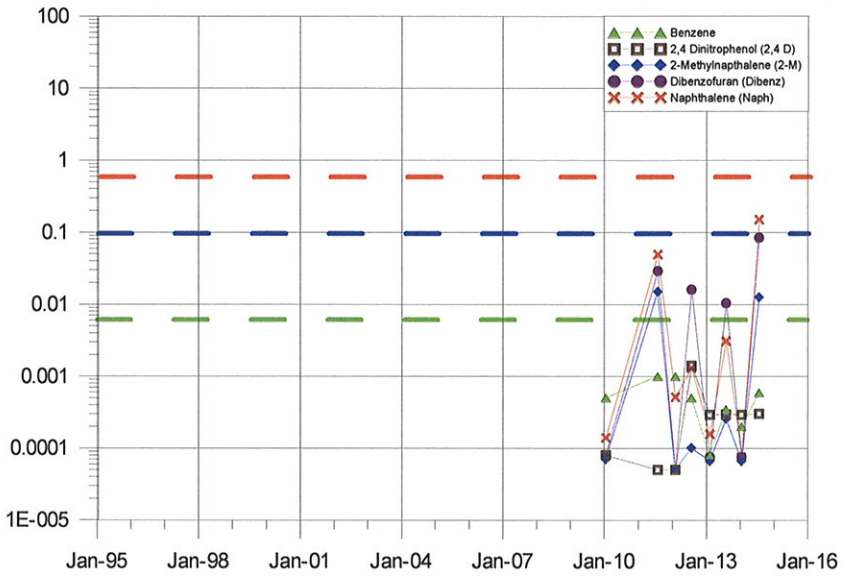


Attachment 1B-66
B-TZ & B-CZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

P-12

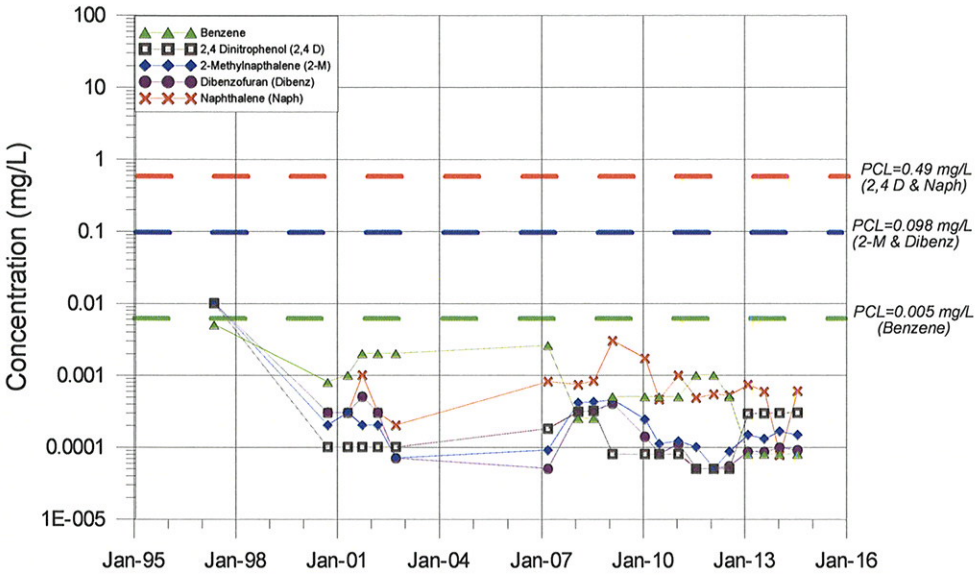


TW-41B

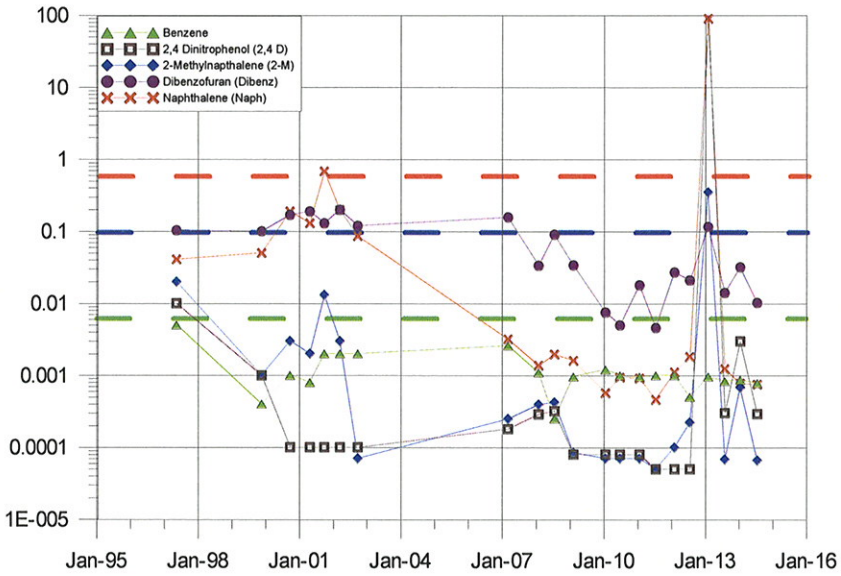


Attachment 1B-67
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

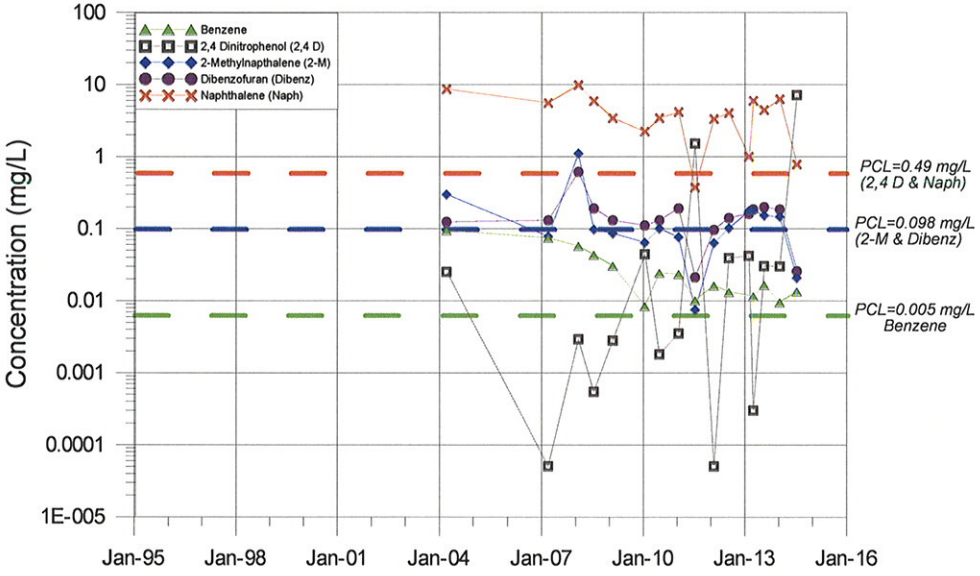
MW-12C



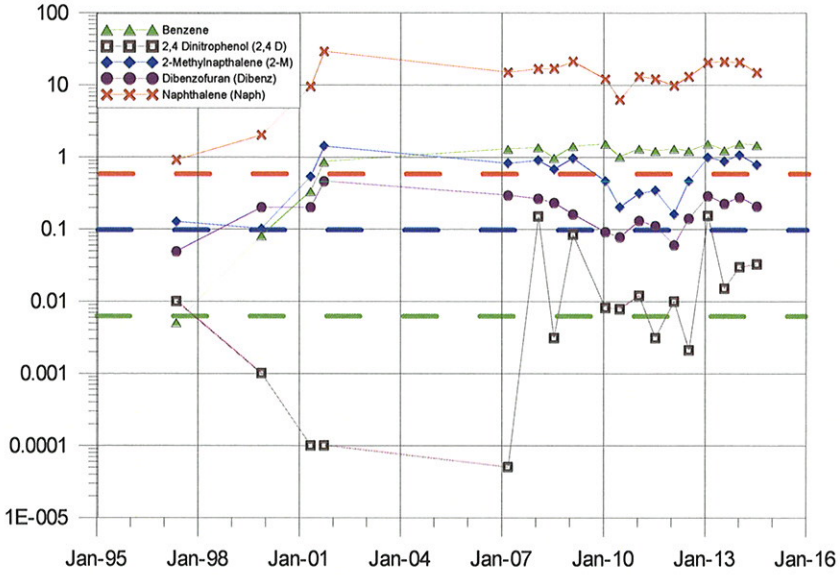
MW-15C



MW-17C

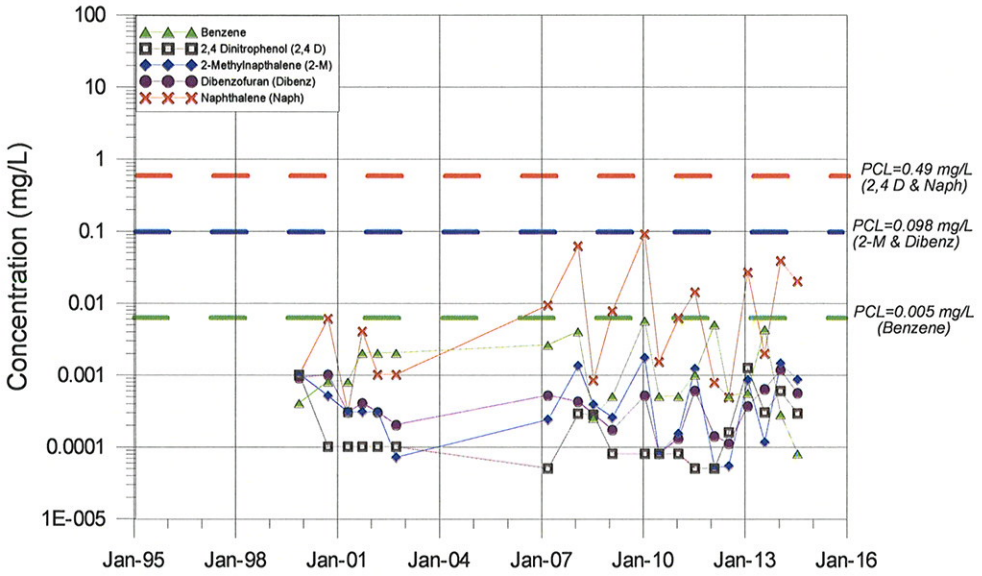


MW-18C



Attachment 1B-68
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-19C



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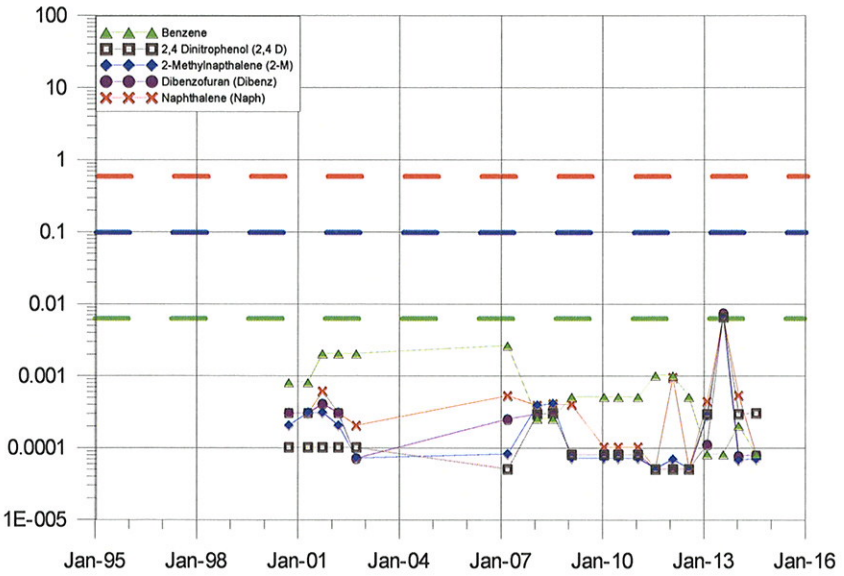

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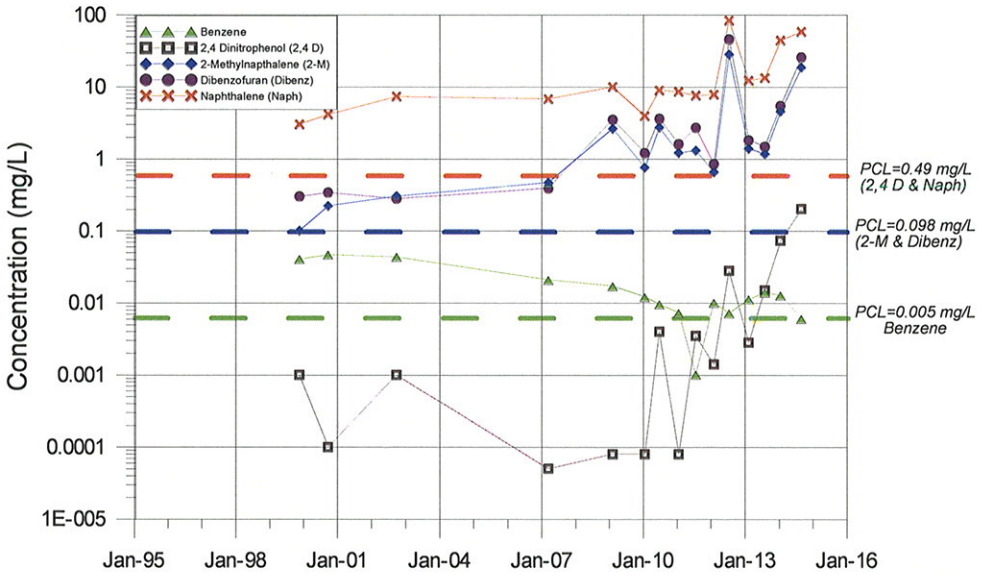

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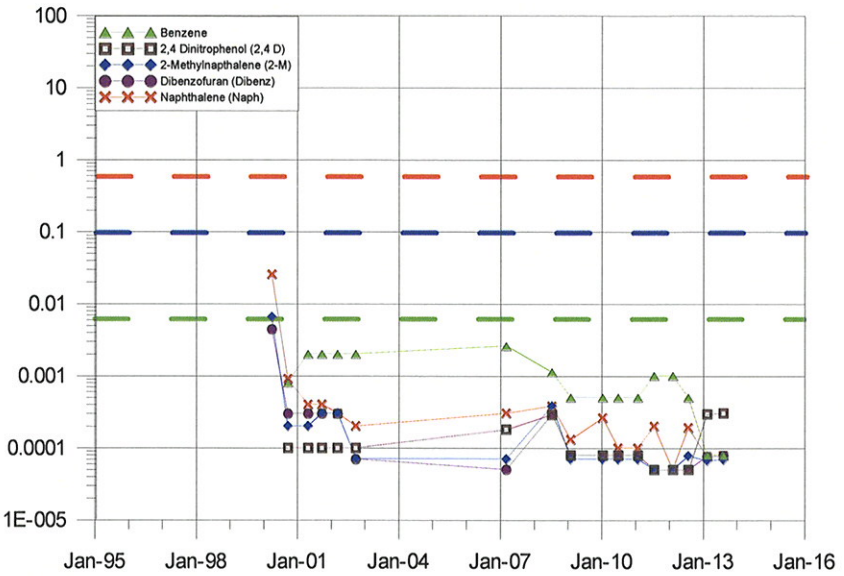
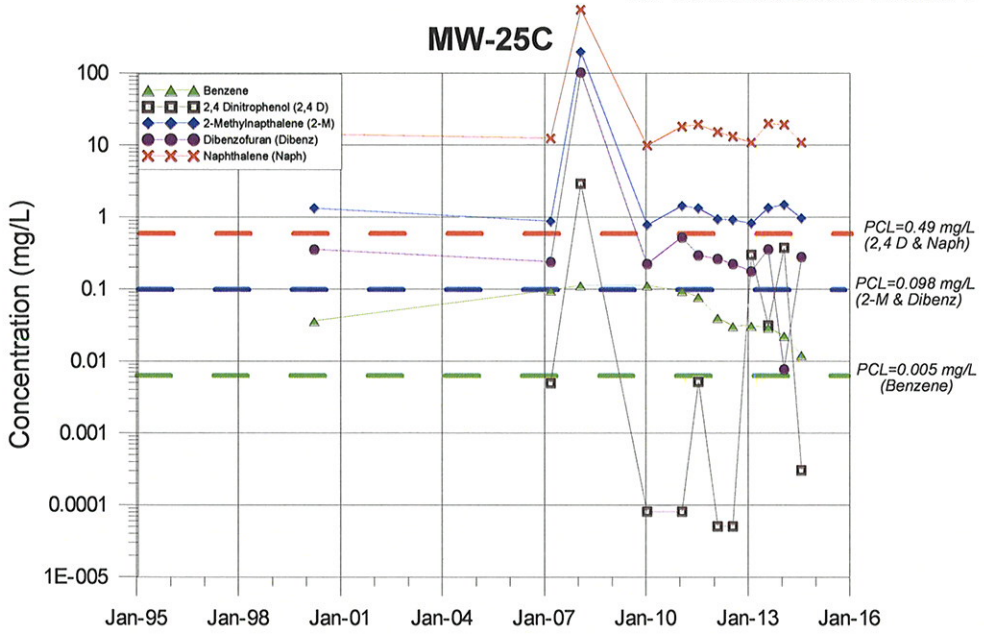


Attachment 1B-69
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-25C



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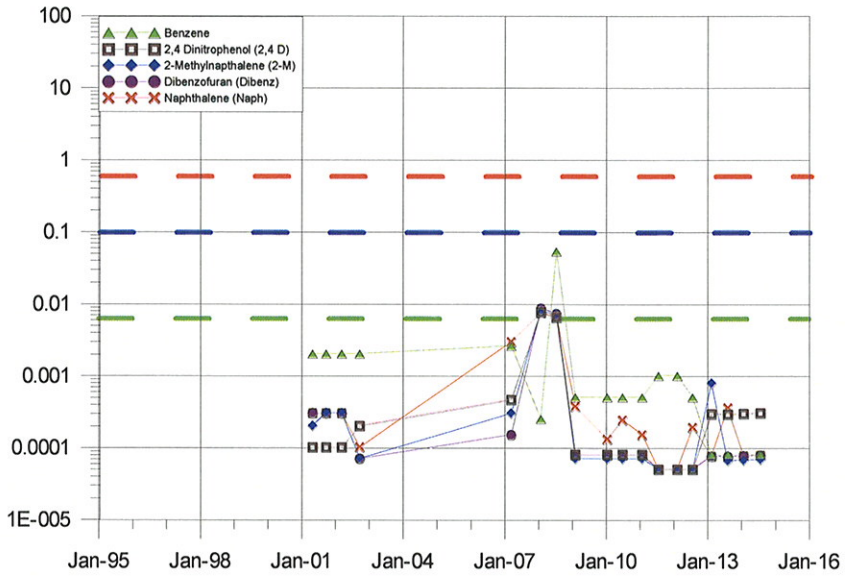

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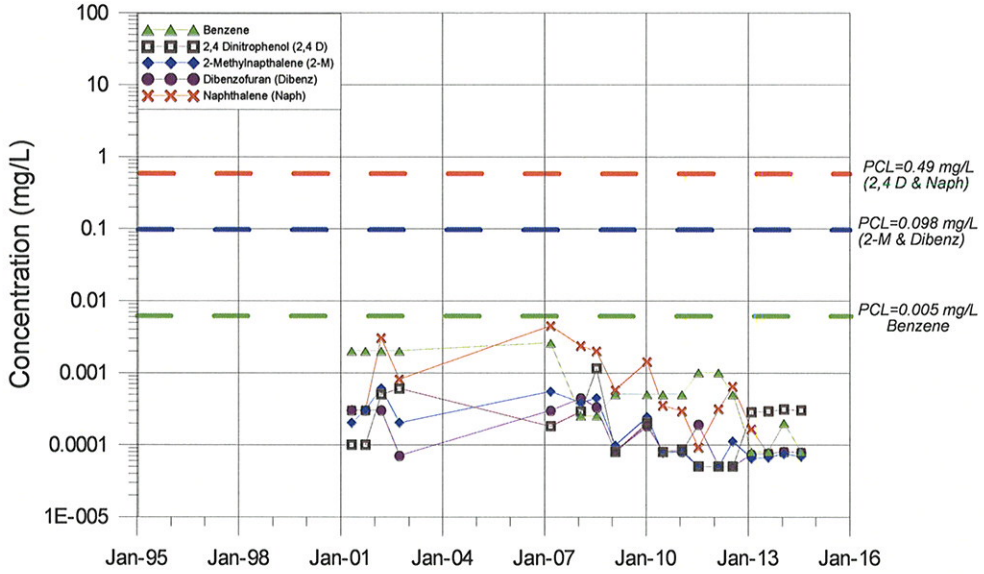

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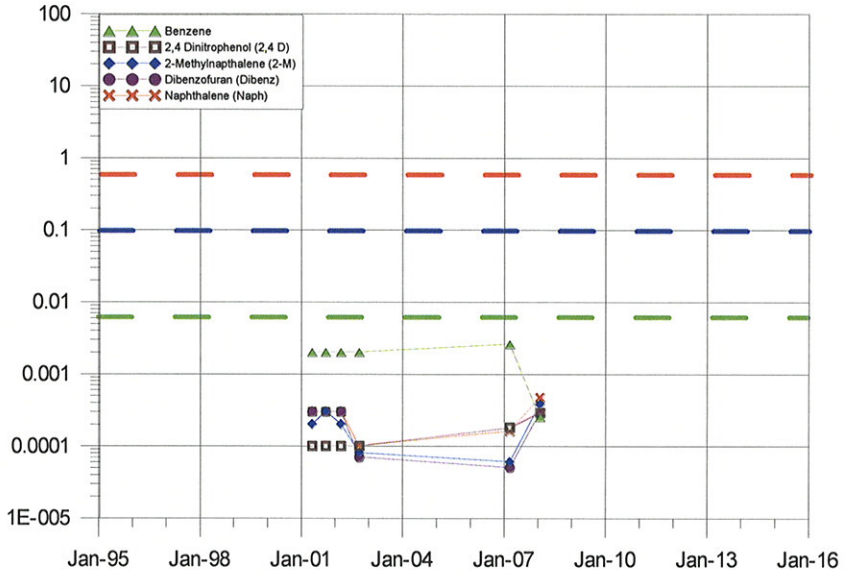
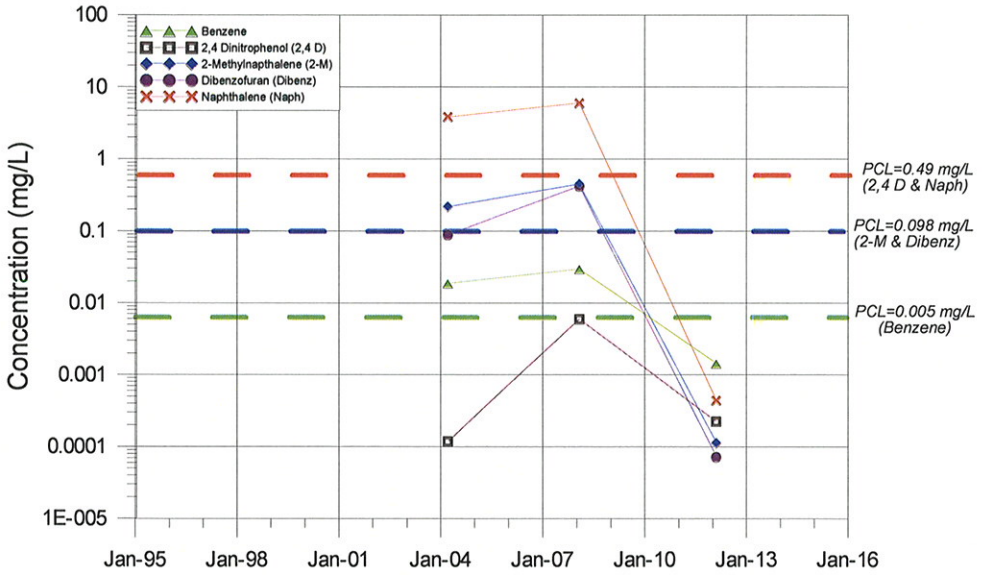


Attachment 1B-70
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-34C



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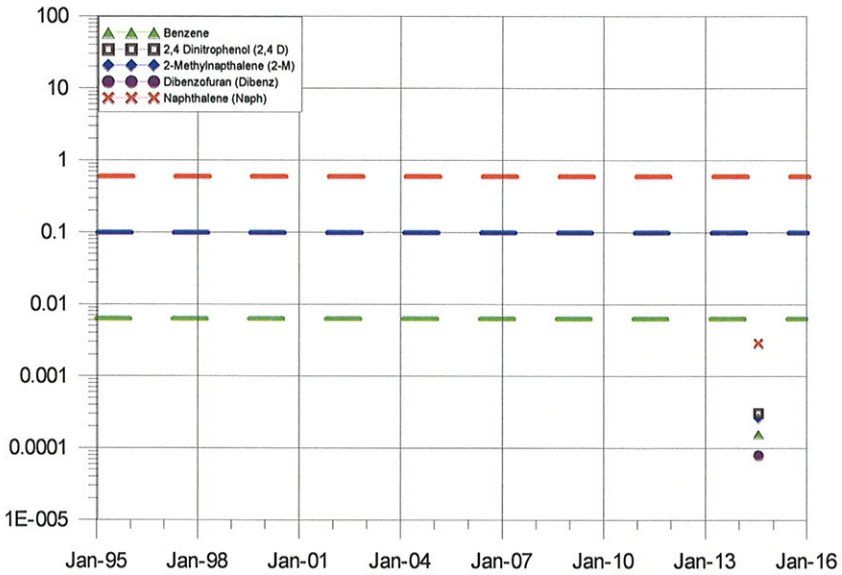

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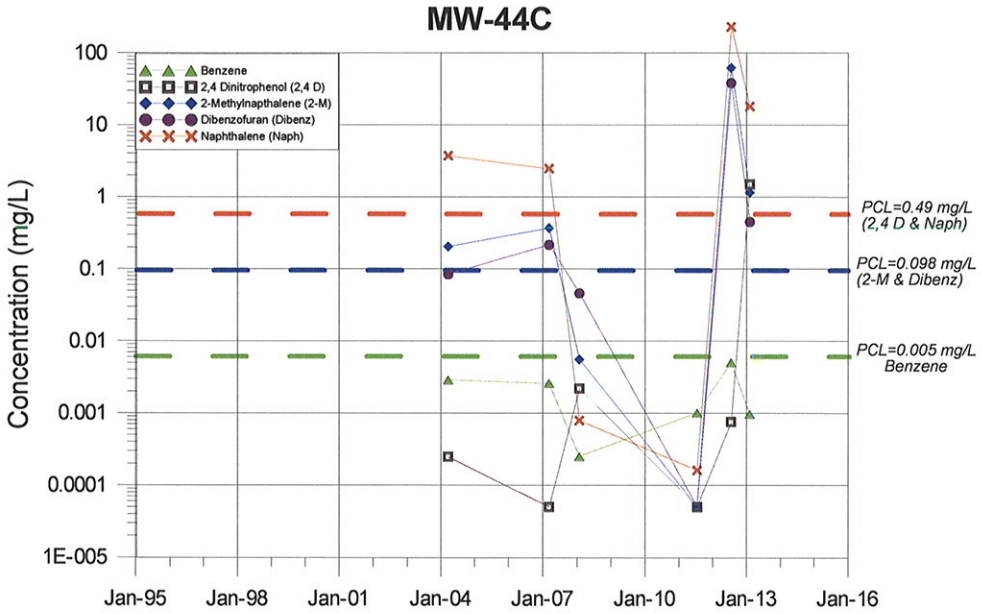

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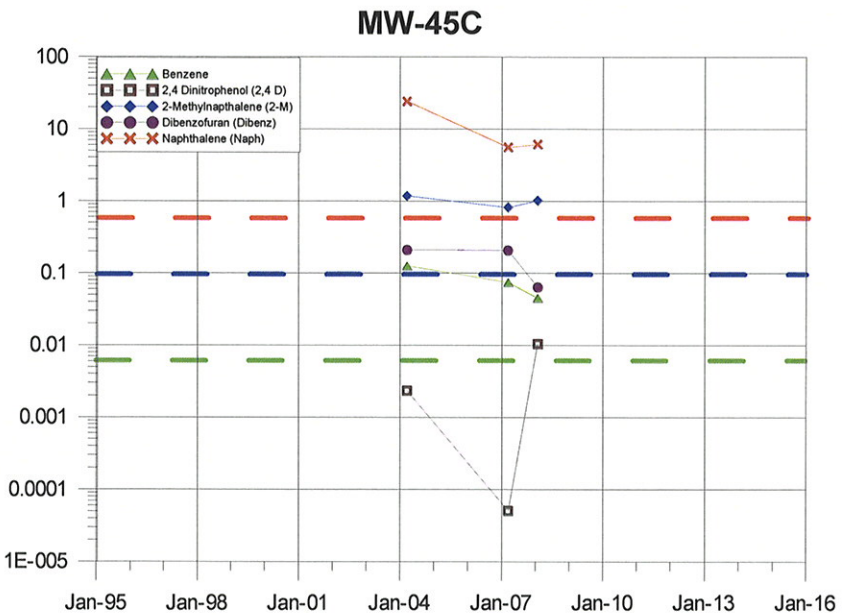
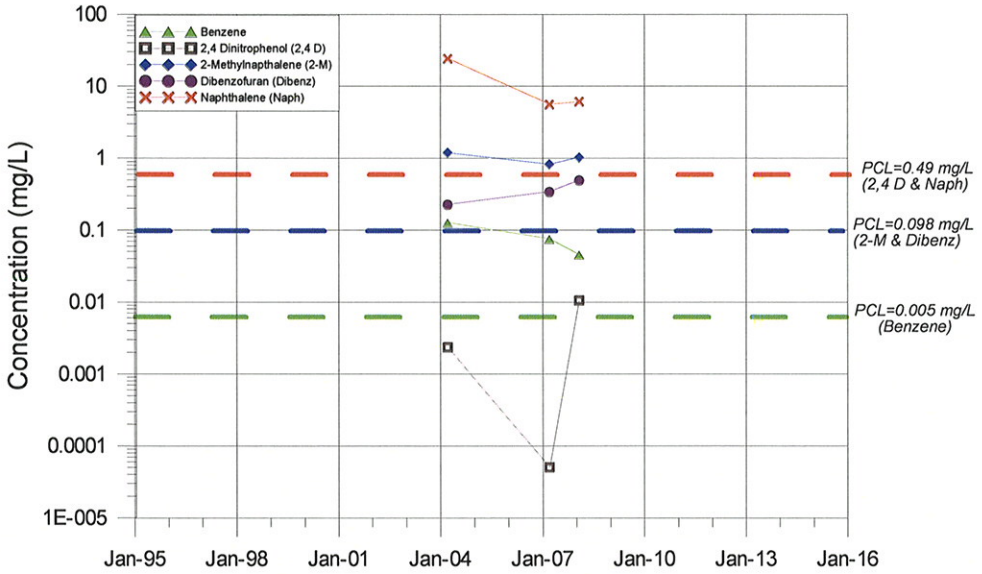


Attachment 1B-71
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-45C



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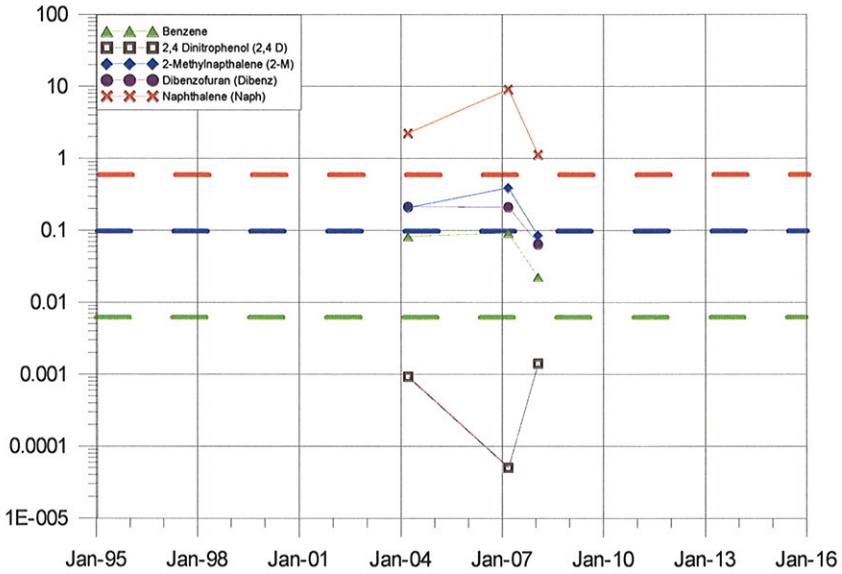

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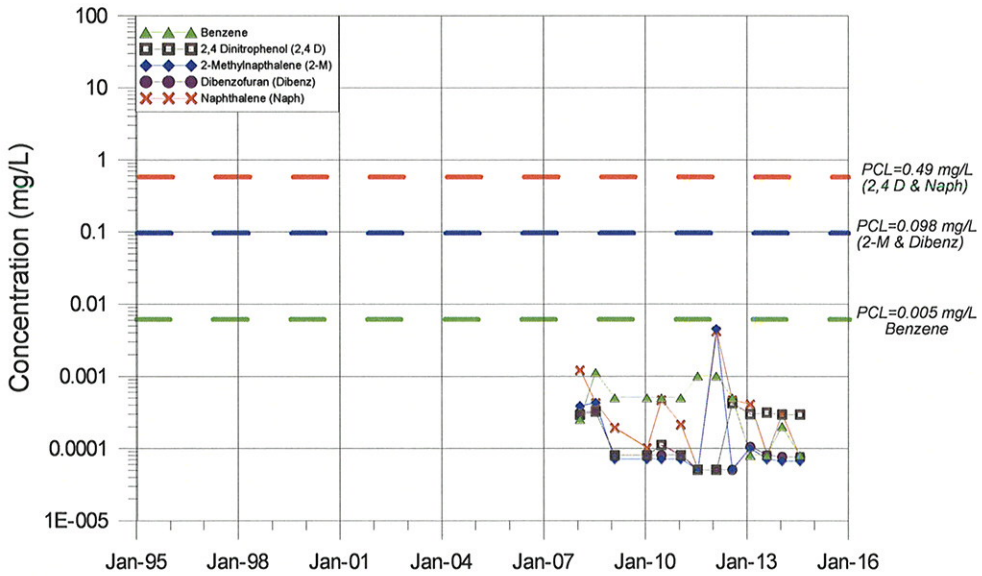

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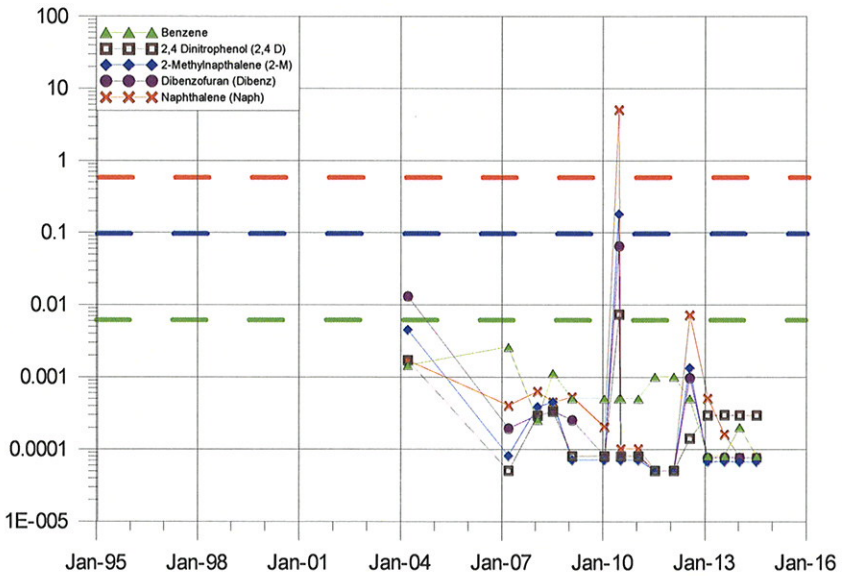
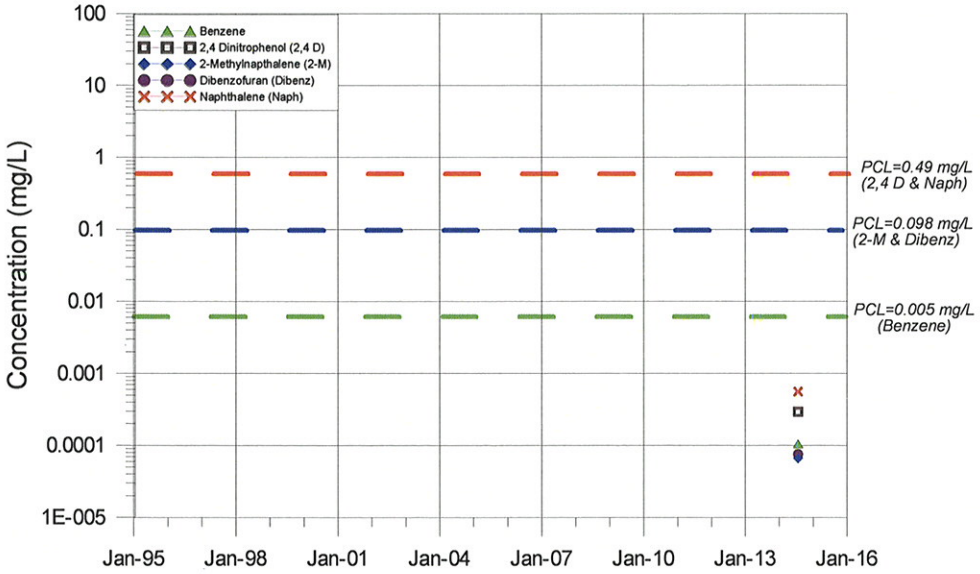


Attachment 1B-72
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-51C



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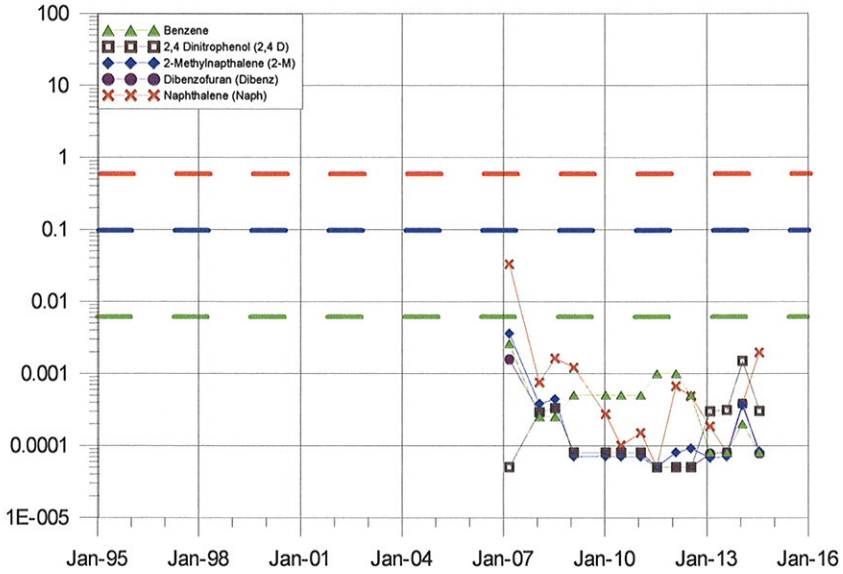

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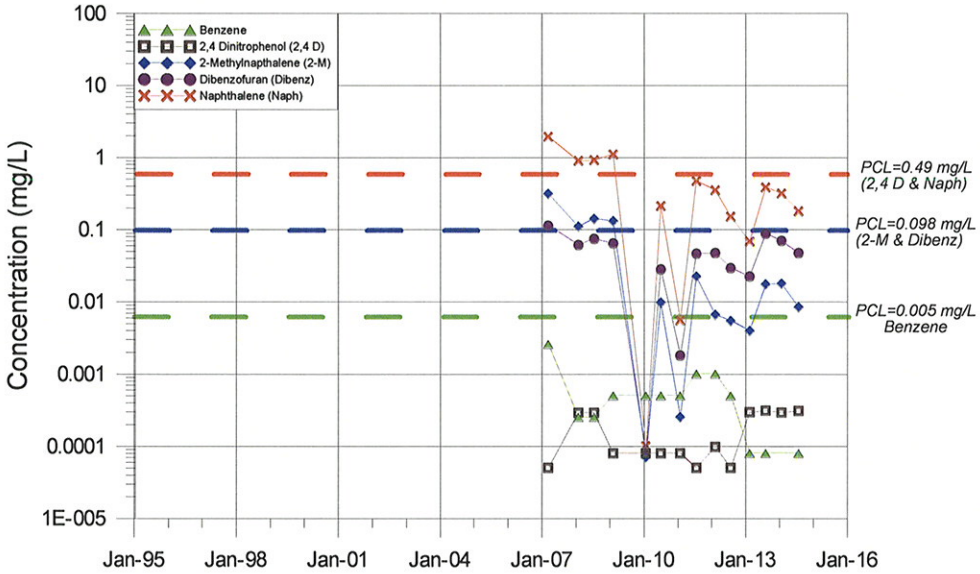
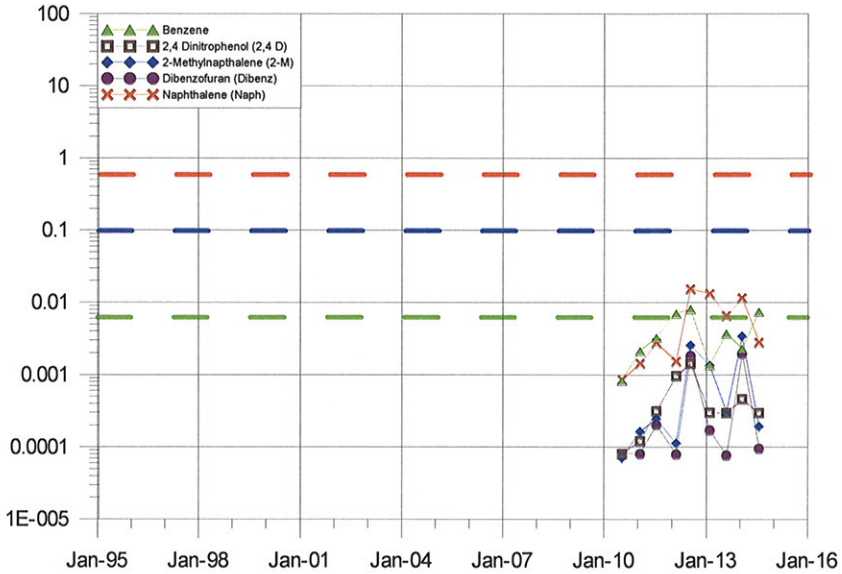
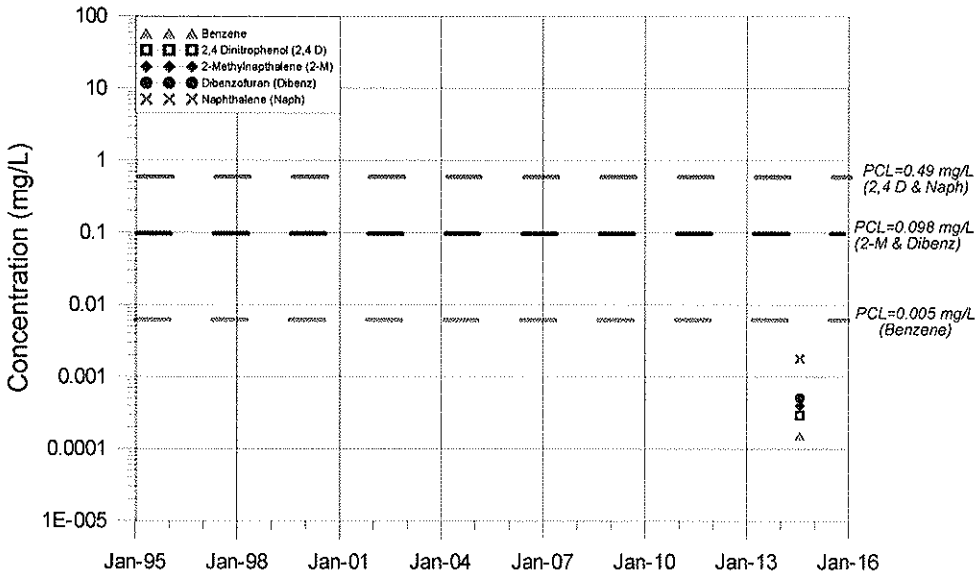


MW-68C



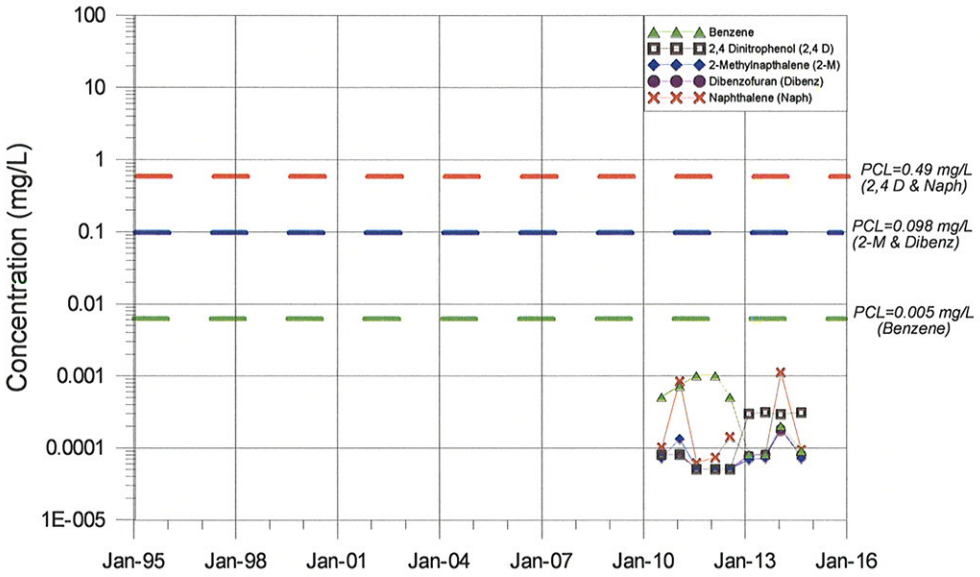
Attachment 1B-73
C-TZ Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-76C



Attachment 1B-74
D-TZ- Wells COC Concentrations
UPRR Houston Wood Preserving Works

MW-36D



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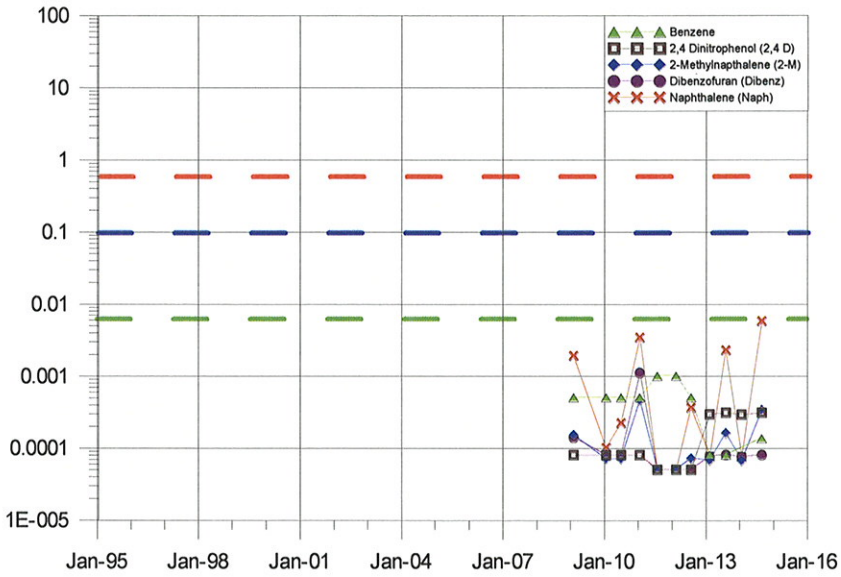

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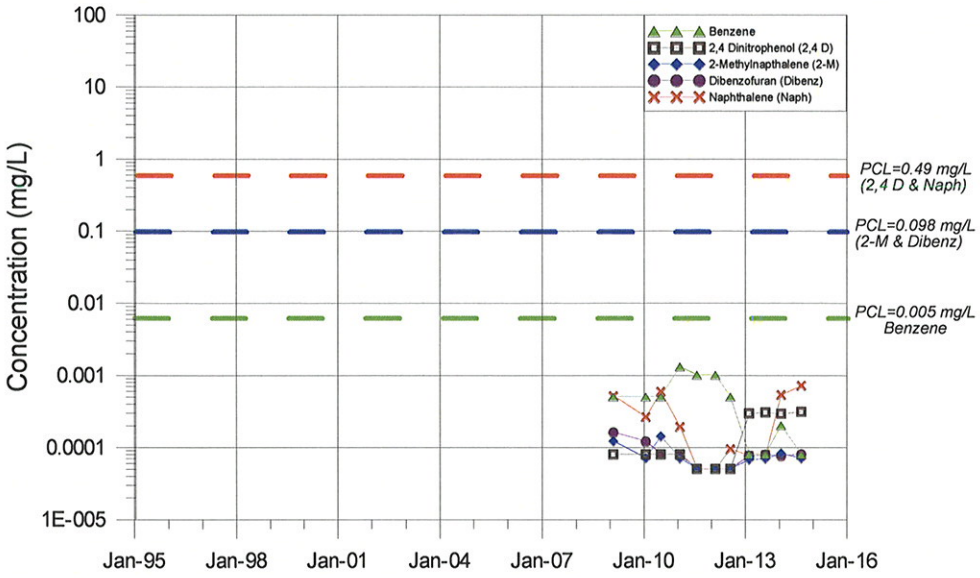

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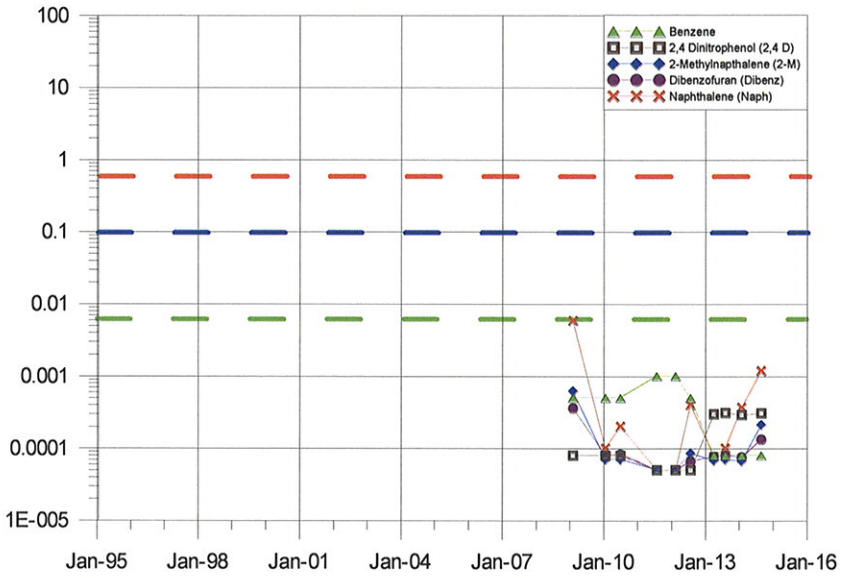


Response Action Design

Use this worksheet to provide detailed descriptions of the response action. Attach design and layout drawings and equipment specifications in Attachment 2A.

Media: **Surface Soil/Subsurface Soils**
List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

For surface soils, the Remedy Standard B RAOs will include two approaches:

- Former HWPW area: Using the Area of Contamination (AOC) policy, surface soils with cPCL exceedances in the SDD (SWMU 2), Inactive Wastewater Lagoon (AOC 6), and areas north of the AST Area (SWMU 8) will be consolidated in the area of SWMUs 4, 5, and 8. As allowed under the EPA AOC policy, soils may be consolidated within the AOC (defined at the Site as the "Affected Property") and not be considered to be removed from the land or generated. Soils removed from the proposed areas will be conducted under Remedy Standard A. The removal action has been designed to remove surface soils containing COCs at concentrations exceeding the critical PCLs as shown on Attachment 2A-1a and 2A-1b. The soils will be excavated to the vertical extent of the PCLE zone, estimated to be a maximum of approximately 3 feet deep (no greater than 5 feet deep). Soils will be placed within the AOC near SWMU 4, 5 and 8 and covered with an engineered soil cap (Attachment 2A-1a). A request for TCEQ concurrence to consolidate soils was submitted under cover letter dated November 20, 2014 (copy of letter provided in Appendix 3).

  To protect on-site commercial/industrial receptors, a vapor barrier with geotextile fabric, and an engineered soil cap (12-in clay soil, 6-in topsoil) will be constructed to cover the consolidated soil and remaining surface soil PCLE Zone on the former HWPW area (Attachment 2A-1a) and prevent exposure to surface soils within this area of the Site. The soil cap will be vegetated and sloped to minimize infiltration over the surface/subsurface soil PCLE Zone. The vegetated cap will be maintained under the post-response action care. In the areas where surface soils will be removed, subsurface soils do not appear to be impacted above cPCLs. The subsurface soil PCLE Zone within the HWPW area appears to be only in the areas where the proposed engineered soil cap will be constructed. The proposed vapor barrier in the soil cap area will also address the $^{Air}Soil_{Inh\text{-}V}$ PCLE Zone for naphthalene detected in the subsurface soils within and near SWMU 5.

  Based on the current areas delineated, the estimated volume of soil to be consolidated is approximately 23,000 cubic yards. However, prior to consolidation of the soils and construction of the cap, additional soil samples will be collected to refine the surface soil PCLE Zone to ensure the proper area to be excavated and for the construction of the cap area (Attachments 2A-1a and 2A-1b). The additional soil sampling will be conducted to also evaluate the representative concentrations of COCs in surface soil using statistics assuming a ½-acre default area for the current surface soil PCLE Zone near the Inactive Waste Water Lagoon (AOC 6) and the southern end of the SDD (SWMU 2) in accordance with 30 TAC §350.51(l). The proposed

additional sampling was developed based on at least eight surface soil samples collected within a ½-acre exposure area. The 95 percent upper confidence limit (UCL) of the arithmetic mean for each ½-acre study area will be calculated using PRO UCL and the Student's *t*-statistic. Soil data sets will be evaluated for outliers to identify hot spots for excavation. The primary COC in this area defining the PCLE Zone is benzo(a)pyrene, which limiting PCL is the $^{Tot}Soil_{Comb}$ PCL.

In addition, underground tanks listed as SWMU 11 (Oil/Water Separators) will be removed, properly disposed of, and filled in with clean fill.

- Englewood Intermodal Yard area: The surface and subsurface soil PCLE zone in the Intermodal Yard area is currently covered with a physical barrier (concrete pavement), preventing contact with impacted soils for on-site workers. As part of the post-response action care, the concrete pavement in the area of the surface soil PCLE Zone will be routinely inspected to ensure on-site worker protection. Attachment 2A-1a shows the Surface Soil Affected Property and its location beneath the concrete parking lot on the Site. In addition, storm drains within the proposed response action area will be inspected and sediment in the drains if present will be sampled to evaluate if COCs from surface soils have migrated into the storm water drainage system.

- UPRR Main Lines Ballast Area: The area between the former HWPW area and the Englewood Intermodal Yard (approximately 100 feet width) is covered with railroad ballast, ties, and rail. UPRR proposes to use the existing railroad ballast as an engineering control for preventing on-site worker exposure to impacted surface soils in this area. The railroad ballast area will be maintained as part of normal railroad operations. The track is owned and controlled by UPRR. In the event construction activities are necessary within the railroad ballast area, a health and safety plan will be implemented to ensure worker protection from COCs in the surface soils and a soil management plan will be developed if soils are excavated as part of the construction activities.

The Affected Property (including the entire HWPW and Englewood Intermodal Yard Area) will also be deed restricted for commercial-industrial land use and for the use of a physical controls on surface and subsurface soil in accordance with §350.31(g). Institutional controls will also be used to prevent exposure to the COCs in the surface and subsurface soils. Deed restriction of the Site to commercial-industrial use will limit future use and document the use of the physical barrier for surface soils. The PCLE zones for surface and subsurface soils are in an area with restricted property access.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

For surface and subsurface soils, there is no treatment system proposed.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
Harris County Clerk	Deed restriction of property to commercial-industrial use and document the use of a physical	NA	Within 120 days of RAP approval

	control on surface soils		
TCEQ	TCEQ Hazardous Waste (HW) Permit/Compliance Plan	SWR 31547 HW Permit: 50343 Expires June 10, 2015	HW Permit Renewal/Revision submittal by December 10, 2014

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

Not applicable for this media.

Media: **Shallow Groundwater – A-TZ, B-TZ, C-TZ GWBU**
List all media to which this information applies. If the response action is different for another media, complete a separate worksheet.

Provide a detailed description of the response action. Describe the removal action, decontamination, treatment system(s), and/or physical or institutional control actions that are proposed for each media and discuss the reasons for choosing the response action(s). Identify and describe any ecological services analysis and compensatory restoration plan that will be utilized (if so, include the complete ESA and compensatory restoration plan in Attachment 2C).

The response action design for the groundwater PCLE Zones will be to implement the modified Remedy Standard B groundwater response action through use of two approaches:

1. A PMZ for the groundwater PCLE Zones in the A-TZ, B-CZ, B-TZ, and C-TZ (discussed in Worksheet 2.1);
2. Where creosote DNAPL has been observed in soil boring logs and/or monitoring wells, a TI Zone is proposed for those GWBUs A-TZ, B-CZ, B-TZ, and C-TZ (discussed in Worksheet 2.3)

For the PMZ, MNA will be used for the physical control mechanism, which has shown to be a control for migration of the COC groundwater plumes. An evaluation of historical groundwater monitoring data and data trends for the Site indicates that natural attenuation of COCs in groundwater is occurring (Attachments 1A (evaluation of recent groundwater data) and 1B (concentration versus time graphs)). Site-specific COCs will be monitored to ensure the levels of these constituents remain stable and below cPCLs at the point of exposure (POE) wells as well as below the attenuation action levels (AAL) at the attenuation monitoring points (AMP) (Attachment 2A-2). MNA will be used to confirm the continued attenuation of COCs to concentrations below cPCLs throughout the PCLE zone; however, this will not likely be achieved in a reasonable timeframe given the nature of the creosote DNAPL. Groundwater monitoring will be performed on a semi-annual basis. For the purposes of this RAP submittal, there will be two overall PMZ areas:

1. On-Site PMZ – The on-site PMZ will include the cumulative groundwater PCLE Zone (A-TZ, B-CZ/B-TZ, and C-TZ PCLE Zones) within the UPRR-owned property and adjacent City of Houston ROW.
2. Off-Site PMZ – The off-site PMZ includes the cumulative groundwater PCLE Zone that extends off-site to the north of the Site. The proposed off-site PMZ will require institutional controls for up to 101 individual properties. Given the large number of off-site properties, and issues with property ownership in the area, the proposed timeframe to acquire the necessary landowner consent for the PMZ will be two years following approval of the RAP.

The on-site PMZ (including the former HWPW, Englewood Intermodal Yard, and adjacent City of Houston ROW) will be deed restricted to commercial-industrial land use and to restrict future use of groundwater on-site, as well as restrictions on soil excavation activities within the surface soil PCLE Zone on the UPRR-owned property. For the off-site PMZ, UPRR is currently acquiring the necessary landowner consent to establish the PMZ on properties not owned by UPRR. UPRR has proposed to file restrictive covenants with the Harris County Clerk for the off-site properties (101 off-site properties) within the proposed cumulative PMZ area (includes the three individual PMZs for the A-TZ, B-CZ/B-TZ, and C-TZ PCLE Zones) (Attachment 2A-2).

To address the NAPL, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be addressed through control via TI. For areas where either creosote NAPL was noted in the soil boring log in the saturated zone or is detected in monitoring

wells, the TI demonstration details the difficulty of achieving groundwater PCLs within a reasonable timeframe in these areas because of complex hydrogeology and physical nature of creosote (discussed in Worksheet 2.3). The control endpoint will be to control the soluble NAPL fraction sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical (recover readily recoverable creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based "no growth" PMZ can be met. UPRR is currently conducting a DNAPL Recovery Pilot Test to evaluate the recoverability of the DNAPL at the Site. The pilot test consists of monthly pumping events from wells with DNAPL. The pilot test will conclude following the January 2015 recovery event. At that time, a DNAPL recoverability evaluation will be completed and submitted to the TCEQ.

Institutional controls as detailed in §350.31(g) through deed recordation (UPRR-owned property) and restrictive covenants (off-site properties) within the PMZ and TI Zone and restricting the use of groundwater will be used at the Site to prevent future exposure risk until groundwater concentrations achieve critical PCLs.

Describe all major treatment system components and equipment of the response action. Illustrate the response action design and provide equipment specifications in Attachment 2A.

There is no major treatment system proposed to address the groundwater PCLE. Creosote DNAPL will be recovered from the wells using manual pumping (or equivalent) methods, stored on-site at the Container Storage Area (NOR 4), and disposed of in accordance with state and federal regulations within the required timeframes.

List permits or registrations needed to construct or implement the response action, including permits or registrations needed to conduct studies or tests. For VCP sites, list the permits that would be required if the site was not in the VCP (required by the VCP).

Permitting/Registration Authority	Type of permit/registration	Permit or registration number if already issued	Anticipated application date
Harris County Clerk	Deed restriction of property to commercial-industrial use and document the use of a physical control on surface soils	NA	Within 120 days of RAP approval
TCEQ	TCEQ Hazardous Waste (HW) Permit/Compliance Plan	SWR 31547 HW Permit: 50343 Expires June 10, 2015	HW Permit Renewal/Revision submittal by December 10, 2014

Identify and discuss the results of any studies or tests, such as pilot studies, feasibility studies, technical impracticability studies, treatability studies, and/or toxicity studies conducted or proposed to be conducted at the affected property. Discuss the reason for the study or test and how it verifies the effectiveness and appropriateness of the chosen response action or documents that a particular response action is not appropriate for the affected property. Describe how the results of completed studies or tests determined the design or choice of response action. Attach any separate reports and supporting documentation in Appendix 3.

The following two studies have been conducted at the Site to evaluate the groundwater response action methods:

1. DNAPL Recovery Pilot Study (currently on-going); and
2. Front-end TI Demonstration Study.
3. Request for No Further Action for RCRA Unit 1/SWMU No. 1

PBW initiated a 24-month pilot study in February 2013 to evaluate DNAPL recovery at the Site by conducting tests on selected wells where DNAPL had been observed. Details of the scope of work for the pilot test were submitted to the TCEQ in a letter dated February 5, 2013 (PBW, 2013). A copy of the scope of work is provided in Appendix 3. The pilot test procedures consists of measuring the depth to groundwater surface, the depth to the groundwater/DNAPL interface, and the total depth of the well relative to the top of well casing prior to DNAPL recovery. Using a peristaltic pump, DNAPL is pumped from the bottom of the well until groundwater is returned in the pump discharge. The volume of recovered DNAPL is estimated from each well, and the well is gauged to measure the total depth of the well and depth to residual DNAPL following pumping. Recovered DNAPL is temporarily stored at the Containment Storage Area. PBW submitted to the TCEQ in a letter dated September 25, 2014 an update after the first 18 months of the pilot test. A copy of the letter is also provided in Appendix 3. After the monthly DNAPL recovery pilot test has concluded following the January 2015 recovery event, UPRR will submit to the TCEQ the results of the 24-month pilot test. This submittal will also include an evaluation of other recovery alternatives, including continuing DNAPL recovery activities.

PBW prepared a Front-end TI Demonstration (Worksheet 2.3, Attachment 2G) highlighting the factors that inhibit groundwater restoration to cPCLs at the Site within a reasonable timeframe. These include hydrogeological factors and contaminant-related factors that limit the effectiveness of any remediation approach from achieving cPCLs. A key part of the TI Demonstration is the summary of similar creosote sites throughout Texas where TIs have been approved for the sites that have similar hydrogeologic factors and similar contaminants.

PBW prepared a report in Appendix 3C detailing the supporting documentation for requesting a No Further Action (NFA) for the Closed Surface Impoundment (Solid Waste Management Unit (SWMU) 1) at the Site. The groundwater monitoring activities over the past three years have shown compliance with groundwater protective standards, and have achieved the groundwater Remedy Standard A requirements under TRRP. Based on the last three years of groundwater monitoring data at the SWMU 1 less than TRRP PCLs and that the unit was “clean closed” in 1984, UPRR requests a No Further Action Determination to cease all post-closure care including response action and maintenance activities for SWMU No.1.

ATTACHMENT 2A

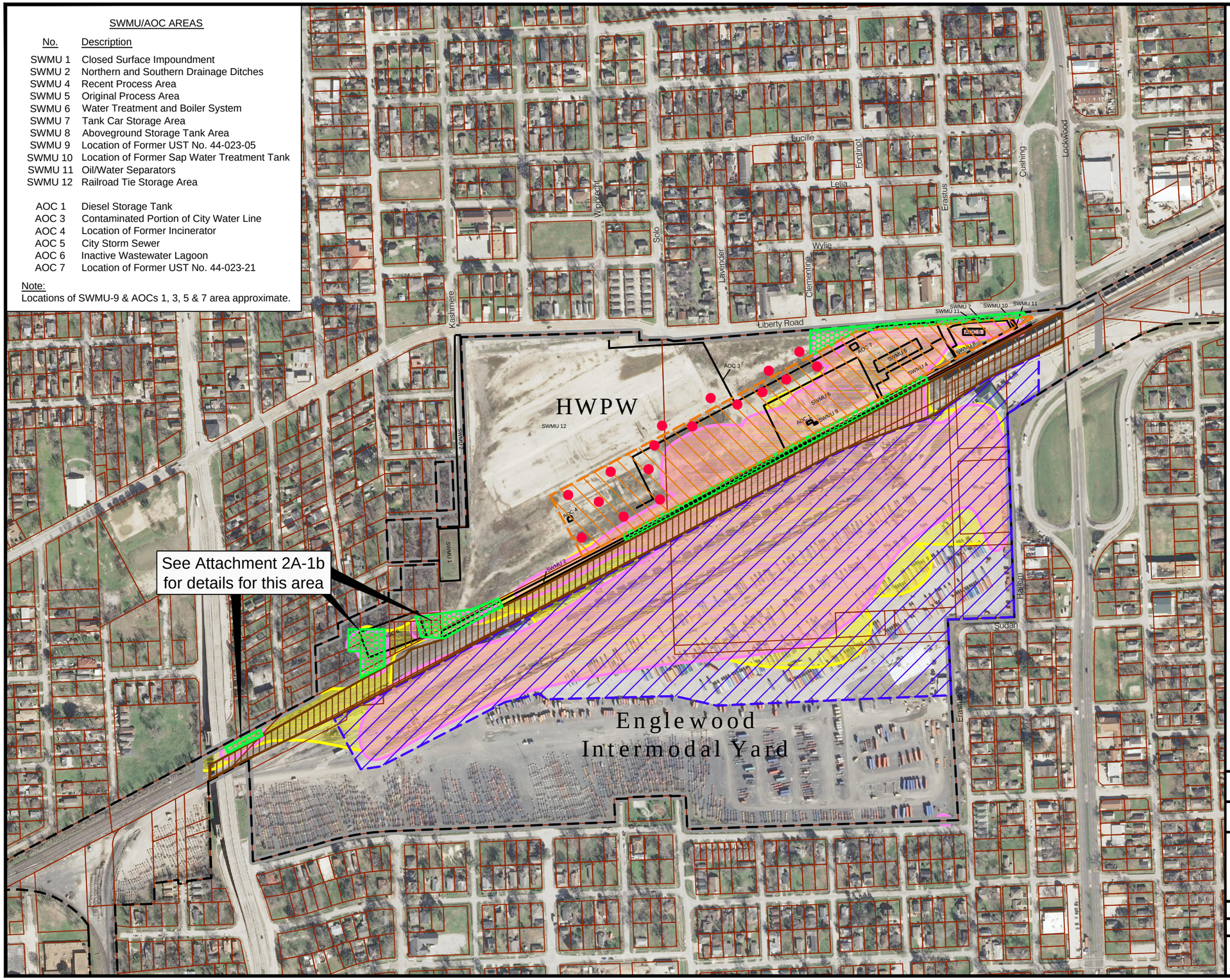
RESPONSE ACTION DIAGRAMS AND COMPONENT/EQUIPMENT DESCRIPTIONS

ATTACHMENT 2A-1a RESPONSE ACTION DESIGN – SOILS
ATTACHMENT 2A-1B RESPONSE ACTION DESIGN – SOILS (AOC6)
ATTACHMENT 2A-2 RESPONSE ACTION DESIGN - GROUNDWATER

SWMU/AOC AREAS

No.	Description
SWMU 1	Closed Surface Impoundment
SWMU 2	Northern and Southern Drainage Ditches
SWMU 4	Recent Process Area
SWMU 5	Original Process Area
SWMU 6	Water Treatment and Boiler System
SWMU 7	Tank Car Storage Area
SWMU 8	Aboveground Storage Tank Area
SWMU 9	Location of Former UST No. 44-023-05
SWMU 10	Location of Former Sap Water Treatment Tank
SWMU 11	Oil/Water Separators
SWMU 12	Railroad Tie Storage Area
AOC 1	Diesel Storage Tank
AOC 3	Contaminated Portion of City Water Line
AOC 4	Location of Former Incinerator
AOC 5	City Storm Sewer
AOC 6	Inactive Wastewater Lagoon
AOC 7	Location of Former UST No. 44-023-21

Note:
Locations of SWMU-9 & AOCs 1, 3, 5 & 7 area approximate.



EXPLANATION

- UPRR Property Boundary
- Property Boundary (GIMS)

Area of Contamination:

- Soil Affected Property
- Soil PCLE Zone
- Railroad Ballast Cap Area
- Concrete Cap Area
- Extent of Soil Cap
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area
- Proposed Surface Soil Boring

Note:
Vertical datum based on City of Houston Vertical Datum (HVD).

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N

Approx. Scale in Feet

0 200 400

Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 2A-1a

RESPONSE ACTION DESIGN SOILS

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

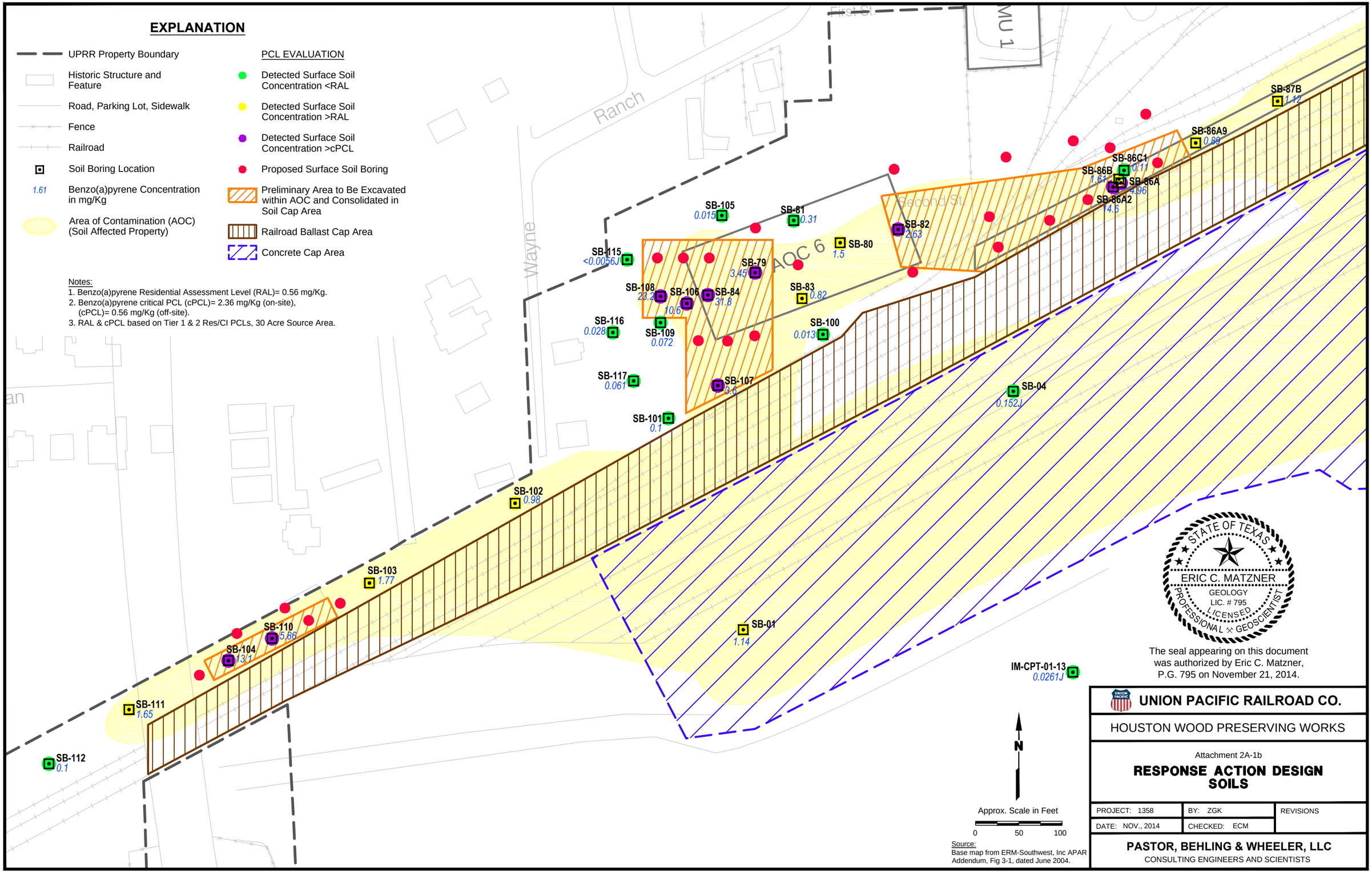
EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- Soil Boring Location
- 1.61 Benzo(a)pyrene Concentration in mg/Kg
- Area of Contamination (AOC) (Soil Affected Property)

PCL EVALUATION

- Detected Surface Soil Concentration <RAL
- Detected Surface Soil Concentration >RAL
- Detected Surface Soil Concentration >cPCL
- Proposed Surface Soil Boring
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area
- Railroad Ballast Cap Area
- Concrete Cap Area

Notes:
1. Benzo(a)pyrene Residential Assessment Level (RAL)= 0.56 mg/Kg.
2. Benzo(a)pyrene critical PCL (cPCL)= 2.36 mg/Kg (on-site), (cPCL)= 0.56 mg/Kg (off-site).
3. RAL & cPCL based on Tier 1 & 2 Res/CI PCLs, 30 Acre Source Area.



Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

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HOUSTON WOOD PRESERVING WORKS

Attachment 2A-1b

RESPONSE ACTION DESIGN SOILS

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

EXPLANATION

- UPRR Property Boundary
- Property Boundary (GIMS)
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- Proposed Well for PMZ

Notes:

1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. *- Wells fall within soil cap area and will be plugged and abandoned.
4. **- On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.

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OFF-SITE PMZ

**ON-SITE PMZ

HWPW

Englewood Intermodal Yard

MW-67B MW-27A MW-27C PMW-83B PMW-85C PMW-84B MW-28C MW-28A MW-65D MW-63B MW-54C MW-66D MW-68C MW-26A MW-33BR MW-36B MW-36D MW-45C MW-44A (DNAPL) MW-46C (DNAPL) MW-36A MW-25C MW-25A PMW-82B MW-35B MW-35A MW-32AR (DNAPL) MW-33A MW-70B (DNAPL) MW-32B MW-71B MW-34CR MW-44C (DNAPL) MW-57A* (DNAPL) MW-58A* MW-57B* MW-18AR MW-60A MW-13 MW-15C MW-17 MW-17C MW-30A* MW-72B* MW-18C* MW-18A* MW-47C MW-14 MW-15A MW-15B MW-23C* (DNAPL) MW-52A* TW-56A* MW-20A MW-31A* MW-19C* MW-55B* MW-55A* MW-73B* MW-74B MW-49B MW-48C MW-16* MW-79A MW-49A MW-61A MW-59A MW-59B MW-59D MW-69A MW-75B (DNAPL) MW-78A (DNAPL) MW-80B MW-38A MW-39B MW-12C MW-12A MW-40B MW-38B MW-12B (DNAPL) MW-42B TW-41B MW-62B MW-41B (DNAPL) MW-02 P-11 MW-01A MW-03 MW-10A MW-08 P-12 MW-22A MW-10B MW-09 MW-22B MW-11B MW-11A P-10 MW-04 MW-07 MW-21C MW-05 MW-64A MW-77A MW-76C MW-50A MW-81B MW-51A MW-51C

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 2A-2

RESPONSE ACTION DESIGN GROUNDWATER

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

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ATTACHMENT 2B

PROPOSED WELL DESIGN

ATTACHMENT 2B – 1 PROPOSED MONITORING WELL NETWORK
ATTACHMENT 2B – 2 TYPICAL MONITORING WELL CONSTRUCTION

ATTACHMENT 2B

PROPOSED WELL DESIGN

Introduction

As detailed in RAP Worksheet 2.1, the following wells are proposed to be installed:

1. Point of Exposure Wells:
    a. B-TZ/B-CZ: PMW-82B, PMW-83B, PMW-84B
    b. C-TZ: PMW-85C
2. Replacement Wells:
    a. A-TZ: MW-18AR and MW-22AR
    b. B-TZ: MW-22BR

The proposed new wells and replacement wells are shown on Attachment 2B-1. Monitoring wells MW-22AR and 22BR are to be installed to replace damaged wells MW-22A and MW-22B, respectively. Details of the well installation are discussed below.

Permanent Monitoring Well Installation

Soil borings for monitoring wells will be advanced using hollow stem auger, mud rotary, or sonic drilling methods. Soil samples will be collected continuously from each boring and will be logged in the field for lithology and sedimentary structure. Soil headspace samples will be collected every two feet and screened in the field for total organic vapor concentrations. In addition, soil core samples will be visually inspected for contamination and non-aqueous phase liquid (NAPL) presence.

Soil borings that will be used for monitoring well installation will be advanced as necessary to identify the top and base of the targeted groundwater bearing-unit (GWBU) (i.e., A-TZ, B-TZ, C-TZ). Based on the boring logs for previous monitoring wells drilled at the Site, it is anticipated that these borings will be advanced to the following maximum depths (subject to field conditions):

- A-TZ: approximately 30 feet below ground surface (bgs)
- B-TZ/B-CZ: approximately 36 feet to 40 feet bgs
- C-TZ: approximately 70 feet bgs.

Although the proposed borings for wells below the A-TZ will be located away from areas where NAPL has been identified, surface or isolation casing (permanent isolation casing or temporary isolation casing using sonic drilling techniques) may be installed prior to penetration of any low permeability confining unit.

Permanent monitoring wells will be constructed after the total depth of the borehole is reached. Monitoring wells will be constructed using 2-inch or larger diameter, flush-joint-threaded Schedule 40 PVC casing and 0.010-inch slotted PVC screen. Other well casing and screen materials (i.e., stainless steel) may be used instead of PVC depending on the potential for exposure to NAPL. The specific well design will be determined in the field based on the observed lithology with the goal of screening the well at the base of the targeted GWBU. It is anticipated that each well screen will be approximately 10 feet in length, but shorter screen intervals may be installed for the B-CZ wells. After the boring is completed to the total depth, the casing and screen will be lowered into the borehole through the augers or sonic isolation casing.

Once the casing and screen are in place, the remaining well materials (filter sand, bentonite pellets, and cement/bentonite grout) will be added to the hole as the augers/sonic casings are slowly removed. Depths to the top of the annular materials will be measured with a weighted, calibrated tape and recorded on the Well Completion Log. A bentonite seal layer will be installed on top of the filter sand and will be a

minimum of 2 feet in thickness. The remainder of the borehole annulus will be filled with a Portland/bentonite grout (or bentonite pellets). Each well will be completed with either a flush-grade surface completion with a 2-foot by 2-foot pad or above grade within a protective casing on a 4-foot-by-4-foot concrete pad. If an above grade completion is constructed, bollards or bumper guards should be installed around the surface completion. Typical monitoring well completion details are shown on Attachment 2B-2. After construction, the position and elevation of each monitoring well will be surveyed by a licensed, professional surveyor relative to Texas State Plane Coordinates and mean sea level.

Monitoring Well Development

A minimum of 24 hours shall elapse after well construction and before well development to allow for bentonite hydration and grout set. Development will consist initially of surging and bailing or pumping; however, the specific development method will ultimately be decided by the field personnel based on the specific conditions encountered. Temperature, pH, specific conductivity, and turbidity will be monitored during purging. Development will continue until the well produces water with stable field parameter readings (i.e., temperature, pH, conductivity) and turbidity is below 10 NTU. At least five casing volumes of water will be removed from the well during development unless the well pumps dry. If the turbidity is not below 10 NTU after 10 casing volumes of water are removed from the well, then the final turbidity will be recorded and more aggressive development procedures such as air lifting may be considered. General procedures for monitoring well development are outlined in PBW SOP No. 8: Monitoring Well Development (Appendix A).

Monitoring Well Documentation

Documentation of well installation and development will include field boring logs, monitoring well installation forms, well development forms, and any photographs. For wells installed within the City of Houston right of way (ROW), city permits will be required prior to installing the wells. Investigation-derived wastes (IDW), such as soil cuttings, decontamination fluids, or development water, generated from the drilling activities will be stored and disposed of in accordance with state and federal requirements. Documentation of the wastes disposed of as part of the well installation will be maintained.

Following installation, a certification report will be submitted to the Texas Commission on Environmental Quality (TCEQ) detailing the well installation and related documentation.

FIGURES

EXPLANATION

- UPRR Property Boundary
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
- Proposed Well for PMZ
- Proposed Replacement Well (MW-22AR & MW-22BR)

Notes:

1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Houston-Galveston Area Council (HGAC) 2012 Aerial.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

MW-67B
PMW-83B
PMW-85C
PMW-84B
MW-28C
MW-63B
MW-68C
MW-33BR
MW-26A
PMW-82B
MW-35A
MW-32B
MW-70B
MW-34CR
MW-36B
MW-36A
MW-44A (DNAPL)
MW-45C
MW-54C
MW-46C (DNAPL)
MW-25A
MW-44C (DNAPL)
MW-18AR
MW-60A
MW-47C
MW-15C
MW-15A
MW-14
MW-17C
MW-39B
MW-38B
MW-12B (DNAPL)
MW-62B
MW-41B (DNAPL)
P-11
MW-22BR
MW-22AR
MW-21C
MW-48C
MW-61A
MW-69A
MW-59A
MW-59B
MW-75B (DNAPL)
MW-78A (DNAPL)
MW-80B
MW-77A
MW-76C
MW-50A
MW-81B
MW-51C

Lucille
Fontinot
Lelia
Erastus
Cushing
Lockwood
Wipprecht
Solo
Lavender
Clementine
Wylie
Kashmere
Liberty Road
Harlem
Sudan
Erastus

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HOUSTON WOOD PRESERVING WORKS

Attachment 2B-1

PROPOSED MONITORING WELL WELL LOCATION MAP

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

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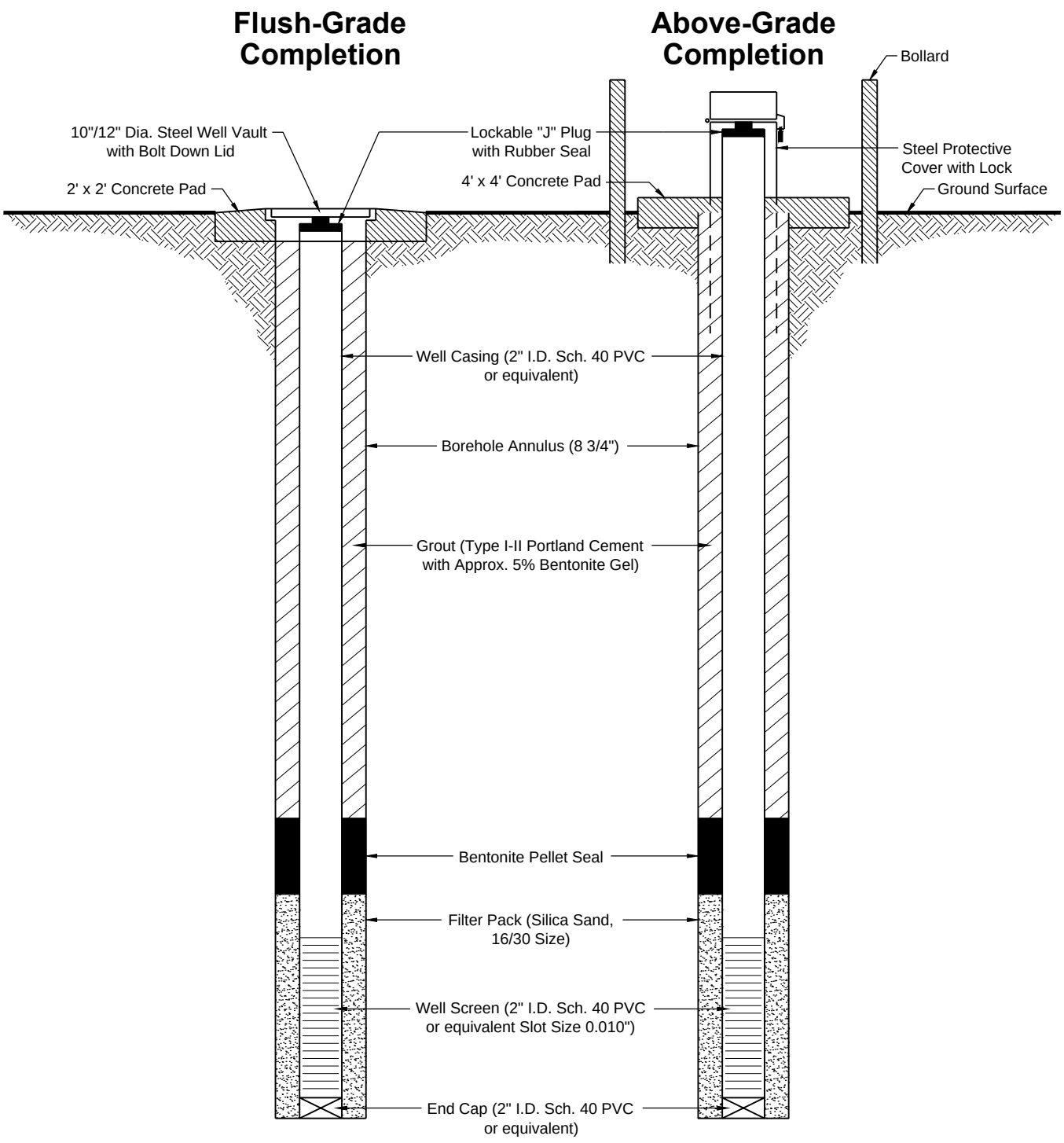
CONSULTING ENGINEERS AND SCIENTISTS



NOT TO SCALE

Notes:
Wells completed below the A-TZ will be installed with isolation casings (PVC or sonic casing, if drilled with sonic methods) isolating the shallow zone.

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HOUSTON WOOD PRESERVING WORKS

Attachment 2B-2

TYPICAL MONITORING WELL CONSTRUCTION

PROJECT: 1358	BY: ZGK	REVISIONS
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Complete this worksheet when a PMZ is proposed as part of the response action. Include in Attachment 2D a map of the proposed PMZ with alternate POE(s) and attenuation monitoring points identified and the current groundwater PCLE zone. If a PMZ is not proposed, do not submit this worksheet.

Groundwater-bearing unit **A-TZ**
Repeat this worksheet for each groundwater-bearing unit for which a PMZ is proposed.
Groundwater classification **X** 2 ____ 3

Provide justification as to why the PMZ is appropriate in accordance with §350.33(f)(4)(A). Include supporting documentation in Attachment 2E.

The on-site and off-site PMZs proposed as a response action for the A-TZ PCLE zone (Attachment 2D-1) ensures that COCs will not pose a potential unacceptable risk to human health or the environment as long as the AALs are not exceeded at the respective AMPs, and COC concentrations less than cPCLs at the proposed Alternate POE wells. PMZs are appropriate for this PCLE zone based on a relatively low groundwater velocity, overall stable/declining COC concentrations, the proposed institutional controls (deed recordation (on-site PMZ) and restrictive covenants (off-site PMZ)) on use of groundwater within the PCLE Zone, and the absence of any existing water supply wells within ½-mile of the Site. In addition, there are no surface water bodies at the Site or near the proposed PMZ; therefore, there is no potential for contaminating surface waters that would be hydraulically connected to groundwater. The City of Houston provides municipal water services for all properties within the Affected Property, so there is no human health complete pathway associated with this GWBU. The Site is also within the jurisdiction of the Harris-Galveston Subsidence District (HGSD), which restricts groundwater use in the area and requires a permit application prior to drilling a groundwater well. There are permitting exemptions, but only in areas that do not have an alternative water supply. The HGSD rules are not a complete prohibition on the use of groundwater in the area, but rather the fees associated with the rules are "intended to operate as an economic disincentive to groundwater withdrawal" (HGSD, 2013).

The PMZs proposed for the A-TZ PCLE zones consists of two components: 1) filing of institutional controls including deed recordation (UPRR-Owned properties) and restrictive covenants (off-site properties) prohibiting the use of groundwater within the PMZs; and 2) performance of ongoing groundwater monitoring at the proposed AMPs and POE wells. The proposed deed recordation and restrictive covenant language, to be filed in the Harris County deed records, is included in Appendix 4.

As detailed in Attachment 1A, the PMZs for A-TZ were established using the July/August 2014 groundwater analytical data collected from the Site, in conjunction with trend analysis for groundwater analytical data from 2010 through 2014 (10 semi-annual sampling events). Comparing the maximum groundwater analytical data from the July/August 2014 groundwater sampling event to cPCLs, concentrations of 23 target COCs exceeded their respective cPCLs in at least one of the four GWBUs. For the A-TZ, the following 12 COCs were detected above cPCLs:

VOCs

- Benzene
- Methylene Chloride
- Vinyl Chloride

SVOCs

- 2,4-Dimethylphenol
- 2-Methylnaphthalene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Bis(2-chloroethoxy)methane
- Chlorobenzene (A-TZ only, one well)
- Dibenzofuran

- Naphthalene
- Phenol

Of those COCs, benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene are the most prominent COCs where the cPCL exceedances for these COCs define the PCLE Zone in the A-TZ. Therefore, the trend analyses and attenuation action levels were calculated for these five COCs (Attachment 2E). None of the COCs listed above were detected in the A-TZ at concentrations that exceeded the $^{Air}GW_{Inh\text{-}V}$ PCL.

The overall groundwater flow across the Site in the A-TZ is to east, until the Lockwood Street Bridge area on the far east side of the Site. As discussed in the APAR Addendum (PBW, 2009), there is a City of Houston 60-inch sanitary sewer line that cuts across the east end of the Site (Attachment 1A, Figure 5A-1) that flows north to south just west of the Lockwood Street Bridge. Based on a review of the City of Houston engineering drawing files for the sanitary sewer line, the sewer line potentially intersects the saturated A-TZ unit, and may be affecting the groundwater potentiometric surface elevation of the A-TZ (Attachment 1A, Figure 4C-1).

PBW installed a small diameter piezometer MW-69A in June 2010 in the City of Houston ROW along the west side of the sanitary sewer line south of MW-49A (Attachment 1A, Figure 1A) to evaluate the potential for site-specific COCs affecting the sanitary sewer. The location of the piezometer was chosen to evaluate if COCs in groundwater are travelling along the west side of the sanitary sewer line. Groundwater data from monitoring well MW-59A indicates that the COCs were not detected above PCLs east of the sanitary sewer line. In addition, PBW collected grab samples of fluid from the sanitary sewer line upgradient, within the Site, and downgradient of the Site to evaluate potential discharge of site-specific COCs detected in the A-TZ into the wastewater line (PBW, 2010). Samples from the sanitary sewer were collected from three manholes using a peristaltic pump and tubing inserted through the manhole covers.

Based on the analytical results from July 2010 through July/August 2014, none of the site-specific COCs have been detected above TRRP PCLs in the groundwater samples collected from MW-69A. Also, sanitary sewer water analytical results from the three sanitary sewer samples were also compared to TRRP Tier 1 PCLs for groundwater, even though the fluid in the line is not considered groundwater. Of the three samples collected in 2010, the only sample with concentrations greater than PCLs was the upgradient sample SSW1 that had a detection of bis(2-ethylhexl)phthalate (0.0092 mg/L) above the $^{GW}GW_{ing}$ PCL of 0.006 mg/L; however, bis(2-ethylhexyl)phthalate is a common laboratory contaminant (as cited in 30 TAC§350.71(k)(2)(B)). The sanitary sewer sample analytical results suggest that there is not a significant mass loading of COCs from groundwater into the sanitary sewer.

As discussed in Worksheet 2.3, a TI Zone will also be established for areas where DNAPL has been detected in monitoring wells or observed in the soil boring log for the GWBUs on site and off site. The proposed boundary will follow the outline of the proposed on-site and off-site PMZs. Details of the TI Zone are provided in Attachment 2G..

In accordance with §350.33(f)(4)(A), both PMZs for the A-TZ Unit will be actively monitored (semi-annually). MNA will be used as a control response for the Site.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone? **X** Yes ___ No

If yes, how far? Approximately 400 feet (§350.37(l) or (m) as applicable)
Is it to be off-site? **X** Yes ____ No
On an off-site property that currently does not contain a residential-based groundwater PCLE zone?
X Yes ____ No -

If yes and this is a Class 2 groundwater, provide the basis for concluding that this groundwater does not have a reasonably anticipated future beneficial use (§350.37(l)(3)).

The residential-based PCLE zone extends onto the off-site properties (to the north and to the east), and on to the City of Houston ROW. The proposed PMZ extends to the closest monitoring wells where COC concentrations in groundwater are less than the cPCL based on the groundwater data collected in July/August 2014. As previously discussed, the City of Houston provides municipal water services for all properties within the Affected Property, so there is no current beneficial use for the GWBU. The Site is also within the jurisdiction of the HGSD, which restricts groundwater use in the area and requires a permit application prior to drilling a groundwater well. There are permitting exemptions for small domestic wells, but only in areas that do not have an alternative water supply. The HGSD rules are not a complete prohibition on the use of groundwater in the area, but rather the fees associated with the rules are "intended to operate as an economic disincentive to groundwater withdrawal" (HGSD, 2013).

Therefore, with the City of Houston providing water for the area, and financial disincentives placed on shallow groundwater use by the HGSD (which the Texas Supreme Court ruled in favor of the HGSD in 1977 to protect public welfare by limiting harmful pumping, which was causing ground subsidence of the land resulting in flooding (*Beckendorff v. Harris-Galveston Coastal Subsidence District (1977)*), the shallow groundwater does not have a reasonably anticipated future beneficial use in the area.

Is NAPL present? **X** Yes ____ No
If so, describe how the response action will achieve the performance criteria in §350.33(f)(4)(E).

§350.33(f)(4)(E) The person is required to reduce NAPLs which contain COCs in excess of PCLs within a plume management zone to the extent practicable. In the determination of adequate NAPL reduction, the executive director may consider conformance with the following criteria and other relevant factors:

(i) readily recoverable NAPLs have been recovered;

(ii) the NAPLs will not generate explosive conditions as defined in §350.31(c) of this title (relating to General Requirements for Remedy Standards);

(iii) the NAPLs will not discharge to the ground surface, to surface waters, to structures, or to other groundwater-bearing units;

(iv) the vertical and lateral extent of NAPLs will not increase under natural conditions, or sufficient NAPLs have been recovered such that an active recovery system can be demonstrated to effectively control or contain migration of NAPLs (i.e., no increased NAPL extent); and

(v) the NAPLs will not result in the critical groundwater PCLs being exceeded at the downgradient boundary of the plume management zone or in the critical PCLs for other environmental media being exceeded at the applicable POE.

To address the NAPL in the TI Zone for the A-TZ, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be achieved through control via TI based on the occurrence of DNAPL in wells completed in the A-TZ. For areas where either creosote NAPL was noted in the soil boring log in the saturated zone or is detected in monitoring wells (i.e., MW-57A and MW-78A, and observed DNAPL in soil borings (Attachment 1A, Figure 5A-5)), the TI demonstration details the difficulty of achieving groundwater PCLs in these areas because of complex hydrogeology and physical nature of creosote (discussed in Worksheet 2.3). The control endpoint will be

to control the soluble NAPL fraction sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical (recover readily recoverable creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based "no growth" PMZ can be met, including no cPCL exceedances at the alternate POE wells.

Therefore, the current response objective per the TCEQ Guidance is to ensure compliance of NAPL zone in both the TI Zone through control and within the PMZ through recovery. Since both proposed boundaries are the same, readily recoverable NAPL will be recovered from wells in order to control potential migration from the TI Zone. Once the PMZs have been established, the response objectives will include compliance with PMZ performance criteria at the NAPL zone and control through institutional controls on groundwater use to protect exposure to residual NAPL in the GWBUs. As part of the evaluation for compliance with PMZ performance criteria, the on-going DNAPL Recovery Pilot Test will be used to assess if the DNAPL in the GWBUs is considered readily recoverable using the NAPL Management Tool A detailed in Appendix A of the TCEQ TRRP-32 Risk-Based NAPL Management guidance document (TCEQ, 2010). Following the pilot test that is scheduled to end after January 2015, the NAPL Management Tool A will be updated and submitted to the TCEQ.

DNAPL recovered as part of the on-going pilot study is stored on-site in DOT approved drums within the CSA (Unit 4), and then disposed of in accordance with all applicable laws and regulations within the applicable timeframes.

If this is a Class 2 groundwater, explain how the response action will ensure that leachate from the surface soil and subsurface soil PCLE zones will not increase concentration of COCs greater than the current measured concentrations (at time of RAP submittal). (§350.33(a)(2))

Groundwater monitoring has been on-going at the Site since 1997. Current and historical groundwater data from the A-TZ source areas (SWMU 4, 5, 8) (Attachment 1B), especially wells with data going back to 1997, suggest that the COC concentrations in the A-TZ groundwater plume were historically higher compared to present day data. Overall the primary COC concentrations are stable or decreasing. The few wells with increasing concentrations either contain DNAPL or had DNAPL noted in the GWBU on the soil boring log. Therefore, the COCs in the vadose zone (surface and subsurface soil) have reached a point where the mass loading to the A-TZ has reached a state of equilibrium and continued leachate migration to groundwater from surface or subsurface soil will not cause expansion of the groundwater PCLE Zone for the A-TZ.

As part of the response action for the surface and subsurface soils in the former HWPW area, the proposed response will be to construct a capped area over the surface soil PCLE Zone. Even though the cap is not designed for hydraulic control, the cap will be constructed with compacted clay and vegetation and sloped to drain storm water. The design of the cap will minimize infiltration across the surface soil PCLE Zone and reduce leachate migration from the vadose zone to the A-TZ.

Provide the basis that the COCs will not migrate beyond the downgradient boundary of the PMZ at concentrations above the critical PCL. Include supporting documentation in Attachment 2E.

Since the Site was first developed for creosoting operations in 1899, various releases over time likely occurred until the Site operations ceased in 1984. The facility was dismantled in the early 1990s. There

have been no other operations at the former HWPW Site in over 30 years. Given the long period of time since releases have occurred at the Site, impacts to surface soils that have migrated to the A-TZ groundwater have likely reached a state of equilibrium, as discussed above. This is supported with the A-TZ groundwater analytical data that indicate the distribution of COCs dissolved in Site groundwater is relatively stable in the source areas. The concentration vs time graphs presented in Attachment 1B-1 through 1B-15 indicate that most of the groundwater COC concentrations are remaining relatively stable. This is confirmed for most of the wells with the Mann-Kendall statistical analysis included in Attachment 2E, except for the following wells:

- For wells MW-12A and MW-18A in the source areas, the Mann-Kendall trend analysis for 2-methylnaphthalene (MW-18A) and dibenzofuran (MW-12A and MW-18A) show increasing trends from 2010 to 2014. However, for both MW-12A and MW-18A, both 2-methylnaphthalene (Attachment 1B-3) and dibenzofuran (Attachment 1B-4) concentrations were greater in 2001 to 2002 compared to recent concentrations.
- An increasing trend for naphthalene in MW-15A was noted, but similar to MW-12A and MW-18A, the highest concentrations in this well were detected in 2001 to 2003 sampling events. None of the COCs were detected above cPCLs during the most recent sampling event.
- Increasing trends for 2-methylnaphthalene, dibenzofuran, and naphthalene were calculated for off-site well MW-33A (with probably increasing trends for benzene and 2,4-dimehtylphenol); however, the most recent groundwater data indicate COC concentrations less than cPCLs.
- Increasing trends for benzene and 2-methylnaphthalene were calculated for off-site well MW-44A; however, the most recent groundwater data indicate COC concentrations less than cPCLs.

Therefore, the increasing trends calculated may be due to fluctuations over time rather than indicative of additional release causing the apparent increase. As shown on Attachment 1A, Figure 5B-20, the groundwater PCLE Zone for the A-TZ has remained stable over the past four years.

The downgradient boundary of the on-site and off-site A-TZ PMZ is located at monitoring wells MW-25A, MW-26A, MW-36A, MW-59A, MW-60A, MW-61A, and MW-69A (alternate points of exposure) (Attachment 2D-1). As previously discussed, there appears to be a groundwater divide near MW-44A on the north end and MW-49A/MW-59A on the south end just east of MW-18A (Attachment 1A, Figure 5A-1), which lines up with the 60-inch sanitary sewer line that runs north-south. Wells MW-25A, MW-59A, MW-60A, and MW-61A appear to be east of the groundwater divide. This is supported with by the low concentrations of COCs in these wells (Attachment 1A, Figure 5B-1). Fluid samples collected from the sanitary sewer line in 2010 did not indicate a significant loading of COC concentrations into the sewer line; however, the sewer line appears to serve as the downgradient groundwater control for the PMZ. Therefore, it is not anticipated that the on-site and off-site A-TZ groundwater PCLE zone will migrate beyond the proposed A-TZ PMZ boundary.

Attenuation Action Levels (AALs) have been established for Attenuation Monitoring Points (AMPs) within the centerline of the A-TZ plume in order to ensure groundwater COC concentrations do not exceed the cPCLs at the alternate point of exposure (POE) wells. Details on AAL development are provided in Attachment 2E. However, given the complex hydrogeology in the A-TZ, the primary monitoring points for the on-site and off-site PMZs will be at the proposed alternate POE wells. The proposed POE wells are shown on Attachment 2D-1. In addition, monitoring well MW-18A, which is listed as an AMP for the A-TZ, will be plugged and abandoned as part of the soil cap construction. The replacement well MW-18AR will be installed east of the current location outside of the proposed soil cap area. The proposed location is also shown on Attachment 2D-1.

Details of the monitoring plan for the A-TZ PMZ are provided in Worksheet 3.1 and Appendix 6.

Describe the methods used to determine that there are no artificial penetrations which can allow COCs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units. Include supporting documentation in Attachment 2E.

An on-site field survey and water-well data search was conducted, indicating no potential artificial penetrations that would act as a conduit for migration of shallow groundwater into the underlying groundwater formation. However, as discussed in the APAR Addendum (PBW, 2009), two sets of fiber optic lines, Level 3 Communications and Qwest, run along the north side of the rail main lines across the entire length of the Site (Attachment 1A, Figure 5A-1). Based on conversations with both Level 3 Communications and Qwest representatives, the fiber lines run underneath SWMUs 2, 5, 4, 8, and 10/11. The fiber lines run directly underneath the drainage ditch southwest of the Site and under the SDD about 3 to 5 feet bgs. The Level 3 Communications line reportedly was directionally bored to a depth of 40 to 45 feet bgs underneath the Original and Recent Process Areas (SWMU Nos. 5 and 4, respectively) and under the AST Area (SWMU No. 8). The Qwest fiber line reportedly runs 10 to 15 feet northwest and parallel of the main rail line, and is about 5 to 10 feet bgs through the Site. Just east of SWMU No. 8, the both fiber lines return to approximately 4 to 6 feet below grade an continue running northeast parallel to the rail main line. The Level 3 Communications line may act as an artificial penetration since the reported depths of the line go through both the A-TZ and into the B-CZ immediately below the primary source areas.

In addition to the fiber lines, three City of Houston utilities were identified in the previous APAR (PBW, 2009) that cut across the Site oriented north-south just west of the Lockwood Street Bridge: 1) 60-in wastewater line, 2) 84-in water line, and 3) a 42-in storm sewer line (PBW, 2009). Through a review of the utility drawing files obtained from the City of Houston Public Works Survey Department, two of the underground utility lines (the 60-in sanitary sewer line and the 84-in water line) appear to be at depths that potentially intersect the uppermost GWBU A-TZ. The estimated depths of the utilities based on the city drawings are shown on the Geologic Cross Sections A-A', B-B', and C-C' (Attachment 1A, Figure 4C-1). The estimated base depth of the 60-in wastewater line and the 84-in water line where Cross Section B-B' crosses the utility lines is approximately 23 feet bgs (approximate elevation of 26 feet HVD). It is highly unlikely that A-TZ groundwater is seeping into the 84-in water line, given the line is under pressure (flow is south to north), constructed with welded steel pipe, and is relatively new (constructed in 2000). Sampling of the 60-in sanitary sewer line was conducted in 2010, as previously discussed.

List the attenuation action level determined for each attenuation monitoring point. Illustrate the proposed attenuation monitoring points and the groundwater PCLE zone on the map in Attachment 2D. Include all calculations and other methods of determining the attenuation action levels in Attachment 2E.

COC	Attenuation Monitoring Point (well number)	Attenuation Action Level (mg/L)	Attenuation Action Level limited by $^{Air}GW_{Inh\text{-}V}$ or existing COC concentration? Y/N
Benzene	MW-18A*	1.5	N
	MW-44A	0.0132	N
	MW-25A	0.005 (cPCL)	N
2,4-Dimethylphenol	MW-18A*	24	NA
	MW-44A	1.251	NA
	MW-25A	0.49 (cPCL)	NA
2 Methylnaphthalene	MW-18A*	1.5	NA
	MW-44A	0.189	NA
	MW-25A	0.098 (cPCL)	NA
Dibenzofuran	MW-18A*	0.52	NA
	MW-44A	0.147	NA
	MW-25A	0.098 (cPCL)	NA
Naphthalene	MW-18A*	26.16	N
	MW-44A	1.424	N
	MW-25A	0.49 (cPCL)	N

Note: * - Monitoring Well MW-18A is within the proposed soil cap area and will be plugged and abandoned. A replacement well (MW-18AR) is proposed to be installed outside of the capped well to the east of MW-18A (see Attachment 2D-1).

Attenuation Action Levels were not developed for other COCs since the primary COCs listed above define the PCLE Zone.

Groundwater-bearing unit **B-CZ/B-TZ**

Repeat this worksheet for each groundwater-bearing unit for which a PMZ is proposed.

Groundwater classification **X** 2 ____ 3

Provide justification as to why the PMZ is appropriate in accordance with §350.33(f)(4)(A). Include supporting documentation in Attachment 2E.

On-site and off-site PMZs proposed (Attachment 2D-2) as a response action for the B-CZ/B-TZ PCLE zone ensures that COCs will not pose a potential unacceptable risk to human health or the environment as long as the AALs are not exceeded at the respective AMPs and exceedances of cPCLs at the proposed alternate POE wells. Both the on-site and off-site PMZs are appropriate for this PCLE zone based on a low groundwater velocity (hydraulic conductivities are indicative of saturated soils in the B-CZ (see Attachment 1A)), overall stable/declining COC concentrations, the proposed institutional controls (deed recordation and restrictive covenants) on use of groundwater within the PCLE Zone, and the absence of any existing water supply wells within ½-mile of the Site. In addition, there are no surface water bodies at the Site or near the proposed PMZs; therefore, there is no potential for contaminating surface waters that would be hydraulically connected to groundwater. The City of Houston provides municipal water services for all properties within the Affected Property, so there is no complete human health pathway associated with this GWBU. The Site is also within the jurisdiction of the HGSD, which restricts groundwater use in the area and requires a permit application prior to drilling a groundwater well. There are permitting exemptions, but only in areas that do not have an alternative water supply. The HGSD rules are not a complete prohibition on the use of groundwater in the area, but rather the fees associated with the rules are "intended to operate as an economic disincentive to groundwater withdrawal" (HGSD, 2013).

The PMZs proposed for the B-CZ/B-TZ PCLE zones consists of two components: 1) filing of institutional controls including deed recordation (UPRR-Owned properties – on-site PMZ)) and restrictive covenants (off-site properties – off-site PMZ)) prohibiting the use of groundwater within the PMZs; and 2) performance of ongoing groundwater monitoring. The proposed deed recordation and restrictive covenant language, to be filed in the Harris County deed records, is included in Appendix 4.

As detailed in Attachment 1A, the B-CZ/B-TZ on-site and off-site PMZs were established using the July/August 2014 groundwater analytical data collected from the Site, in conjunction with trend analysis for groundwater analytical data from 2010 through 2014 (10 semi-annual sampling events, Attachment 2E) and development of attenuation action levels from groundwater data collected from 2006 through 2014. Comparing the maximum groundwater analytical data from the July/August 2014 groundwater sampling event to cPCLs, concentrations of 23 target COCs exceeded their respective cPCLs in at least one of the four GWBUs. For the B-CZ/B-TZ, the following 14 COCs were detected above cPCLs (using Class 2 groundwater PCLs for both the B-TZ and B-CZ (see Attachment 1A for discussion on B-CZ as a saturated soil):

VOCs

- Benzene
- Ethylbenzene (B-CZ only)
- Methylene Chloride
- Toluene (B-CZ only)
- Vinyl Chloride

SVOCs

- 2,4-Dimethylphenol
- 2,6-Dinitrotoluene
- 2-Methylnaphthalene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Bis(2-chloroethoxy)methane
- Dibenzofuran

- Naphthalene
- Phenol

Similar to the A-TZ PCLE Zone, benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene are the most prominent COCs where the cPCL exceedances for these COCs define the PCLE Zone in the B-CZ/B-TZ. Therefore, the trend analyses were conducted for these five COCs (Attachment 2E).

As discussed in Worksheet 2.3, a TI Zone will also be established for areas where DNAPL has been detected in monitoring wells or observed in the soil boring log for the GWBUs on site and off site. The proposed boundary will follow the outline of the proposed on-site and off-site PMZs. Details of the TI Zone are provided in Attachment 2G.

In accordance with §350.33(f)(4)(A), the on-site and off-site PMZs for the B-CZ and B-TZ Unit will be actively monitored (semi-annually). MNA will be used as a control response for this unit.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone? X Yes ___ No
If yes, how far? Approximately 150 feet downgradient (§350.37(l) or (m) as applicable)
Is it to be off-site? **X** Yes ___ No
On an off-site property that currently does not contain a residential-based groundwater PCLE zone?
___ Yes **X** No - The residential-based PCLE zone extends onto the off-site properties (to the north and to the east) and the City of Houston ROW.

If yes and this is a Class 2 groundwater, provide the basis for concluding that this groundwater does not have a reasonably anticipated future beneficial use (§350.37(l)(3)).

Is NAPL present? X Yes ___ No
If so, describe how the response action will achieve the performance criteria in §350.33(f)(4)(E).

To address the NAPL in the TI Zone for the A-TZ, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be achieved through control via TI based on the occurrence of DNAPL in wells completed in the B-CZ/B-TZ. For areas where either creosote NAPL was noted in the soil boring log in the saturated zone or is detected in monitoring wells (i.e., MW-12B, MW-32B, MW-41B, MW-70B, MW-75B and MW-78A, and observed DNAPL in soil borings (Attachment 1A, Figure 5A-6)), the TI demonstration details the difficulty of achieving groundwater PCLs in these areas because of complex hydrogeology (B-CZ consists of thin carbonate seams with average hydraulic conductivity of approximately 2×10^{-7} cm/sec (Attachment 1A)) and physical nature of creosote (discussed in Worksheet 2.3). The control endpoint will be to control the soluble NAPL fraction sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical (recover readily recoverable creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the overall TI-based "no-growth" PMZ (includes on-site and off-site PMZs) can be met, including no cPCL exceedances at the alternate POE wells.

Therefore, the current response objective per the TCEQ Guidance is to ensure compliance of NAPL zone

in both the TI Zone through control and within the PMZs through recovery. Since both proposed boundaries are the same, readily recoverable NAPL will be recovered from wells in order to control potential migration from the TI Zone. Once the PMZs have been established, the response objectives will include compliance with PMZ performance criteria at the NAPL zone and control through institutional controls on groundwater use to protect exposure to residual NAPL in the GWBUs. As part of the evaluation for compliance with PMZ performance criteria for both the on-site and off-site areas, the on-going DNAPL Recovery Pilot Test will be used to assess if the DNAPL in the GWBUs is considered readily recoverable using the NAPL Management Tool A detailed in Appendix A of the TCEQ TRRP-32 Risk-Based NAPL Management guidance document (TCEQ, 2010). Following the pilot test that is scheduled to end after January 2015, the NAPL Management Tool A will be updated and submitted to the TCEQ.

DNAPL recovered as part of the on-going pilot study is stored on-site in DOT approved drums within the CSA (Unit 4), and then disposed of in accordance with all applicable laws and regulations within the applicable timeframes.

If this is a Class 2 groundwater, explain how the response action will ensure that leachate from the surface soil and subsurface soil PCLE zones will not increase concentration of COCs greater than the current measured concentrations (at time of RAP submittal). (§350.33(a)(2))

With the B-CZ/B-TZ underlying the A-TZ, see response to this question for the A-TZ unit.

Provide the basis that the COCs will not migrate beyond the downgradient boundary of the PMZ at concentrations above the critical PCL. Include supporting documentation in Attachment 2E.

As discussed for the A-TZ PMZs, wood treating operations began at the Site over 115 years ago and continued until about 30 years ago. Given the long period of time since releases have occurred at the Site, creosote DNAPL and related COCs has migrated from the vadose zone (surface and subsurface soils) to the A-TZ groundwater, then to the B-CZ/B-TZ. There are two main areas within the B-CZ/B-TZ where the DNAPL has migrated and resulted in a PCLE Zone:

1. Area 1 - Centered in the northeast part of the Site near SWMUs 4, 5, and 8, onto the eastern portion of the Englewood Intermodal Yard, and extending off-site to the north of the Site; and
2. Area 2 - On the west side of the Site near MW-12B and MW-41B.

<u>Area 1:</u>

For the area centered over the northeast portion of the Site, DNAPL has been either observed in the monitoring well soil borings (i.e., MW-35B, MW-63B, MW-68B, and others) or has been detected in the wells (i.e., MW-32B, MW-70B, MW-75B) that fall within the B-CZ/B-TZ groundwater PCLE Zone (Attachment 1A, Figure 5A-6). The fact that the PCLE Zone in the B-CZ is closely tied to where NAPL was observed suggests that there is both not a high rate of dissolved constituent migration beyond the DNAPL areas. Also groundwater velocities through the B-CZ are very low given the low hydraulic conductivity of the carbonate gravel seams within the clay unit. Proposed POE wells MW-14, MW-36B, MW-59B, MW-67B, MW-80B and MW-81B show either no detections of the COCs or relatively stable COC concentrations well below the RALs (Attachment 1B-11 through 1B-15). This is supported with the B-CZ/B-TZ groundwater analytical data that indicate the distribution of COCs dissolved in Site groundwater is relatively stable in the source areas.

For wells with concentrations near or above cPCLs, the concentration vs time graphs presented in Attachment 1B indicate that groundwater concentrations are remaining relatively stable, which is confirmed with the Mann-Kendall statistical analysis (Attachment 2E), except for MW-49B, MW-70B

and MW-74B. Mann-Kendall trend analyses of the groundwater data from MW-49B indicate increasing trends for 2,4-dimethylphenol, 2-methylnaphthalene, and naphthalene; and probably increasing trends for benzene and dibenzofuran using data from 2010 through 2014. Benzene concentrations in well MW-70B indicate a Mann-Kendall increasing trend; however, DNAPL is present in the well. An increasing trend was noted for 2-methylnaphthalene in MW-74B. There have been only five sampling events from MW-74B; therefore, the trends may be indicative of seasonal variation rather than a true increase that will be confirmed with additional sampling. Both MW-70B and MW-74B are located within the central portion of the plume. As shown on Attachment 1A-Figure 5B-21, the overall groundwater PCLE Zone for the B-CZ/B-TZ has remained stable over the past four years.

In addition, migration of either DNAPL or dissolved-phase COCs in the B-CZ is not likely to extend beyond the current impacted areas based on the very low hydraulic conductivity of the wells north of the Site (consistently less than 1×10^{-5} cm/sec as discussed in Attachment 1A).

Area 2:
On the west side of the Site, the B-TZ groundwater PCLE zone appears to be confined to three wells: MW-12B, MW-40B, and MW-41B. Historically, wells MW-12B and MW-41B have had DNAPL in-well thicknesses as thick as 15 feet (MW-12B) and 22.8 feet (MW-41B). Both wells are part of the on-going DNAPL recovery pilot test. In 2009, monitoring well (test well) TW-41B was installed about 40 feet north of MW-41B between MW-41B and MW-12B to serve as a possible DNAPL recovery well. The well was constructed to the same general elevations and screened intervals as MW-41B (Attachment 1A, Figure 4C-3). However, no DNAPL has been detected in TW-41B, and groundwater samples from the well have been less than RALs.

The boundary of the B-TZ PMZ on the west side is located at monitoring wells MW-38B, MW-39B, MW-62B, and P-11 (alternate POE wells) (Attachment 2D-2). Groundwater analytical data from these west perimeter wells indicate COC concentrations less than cPCLs, and most show either no trend or decreasing trends (Attachment 1B-16 through 1B-20). Monitoring well MW-38B is located approximately 50 feet west of MW-12B. The viscosity of the DNAPL from MW-12B was tested in 2007 with a reading of 192 centipoises, indicating a relatively viscous liquid. With groundwater data less than cPCLs in the wells in close proximity of the wells with DNAPL, this supports the limited dissolved COC migration in the area. Therefore, it is not anticipated that the B-TZ groundwater PCLE zone will migrate beyond the proposed B-CZ/B-TZ PMZ boundary.

For the B-CZ groundwater PCLE Zone on the northeast side of the Site, AALs were established for sampling points leading from MW-70B (off-site, and contains DNAPL) to MW-67B (Attachment 2E-6 through 2E-10 for benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene, respectively) in order to ensure groundwater COC concentrations do not exceed the cPCLs at the point of exposure (MW-67B). Details on AAL development are provided in Attachment 2E. POE wells for the north and east sides of the B-CZ PMZ are shown on Attachment 2D-2. Three additional B-TZ/B-CZ wells (PMW-28B, PMW-82B, and PMW-83B) are proposed to be installed to serve as POE wells and monitor the PMZ to the north of the Site (Attachment 2D-2). Details of the well installation are provided in Attachment 2B.

Describe the methods used to determine that there are no artificial penetrations which can allow COCs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units. Include supporting documentation in Attachment 2E.

The site-related contaminants and DNAPL have been detected in the B-CZ/B-TZ, and underlying C-TZ.

PMZs are also proposed for the other GWBUs at the Site. Groundwater wells were installed in the underlying D-TZ, and until the July/August 2014 groundwater sampling event, Site-related COC concentrations have been below RALs in those wells.

An on-site field survey and water-well data search was conducted, indicating no potential artificial vertical penetrations that would act as a conduit for migration of shallow groundwater into the underlying groundwater formation. A discussion on underground utilities for A-TZ and possible communication with the B-CZ was provided under the A-TZ summary.

List the attenuation action level determined for each attenuation monitoring point. Illustrate the proposed attenuation monitoring points and the groundwater PCLE zone on the map in Attachment 2D. Include all calculations and other methods of determining the attenuation action levels in Attachment 2E.

COC	Attenuation Monitoring Point (well number)	Attenuation Action Level (mg/L)	Attenuation Action Level limited by $^{Air}GW_{Inh\text{-}V}$ or existing COC concentration? Y/N
Benzene	MW-70B	38.45	Y -23 mg/L (Res, 30-ac Source)
	MW-33BR	3.259	N
	MW-63B	0.210	N
	MW-67B	0.005 (cPCL)	N
2,4-Dimethylphenol	MW-70B	72	NA
	MW-33BR	18.18	NA
	MW-63B	3.94	NA
	MW-67B	0.49 (cPCL)	NA
2 Methylnaphthalene	MW-70B	2.399	NA
	MW-33BR	0.993	NA
	MW-63B	0.3727	NA
	MW-67B	0.098 (cPCL)	NA
Dibenzofuran	MW-70B	0.6483	NA
	MW-33BR	0.3850	NA
	MW-63B	0.2158	NA
	MW-67B	0.098 (cPCL)	NA
Naphthalene	MW-70B	87.86	Y – 41 mg/L (>S) (Res, 30-ac Source)
	MW-33BR	21	N
	MW-63B	4.281	N
	MW-67B	0.49 (cPCL)	N

Note: Attenuation Action Levels were not developed for other COCs since the primary COCs listed above define the PCLE Zone.

The proposed PMZ and AMPs for the B-CZ/B-TZ are shown on Attachment 2D-2.

Groundwater-bearing unit **C-TZ**

Repeat this worksheet for each groundwater-bearing unit for which a PMZ is proposed.

Groundwater classification X 2 ____ 3

Provide justification as to why the PMZ is appropriate in accordance with §350.33(f)(4)(A). Include supporting documentation in Attachment 2E.

The on-site and off-site PMZs proposed (Attachment 2D-3) as a response action for the C-TZ PCLE zone ensures that COCs will not pose a potential unacceptable risk to human health or the environment as long as the AALs are not exceeded at the respective AMPs or exceeds the cPCL at the alternate POE wells. The PMZs are appropriate for this PCLE zone based on a low groundwater velocity, stable/declining COC concentrations, the proposed institutional controls (deed recordation and restrictive covenants) on use of groundwater within the PCLE Zone, and the absence of any existing water supply wells within ½-mile of the Site. In addition, there are no surface water bodies at the Site or near the proposed PMZs; therefore, there is no potential for contaminating surface waters that would be hydraulically connected to groundwater. The City of Houston provides municipal water services for all properties within the Affected Property, so there is no complete human health pathway associated with this GWBU. The Site is also within the jurisdiction of the HGSD, which restricts groundwater use in the area and requires a permit application prior to drilling a groundwater well. There are permitting exemptions, but only in areas that do not have an alternative water supply. The HGSD rules are not a complete prohibition on the use of groundwater in the area, but rather the fees associated with the rules are "intended to operate as an economic disincentive to groundwater withdrawal" (HGSD, 2013).

The PMZs proposed for the C-TZ PCLE zones consists of two components: 1) filing of institutional controls including deed recordation (UPRR-Owned properties – on-site PMZ)) and restrictive covenants (off-site properties – off-site PMZ)) prohibiting the use of groundwater within the PMZs; and 2) performance of ongoing groundwater monitoring at the AMP and POE wells. The proposed deed recordation and restrictive covenant language, to be filed in the Harris County deed records, is included in Appendix 4.

The on-site and off-site PMZs for C-TZ were established using the July/August 2014 groundwater analytical data collected from the Site (Attachment 1A), in conjunction with trend analysis for groundwater analytical data from 2010 through 2014 (10 semi-annual sampling events) and development of attenuation action levels from groundwater data collected from 1997 through 2014. Comparing the maximum groundwater analytical data from the July/August 2014 groundwater sampling event to cPCLs, concentrations of 23 target COCs exceeded their respective cPCLs in at least one of the four GWBUs. For the C-TZ, the following 19 COCs were detected above cPCLs:

VOCs

- Benzene
- Methylene Chloride

SVOCs

- 2,4-Dimethylphenol
- 2,6-Dinitrotoluene
- 2-Methylnaphthalene
- Acenaphthene (one well*)
- Anthracene (one well*)
- Benzo(a)anthracene
- Benzo(a)pyrene
- Bis(2-chloroethoxy)methane (one well*)
- Chrysene (one well*)

SVOCs (cont)

- Dibenzofuran
- Fluoranthene (one well*)
- Fluorene (one well*)
- Naphthalene
- Pentachlorophenol
- Phenanthrene (one well*)
- Phenol
- Pyrene (one well*)

* - COC only detected in wells with DNAPL present

Similar to the A-TZ PCLE Zone, benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene are the most prominent COCs where the cPCL exceedances for these COCs define the PCLE Zone in the C-TZ. Therefore, the trend analyses were conducted for these five COCs (Attachment 2E).

As discussed in Worksheet 2.3, a TI Zone will also be established for areas where DNAPL has been detected in monitoring wells or observed in the soil boring log for the GWBU and follows the cumulative outline of the proposed on-site and off-site PMZs (Attachment 2G).

In accordance with §350.33(f)(4)(A), the PMZ for the C-TZ Unit will be actively monitored (semi-annually). MNA will be used as a control response for this unit.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone? ____ Yes __X__ No
If yes, how far? Approximately 100 feet (§350.37(l) or (m) as applicable)
Is it to be off-site? __X__ Yes _____ No
On an off-site property that currently does not contain a residential-based groundwater PCLE zone?
_____ Yes ___X___ No - The residential-based PCLE zone extends onto the off-site property (to the north and to the east).

If yes and this is a Class 2 groundwater, provide the basis for concluding that this groundwater does not have a reasonably anticipated future beneficial use (§350.37(l)(3)).

Is NAPL present? **X** Yes _____ No
If so, describe how the response action will achieve the performance criteria in §350.33(f)(4)(E).

To address the NAPL in the TI Zone for the C-TZ, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be achieved through control via TI based on the occurrence of DNAPL in wells completed in the C-TZ. For areas where either creosote NAPL was noted in the soil boring log in the saturated zone or is detected in monitoring wells (i.e., MW-17C, MW-18C, MW-23C, MW-25C, MW-34CR, MW-44C, MW-45C, MW-46C, MW-47C, MW-48C, and MW-68C, and observed DNAPL in soil borings (Attachment 1A, Figure 5A-7)), the TI demonstration details the difficulty of achieving groundwater PCLs in these areas because of complex hydrogeology (Attachment 1A) and physical nature of creosote (discussed in Worksheet 2.3). The control endpoint will be to control the soluble NAPL fraction sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical (recover readily recoverable

creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based "no growth" PMZ can be met including no cPCL exceedances at the alternate POE wells.

Therefore, the current response objective per the TCEQ Guidance is to ensure compliance of NAPL zone in both the TI Zone through control and within the on-site and off-site PMZs through recovery. Since both proposed boundaries are the same, readily recoverable NAPL will be recovered from wells in order to control potential migration from the TI Zone. Once the on-site and off-site PMZs have been established, the response objectives will include compliance with PMZ performance criteria at the NAPL zone and control through institutional controls on groundwater use to protect exposure to residual NAPL in the GWBUs. As part of the evaluation for compliance with PMZ performance criteria, the on-going DNAPL Recovery Pilot Test will be used to assess if the DNAPL in the GWBUs is considered readily recoverable using the NAPL Management Tool A detailed in Appendix A of the TCEQ TRRP-32 Risk-Based NAPL Management guidance document (TCEQ, 2010). Following the pilot test that is scheduled to end after January 2015, the NAPL Management Tool A will be updated and submitted to the TCEQ.

DNAPL recovered as part of the on-going pilot study is stored on-site in DOT approved drums within the CSA (Unit 4), and then disposed of in accordance with all applicable laws and regulations within the applicable timeframes.

If this is a Class 2 groundwater, explain how the response action will ensure that leachate from the surface soil and subsurface soil PCLE zones will not increase concentration of COCs greater than the current measured concentrations (at time of RAP submittal). (§350.33(a)(2))

With the C-TZ underlying the A-TZ and the B-CZ/B-TZ, please see response to this question for the A-TZ unit.

Provide the basis that the COCs will not migrate beyond the downgradient boundary of the PMZ at concentrations above the critical PCL. Include supporting documentation in Attachment 2E.

Wood treating operations began at the Site over 115 years ago and continued until about 30 years ago. Given the long period of time since releases have occurred at the Site, creosote DNAPL and related COCs has migrated from the vadose zone (surface and subsurface soils) to the A-TZ groundwater, to the B-CZ/B-TZ, and to the C-TZ. The PCLE Zone for the C-TZ groundwater appears to correlate well with where DNAPL was observed in the C-TZ sand in the soil borings or where DNAPL has been detected in the monitoring wells. The center of the groundwater PCLE Zone appears to be in the vicinity of MW-23C (near SWMU 4 and 6), and extends off-site to the northeast near the Lockwood Street Bridge overpass (DNAPL present in wells MW-25C, MW-44C, MW-45C, and MW-46C). Unlike the A-TZ and B-CZ/B-TZ units, groundwater flow in the C-TZ is generally to the southwest across the area.

For the off-site area northeast of the Site, DNAPL has been detected in the wells (i.e., MW-25C, MW-44C, MW-45C, and MW-46C) that fall within the C-TZ groundwater PCLE Zone (Attachment 1A, Figure 5A-7). Similar to the B-CZ/B-TZ, the PCLE Zone in the C-TZ is closely tied to where NAPL was observed. This suggests that there is not a high rate of dissolved constituent migration beyond the DNAPL areas. This is supported with the C-TZ groundwater analytical data that indicate the distribution of COCs dissolved in Site groundwater is relatively stable in the source areas, with the exception of MW-18C. The Mann-Kendall trend analysis for MW-18C groundwater data from 2010 through 2014 indicate

increasing trends of 2-methylnaphthalene, dibenzofuran, and naphthalene. Well MW-18C is upgradient of MW-23C, which has higher concentrations of these COCs relative to MW-18C and also has DNAPL present in the well. MW-19C dibenzofuran concentrations from 2010 to 2014 indicate a Mann-Kendall probably increasing trend; however, concentrations in MW-19C (0.000554 mg/L) are well below the cPCL (0.29 mg/L (on-site)).

Along the edges of the PCLE Zone, concentration vs time graphs presented in Attachment 1B (1B-31 through 1B-40) indicate that groundwater concentrations are remaining relatively stable, which is confirmed with the Mann-Kendall statistical analysis included in Attachment 2E, except for MW-68C. As shown on Attachment 1A-Figure 5B-22, the groundwater PCLE Zone for the C-TZ has remained relatively stable over the past four years, with slight changes along the northeast and cross gradient side during the July 2012 and July/August 2014 events because of benzene cPCL exceedances in MW-68C. Benzene and naphthalene concentrations have been sporadic in MW-68C, where benzene concentrations exceeded the cPCL in January and July 2012, decreased below the cPCL in January 2013, then exceeded the cPCL in July/August 2014, and then decreased below the cPCL during the resampling event in September 2014 (discussed in Attachment 1A). For the purposes of this RAP, the PMZ will include MW-68C to account for the occasional benzene PCLE at that well. In addition, newly installed well MW-76C (installed in May 2014) had a detection of pentachlorophenol (0.00272 mg/L) above the cPCL (0.002 mg/L) during the July/August 2014 sampling event. The well was resampled in September 2014, and pentachlorophenol concentrations were not detected (SDL<cPCL), but benzo(a)pyrene concentrations were detected at 0.000278 mg/L, just above the cPCL of 0.0002 mg/L. Benzo(a)pyrene concentrations were less than the cPCL during the initial sampling event. However, for the purposes of this RAP, the PCLE Zone in the C-TZ will include the area near MW-76C unless future sampling suggests no PCLE Zone in this area.

Proposed point of exposure wells MW-15C, MW-21C, MW-28C, MW-47C, MW-48C, M-51C, and MW-54C show either predominantly no detections of the COCs or relatively stable COC concentrations well below the RALs (Attachment 1B-26 through 1B-30). Mann-Kendall trend analysis shows an increasing concentration for dibenzofuran from 2010 to 2014 in MW-54C (Attachment 2E); however, concentrations have been decreasing since July 2013 (Attachment 1B-39). With groundwater data less than cPCLs in the wells (MW-19C and MW-54C) in close proximity of the wells with DNAPL, this supports the limited dissolved COC migration in the area. Therefore, it is not anticipated that the C-TZ groundwater PCLE zone will migrate beyond the proposed C-TZ on-site and off-site PMZ boundary.

For the C-TZ groundwater PCLE Zone, AALs were established for sampling points leading from MW-23C (contains DNAPL) to MW-76C (Attachment 2D-3) in order to ensure groundwater COC concentrations do not exceed the cPCLs at the POE (just beyond MW-76C, on-site). Details on AAL development are provided in Attachment 2E. POE wells for the C-TZ PMZ are also shown on Attachment 2D-3. With the low detections of benzene in MW-68C, one additional C-TZ well (PMW-85C) is proposed to be installed to serve as a POE well and monitor the PMZ cross gradient to the north of the Site and MW-68C (Attachment 2D-3). Details of the well installation are provided in Attachment 2B.

Describe the methods used to determine that there are no artificial penetrations which can allow COCs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units. Include supporting documentation in Attachment 2E.

An on-site field survey and water-well data search was conducted, indicating no potential artificial

penetrations that would act as a conduit for migration of shallow groundwater into the underlying groundwater formation. A discussion on underground utilities for A-TZ and possible communication with the B-CZ was provided under the A-TZ summary.

List the attenuation action level determined for each attenuation monitoring point. Illustrate the proposed attenuation monitoring points and the groundwater PCLE zone on the map in Attachment 2D. Include all calculations and other methods of determining the attenuation action levels in Attachment 2E.

COC	Attenuation Monitoring Point (well number)	Attenuation Action Level (mg/L)	Attenuation Action Level limited by $^{Air}GW_{Inh-V}$ or existing COC concentration? Y/N
Benzene	MW-23C*	0.131	N
	MW-17	0.093	N
	MW-76C	0.007	N
2,4-Dimethylphenol	MW-23C*	9.74	N
	MW-17	7.09	N
	MW-76C	0.629	N
2 Methylnaphthalene	MW-23C*	28	N
	MW-17	18.22	N
	MW-76C	0.688	N
Dibenzofuran	MW-23C*	46	N
	MW-17	23.94	N
	MW-76C	0.164	N
Naphthalene	MW-23C*	83	**NA – 41 mg/L (>S) (Res, 30-ac Source)
	MW-17	48.13	**NA – 41 mg/L (>S) (Res, 30-ac Source)
	MW-76C	0.753	N

Note: * - Monitoring well MW-23C is within the proposed soil cap area and will be plugged and abandoned. Well MW-17C will be considered a near-source AMP for the C-TZ.
** - $^{Air}GW_{Inh-V}$ PCL for naphthalene not applicable since solubility for naphthalene (31.4 mg/L) is less than $^{Air}GW_{Inh-V}$. In addition, the C-TZ GWBU underlies other GWBUs, where upward vapor migration is not possible.

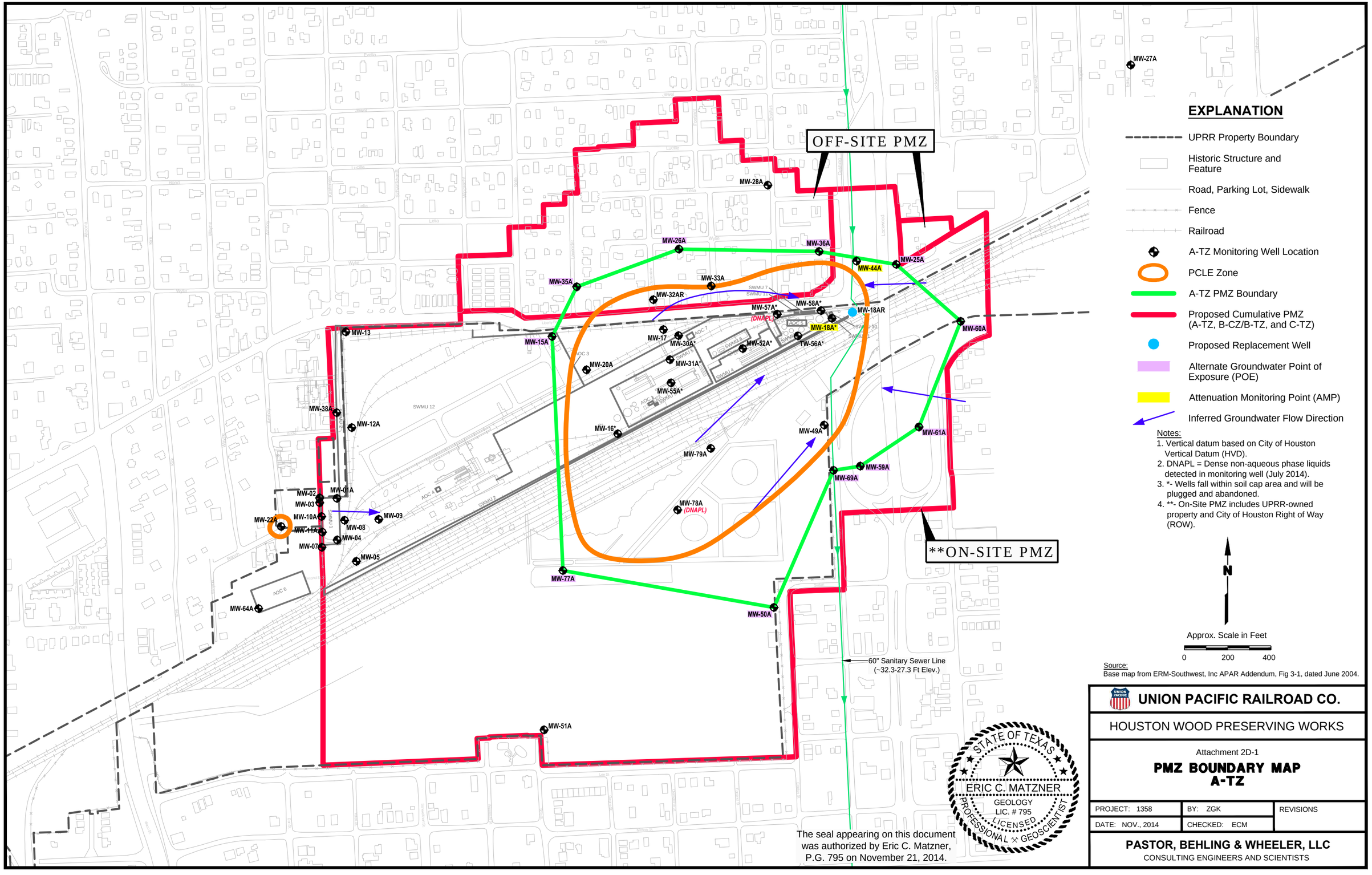
Attenuation Action Levels were not developed for other COCs since the primary COCs listed above define the PCLE Zone (except for benzo(a)pyrene in MW-76C, which will be verified during next sampling event).

The proposed PMZ and AMPs for the C-TZ are shown on Attachment 2D-3.

ATTACHMENT 2D

PLUME MANAGEMENT ZONE MAP

ATTACHMENT 2D – 1 PMZ BOUNDARY MAP – A-TZ
ATTACHMENT 2D – 2 PMZ BOUNDARY MAP – B-CZ/B-TZ
ATTACHMENT 2D – 3 PMZ BOUNDARY MAP – C-TZ



EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location
- PCLE Zone
- A-TZ PMZ Boundary
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- Proposed Replacement Well
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Inferred Groundwater Flow Direction

Notes:

1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. *- Wells fall within soil cap area and will be plugged and abandoned.
4. **- On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

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UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 2D-1

PMZ BOUNDARY MAP A-TZ

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

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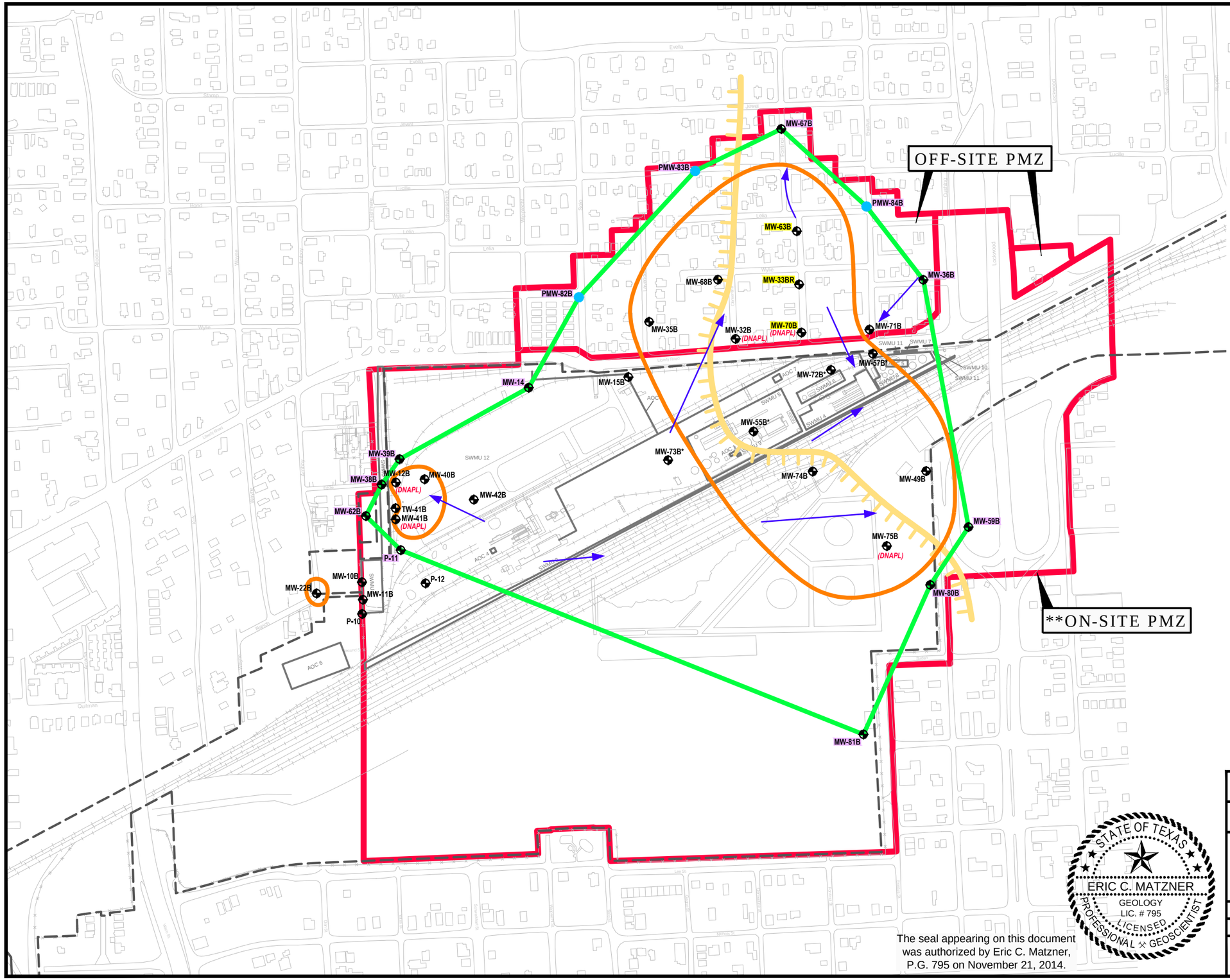

EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- B Unit Monitoring Well Location
- B-CZ / B-TZ Boundary
- PCLE Zone B-TZ/B-CZ
- B-CZ/B-TZ PMZ Boundary
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- Proposed Well for PMZ
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Inferred Groundwater Flow Direction

Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. *- Wells fall within soil cap area and will be plugged and abandoned.
4. **- On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

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HOUSTON WOOD PRESERVING WORKS

Attachment 2D-2

PMZ BOUNDARY MAP B-CZ/B-TZ

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DATE: NOV., 2014	CHECKED: ECM	

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OFF-SITE PMZ

**ON-SITE PMZ

MW-27C
MW-53C
MW-28C
PMW-85C
MW-68C
MW-54C
MW-45C
(DNAPL)
MW-25C
MW-46C
(DNAPL)
MW-34CR
MW-44C
(DNAPL)
MW-18C*
MW-23C*
(DNAPL)
MW-17C
MW-15C
MW-47C
MW-19C*
MW-48C
MW-12C
MW-21C
MW-76C
MW-51C

EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- C-TZ Monitoring Well Location
- PCLE Zone
- C-TZ PMZ Boundary
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- Proposed Well for PMZ
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Inferred Groundwater Flow Direction

Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. *- Wells fall within soil cap area and will be plugged and abandoned.
4. **- On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

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HOUSTON WOOD PRESERVING WORKS

Attachment 2D-3

PMZ BOUNDARY MAP C-TZ

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

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ATTACHMENT 2E

ATTENUATION ACTION LEVEL DETERMINATION

ATTACHMENT 2E

ATTENUATION ACTION LEVELS DETERMINATION

ATTACHMENT 2E
ATTENUATION ACTION LEVELS DETERMINATION

Introduction

As described in this RAP, benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene are the most prominent chemicals of concern (COCs) where the critical Protective Concentration Levels (cPCL) exceedances for these COCs define the PCL Exceedance (PCLE) Zone in each of the groundwater-bearing units (GWBUs). Therefore, the attenuation action levels (AALs) developed for these five COCs.

TCEQ requirements related to the development of attenuation monitoring points (AMPs) and AALs are specified in §350.33(f)(4)(D). PMZ components are described in sections of three guidance documents, TRRP-28 - *Application of Remedy Standards A and B* (TCEQ, 2001a), TRRP-29 - *Soil and Groundwater Response Objectives* (TCEQ, 2001b), and TRRP-33 - *Monitored Natural Attenuation Demonstrations* (TCEQ, 2001c). These regulations and guidance documents were used as the basis for establishing AMPs and AALs, as described below.

Attenuation Monitoring Point Selection

TRRP requirements in §350.33(f)(4)(D) specify that: "*The person shall establish groundwater attenuation monitoring points beginning at an appropriate hydraulically upgradient location within the groundwater PCLE zone and continuing down the approximate central flow path of the COCs to the downgradient extent of the PMZ.*" As discussed in Attachment 1A of the RAP, potentiometric surface maps from the July 2014 sampling event for each of the four transmissive zones, A-TZ, B-TZ, C-TZ, and D-TZ (Attachment 1A Figures 5A-1 through and 5A-4, respectively) were prepared to evaluate the groundwater flow direction in each GWBU and to develop AMPs. Below is a discussion for the GWBUs where AALs are proposed:

- A-TZ - Groundwater in the A-TZ generally flows from west to east across the Site at a gradient ranging from approximately 0.0009 ft/ft to 0.011 ft/ft (approximate average of 0.006 ft/ft), with a groundwater divide on the east side of the Site just west of the Lockwood Road Bridge (Figure 5A-1).

- B-TZ/B-CZ - Groundwater in the B-TZ/B-CZ generally flows from west to east-northeast across the Site at gradients ranging from 0.005 ft/ft to 0.011 ft/ft, with an average of approximately 0.008 ft/ft (Figure 5A-2). As shown on Figure 5A-2, there is a piezometric high near the west perimeter of the Site, similar to the A-TZ. The highest groundwater elevation in the B-TZ in July 2014 was 43.15 feet HVD (MW-42B), and lowest elevation in the B-TZ wells was 37.22 feet HVD (MW-68B). The highest groundwater elevation in the B-CZ in July 2014 was 40.46 feet HVD (MW-36B), and the lowest elevation in the B-CZ wells was 32.71 feet HVD (MW-67B).

- C-TZ - The groundwater flow direction in the C-TZ is from northeast to southwest across the Site (Figure 5A-3) at a gradient about 0.001 ft/ft.

Also provided in Attachment 1A, individual COC concentration maps for the most common groundwater COCs at the Site (benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran,

and naphthalene) were prepared for the three zones at the Site using the July/August 2014 groundwater data:

- A-TZ - Figures 5B-5 through 5B-9,
- B-CZ/B-TZ - Figures 5B-10 through 5B-14, and
- C-TZ - Figures 5B-15 through 5B-19.

Although these maps represent concentrations in samples collected in July/August 2014, the COC distributions are similar to those observed during previous monitoring periods.

For establishing AMPs, the lateral and vertical distribution of creosote dense non-aqueous phase liquid (DNAPL) leads to a larger "source" area. The PCLE Zones in each of the GWBUs are closely tied to where DNAPL was observed either in soil borings or in the individual monitoring wells. Groundwater analytical data suggest that there is not a high rate of dissolved constituent migration beyond the DNAPL areas. This is supported with groundwater analytical data from each GWBU that indicate the distribution of COCs dissolved in Site groundwater is relatively stable in the source areas. Therefore, AMPs were selected based on the distribution of COCs and presence of DNAPL in the areas.

The groundwater flow conditions and COC distribution in the A-TZ groundwater lead to establishing AMPS near the northeast portion of the plume near the sanitary sewer line (see RAP Worksheet 2.1 for details). For the B-CZ groundwater PCLE Zone on the northeast side of the Site, AMPs leading from MW-70B (off-site, and contains DNAPL) to MW-67B in order to ensure groundwater COC concentrations do not exceed the cPCLs at the point of exposure (MW-67B). For the C-TZ groundwater PCLE Zone, AMPs were selected from MW-23C (contains DNAPL, toward the upgradient portion of the Site) to MW-76C in order to ensure groundwater COC concentrations do not exceed the cPCLs at the POE (just beyond MW-76C, on-site).

Based on the groundwater flow paths and COC distributions, the following AMPs were selected for each GWBU:

- A-TZ AMPs: MW-18A, MW-25A (also alternate point of exposure (POE) well), and MW-44A;
- B-CZ AMPs: MW-70B, MW33BR, MW-63B, and MW-67B (also alternate POE well);
- C-TZ AMPs: MW-17C, MW-23C, and MW-76C.

The proposed AMPs for each GWBU are included in the proposed PMZ, as shown on Attachment 2D-1, 2D-2, and 2D-3 for the A-TZ, B-CZ, and C-TZ units, respectively. As described below, AALs were developed for each of these AMPs.

Attenuation Action Level Calculation

As specified in §350.33(f)(4)(D)(ii), AALs are calculated for each COC at each AMP in order for the critical groundwater PCLs to not be exceeded at the alternate POE wells. Since some natural attenuation of COCs have been observed at the Site (as indicated by the stable/declining concentration trends discussed in this attachment) and future natural attenuation of these COCs is anticipated, proposed AALs were developed based on the procedures described in Section 3.2.1 of TRRP-33. Specifically, the "Method One" approach (a graphical technique based on empirical data from previous monitoring events) provided in that guidance document was used. This approach involves plotting COC concentrations against distance from the COC source to the

groundwater POE using existing monitoring data. A first-order curve is then fitted from a point near the source area (after accounting for natural variability) to the POE. The concentrations represented by this line at the identified AMPs are calculated as AALs. As noted in TRRP-33: "The data used to develop the curves should be selected so that the method accounts for routine variations in the data due to seasonal effects or sampling variability, such as by: 1) using the upper range of historical data to construct the AAL first order line; or 2) accounting for some level of exceedences; or 3) using a moving average over the long-term monitoring data in each well; or 4) some other method." As illustrated in the example in this guidance, the natural logarithm of the concentration data are typically plotted on the y-axis to allow the first order decay curve to be plotted as a straight line.

In a typical evaluation, as described in TRRP-33, AALs are then selected from the AAL line to correspond to the distance that the AMP is located from the source (or in regards to the HWPW where DNAPL is present). The natural logarithm (Ln) of the y-coordinate at each of these points is then calculated to establish the AAL at each AMP. The calculated AALs for each GWBU and each primary COC (benzene, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, and naphthalene) are shown on the following:

- A-TZ – Attachments 2E-1 thorough 2E-5;
- B-CZ – Attachments 2E-6 thorough 2E-10; and
- C-TZ – Attachments 2E-11 thorough 2E-15.

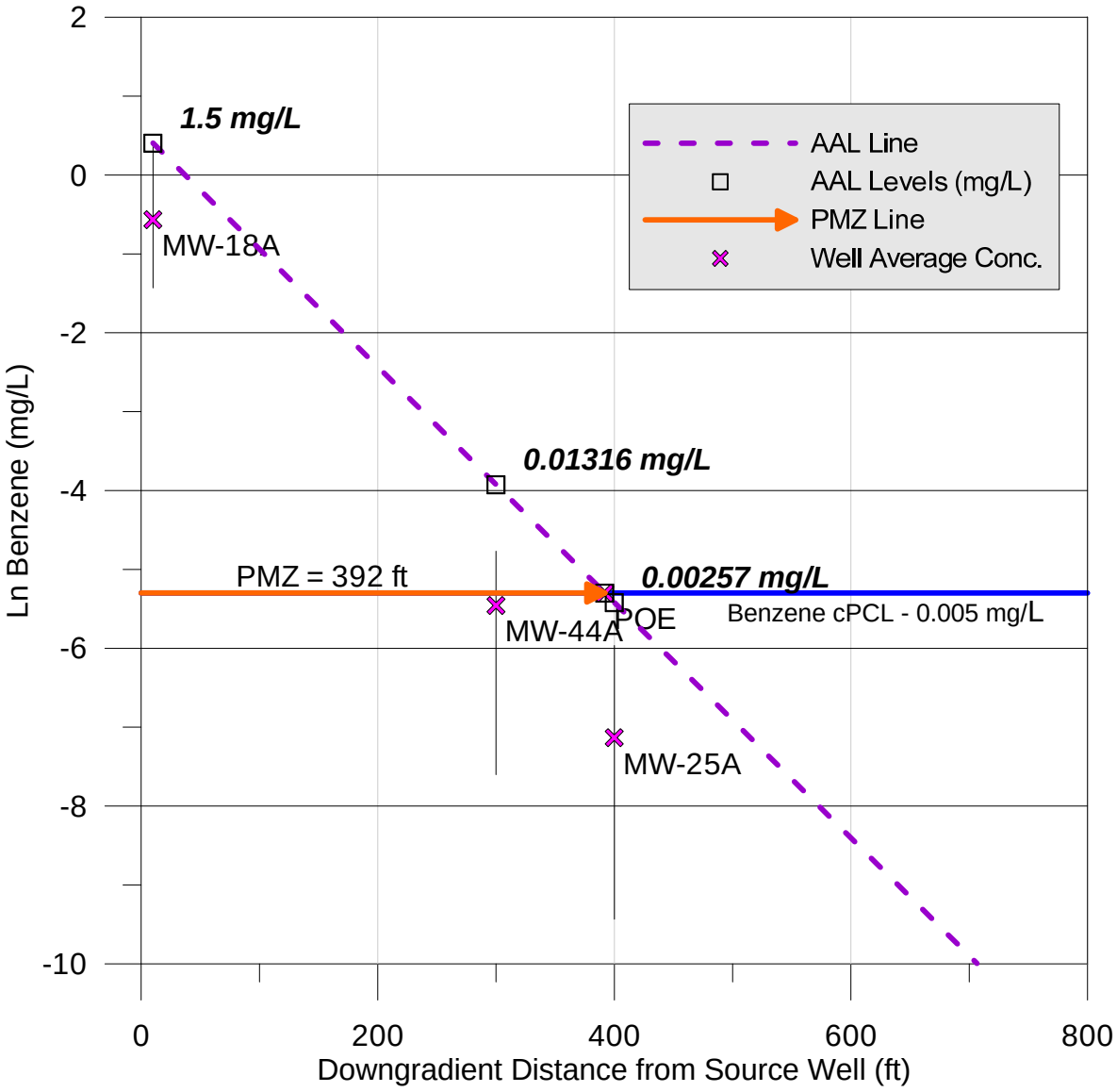
The calculated AALs are summarized below.

GWBU	AMP	Benzene (mg/L)	2,4-Dimethylphenol (mg/L)	2-Methylnaphthalene (mg/L)	Dibenzofuran (mg/L)	Naphthalene (mg/L)
A-TZ	MW-18A	1.5	24	1.5	0.52	26.16
A-TZ	MW-44A	0.0132	1.25	0.189	0.146	1.42
A-TZ	MW-25A	0.005*	0.49*	0.098*	0.098*	0.52
B-CZ	MW-70B	38.45	72.0	44.91	0.648	87.86
B-CZ	MW-33BR	3.26	18.18	2.60	0.385	21
B-CZ	MW-63B	0.21	3.94	0.11	0.216	4.28
B-CZ	MW-67B	0.005*	0.49*	0.098*	0.098*	0.49*
C-TZ	MW-23C	0.131	9.73	28	46	83
C-TZ	MW-17C	0.093	7.09	18.22	23.94	48.14
C-TZ	MW-76C	0.007	0.63	0.687	0.164	0.75

Notes: * - these AMPs also serve as alternate POE wells. The cPCL was used for the AAL at those points.

ATTACHMENT 2E-1
ATTENUATION ACTION LEVELS - A-TZ BENZENE

UPRR Houston Wood Preserving Works, Houston, Texas

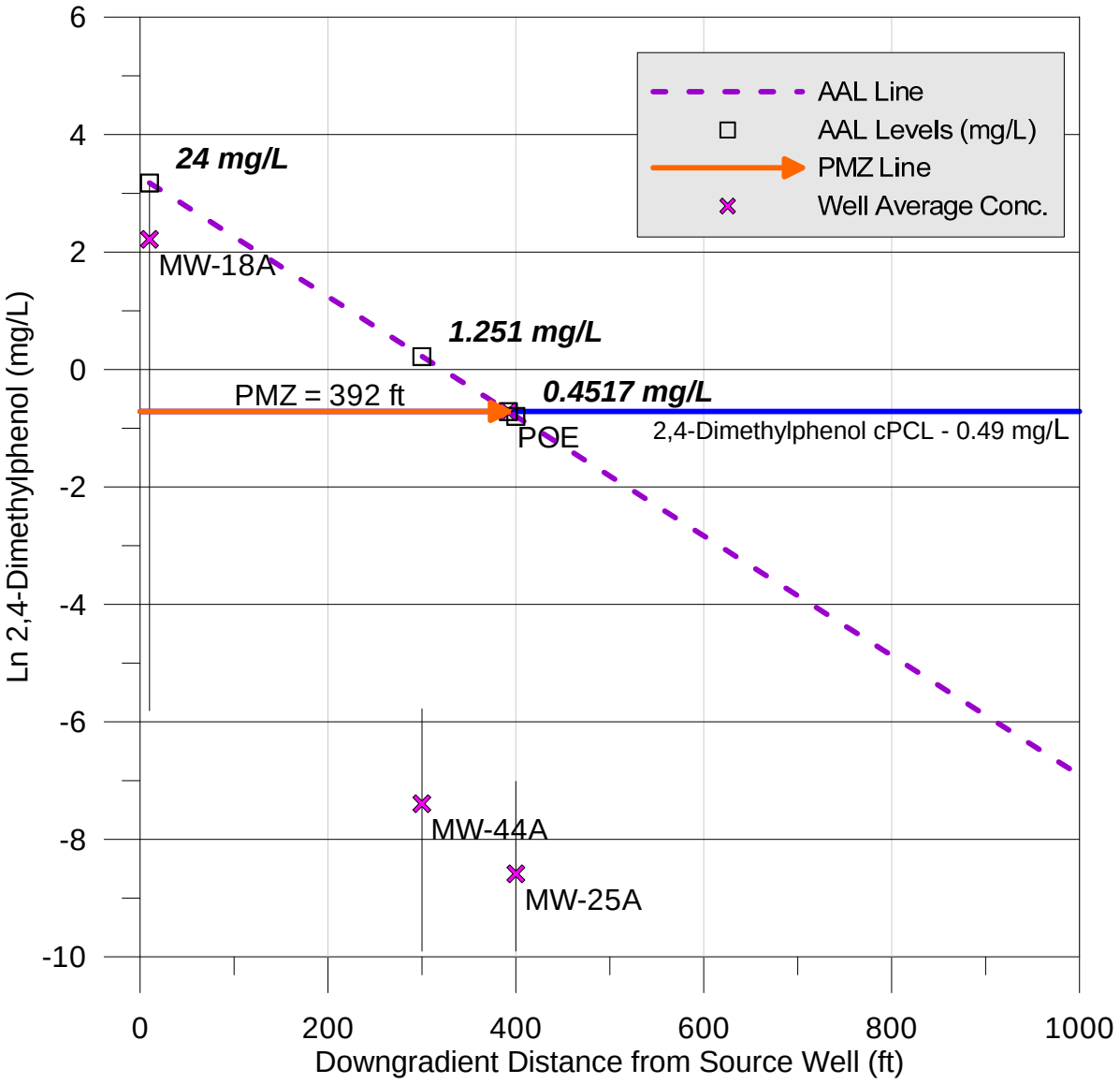


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-18A	1.5	0.239	0.569285714	**1.5000**
MW-44A	0.00849	0.0005	0.004277857	**0.0132**
MW-25A	0.00257	0.00008	0.0008005	**0.005***

Note: * MW-25A is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-2
ATTENUATION ACTION LEVELS - A-TZ 2,4-DIMETHYLPHENOL

UPRR Houston Wood Preserving Works, Houston, Texas

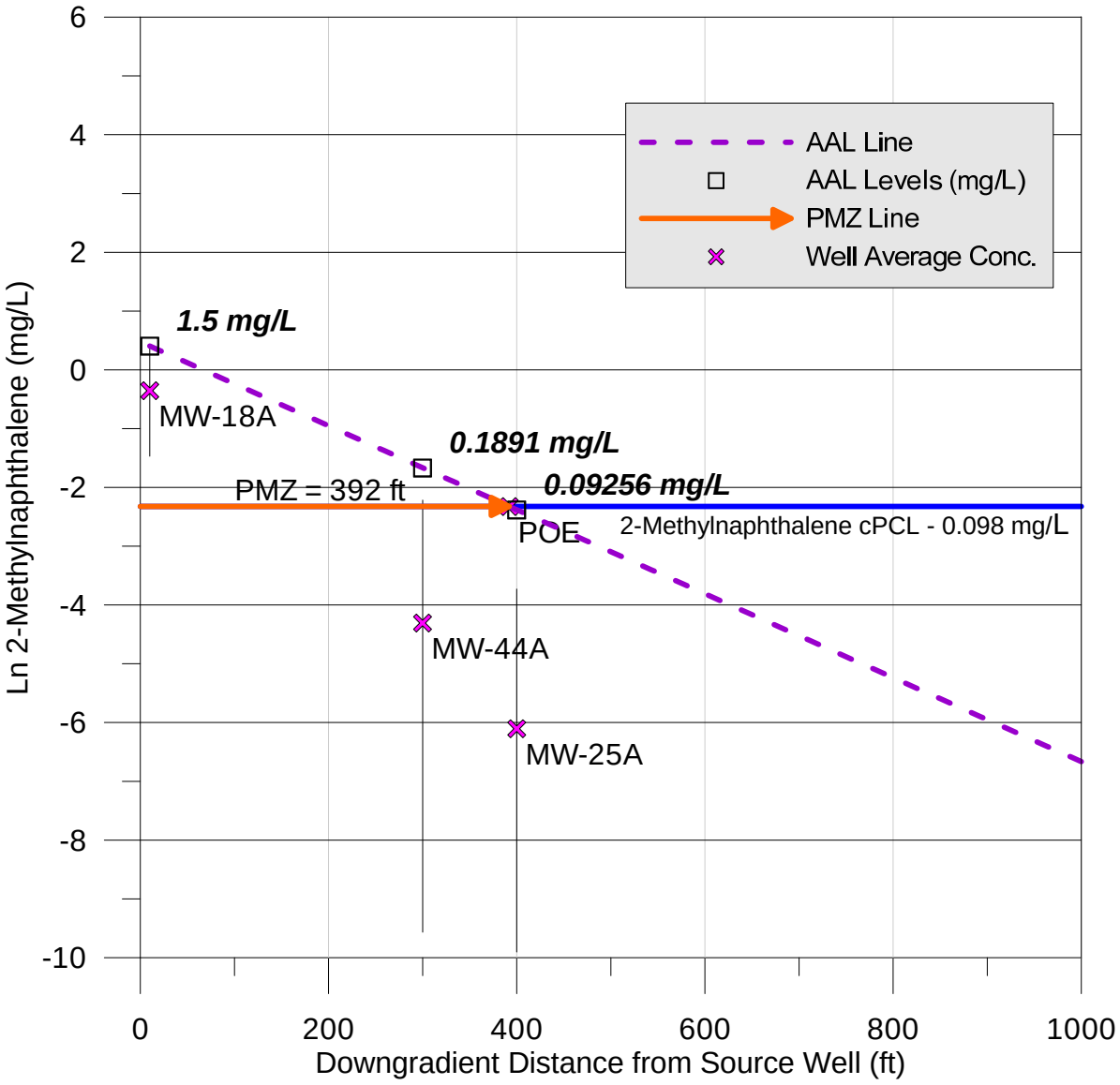


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-18A	24	0.003	9.216809524	**24.0000**
MW-44A	0.0031	0.00005	0.000618	**1.2509**
MW-25A	0.0009	0.00005	0.0001872	**0.49***

Note: * MW-25A is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-3
ATTENUATION ACTION LEVELS - A-TZ 2-METHYLNAPHTHALENE

UPRR Houston Wood Preserving Works, Houston, Texas

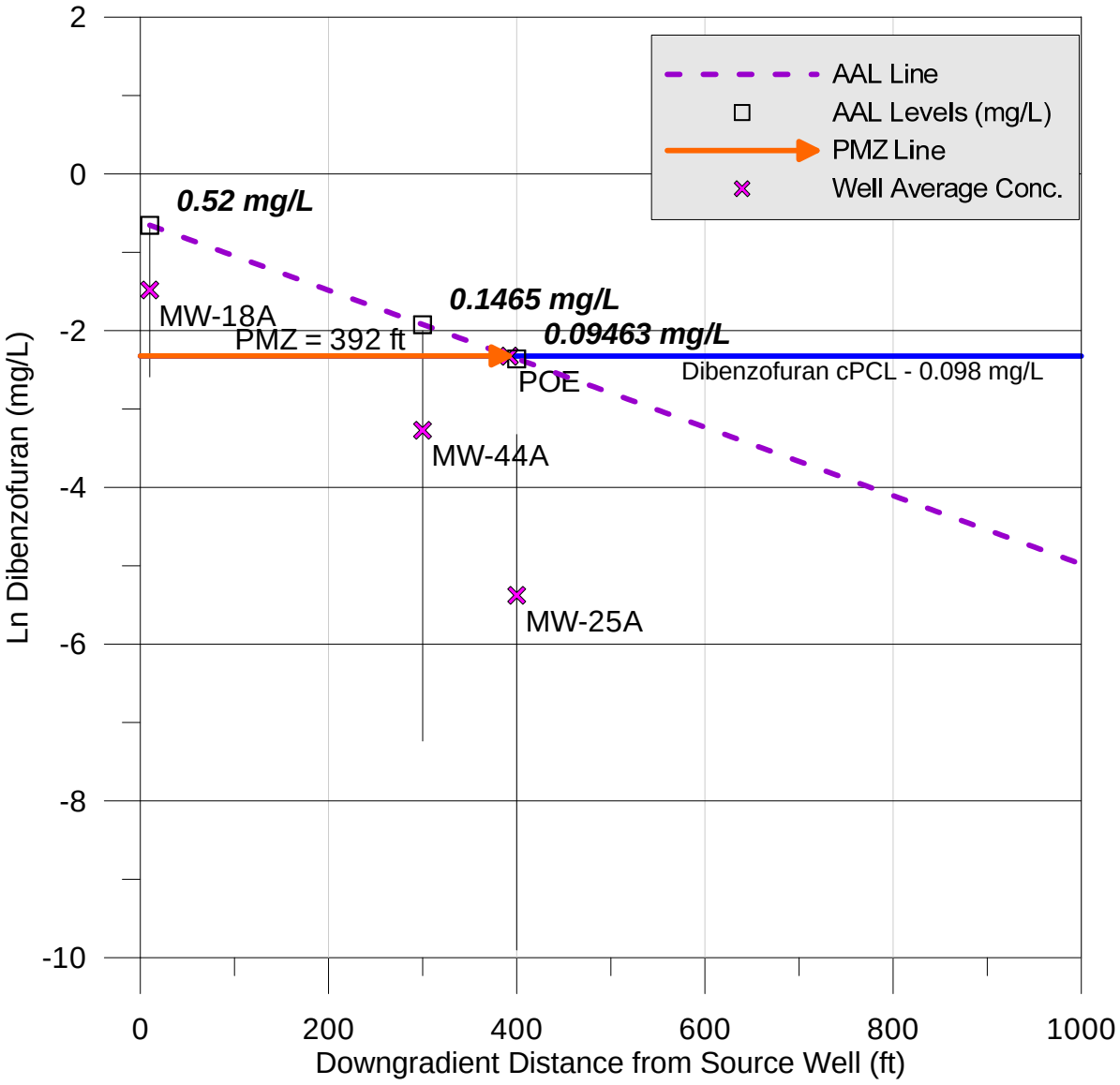


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-18A	1.5	0.23	0.704619048	**1.5000**
MW-44A	0.109	0.00007	0.013514071	**0.1891**
MW-25A	0.024	0.00005	0.00223715	**0.098***

Note: * MW-25A is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-4
ATTENUATION ACTION LEVELS - A-TZ DIBENZOFURAN

UPRR Houston Wood Preserving Works, Houston, Texas

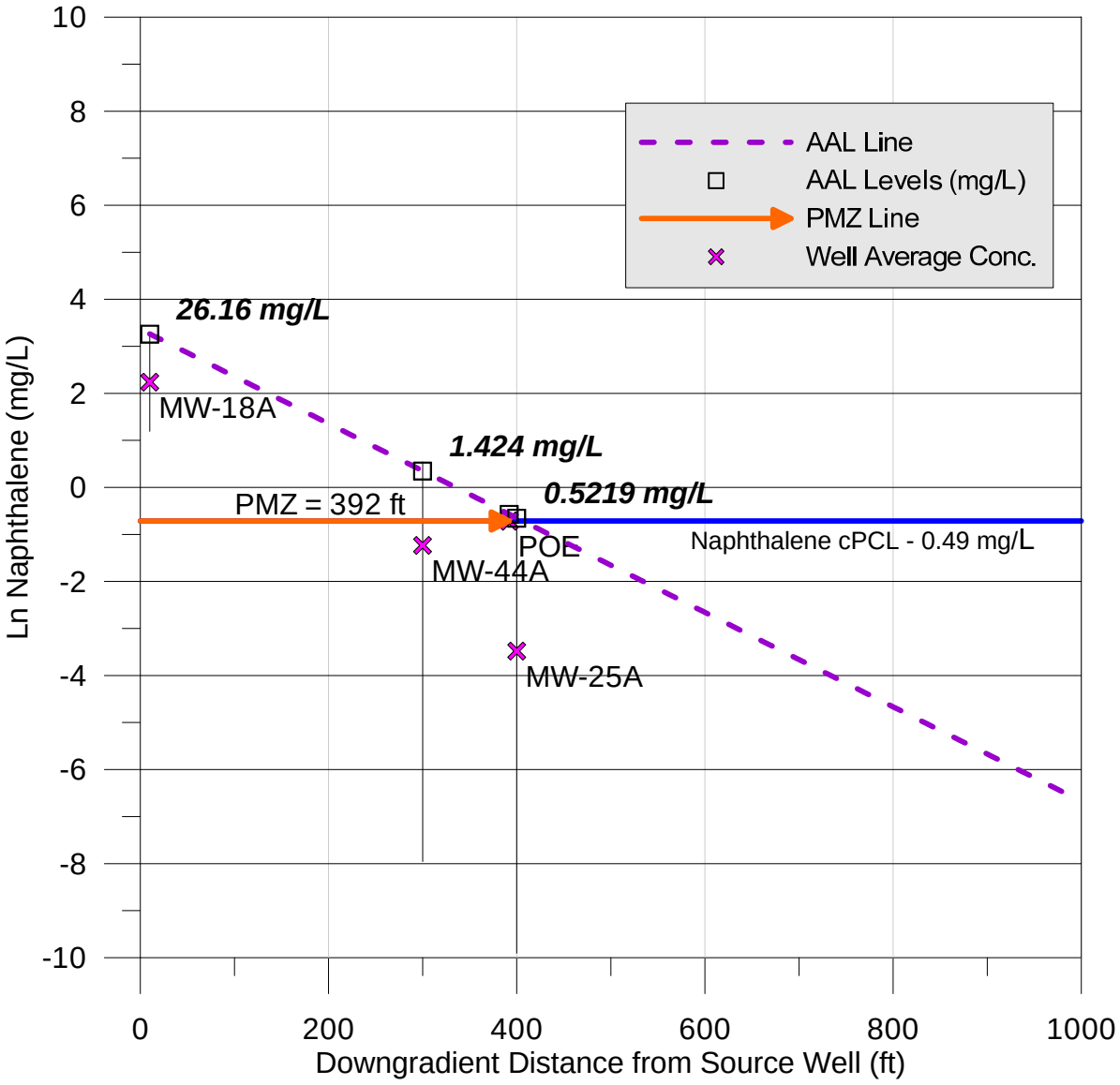


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-18A	0.52	0.075	0.228333333	**0.5200**
MW-44A	0.135	0.00072	0.038055857	**0.1465**
MW-25A	0.036	0.00005	0.00463859	**0.098***

Note: * MW-25A is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-5
ATTENUATION ACTION LEVELS - A-TZ NAPHTHALENE

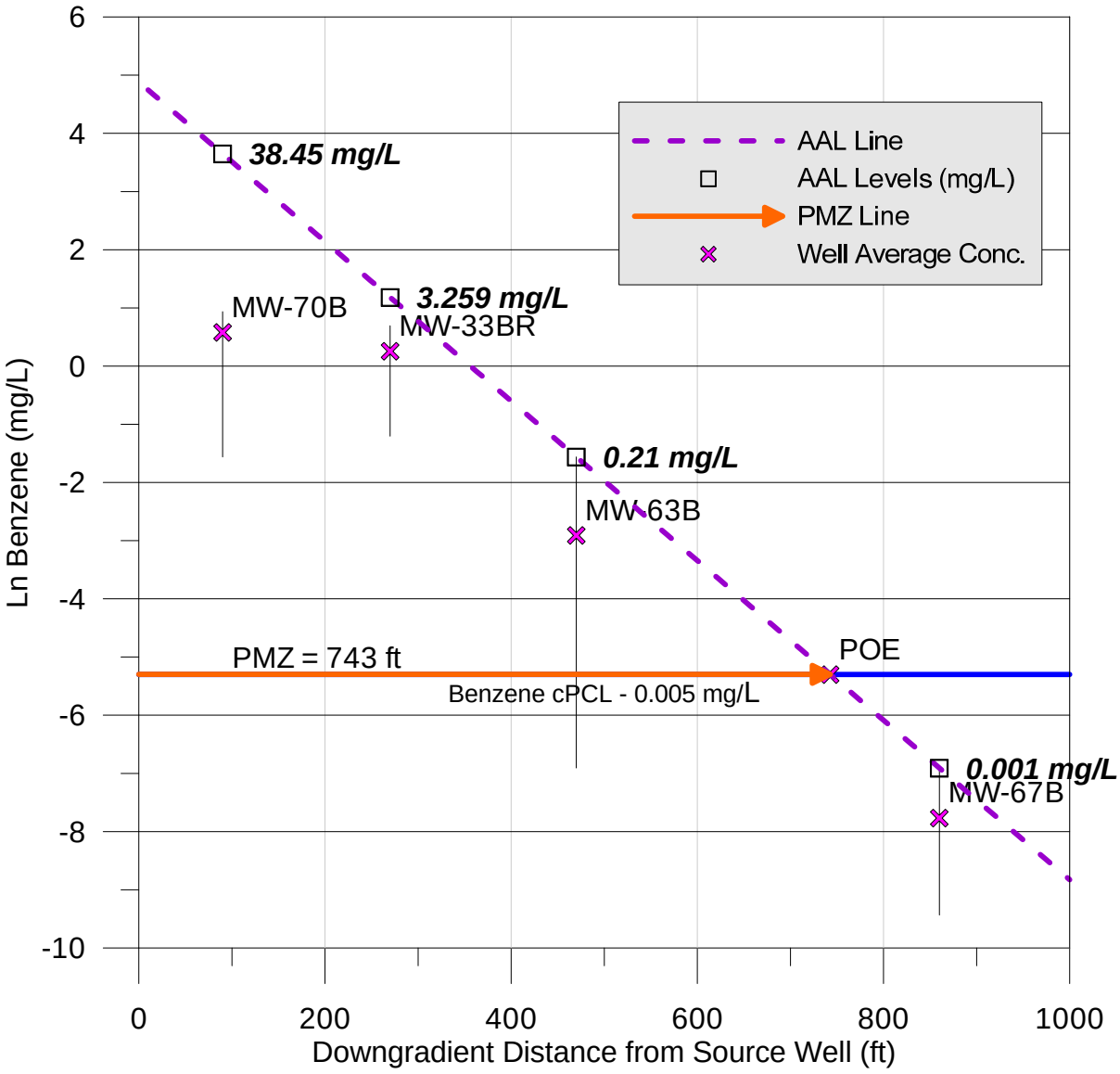
UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-18A	0.52	0.075	0.228333333	**26.1633**
MW-44A	0.135	0.00072	0.038055857	**1.4240**
MW-25A	0.036	0.00005	0.00463859	**0.5219**

ATTACHMENT 2E-6
ATTENUATION ACTION LEVELS - B-CZ BENZENE

UPRR Houston Wood Preserving Works, Houston, Texas

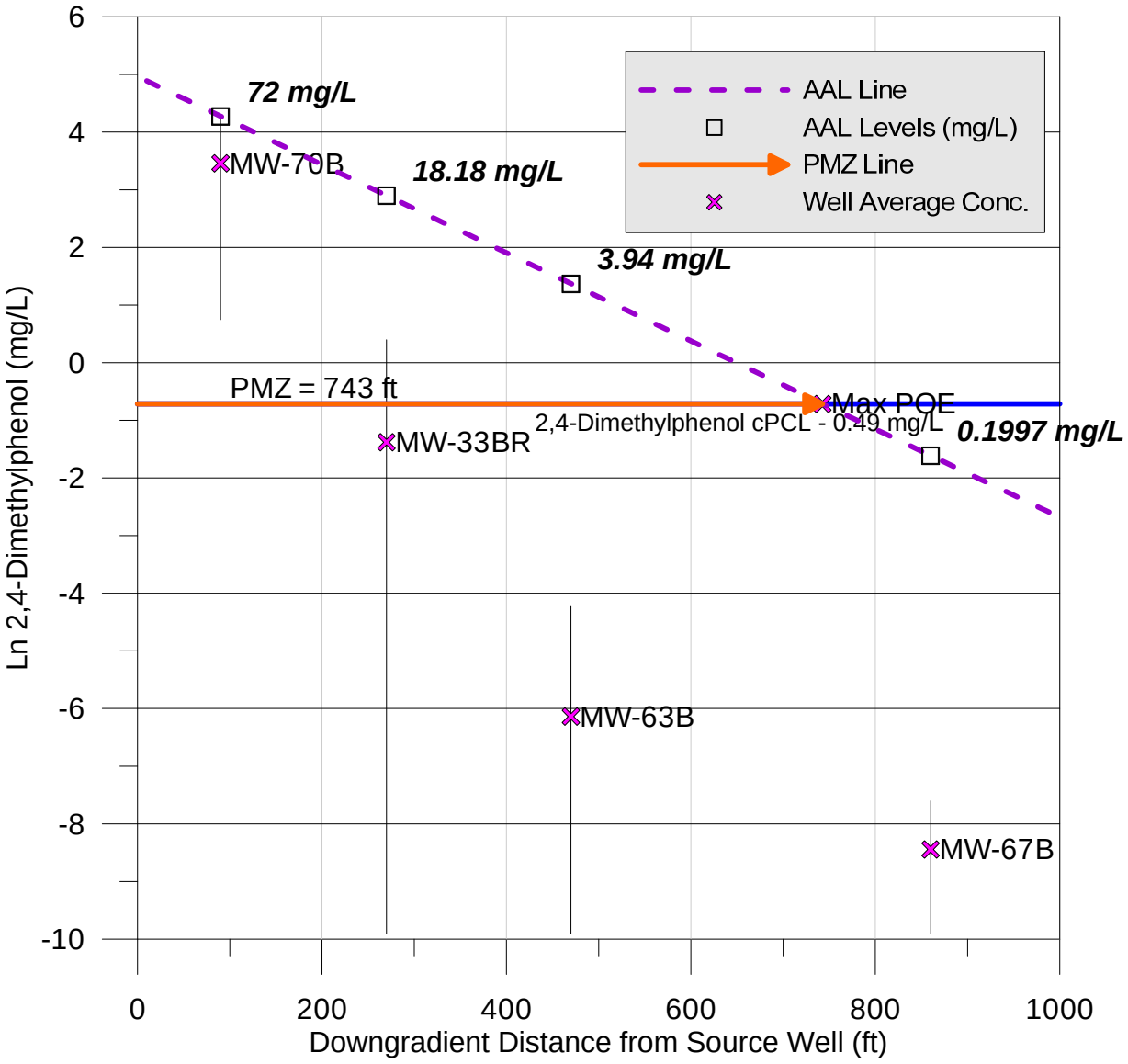


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-70B	2.55	0.21	1.79	**38.4498**
MW-33BR	2	0.3	1.296166667	**3.2591**
MW-63B	0.21	0.001	0.054612	**0.2100**
MW-67B	0.001	0.00008	0.000424444	**0.005***

Note: * MW-67B is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-7
ATTENUATION ACTION LEVELS - B-CZ 2,4-DIMETHYLPHENOL

UPRR Houston Wood Preserving Works, Houston, Texas

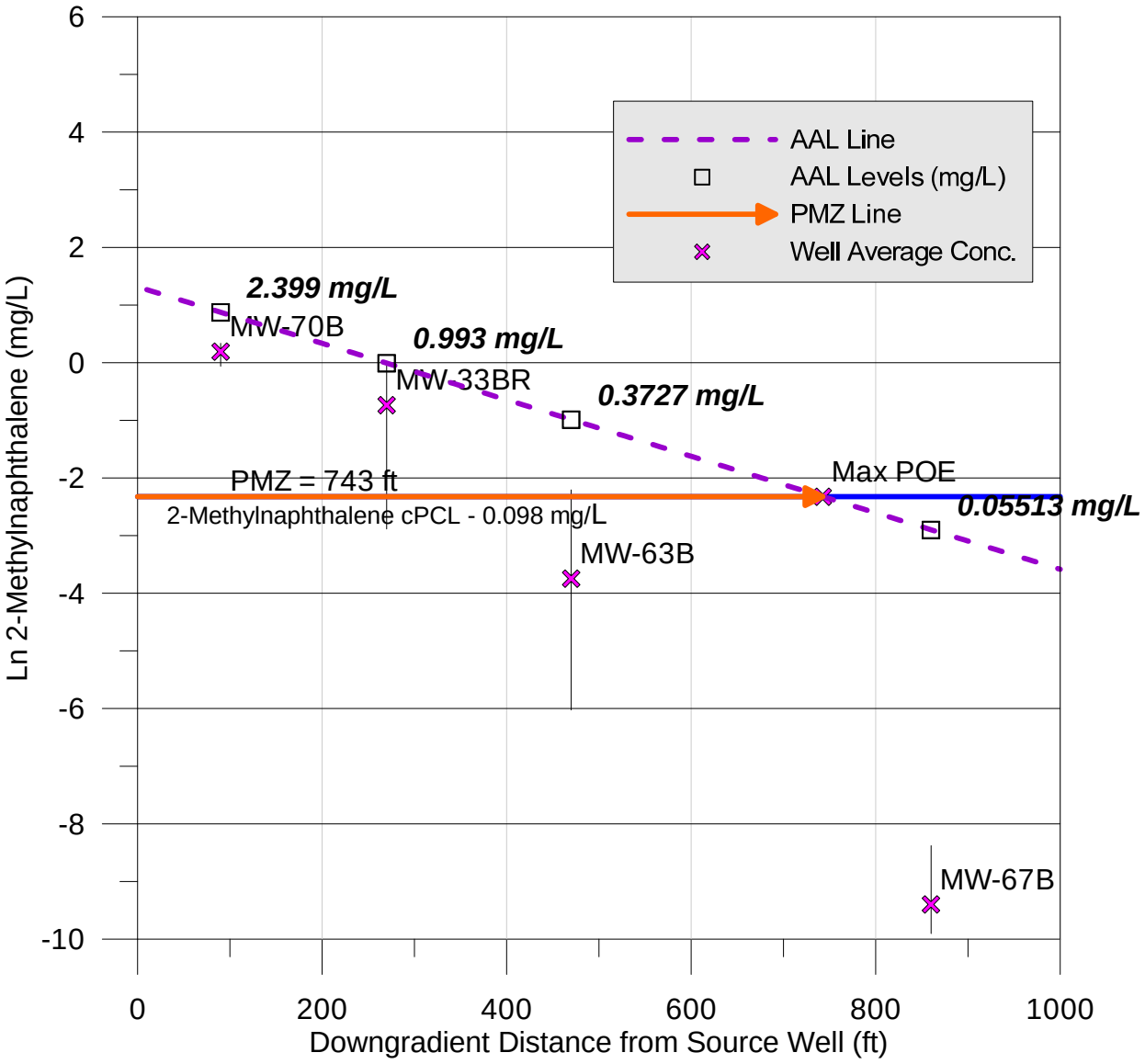


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-70B	72	2.11	31.8775	**72.0000**
MW-33BR	1.49	0.00005	0.252306833	**18.1805**
MW-63B	0.0148	0.00005	0.0021658	**3.9397**
MW-67B	0.0005	0.00005	0.000215889	**0.49***

Note: * MW-67B is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-8
ATTENUATION ACTION LEVELS - B-CZ 2-METHYLNAPHTHALENE

UPRR Houston Wood Preserving Works, Houston, Texas

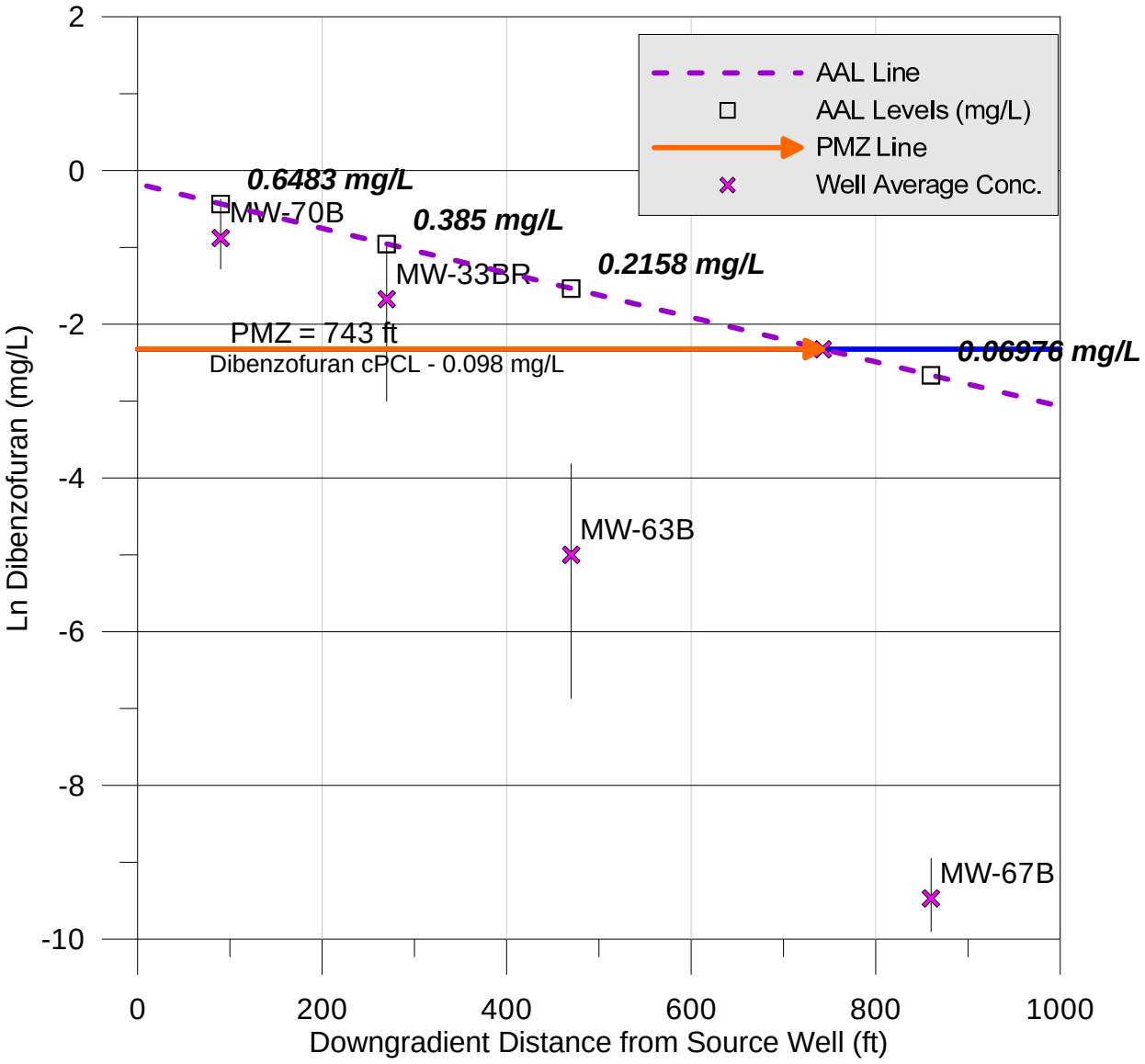


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-70B	1.4	0.94	1.215	**2.3988**
MW-33BR	0.993	0.0558	0.480633333	**0.9930**
MW-63B	0.11	0.00242	0.023688	**0.3727**
MW-67B	0.00023	0.00005	8.32556E-05	**0.098***

Note: * MW-67B is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-9
ATTENUATION ACTION LEVELS - B-CZ DIBENZOFURAN

UPRR Houston Wood Preserving Works, Houston, Texas

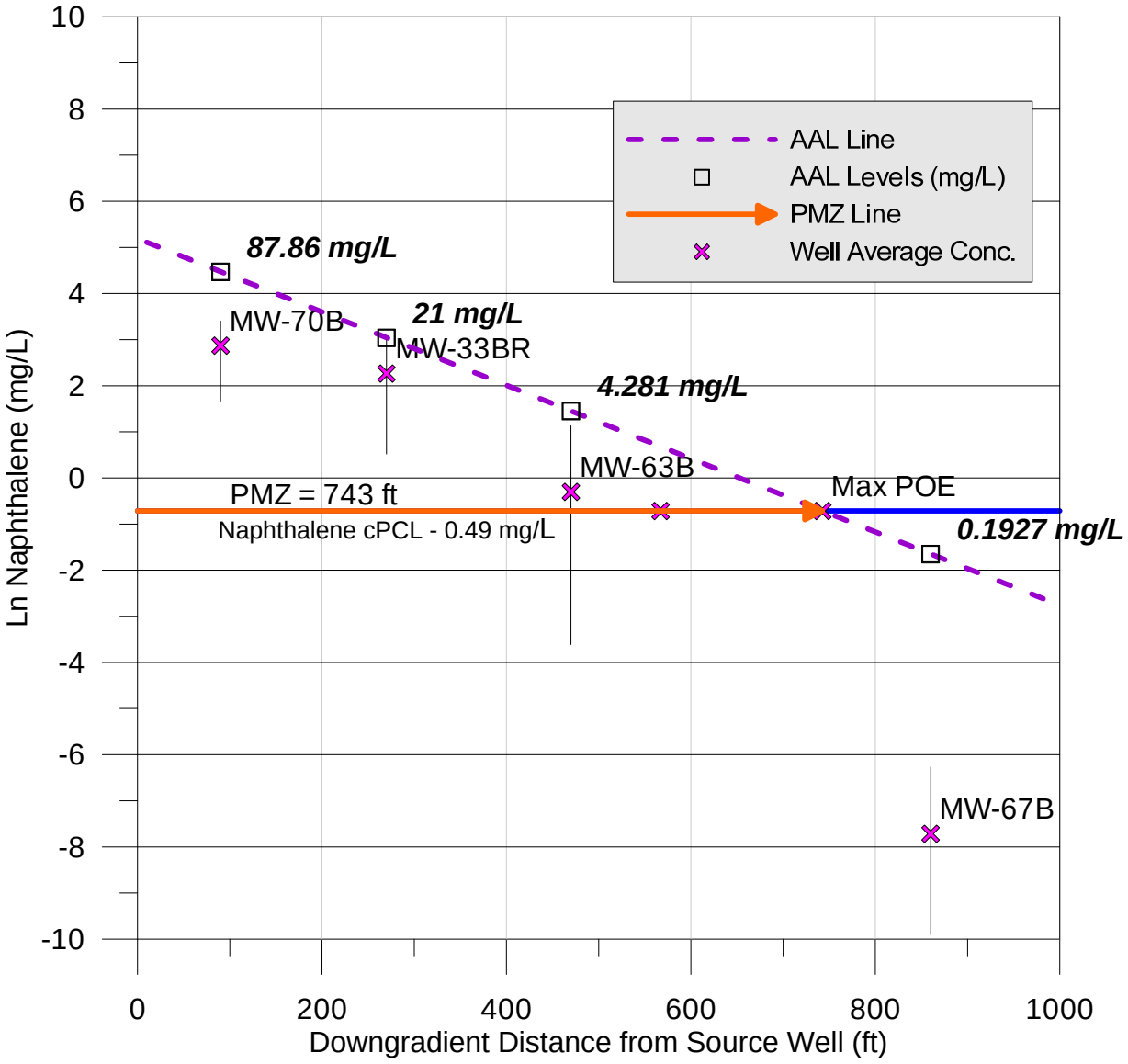


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-70B	0.69	0.278	0.417	**0.6483**
MW-33BR	0.385	0.0498	0.188083333	**0.3850**
MW-63B	0.022	0.00104	0.006753	**0.2158**
MW-67B	0.00013	0.00005	7.72778E-05	**0.098***

Note: * MW-67B is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-10
ATTENUATION ACTION LEVELS - B-CZ NAPHTHALENE

UPRR Houston Wood Preserving Works, Houston, Texas

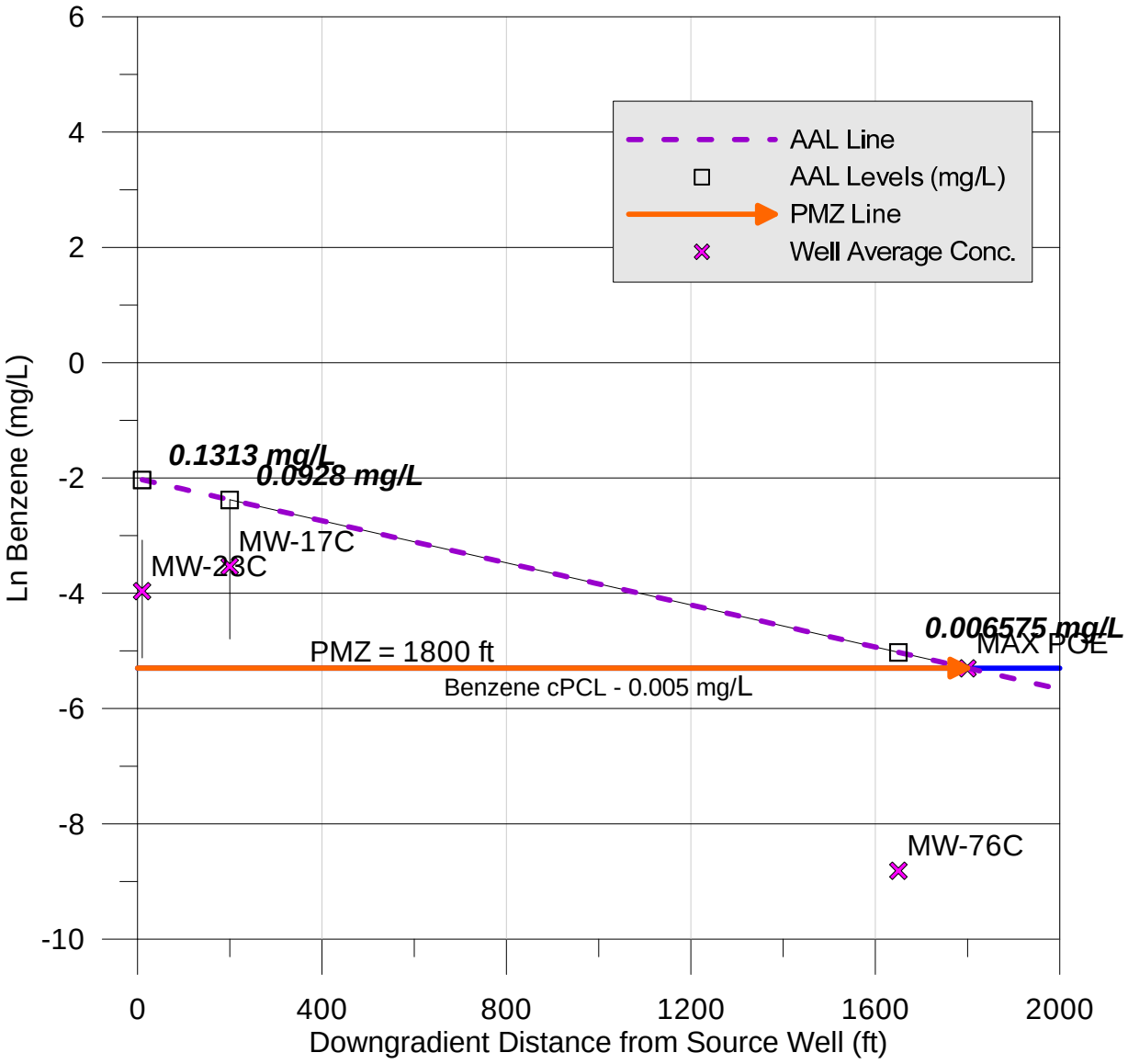


Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-70B	30.1	5.3	17.7	**87.8605**
MW-33BR	21	1.68	9.668333333	**21.0000**
MW-63B	3.1	0.027	0.7422	**4.2814**
MW-67B	0.0019	0.00005	0.000446789	**0.49***

Note: * MW-67B is an alternate POE Well, cPCL used for AAL at this well

ATTACHMENT 2E-11
ATTENUATION ACTION LEVELS - C-TZ BENZENE

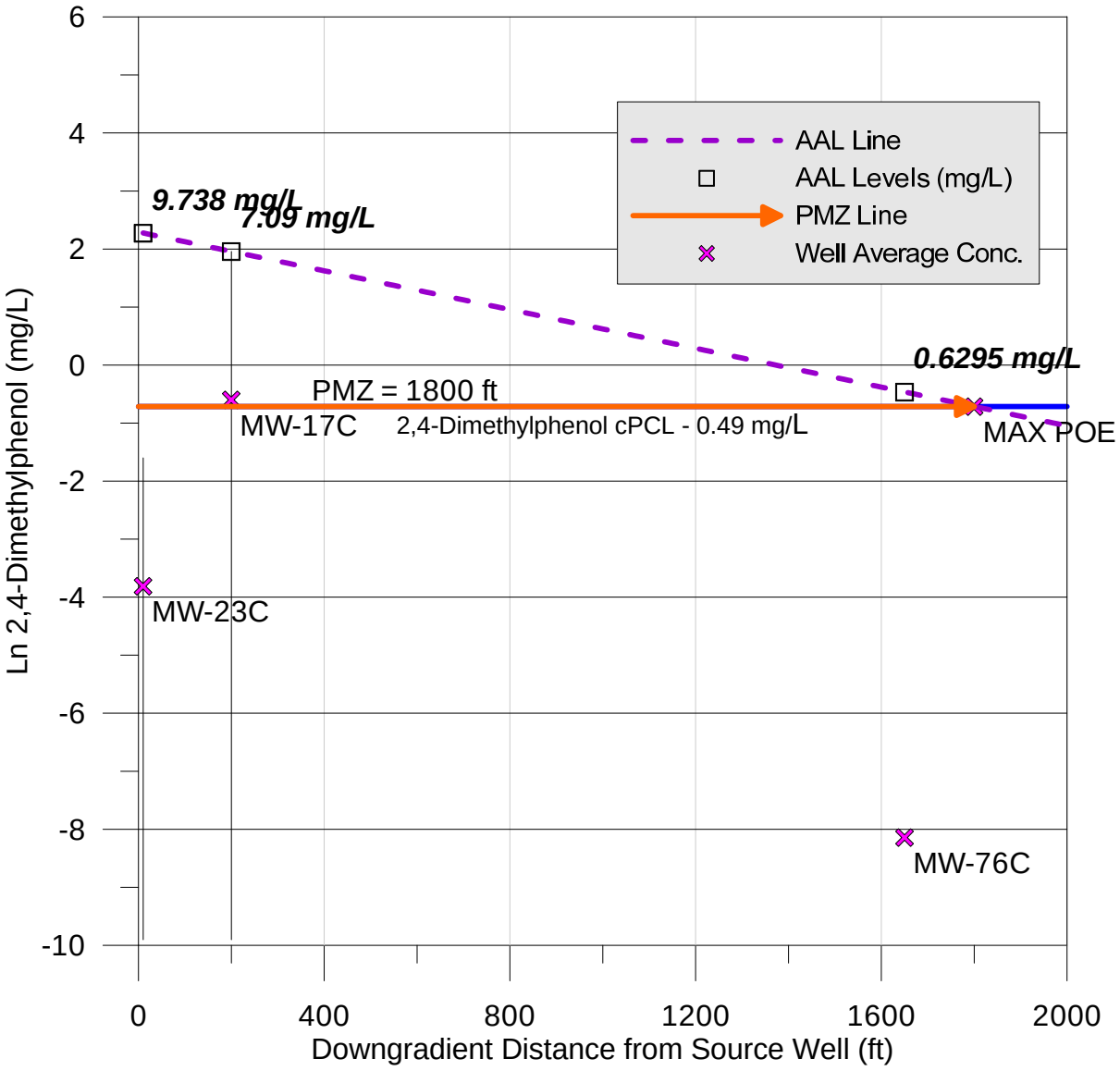
UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-17C	0.0928	0.0083	0.029270714	**0.0928**
MW-23C	0.046	0.00596	0.01908	**0.1313**
MW-76C	0.000149	0.000149	0.000149	**0.0066**

ATTACHMENT 2E-12
ATTENUATION ACTION LEVELS - C-TZ 2,4-DIMETHYLPHENOL

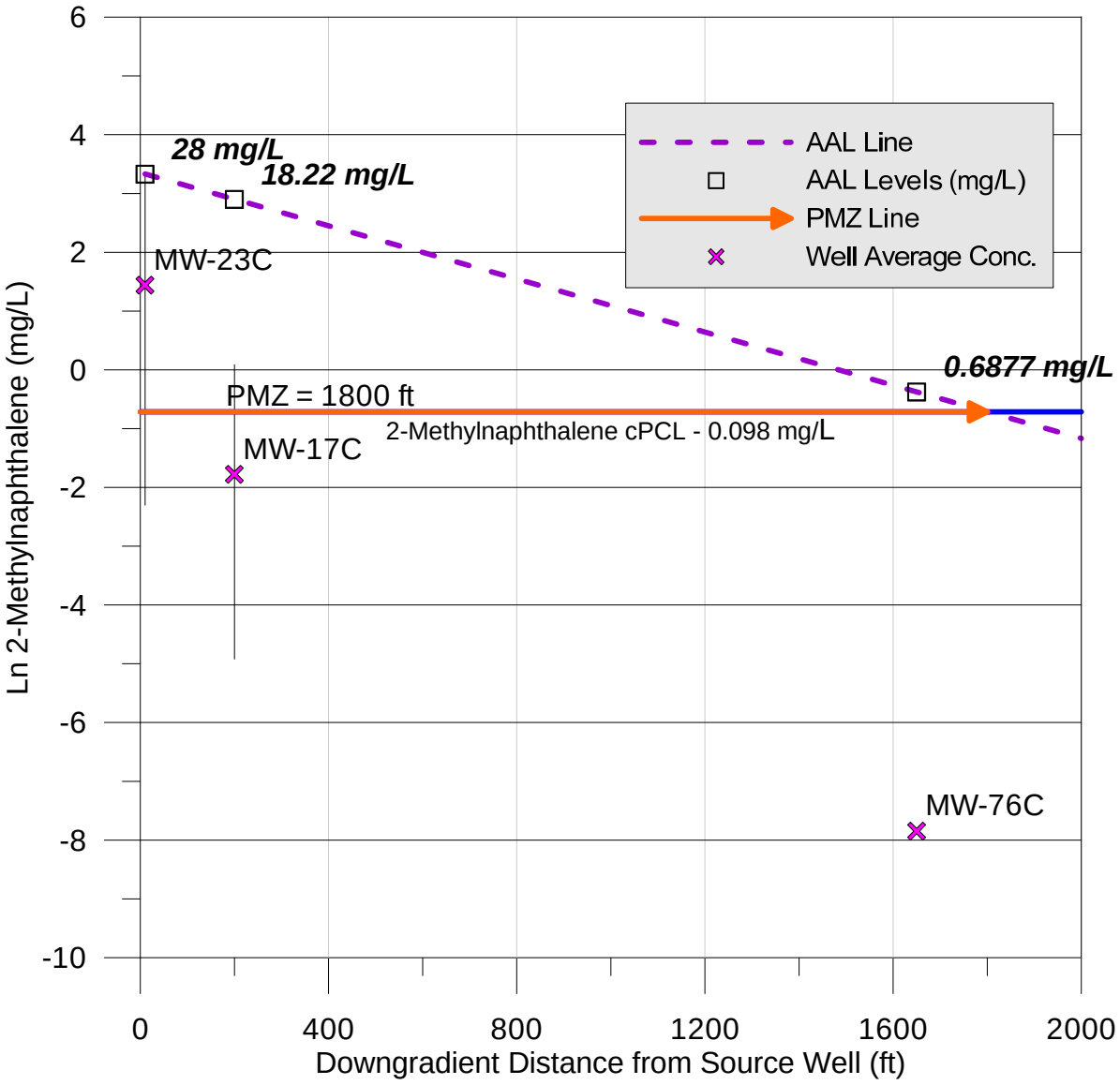
UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-17C	7.09	0.00005	0.55072925	**7.0900**
MW-23C	0.202	0.00005	0.022147333	**9.7375**
MW-76C	0.000292	0.000292	0.000292	**0.6295**

ATTACHMENT 2E-13
ATTENUATION ACTION LEVELS - C-TZ 2-METHYLNAPHTHALENE

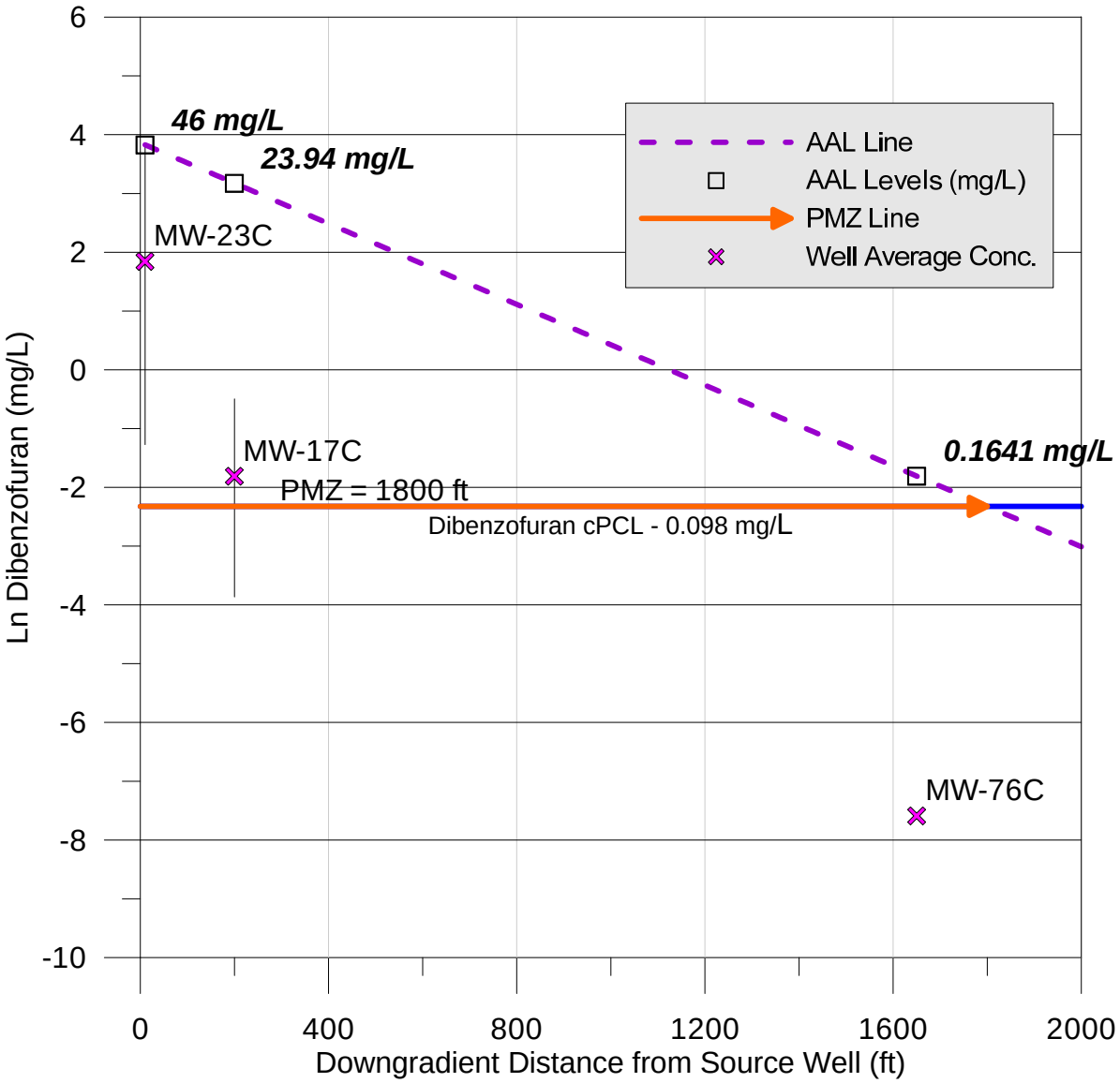
UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-17C	1.09	0.0073	0.16944375	**18.2249**
MW-23C	28	0.1	4.243	**28.0000**
MW-76C	0.000392	0.000392	0.000392	**0.6877**

ATTACHMENT 2E-14
ATTENUATION ACTION LEVELS - C-TZ DIBENZOFURAN

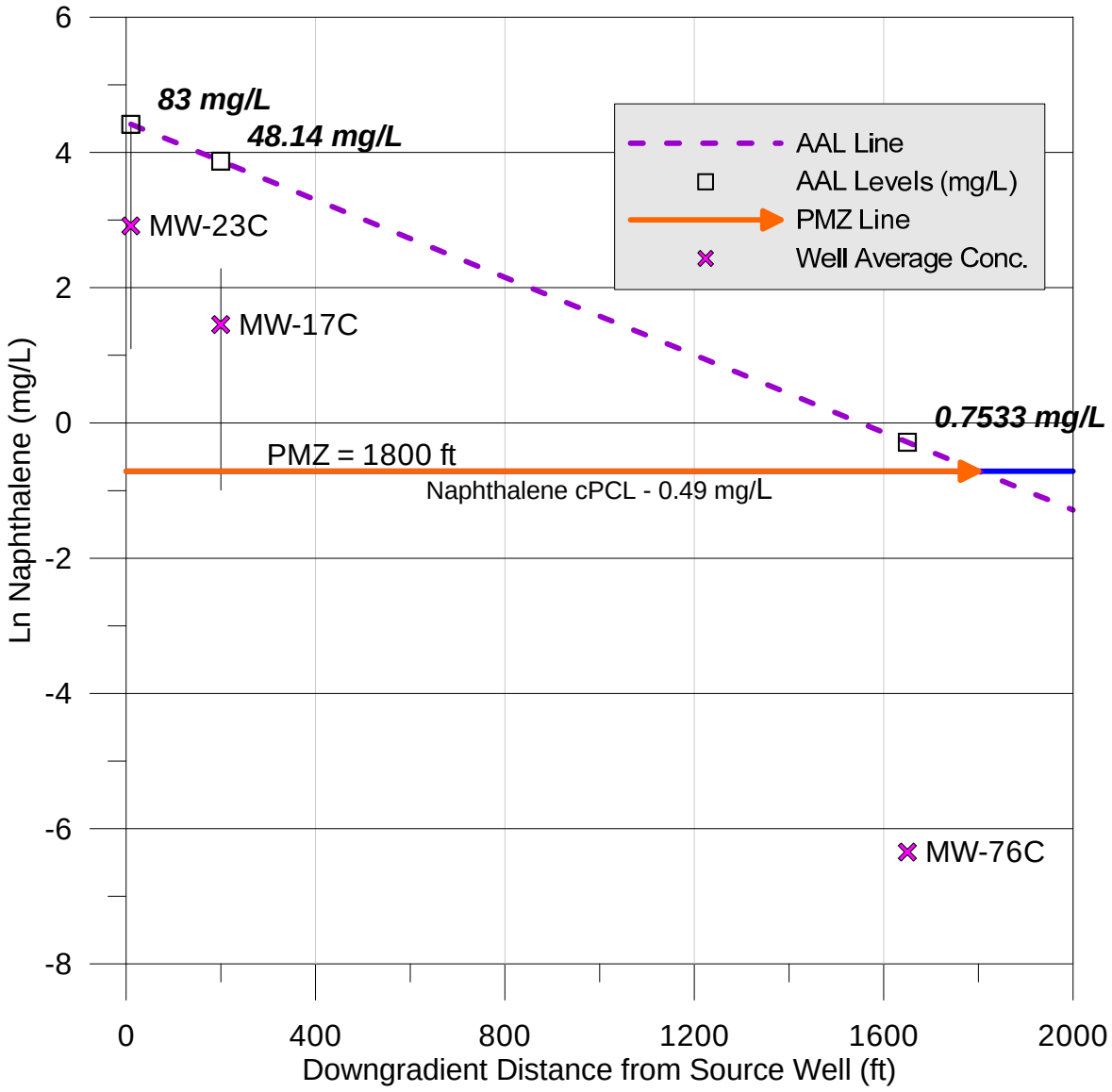
UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-17C	0.61	0.021	0.163975	**23.9435**
MW-23C	46	0.28	6.347466667	**46.0000**
MW-76C	0.000507	0.000507	0.000507	**0.1641**

ATTACHMENT 2E-15
ATTENUATION ACTION LEVELS - C-TZ NAPHTHALENE

UPRR Houston Wood Preserving Works, Houston, Texas



Well	Max (mg/L)	Min (mg/L)	Avg (mg/L)	**AALs (mg/L)**
MW-17C	9.8	0.37	4.2973125	**48.1385**
MW-23C	83	3	18.516	**83.0000**
MW-76C	0.00176	0.00176	0.00176	**0.7533**

ATTACHMENT 2E-16
Summary of Mann-Kendall Trend Analysis - A-TZ
UPRR Houston Wood Preserving Works

		Benzene 71-43-2	2,4-Dimethylphenol 105-67-9	2-Methylnaphthalene 91-57-6	Dibenzofuran 132-64-9	Naphthalene 91-20-3
Source	MW-12A	S	ND	NT	I	PD
	MW-16	S	S	S	PI	NT
	MW-17	S	NT	NT	NT	NT
	MW-18A	S	NT	I	I	PI
	MW-20A	S	S	S	S	NT
	MW-30A	S	S	NT	S	NT
	MW-31A	S	S	NT	NT	S
	MW-32A	NT	NT	NT	NT	NT
	MW-32AR	NT	NT	NT	NT	PI
	MW-52A	S	NT	S	S	S
	MW-55A	S	S	NT	S	NT
	MW-57A	D	D	S	NT	NT
	MW-58A	NT	NT	NT	PD	NT
	TW-56A	S	NT	S	NT	D
Tail	MW-01A	N/A	N/A	NT	I	NT
	MW-02	N/A	N/A	NT	NT	NT
	MW-05	ND	ND	NT	NT	NT
	MW-07	N/A	N/A	ND	ND	ND
	MW-08	N/A	N/A	ND	ND	ND
	MW-09	ND	ND	NT	NT	NT
	MW-10A	N/A	N/A	NT	NT	NT
	MW-11A	N/A	N/A	ND	ND	ND
	MW-13	ND	ND	NT	S	NT
	MW-15A	S	NT	NT	NT	I
	MW-22A	NT	ND	NT	NT	NT
	MW-24AR	ND	NT	NT	S	NT
	MW-25A	ND	ND	NT	NT	NT
	MW-26A	NT	ND	NT	NT	NT
	MW-28A	ND	ND	PD	NT	PD
	MW-33A	PI	PI	I	I	I
	MW-35A	ND	ND	NT	NT	NT
	MW-36A	ND	ND	NT	NT	NT
	MW-38A	ND	ND	NT	ND	NT
	MW-44A	I	NT	I	NT	NT
	MW-49A	S	NT	S	S	S
	MW-50A	ND	NT	NT	NT	NT
	MW-51A	ND	ND	ND	ND	NT
	MW-59A	ND	ND	NT	NT	NT
	MW-60A	ND	ND	NT	NT	NT
	MW-61A	ND	ND	ND	ND	S
	MW-64A	ND	ND	NT	NT	NT
	MW-69A	ND	NT	NT	NT	NT
	MW-77A	ND	ND	N/A	N/A	N/A
	MW-78A	N/A	N/A	N/A	N/A	N/A
	MW-79A	N/A	N/A	N/A	N/A	N/A

Notes:

N/A - Not applicable due to insufficient data.

NT - No trend
ND - Non-detect
D - Decreasing (green)
PD - Probably decreasing (yellow)
S - Stable (blue)
PI - Probably increasing (pink)
I - Increasing (red)

1. Grey highlight indicates concentrations less than cPCLs, regardless of trend.

ATTACHMENT 2E-17
Summary of Mann-Kendall Trend Analysis B-CZ/B-TZ
UPRR Houston Wood Preserving Works

		Benzene 71-43-2	2,4-Dimethylphenol 105-67-9	2-Methylnaphthalene 91-57-6	Dibenzofuran 132-64-9	Naphthalene 91-20-3
Source	MW-10B	N/A	N/A	N/A	NT	PI
	MW-11B	N/A	N/A	N/A	S	NT
	MW-14	ND	ND	PD	NT	PD
	MW-15B	NT	ND	NT	S	NT
	MW-39B	ND	ND	NT	NT	NT
	MW-40B	D	PD	S	I	S
	MW-49B	PI	I	I	PI	I
	MW-55B	S	NT	NT	S	NT
	MW-57B	S	NT	S	S	S
	MW-62B	ND	ND	PD	PD	D
	MW-73B	NT	NT	NT	NT	NT
	MW-74B	NT	NT	I	NT	NT
	MW-75B	S	NT	NT	NT	S
	P-10	N/A	N/A	N/A	ND	ND
	P-11	ND	ND	NT	PI	NT
	P-12	N/A	N/A	ND	ND	ND
	TW-41B	ND	NT	NT	NT	NT
Tail	MW-22B	NT	NT	NT	I	I
	MW-24B	ND	ND	ND	ND	NT
	MW-32B	NT	NT	NT	NT	NT
	MW-33B	S	NT	NT	NT	NT
	MW-33BR	S	NT	S	S	PD
	MW-35B	NT	ND	NT	S	NT
	MW-36B	ND	ND	NT	NT	NT
	MW-38B	ND	ND	NT	NT	NT
	MW-42B	ND	I	NT	S	NT
	MW-59B	ND	NT	ND	NT	NT
	MW-63B	NT	NT	PD	D	NT
	MW-67B	ND	NT	NT	NT	PD
	MW-68B	S	NT	NT	NT	S
	MW-70B	I	NT	NT	S	NT
	MW-71B	NT	NT	NT	NT	NT
	MW-72B	S	NT	NT	NT	NT
	MW-80B	N/A	ND	N/A	ND	N/A
	MW-81B	ND	ND	ND	ND	ND

Notes:

N/A - Not applicable due to insufficient data.

NT - No trend
ND - Non-detect
D - Decreasing (green)
PD - Probably decreasing (yellow)
S - Stable (blue)
PI - Probably increasing (pink)
I - Increasing (red)

1. Grey highlight indicates concentrations less than cPCLs, regardless of trend.

ATTACHMENT 2E-18
Summary of Mann-Kendall Trend Analysis - C-TZ
UPRR Houston Wood Preserving Works

		Benzene 71-43-2	2,4-Dimethylphenol 105-67-9	2-Methylnaphthalene 91-57-6	Dibenzofuran 132-64-9	Naphthalene 91-20-3
Source	MW-12C	ND	ND	NT	NT	S
	MW-15C	PD	NT	NT	NT	NT
	MW-17C	S	NT	NT	NT	NT
	MW-18C	NT	NT	I	I	I
	MW-19C	NT	NT	NT	PI	NT
	MW-21C	ND	NT	NT	NT	NT
	MW-23C	NT	PI	NT	NT	I
Tail	MW-24C	ND	ND	NT	ND	PD
	MW-25C	D	NT	NT	S	NT
	MW-27C	ND	ND	NT	ND	S
	MW-28C	ND	NT	S	ND	D
	MW-34C	N/A	N/A	N/A	N/A	N/A
	MW-34CR	N/A	ND	N/A	ND	N/A
	MW-44C	N/A	ND	N/A	N/A	N/A
	MW-47C	ND	NT	NT	ND	NT
	MW-48C	ND	NT	ND	NT	PD
	MW-51C	N/A	ND	ND	ND	N/A
	MW-53C	ND	ND	NT	ND	NT
	MW-54C	ND	NT	NT	I	NT
	MW-68C	PI	NT	NT	NT	PI
	MW-76C	N/A	ND	N/A	N/A	N/A

Notes:

N/A - Not applicable due to insufficient data.

NT - No trend
ND - Non-detect
D - Decreasing (green)
PD - Probably decreasing (yellow)
S - Stable (blue)
PI - Probably increasing (pink)
I - Increasing (red)

1. Grey highlight indicates concentrations less than cPCLs, regardless of trend.

Use this worksheet to justify the use of technical impracticability (TI) to modify the groundwater response objectives. Also complete Worksheet 2.2 to propose a plume management zone for the TI Zone. Include a map of the groundwater PCLE zone and area of technical impracticability in Attachment 2G. Include in the attachment any other documentation needed to make the justification. If technical impracticability is not proposed as part of the response action, do not submit this worksheet.

Describe the groundwater PCLE zone and demonstrate in accordance with *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration* (EPA OSWER Directive 9234.2-25), unless otherwise approved by TCEQ, why it is technically impractical to reduce the COC concentrations to the critical PCLs, taking into account all currently available remediation technologies, and hydrogeologic and chemical-specific factors. Identify the specific COCs and list the PCLs that cannot be achieved.

As discussed in the previous APARs and in the Worksheet 2.1, the shallow GWBUs have been contaminated with creosote-related DNAPL and associated dissolved COCs. Creosote DNAPL has been detected in the GWBUs as noted in soil borings and monitoring wells across the Site and in areas off site. PCLE Zones in each of the GWBUs is closely tied to where NAPL was observed in either soil borings or accumulated in monitoring wells. This suggests that there is not a high rate of dissolved constituent migration beyond the DNAPL areas. MNA of the COCs in groundwater appears to be limiting the migration of the groundwater PCLE Zones beyond where DNAPL has been noted; however, restoration of the groundwater to cPCLs in a reasonable timeframe may not be practicable per 30 TAC§350.33(f)(3).

According to U.S. Environmental Protection Agency (EPA) "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration" (Office of Solid Waste and Emergency Response Directive 9234.2-25 (EPA, 1993), the goal of restoring contaminated groundwater within a reasonable time frame can be modified after an evaluation of technical impracticability. The EPA's technical impracticability guidance cites the following categories that can lead to a finding of technical impracticability:

1. Hydrogeologic factors
2. Contaminant factors
3. Remediation technology factors

Hydrogeological factors related to the Site include a complex lithology of sands, silts, and clays related to fluvial-deltaic depositional systems found in the Beaumont Formation. In regards to the contaminant at the Site, creosote is characterized as:

- a wood preservative that served as a fungicide, insecticide, miticide, and sporicide (EPA Website: Preliminary Risk Assessment for Creosote, EPA, 2007).
- a complex mixture of polycyclic aromatic hydrocarbons (PAHs), heterocyclic compounds, phenolic compounds, and a small fraction of benzene, toluene, ethylbenzene, and xylenes (BTEX) (Kiilerich, 1996); and
- highly insoluble and hydrophobic.

As a result, creosote DNAPL does not readily attenuate through biological decay or dissolution into the groundwater, and may persist in "pools" in the GWBUs and within the aquifer matrix indefinitely. Even with more aggressive responses such as thermally enhanced treatment that has been tried at similar creosote sites, groundwater response alternatives will not effectively treat groundwater to cPCLs within a reasonable timeframe. Therefore, restoration of the GWBUs below cPCLs is technically impracticable where creosote DNAPL exists because it is a continuing, long-term source of groundwater contamination.

Details of the TI demonstration and associated maps are provided in Attachment 2G. Attachment 2G-Figure 1 summarizes the factors affecting groundwater restoration potential related to the Site.

Attachment 2G Figure 2 shows the proposed TI Zone for the Site. Attachment 2G-Figure 2 and 3 provides a conceptual site model, illustrating the relationship between hydrogeology, surface and subsurface features, and the generalized extent of contamination.

Are there groundwater COCs in excess of the critical PCLs beyond the TI Zone? Yes ____ **X** No ____

If yes, make sure removal/decontamination actions are documented in Worksheet 1.0.

Will actions be required or already completed to prevent COC migration outside the area of technical impracticability and/or outside the existing boundary of the groundwater PCLE zone?

X Yes ____ No

DNAPL recovery from wells in the A-TZ, B-CZ/B-TZ, and C-TZ.

If yes, make sure removal/decontamination actions are documented in Worksheet 1.0.

This would include recovering the readily recoverable DNAPL in the wells within the TI Zone, as discussed in Worksheet 2.1 for the three zones.

ATTACHMENT 2G

TECHNICAL IMPRACTICABILITY DEMONSTRATION

ATTACHMENT 2G – 1 TI FACTORS
ATTACHMENT 2G – 2 PROPOSED TI ZONE
ATTACHMENT 2G – 3 CONCEPTUAL SITE MODEL SW-NE
ATTACHMENT 2G – 4 CONCEPTUAL SITE MODEL S-N

ATTACHMENT 2G

TECHNICAL IMPRACTICABILITY DEMONSTRATION

UNION PACIFIC RAILROAD
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TEXAS

NOVEMBER 21, 2014

Prepared for:

Mr. Geoffrey Reeder, P.G.
UNION PACIFIC RAILROAD COMPANY

24125 Aldine Westfield Road
Spring, Texas 77373

Prepared by:

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Round Rock, Texas 78664
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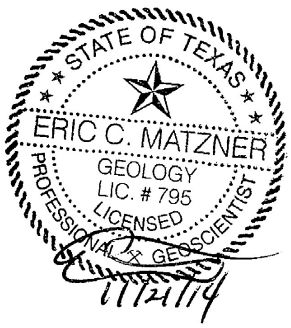
PBW Project No. 1358



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1.0 INTRODUCTION

The Union Pacific Railroad (UPRR) former Houston Wood Preserving Works Facility (hereafter "HWPW" or "the Site") is a former wood treating site located in Houston, Texas. The Site consists of unoccupied industrial land and also includes the Englewood Intermodal Yard, which is to the south of the former HWPW facilities. The Site was first developed for creosoting operations in 1899, and operated various creosoting operations until 1984 when operations ceased. The facility was dismantled in the early 1990s. Details of the history and previous operations at the Site have been discussed in length in the previously submitted Affected Property Assessment Report (APAR) (ERM, 2000) and Revised APAR (ERM, 2004), as well as the RCRA Facility Assessment (RFA) Report (PRC, 1993).

As discussed in the previous APARs and in the Response Action Plan (RAP) that this attachment is part of, the shallow groundwater bearing units (GWBUs) at the Site have been contaminated with creosote-related dense non-aqueous phase liquids (DNAPL) and associated dissolved chemicals of concern (COCs). The sources of DNAPL are likely from spills and drippings at the Site over the 80+ years of operations, with most of the releases likely occurring prior to 1984 when the facility ceased operations. The DNAPL sources were removed over 20 years ago when the wood treating facility was dismantled.

Creosote DNAPL has been observed in the GWBUs as noted in soil borings and monitoring wells across the Site and in areas off site. As a result, the following shallow GWBUs are impacted with COC concentrations greater than Texas Risk Reduction Program (TRRP) critical Protective Concentration Levels (cPCLs) on and off site:

- A-Transmissive Zone (A-TZ);
- B-Cohesive Zone (B-CZ) and B-Transmissive Zone (B-TZ);
- C-Transmissive Zone (C-TZ).

Monitored natural attenuation (MNA) of the COCs in groundwater appears to be limiting the migration of the groundwater PCL Exceedance (PCLE) Zones; however, restoration of the groundwater within the PCLE Zones to cPCLs in a reasonable timeframe may not be practicable due to the presence of creosote DNAPL.

According to U.S. Environmental Protection Agency (EPA) "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration" (Office of Solid Waste and Emergency Response

Directive 9234.2-25 (EPA, 1993), the goal of restoring contaminated groundwater within a reasonable time frame can be modified after an evaluation of technical impracticability. The EPA's technical impracticability guidance cites the following categories that can lead to a finding of technical impracticability:

1. Hydrogeologic factors
2. Contaminant factors
3. Remediation technology factors

Hydrogeological factors related to the Site include a complex lithology of sands, silts, and clays related to fluvial-deltaic depositional systems found in the Beaumont Formation. In regards to the contaminant at the Site, creosote was used as a wood preservative that served as a fungicide, insecticide, miticide, and sporicide (EPA Website: Preliminary Risk Assessment for Creosote, EPA, 2007). Creosote is a complex mixture of polycyclic aromatic hydrocarbons (PAHs), heterocyclic compounds, phenolic compounds, and a small fraction of benzene, toluene, ethylbenzene, and xylenes (BTEX) (Kiilerich, 1996). Creosote is highly insoluble and hydrophobic. As a result, creosote DNAPL may persist in "pools" in the GWBUs indefinitely. Even with more aggressive responses such as thermally enhanced treatment that has been tried at similar creosote sites, groundwater response alternatives will not effectively treat groundwater to cPCLs within a reasonable timeframe. Therefore, restoration of the GWBUs below cPCLs is technically impracticable where creosote DNAPL exists because it is a continuing, long-term source of groundwater contamination.

This document was prepared to serve as a "front-end" Technical Impracticability (TI) Demonstration for the Site in accordance with 30 TAC §350.33(f)(3) and applicable TCEQ guidance to address the PCLE Zones related to creosote DNAPL. Details of the cPCLs requested to be waived (Section 2.0), spatial area for the TI (Section 3.0), conceptual site model including site geology, hydrogeology, DNAPL distribution, and potential receptors (Section 4.0), and restoration potential (Section 5.0), are discussed in the following sections. In addition, an evaluation of similar creosote sites in Texas with TI waivers is provided in Section 6.0. Attachment 2G-Figure 1 summarizes the factors affecting groundwater restoration potential related to the Site. Attachment 2G Figure 2 shows the proposed TI Zone for the Site. Attachment 2G-Figure 2 and 3 provides a conceptual site model, illustrating the relationship between hydrogeology, surface and subsurface features, and the generalized extent of contamination.

2.0 SITE GROUNDWATER CPCLS

The following table lists the PCLs identified for the Site in the APAR and RAP. Since the groundwater PCLE Zones extend on-site and off-site, commercial/industrial (C/I) PCLs and residential assessment levels (RALs) are used respectively depending on the location of the PCLE Zone.

Parameter	**On-Site C/I PCLs** (mg/L)	**Off-Site RALs** (mg/L)
2,4-Dimethlyphenol	1.5	0.49
2-Methylnaphthalene	0.29	0.098
Acenaphthene	4.4	1.5
Benzo(a)anthracene	0.0028	0.0013
Benzene	0.005	0.005
Benzo(a)pyrene	0.0002	0.0002
bis(2-ethylhexyl)phthalate	0.006	0.006
Chrysene	0.28	0.13
Dibenzofuran	0.29	0.098
Fluoranthene	2.9	0.98
Fluorene	2.9	0.98
Naphthalene	1.5	0.49
Pentachlorophenol	0.001	0.001
Phenanthrene	2.2	0.73
Pyrene	2.2	0.73
Toluene	1	1

Based on the available information, all of the COCs listed above originated from the historical creosoting operations at the Site.

3.0 SPATIAL AREA FOR TI ZONE

As detailed in the EPA Guidance, the TI evaluation should specify the horizontal and vertical extent of the area for which the TI determination is sought. The location and extent of the groundwater PCLE zones (see Attachment 1A of RAP) were determined by COCs present in groundwater at concentrations that exceed the cPCL (C/I or RAL) using the most recent groundwater data. Groundwater PCLE Zones were mapped for the three upper GWBUs: A-TZ, B-CZ/B-TZ, and C-TZ based on the July/August 2014 groundwater data (Attachment 1A, Figures 5B-4, 5B-5, and 5B-6, respectively).

As detailed in the RAP (Worksheet 2.1), the PCLE Zones in the GWBUs appear to be tied closely to where DNAPL has been noted in soil borings and/or accumulated in monitoring wells. Taking in account the three GWBU PCLE Zones, the extent of the dissolved phase contamination extends about 750 feet north of the Site (B-CZ PCLE Zone) into the residential off-site properties (Attachment 1A, Figures 5B-5). DNAPL was noted in the boring log for well MW-63B, located approximately 500 feet off-site to the north. Also, on the west side of the Site, DNAPL has been observed in wells MW-12B and MW-41B, but the PCLE Zone is delineated within 100 feet of these wells. This same situation has been noted for the A-TZ and C-TZ where DNAPL has been observed in wells and soils borings within and at the edges of the PCLE Zone (i.e., MW-32AR for the A-TZ and MW-17C in the C-TZ (Attachment 1A, Figures 5B-4 and 5B-6, respectively).

Therefore, the spatial extent of the proposed TI Zone will generally follow the proposed Plume Management Zone (PMZ) outline for all three PMZs and extending vertically to the base of the C-TZ located approximately 65 to 70 feet below ground surface. Since there are multiple off-site properties to the north and east, the proposed TI Zone will follow property boundaries instead of lines cutting across the properties (Attachment 2G, Figure 2).

4.0 CONCEPTUAL SITE MODEL

4.1 Hydrogeologic Considerations - Site-Specific Geology/Hydrogeology

The geology at the Site consists of interbedded clays, silts, and sands representative of fluvial-deltaic deposits of the Beaumont Formation. The site-specific geology and hydrogeology has been described in detail in the previous APAR (ERM, 2000), Revised APAR, (ERM, 2004), APAR Addendum (PBW, 2009) and Updated APAR Addendum (PBW, 2010). The Site stratigraphy from ground surface to a depth of about 135 feet below ground surface is grouped into nine distinct units with transmissive GWBUs separated by cohesive zones (with the GWBUs identified):

(1) Surface fill material (Fill);
(2) A-Cohesive Zone (A-CZ);
(3) A-Transmissive Zone (A-TZ) (GWBU);
(4) B-Cohesive Zone (B-CZ) (interbedded intervals);
(5) B-Transmissive Zone (B-TZ) (GWBU);
(6) C-Cohesive Zone (C-CZ);
(7) C-Transmissive Zone (C-TZ) (GWBU);
(8) D-Cohesive Zone (D-CZ); and
(9) D-Transmissive Zone (GWBU).

Cross sections showing the general relationship of the zones are provided on Attachment 2G Figures 3 and 4. The lithology consists of a complex group of clays, silts and sand layers. As an example, the B-CZ is comprised of clay, silty clay, and sandy clay. The B-TZ, which underlies the B-CZ, grades laterally from west to east into a portion of the B-CZ that contains interbedded, thin seams of silty sand, thin carbonate clayey gravel and nodule seams (~0.1 feet thick). This interval of interbedded carbonate nodules within the B-CZ clay is considered to be a distinct saturated unit based on its hydrologic properties and lithology. Very small amounts of water are observed in the wells completed across this interbedded zone, and numerous soil borings drilled through this interval have noted DNAPL is the soil borings.

General groundwater flow within the GWBU's have been evaluated based on historical water level measurements collected from the monitoring well network installed across the Site. Groundwater in each transmissive zone appears to be under confined conditions. Potentiometric maps for the most recent groundwater monitoring event for the A-TZ, B-CZ/B-TZ, C-TZ, and D-TZ are provided in Attachment 1A of the RAP. Historical groundwater levels measurements collected at the Site are provided in Table 5B in Appendix 2 of the RAP.

Hydraulic properties of the GWBUs through aquifer testing are detailed in the previous APARs. In 2012, additional aquifer tests were conducted on B-CZ wells to evaluate the groundwater classification of the interbedded carbonate seams within the B-CZ. Details of the aquifer testing are provided in RAP Attachment 1A. The additional assessment on B-CZ was conducted since numerous wells screened across the interbedded carbonate seams contain creosote DNAPL. Based on the aquifer testing conducted on wells completed in the B-CZ (11 wells), the calculated hydraulic conductivities ranged from 8.0×10^{-9} cm/sec to 1.1×10^{-6} cm/sec, with a geometric mean of 1.1×10^{-7} cm/sec (see RAP Appendix 3) indicating very low hydraulic conductivity for the unit, and low likelihood of DNAPL recovery from the unit.

4.2 Contaminant Considerations

The Site was used for creosoting operations for about 80 years and ceased operation in 1984. Various releases of creosote occurred during this period. Creosote is hydrophobic, highly insoluble, and consists of a complex mixture of compounds, including PAHs and trace levels of BTEX. Only a few of the components of the creosote are soluble (i.e. aqueous concentration in equilibrium with creosote) including dibenzofuran (1.6 mg/L), naphthalene (12.4 mg/L), and phenol (1,388 mg/L) (King, et al, 1994). This overall low solubility for creosote results in limited groundwater COC concentration plumes that do not extend great distances from the source material. Studies have shown that the dissolved COC plumes from creosote sources tend to have concentrations three to 50 times lower about 150 feet downgradient of the source compared to source concentrations (Kiilerich, 1996). This relationship is observed at the Site with the limited size of the groundwater PCLE Zones relative to the extent of DNAPL (Attachment 1A – Figures 5B-1 to 5B-3) and age of the plumes likely anywhere from 30 to >100 years old.

Therefore, the groundwater PLCE Zones are driven by the presence of creosote in the GWBUs. During the various site investigations, creosote DNAPL has been noted in soil borings and monitoring wells completed in the A-TZ, B-CZ/B-TZ, and C-TZ. The cumulative areal extent of DNAPL noted in the boring logs is about 50 acres. Creosote recovered from monitoring wells at the Site is described as a thick, viscous liquid, with viscosity testing ranging from 8.53 centipoises (sample from MW-32A (DNAPL from the B-CZ zone)) to 192 centipoises (MW-12B) at 70ºF (PBW, 2009). Details of the occurrence and observations of DNAPL in each GWBU are provided in Attachment 1A of the RAP and are summarized below.

DNAPL in the A-TZ

During installation of monitoring wells in the A-TZ, DNAPL (free-phase or sheen) was observed in soil borings within the A-TZ GWBU in 12 wells generally located in the northeast portion of the Site (near SWMUs 4, 5, and 8, and off-site near the northern perimeter of the Site) and extending into the Englewood Intermodal Yard (Attachment 1A, Figure 5A-5). Of these 12 wells, monitoring wells MW-57A and MW-78A had measureable in-well DNAPL thicknesses of approximately 0.81 feet and 1.38 feet, respectively, during the July/August 2014 sampling event. However, evidence of DNAPL within the A-TZ extends out further than the area represented by these two wells, as shown in Attachment 1A, Figure 5A-5). The other 10 wells where DNAPL was noted in the boring logs have not had DNAPL observed in the wells.

As an example, monitoring well TW-56A (intended to be a test well) was installed in 2009 within one of the significant source areas at the Site, SWMU 8 – AST Area. The field geologist observed the lower portion of the A-TZ sand as being "*saturated with NAPL from 29.5 to 30.6'*." Photographs of this interval of the A-TZ show the saturated portion of the sand (see Photograph 1 within this attachment). However, through July 2014, no DNAPL has been observed in TW-56A. This phenomenon has been observed at numerous wells at the Site (MW-30A, MW-31A, MW-52A, MW-55A, MW-79A) where significant NAPL was noted in the boring log when the wells were installed, but no NAPL has been observed in the wells. This indicates that areas of the A-TZ may have residual saturation of DNAPL in the sand matrix that is not mobile, especially given the high viscosity of the DNAPL material. Even though there is little DNAPL migration, the NAPL continues to serve as a source of dissolved-phase COCs into the A-TZ.

In addition to the measured DNAPL thicknesses in the monitoring wells completed in the A-TZ, Attachment 1A Figure 5A-5 presents contours of rapid optical screening tool (ROST) readings from cone penetrometer test (CPT)/ROST borings that encountered the A-TZ. The majority of the elevated ROST readings (i.e., >25 % RE) in the A-TZ are located in and around the Recent Process Area, Original Process Area, and the AST Area (SWMUs 4, 5, and 8, respectively). The elevated ROST readings are generally consistent with intervals where NAPL was visually observed in soil borings for A-TZ wells, except for in the Englewood Intermodal Yard area. NAPL was noted on the boring logs for A-TZ wells MW-78A and MW-79A installed in the Englewood Intermodal Yard. However, there were no significant

ROST readings (i.e., >25% RE) in this area of the Site. This may indicate the NAPL may be more weathered in this area of the Site.

The groundwater PCLE Zone for the A-TZ generally matches the areas where DNAPL was observed in monitoring well borings logs. This is consistent with similar creosote sites where the dissolved COC fraction concentrations significantly decrease within 200 feet of the source material.

DNAPL in the B-CZ/B-TZ

DNAPL has been detected in the B-TZ along the western boundary of the Site at MW-12B and MW-41B (Attachment 1A, Figure 5A-6). During the July 2014 monitoring event, DNAPL present in the B-TZ on the west side of the Site had a maximum in-well thickness of 6.95 feet observed at MW-41B, with MW-12B having a measured thickness of 0.82 feet. Both of these wells are included in the DNAPL recovery pilot test and are pumped monthly since the test began in February 2013. DNAPL has not been detected in nearby monitoring wells MW-38B, MW-39B, MW-40B, TW-41B (located approximately 50 feet from MW-41B), and P-11, which indicates sufficient horizontal delineation of the DNAPL in the B-TZ. In addition, ground COC concentrations are less than cPCLs in the nearby wells within 100 feet of the DNAPL.

For the B-CZ wells, DNAPL was detected in three of the wells completed in the interbedded carbonate nodule seam interval, with two wells (MW-32B and MW-70B) located off site to the north of the Recent Process Area and one well in the Englewood Intermodal Yard (MW-75B). The in-well DNAPL thicknesses were measured at 2.11 feet in MW-32B, 0.94 feet in MW-70B, and 1.44 feet in MW-75B during the July 2014 gauging event.

Previously, DNAPL was noted in monitoring well MW-33B located north of the Site. Approximately 7.24 feet of DNAPL (in-well thickness) was observed at MW-33B in January 2010 (PBW, 2010). During the July 2010 monitoring event, an obstruction was encountered in the well that prevented access to the bottom of the well to gauge the DNAPL. The well was plugged and abandoned, and a replacement well MW-33BR was installed within about 10 feet of MW-33B in December 2011 (boring log provided in RAP Appendix 2). The boring log for MW-33BR noted traces of NAPL in fractures in the B-CZ. However, since the installation of MW-33BR, no DNAPL has been observed in the well.

ROST readings greater than 25% RE from CPT/ROST borings that encountered the B-TZ or B-CZ are also posted on Attachment 1A, Figure 5A-6, showing the overall distribution of ROST responses in the unit. The majority of the elevated ROST readings in the B-CZ/B-TZ are in the vicinity of SWMUs 4 and 5. However, elevated ROST readings were observed in the B-CZ north of the Site at CPT/ROST boring CPT-43R-08, near MW-70B. The ROST readings in this area are consistent with the observations of NAPL in monitoring well soil borings in the B-CZ (i.e., MW-70B). Elevated ROST readings were also noted in the Englewood Intermodal Yard area just slightly above the 25% RE (CPT-14-13). Monitoring wells MW-74B (installed within an area noted with >25% RE ROST readings) and MW-75B were installed in December 2011 in the Englewood Intermodal Yard to evaluate the presence of DNAPL in the B-CZ. NAPL was noted in the boring log in the B-CZ for both wells. However, no DNAPL has been detected in MW-74B during the gauging events. In contrast, no significant ROST readings were noted for CPT/ROST borings CPT-07-13 or CPT-10-13 (Figure 5A-6), but DNAPL has been observed in monitoring well MW-75B located in the immediate vicinity of CPT-07-13. As with the A-TZ, the NAPL in this area may be more weathered and less likely to be detected with the ROST tool.

Similar to the A-TZ, the groundwater PCLE Zone extends just beyond the areas where DNAPL was noted in the boring logs. As an example, the line of wells from the Site to the north off-site (MW-57B, MW-70B, MW-33BR, and MW-63B) all had NAPL noted in the boring logs within the B-CZ interbedded zone where the carbonate nodules were observed. COC concentrations in these wells are greater than their respective cPCLs. To the north of MW-63B at well MW-67B, COC concentrations are less than cPCLs and less than sample detection limits (SDLs) (Attachment 1A, Figure 5B-2).

DNAPL in C-TZ

During the July 2014 gauging event, DNAPL was present in the C-TZ wells extending from the northeast side of the Site at MW-23C to approximately 150 feet off site to the northeast near MW-44C, MW-45C, and MW-46C (Attachment 1A, Figure 5A-7). In-well DNAPL thicknesses in these wells were measured at 1.49 feet in MW-44C, 0.69 feet in MW-45C, 1.51 feet in MW-46C, and 2.14 feet in MW-23C.

As with the other transmissive zone NAPL figures, ROST readings from CPT/ROST borings that encountered the C-TZ unit were contoured and presented on Attachment 1A, Figure 5A-7 with the measured in-well DNAPL thicknesses for the C-TZ unit. Of the 100 CPT/ROST borings conducted at the

Site, only 13 CPT/ROST borings were advanced to the top of the C-TZ. The elevated ROST responses were relatively lower than the other GWBUs, and centered near SWMU 5 (Original Process Area).

4.3 Receptors

As discussed in the RAP, a Plume Management Zone (PMZ) and TI are proposed as a response action for the groundwater PCLE zones to ensure that COCs will not pose a potential hazard to human health or the environment as long as the PMZ attenuation action levels (AALs) are not exceeded at the respective attenuation monitoring points (AMPs) and COC concentrations less than cPCLs at the proposed Alternate POE wells. The PMZ/TI is appropriate for the PCLE zones based on a relatively low groundwater velocity, overall stable/declining COC concentrations, the proposed institutional controls (deed recordation and restrictive covenants) on use of groundwater within the PCLE Zone, and the absence of any existing water supply wells within ½-mile of the Site. In addition, there are no surface water bodies at the Site or near the proposed PMZ; therefore, there is no potential for contaminating surface waters that would be hydraulically connected to groundwater.

The City of Houston provides municipal water services for all properties within the Affected Property, so there is no human health complete pathway associated with the GWBUs. The Site is also within the jurisdiction of the Harris-Galveston Subsidence District (HGSD), which restricts groundwater use in the area and requires a permit application prior to drilling a groundwater well. There are permitting exemptions for small diameter wells, but only in areas that do not have an alternative water supply. The HGSD rules are not a complete prohibition on the use of groundwater in the area, but rather the fees associated with the rules are "intended to operate as an economic disincentive to groundwater withdrawal" (HGSD, 2013).

5.0 EVALUATION OF RESTORATION POTENTIAL

One of the major aspects of the TI demonstration in the EPA guidance is to evaluate the restoration potential through source control measures, remedial action performance, restoration timeframe analysis, applicable technologies, and cost estimate. With this demonstration considered a "front-end" TI demonstration, extensive site-specific remedial actions to address the groundwater PCLE Zones have not

been conducted. However, extensive site investigations have been conducted to understand the hydrogeologic and contaminant fate and transport at the Site, with emphasis on understanding the nature and extent of DNAPL at the Site.

5.1 Source Control

As previously discussed, the operations at the former HWPW ceased in 1984 and the facilities were dismantled and removed from the Site in the early 1990s. Therefore, there have been no new releases from creosote sources at the Site in the last 20 to 30 years. The DNAPL that has migrated to the GWBUs continues to act as a source material for dissolved-phase COCs in the groundwater. Evidence of the DNAPL migration extends across a majority of the area where the groundwater PCLE Zones have been identified.

Two major aspects that are functions of the physical property of creosote and hydrogeologic complexity greatly hinder recoverability of the DNAPL source from the subsurface:

1. As discussed in Section 4.0, a majority of monitoring wells where DNAPL was noted in the boring logs do not have measureable, or recoverable, DNAPL present in the wells. This indicates that in many areas within the Affected Property the creosote resides in the GWBUs as residual saturation and no longer flows under natural conditions; and
2. DNAPL noted in the boring logs for the B-CZ wells was typically observed within the B-CZ interbedded zone where the carbonate gravel seams were located. The hydraulic conductivities discussed in Section 2.0 for these B-CZ wells screened across the carbonate seams had a geometric mean of $1.1x10^{-7}$ cm/sec. Therefore, the ability to move fluids through the B-CZ is not practicable.

As an example of the difficulty of recovering DNAPL at the Site, wells MW-12B and MW-41B on the west side of the Site have had DNAPL in-well thicknesses as thick as 15 feet (MW-12B) and 22.8 feet (MW-41B). In 2009, monitoring well (test well) TW-41B was installed about 40 feet north of MW-41B between MW-41B and MW-12B to serve as a possible DNAPL recovery well given the relatively thick DNAPL noted in the two nearby wells. The well was constructed to the same general elevations and

screen interval as MW-41B (Attachment 1A, Figure 4C-3). However, no DNAPL has been detected in TW-41B, and groundwater samples from the well have been less than RALs.

Monitoring wells where DNAPL does flow into the wells, UPRR is conducting a DNAPL recoverability pilot study (discussed below). At these wells, DNAPL recovery will be evaluated for long-term source control of the creosote DNAPL in the three GWBUs.

To address the NAPL source control within the TI Zone for each of the GWBUs, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will be addressed through control via TI based on the occurrence of DNAPL in wells at the Site. The control endpoint will be to control the source (i.e., soluble NAPL fraction) sufficient to create stable or shrinking PCLE zones. Methods to control the creosote DNAPL will include physical (recover readily recoverable creosote DNAPL from wells with DNAPL present) or natural means at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the TI-based PMZ can be met.

The proposed response action to address the surface soils is through a soil cap over approximately 13 acres including most of the potential source areas (i.e., SWMU 4, 5, and 8). Even though the soil cap will not be designed for hydraulic control (designed to protect human health exposure to surface soils), the construction of the soil cap will be slightly sloped and vegetated, which will likely limit infiltration through the former source areas and limit further migration from the vadose zone to the upper GWBUs.

5.2 Remedial Action Performance

As discussed in Section 2.0, PBW initiated a 24-month pilot study in February 2013 to evaluate DNAPL recovery by conducting tests on selected wells where DNAPL had been observed. Details of the scope of work for the pilot test were submitted to the TCEQ in a letter dated February 5, 2013 (PBW, 2013). A copy of the scope of work is provided in RAP Appendix 3.
The preliminary results from the DNAPL recovery pilot test after the first 18 months indicate the following:

- Once per month DNAPL recovery activities are resulting in an overall stable DNAPL thickness trend in the wells tested. Wells showing increasing trends will continue to be evaluated over the next six months of the pilot test program.
- The current monthly recovery frequency appears to be effective with total DNAPL volume recovered becoming stable in the wells over time.

UPRR plans to continue the monthly DNAPL pilot test recovery efforts, and will submit the findings report following the January 2015 recovery event. The findings report will also have an assessment of other DNAPL recovery approaches, and will include recommendations for future DNAPL recovery to meet the response action objectives to address readily recoverable NAPL.

5.3 Restoration Timeframe Analysis

The presence of NAPL across the Site within the GWBUs is the key factor in evaluating the timeframe to achieve the Site remedial goals. Creosote NAPL is present as both a residual phase adsorbed onto the soil and GWBU matrix and as free-phase within the GWBUs. DNAPL removal through the use of groundwater extraction wells is limited by the characteristics of the complex hydrogeology and the physical properties of the creosote in the GWBUs. Creosote is a highly insoluble DNAPL that readily absorbs onto the soil matrix. Groundwater tends to flow around these areas saturated with DNAPL because creosote is highly hydrophobic, and as a result only a small fraction of the total contained PAH mass is actually exposed to the groundwater. Groundwater modeling at other creosote sites (i.e. North Cavalcade Superfund Site, Houston, Texas) indicate time frames of 50 to >100 years for restoration to groundwater protective standards (Idaho National Laboratory, 2006).

With DNAPL present within the GWBUs, efficiency of any recovery system installed at the Site will be limited by the slow rate of desorption of the creosote from the soil and GWBUs as a result of the low solubilities of the COCs in the DNAPL. Using traditional groundwater pumping and recovery system, large quantities of water would need to be pumped to remove a small fraction of the contaminants. Unless both the free-phase and residual DNAPL are removed from the soil and GWBUs material (as deep as approximately 68 feet in C-TZ), a groundwater extraction remedy will not be able to attain the remedial goals within the PCLE Zones in a reasonable time frame.

5.4 Alternative Cleanup Technologies

Aggressive cleanup technologies attempted at other creosote sites include thermal remediation. Thermal remediation using steam enhanced extraction (SEE) has been used as an alternative cleanup technology for creosote DNAPL. Through heating of the GWBU and DNAPL, SEE has been shown to reduce the residual soil saturation and enhance the mobility of the creosote for recovery by conventional groundwater extraction wells. The variables that affect the success of SEE include the hydrogeology of the site and extent of NAPL to be treated. Subsurface conditions such as permeability, heterogeneities, water saturation, and depth to contamination greatly affect the effectiveness of SEE. The target GWBUs must have adequate permeability (i.e., 10^{-3} cm/sec) in order to conduct the steam to heat the NAPL. GWBUs with low hydraulic conductivities would limit the radius of influence for the SEE system. The horizontal and vertical extent of the residual and free-phase DNAPL contamination is another major variable for evaluating SEE to address the creosote DNAPL. As previously discussed, the footprint of where DNAPL in each of the three GWBUs where DNAPL has been encountered extends over 50 acres and down to depths near 70 feet bgs. Based on a review of sites where SEE was used, the widespread contamination and multiple GWBUs at the Site would require numerous injection and extraction points to address the lower permeability sediments as well as prevent downward migration of the mobilized NAPL beyond the C-TZ.

Another limiting factor in applying the technology to this Site is the high capital cost involved for the installation of the systems. A review of available reports and studies on thermal remediation has shown that a limited number of sites have used SEE to address creosote impacted GWBUs. One site where SEE was applied was at the Visalia Pole Yard Superfund Site in California where creosote is a major contaminant at the site (US DOD, 2006). The SEE study was conducted at the Visalia site in 1997 through 2000 over a 1.75 acre area. Steam injection wells were installed at about 14 wells per acre and spaced about 57 feet apart. The cost estimates from the Visalia site indicated a unit cost of $197 per cubic yard of soil treated with an approximate total project cost of $21.5 million for the 1.75 acre area (US DOD, 2006). Applying the approximately $12 million per acre cost, the preliminary costs for the Site would be approximately $500 to $600 million to treat the 50 acre area.

Since the shallow GWBUs are not used for water supply, and the area is provided water by the City of Houston, remediation of the shallow GWBUs is cost prohibitive. The cost for an alternative cleanup technology such as SEE is impracticable given the limited future beneficial use. In addition, implementation of this approach would not be feasible in a residential area with numerous houses and city streets given the required well spacing to implement the system.

6.0 SIMILAR TI WAIVER SITES

PBW reviewed similar wood preserving sites where TI waivers have been granted for groundwater impacted with creosote. In EPA Region 6 alone, the following EPA Superfund sites that conducted wood preserving activities have been granted TI waivers (US EPA, 2012):

- Popile, Inc., El Dorado, Arkansas;
- Midland Products, Yell Co, Arkansas;
- Garland Creosoting, Longview, Texas;
- Hart Creosoting, Jasper, Texas;
- Jasper Creosoting, Jasper, Texas; and
- North Cavalcade, Houston, Texas.

A summary of the waivers are provided on Table 2G-1 of this attachment and the Texas sites that are listed are discussed below. In each case, the rationale for the TIs were that the waiver was necessary because the presence of PAHs in the dissolved phase groundwater plume and free-phase and residual DNAPL in the GWBUs make it technically impracticable to restore groundwater within a reasonable timeframe.

Garland Creosoting, Longview, Texas

The Garland Creosoting Superfund Site (CERCLIS ID TXD007330053) is located on 12 acres of land in Longview, Gregg County, Texas. Garland Creosoting began manufacturing creosote-treated wood products in 1960 and continued operations until declaring bankruptcy in February 1997. Creosote-contaminated groundwater was found during the investigation phase of the project. Creosote DNAPL was discovered in six of 16 monitoring wells during the investigation with DNAPL thickness ranging between 2 and 15 inches, and encompasses an area of about 1 acre (US EPA, 2006a). The TI waiver was

detailed in the EPA Record of Decision (ROD) dated September 2006. Below are the key aspects of the TI waiver(US EPA, 2012).

- TI Decision: ARARs waived are MCLs for PCP and benzo(a)pyrene.
- Rationale: Based on monitoring data, DNAPL was found from 2 to 15 inches in thickness over 1 acre. However, assuming the DNAPL is 6 inches thick and the aquifer has an effective porosity of 25 percent, more than 35,700 gallons of DNAPL are present. DNAPL may not be adequately delineated and its movement in the subsurface is difficult to predict. Previous non-time critical removal actions included soil removal and interceptor trenches that collect and treat water and NAPL before it migrates off-site; these trenches continue to operate. It is believed the trenches will be required to operate indefinitely to contain the groundwater contamination.
- Conditions: NAPL (suspected or observed) – DNAPL is present.
- COCs – PCP and benzo(a)pyrene
- Concentration – Maximum concentrations in 2002 were 16.4 µg/L for pentachlorophenol and 10.8 µg/L for benzo(a)pyrene.
- Geology – Silt and fine-grained sand unit overlain and underlain by clay unit.
- TI Zone – The TI Zone encompasses the entire site and areas that are captured by the existing trenches. Vertically, the zone extends through the shallow water-bearing zone down to the clay layer.
- Evaluation: Remedial Timeframe Estimate (years) – Exceeds reasonable timeframe estimate for site conditions.
- Remedial Action Alternatives – Selected remedy consists of continued operation of the interceptor trench, installation of additional groundwater recovery wells, MNA, and ICs to restrict future use of the groundwater.

Hart Creosoting, Jasper, Texas

The Hart Creosoting Company (HCC) Site (CERCLIS ID TXD050299577) is a former wood treating facility located near Jasper, Texas. The HCC Site is approximately 23.4-acres in size located 1 mile south of downtown Jasper and lies predominantly within a wooded area with light industrial, commercial, and residential land use. Wood treatment operations using creosote began in 1958 and ended in May 1993. The major features of the Site are: the former process area, the waste water treatment areas, a temporary waste cell, and non-process areas. The Site is underlain by alluvium composed of varying proportions of clay, silt, and sand size material extending to depths up to 220 feet. The subsurface geology was grouped into three low-permeability and three permeable zones, with the low-permeability zones comprised primarily of silt to clay size material and the permeable units comprised primarily of sand sized material. The estimated area where free phase and residual NAPL may occur is 2 acres (US EPA, 2006b). The TI waiver was detailed in the EPA ROD dated September 2006. Below are the key aspects of the TI waiver (US EPA, 2012).

- TI Decision: MCLs are being waived for all contaminants; the prominent one is naphthalene (MCL–100 µg/L). Groundwater PRGs will also not be achieved. See Table 3 of the 2006 ROD for all PRGs.
- Rationale: A TI waiver is necessary because the presence of PAHs in the dissolved phase groundwater plume and free-phase and residual DNAPL in multi-lithology zones make it technically impracticable to restore groundwater within a reasonable timeframe.
- Conditions: NAPL (suspected or observed) – Free-phase and residual DNAPL has been observed.
- COCs – 12 PAHs, 4 SVOCs, and benzene
- Concentration – Naphthalene was detected between 0.11 and 15.2 mg/L in 1986.
- Geology – Multi-lithology zones
- TI Zone – TI Zone includes all portions of on-site groundwater where naphthalene exceeds the PRG and extends from 10 to 200 feet bgs (groundwater zones P-2 and P-4); however the lateral extent of the TI zone is undefined in the references reviewed.
- Evaluation: Remedial Timeframe Estimate (years) – Exceeds reasonable timeframe estimate for site conditions.
- Remedial Action Alternatives – The selected remedy includes a NAPL recovery system, treatment of surface water, excavation and on-site landfilling for site soils and sediments, a TI waiver, MNA, and ICs (land and groundwater use restrictions).

Jasper Creosoting, Jasper, Texas

The Jasper Creosoting Company (CERCLIS ID TXD008096240) operated a wood treating facility on an 11 acre site located near Jasper, Texas. From 1946 until 1992, the facility discharged wastewater from the wood treatment process directly into an off-site drainage ditch, contaminating the soil, sediment, and groundwater with semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), pentachlorophenol (PCP) and dioxins/furans.(US EPA, 2014) Free phase NAPL was observed at two monitoring wells during the RI sampling event. The TI waiver was granted as detailed in the ROD dated September 2006 (US EPA, 2006c). Below are the key aspects of the TI waiver (US EPA, 2012).

- TI Decision: Maximum Contaminant Levels (MCLs) are being waived for all contaminants; the prominent one is naphthalene (MCL–100µg/L). Groundwater PRGs will also not be achieved. See Table 3 of 2006 ROD for all PRGs.
- Rationale: A TI waiver is necessary because the presence of PAHs in the dissolved phase groundwater plume and free-phase and residual DNAPL in multi-lithology zones make it technically impracticable to restore groundwater within a reasonable timeframe.
- Conditions: NAPL (suspected or observed) – Free-phase and residual DNAPL has been observed.
- COCs – PAHs
- Concentration – Maximum concentrations were 307,000 µg/L for total PAH and 105,000 µg/L for naphthalene in 2004.
- Geology – Multi-lithology zones
- TI Zone – TI Zone covers 12 acres and includes all portions of on-site and off-site groundwater where site COCs are above PRGs. Vertically, the zone includes groundwater zones P1 and P3 and extends to 150 feet bgs on-site and to 130 feet off site.
- Evaluation: Remedial Timeframe Estimate (years) – Exceeds reasonable timeframe estimate for site conditions.

- Remedial Action Alternatives – The selected remedy includes a NAPL recovery system, excavation and on-site landfilling for site soils, MNA for sediments and groundwater, a TI waiver, ICs, and P&T for containment (if necessary).

North Cavalcade, Houston, Texas

The North Cavalcade Street Superfund Site (CERCLIS ID TXD 980873343) is a 21-acre property and former wood treating site located in Houston, Harris County, Texas, about one mile southwest of the intersection of Loop 610 and U.S. Highway 59 (approximately 2 miles northwest of the UPRR Former HWPW). The Site is located within a commercial/industrial corridor, just north of the downtown Houston, with residential areas to the west (200 feet downgradient) and to the northeast. The wood treating facility was established in 1946 and continued in operation until 1961. The groundwater contaminant source areas are located on the southern 10-acre portion of the property. The two source areas include the former operation area and waste pits. The groundwater contamination in the lower interbedded dissolved phase plume extends offsite, with the groundwater contamination in the shallow sand is limited to onsite. Areas of residual DNAPL and isolated free-phase DNAPL have been encountered at the site. Natural attenuation of the groundwater contaminants and the lithologic characteristics of both shallow and interbedded water bearing zones limit expansion of the plume and provide containment of the dissolved contaminant plume. To address the DNAPL and associated COC groundwater plume, the Technical Impracticability of Ground Water Restoration technical memorandum was prepared for the EPA dated July 6, 2011 (CH2MHill, 2011). The EPA concluded that it is technically impracticable to restore all parts of the dissolved phase groundwater because of the intermittent occurrence of residual and free-phase DNAPL in the shallow sand and interbedded unit water-bearing zones. In particular, the contaminant plume in the interbedded unit will not be responsive to existing treatment technologies (US EPA, 2011). Below are the key aspects of the TI waiver (US EPA, 2012).

- TI Decision: ARARs waived are MCLs for benzene (5 µg/L) and benzo(a)pyrene (0.2 µg/L), and a state promulgated standard for naphthalene (1,500 µg/L onsite and 490 µg/L offsite) in the shallow sand and interbedded units.
- Rationale: Dissolved phase contamination exceeding these cleanup levels is limited to within 2 blocks west of the site despite wood treating operations ceasing at the site over 50 years ago. P&T was conducted for the shallow aquifer and removed an estimated 8,000 pounds of creosote from the shallow sand. Later investigation verified that contamination was also present in the underlying interbedded unit, a much siltier zone that was not conducive to the P&T remedy.

TI of groundwater restoration is supported by the following: (1) the remaining residual and free-phase DNAPL, although limited in extent, will continue to act as a source for site-related contaminants in groundwater, essentially outpacing the natural degradation of these contaminants in the areas where DNAPL appears. In this case, natural attenuation serves as a process for plume stability and containment, rather than restoration; (2) the heterogeneity and lithologic complexity of the interbedded unit limits the effectiveness of treatment technologies for source material and contaminated groundwater. While the predominant clay and silt limit migration of contamination, material bound in the matrix will continue to serve as an active source of contamination through dissolution. However, it cannot be removed or treated effectively or sufficiently to eventually achieve cleanup levels throughout the contaminated area; (3) the occurrence of DNAPL accumulation is limited to 4 wells out of the 65-well network associated with the source areas. DNAPL accumulation will continue to be measured and recovered when observed; and (4) source treatment has already been implemented using P&T and in situ source stabilization (ISS). P&T was found to be ineffective for the interbedded unit where the majority of contamination is observed, and expansion of the implemented ISS remedy or application of other remedies is limited by site features (active commercial businesses onsite, active rail lines, and future above-ground construction extending a highway).

- Conditions: NAPL (suspected or observed) – Free-phase and residual DNAPL are present.
- COCs – Benzene, benzo(a)pyrene and naphthalene
- Concentration – Maximum concentrations in 2010 exceed 10,000 µg/L for naphthalene and 500 µg/L for benzene. Plume maps are provided in the Technical Memorandum.
- Geology – The site is underlain by two water-bearing zones (shallow sand and interbedded unit) located above a thick regional clay layer (approximately 100 feet thick), which serves as a barrier to downward groundwater flow. The shallow sand is mostly poorly graded sand or silt sand. The interbedded unit is comprised of various clays, silts, and sands.
- TI Zone –The TI zone applies to both the shallow sand and interbedded units. The TI zone covers approximately 16 acres and is defined by the extent of the naphthalene plume in the interbedded unit.
- Evaluation: Remedial Timeframe Estimate (years) – Not provided in documents reviewed.
- Remedial Action Alternatives – The 2011 ROD Amendment selected containment of the shallow sand and interbedded unit dissolved phase plumes, as restoration throughout the impacted groundwater would not be achievable in the presence of DNAPL. The decision established a 16-acre TI Zone, wherein cleanup levels would be waived for benzene, benzo(a)pyrene, and naphthalene. ICs will be established to restrict the installation of groundwater wells within this zone to prevent exposure to contaminants.

The rationale for the TIs previously listed were that the waiver was necessary because the presence of PAHs in the dissolved phase groundwater plume and free-phase and residual DNAPL in the GWBUs make it technically impracticable to restore groundwater within a reasonable timeframe. Each one of the sites has similar geologic settings as the Former HWPW Site, with intervals of sand, silts, and clays. Of particular note is the geology at North Cavalcade, which is approximately two miles northeast of the Site. The description and general elevation of the shallow sand interval at the North Cavalcade site closely matches the A-TZ at the Site, and the interbedded unit may also match the intervals noted in the B-CZ at the Site.

Creosote is the common contaminant at each of these sites where TI waivers were granted. Restoration of the GWBU is not practicable while creosote DNAPL persists in the subsurface because it is a continuing source of groundwater contamination. Creosote DNAPL is also difficult to remove because the thick, oily liquids have an affinity for the soil matrix leaving residual DNAPL that may persist in the GWBU matrix for long periods of time after treatment. Therefore, attempts to reduce the DNAPL in the GWBUs may reduce the overall volume of contamination in the groundwater, the success of removing all of the DNAPL to the point where groundwater will be restored to cPCLs within a reasonable timeframe is not likely.

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FIGURES

ATTACHMENT 2G – PHOTOGRAPH 1
EXAMPLE OF CREOSOTE DNAPL SATURATION IN A-TZ WELL TW-56A
UPRR HOUSTON WOOD PRESERVING WORKS, HOUSTON TEXAS

Union Pacific Railroad — **Log of Boring: TW-56A**

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	1/23/09	Drilling Method:	Roto Sonic
Drilling Company:	WDC Exploration	Borehole Diameter (in.):	6
Driller:	William Bludworth	Total Depth (ft):	32.0
Driller's License:	4885	Northing:	728757.67
Field Supervisor:	Chris Moore	Easting:	3168069.59
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	49.1

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0		–	DO	FILL	(0 - 1.5) GRAVEL, fill.
				GC	(1.5 - 4.0) CLAYEY GRAVEL, GC, very dark gray, moist, hard, odor.
5					(4.0 - 18.2) SANDY CLAY, CL, light greenish gray, moist, firm to hard, some orange staining, odor.
10		27.3	6.0/7.0	CL	
		82.9			
		92.9			
15		124			
		18.1			
20		18	10.0/10.0		(18.2 - 30.6) SAND, SP, light greenish gray, wet, soft, fine sand, odor, some NAPL staining from 27.5-28.7, clay lens from 28.7-29.5, saturated with NAPL from 29.5-30.6.
		276			
		18.6		SP	
25		10.6			
		68.4	7.0/7.0		
		232			
30		20.6		CH	(30.6 - 32.0) CLAY, CH, red, moist, hard, odor.

PBW
Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
Tel (512) 671-3434 Fax (512) 671-3446

Notes:
Top 8 feet drilled out (DO) with a hydrovac to clear for utilities.

Initial Fluid Level (2/05/08)
▼ Depth to water: 17.48 ft BTOC

Annular Materials
(0.0 - 17.0) Portland/Bentonite Grout
(17.0 - 19.0) Bentonite Chips
(19.0 - 31.0) 16/30 Silica Sand
(31.0 - 32.0) Hole cave-in

Well Materials
(+3 - 21.0) Casing, 4" FJT Stainless Steel
(31.0 - 31.0) Screen, 4" FJT Stainless Steel, 0.01 wire wrap

TOC Elevation (ft AMSL)
51.89

ATTACHMENT 2G-1
FACTORS AFFECTING GROUNDWATER RESTORATION
UPRR HOUSTON WOOD PRESERVING WORKS, HOUSTON, TEXAS

Site/Contaminant Characteristics		Generalized Remediation Difficulty Scale →	
Site Use	**Nature of Release**	**Small Volume, Short Duration, Slug Release** → **Large Volume, Large Duration, Continual Release**	***Conditions at the Former HWPW Site***
Chemical Properties	Biotic/Aboitic Decay Potential	High → ***Low***	*Creosote has low decay potentail*
	Volatility	High → ***Low***	*Creosote is predominately PAHs, low volatility*
	Contaminant Retardation (Sorption) Potential	High → ***Low***	*High contaminant retardation, but large volumes to create DNAPL in GWBUs*
Contaminant Distribution	Contaminant Phase	Aqueous, Gaseous → Sorbed → LNAPLS → ***DNAPLS***	*Large amounts of DNAPL, in multiple GWBUs - A-TZ, B-CZ, B-TZ, & C-TZ.*
	Volume of Contaminated Media	Small → ***Large***	*DNAPL has been detected in soil borings and wells extending over a 50 acre area.*
	Contaminant Depth	Shallow → ***Deep***	*Creosote DNAPL is observed in the C-TZ, approx 68 feet bgs*

Hydrogeologic Characteristics			
Geology	Stratigraphy	Simple Geology, e.g., planar bedding strata → ***Complex Geology, e.g., interbedded and discontinuous***	*Complex lithology, sands, silts, clays, interbedded zones (B-CZ), find grained silty sand (A-TZ, C-TZ).*
	Texture of Unconsolidated Deposits	Sand → ***Clay***	*DNAPL has been observed in the sandy intervals, as well as within the clay and carbonate gravel seams within the B-CZ. C-TZ is characterized as a silty sand with high silt content*
	Degree of Heterogeneity	Homogenous e.g., well-sorted sand → ***Heterogeneous e.g., interbedded sand and silts, clays, fractured media, karst***	*Site geology is heterogeneous with multiple interbedded sand, silt and clay intervals. DNAPL has been noted in the A-CZ, A-TZ, B-CZ, B-TZ, C-CZ, and C-TZ(six cohesive and transmissive zones).*
Hydraulics/Flow	Hydraulic Conductivity of Aquifer	High (>10^{-2} cm/sec) → ***Low (<10^{-4} cm/sec)***	*Hydraulic conductivites range from 10^{-3} cm/s (A-TZ), 10-4 cm/sec (B-TZ), to 10^{-7} cm/sec (B-CZ).*
	Temporal Variation of Flow Regime	Little/None → High	*Portions of the A-TZ, B-CZ, and B-TZ have varioations in flow on the west side of the Site, with varible flow north of the Site in the B-CZ. C-TZ flow is relatively consistent over time, but in opposite diretion of A-TZ, B-CZ, and B-TZ*
	Vertical Flow	Little Component → ***Large Downward Flow***	*There is a large downward vertical gradient between A-TZ-B-CZ/B-TZ and C-TZ. In addition, with creosote DNAPL, the density difference also drives migration downward.*

Source: EPA, 1993 with minor modifications

EXPLANATION

- UPRR Property Boundary
- Property Boundary (GIMS)
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- NAPL Noted on Boring Log
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- Proposed Well for PMZ
- Proposed TI Zone

Notes:

1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

Lucille
Lelia
Wylie
Liberty Road
Lavender
Clementine
Wipprecht
Kashmere
Erastus
Cushing
Lockwood
Harden
Sudan

PMW-83B
PMW-85C
PMW-82B
PMW-84B
MW-67B
MW-28C
MW-28A
MW-63B
MW-68C
MW-68B
MW-26A
MW-33BR
MW-35B
MW-35A
MW-32AR
MW-32B (DNAPL)
MW-33A
MW-70B
MW-71B
MW-34CR
MW-36B
MW-36A
MW-44A
MW-45C (DNAPL)
MW-46C (DNAPL)
MW-25C
MW-25A
MW-44C (DNAPL)
MW-54C
MW-57A
MW-58A
MW-57B
MW-18AR
MW-18C
MW-18A
MW-60A
MW-47C
MW-72B
MW-52A
TW-56A
MW-23C
MW-30A
MW-17
MW-17C
MW-15C
MW-15A
MW-15B
MW-13
MW-14
MW-20A
MW-31A
MW-19C
MW-55B
MW-55A
MW-73B
MW-74B
MW-16
MW-79A
MW-49B
MW-48C
MW-49A
MW-61A
MW-69A
MW-59A
MW-59B
MW-75B (DNAPL)
MW-78A (DNAPL)
MW-80B
MW-77A
MW-76C
MW-50A
MW-81B
MW-51A
MW-51C
MW-64A
MW-21C
MW-07
MW-10B
MW-11B
MW-22A
MW-22B
MW-10A
MW-03
MW-02
MW-01A
MW-08
MW-11A
MW-04
MW-05
P-10
P-11
P-12
MW-09
MW-62B
TW-41B
MW-41B (DNAPL)
MW-38E
MW-12A
MW-12C
MW-12B (DNAPL)
MW-38A
MW-39B
MW-40B
MW-42B
MW-27A
MW-27C

UNION PACIFIC RAILROAD CO.

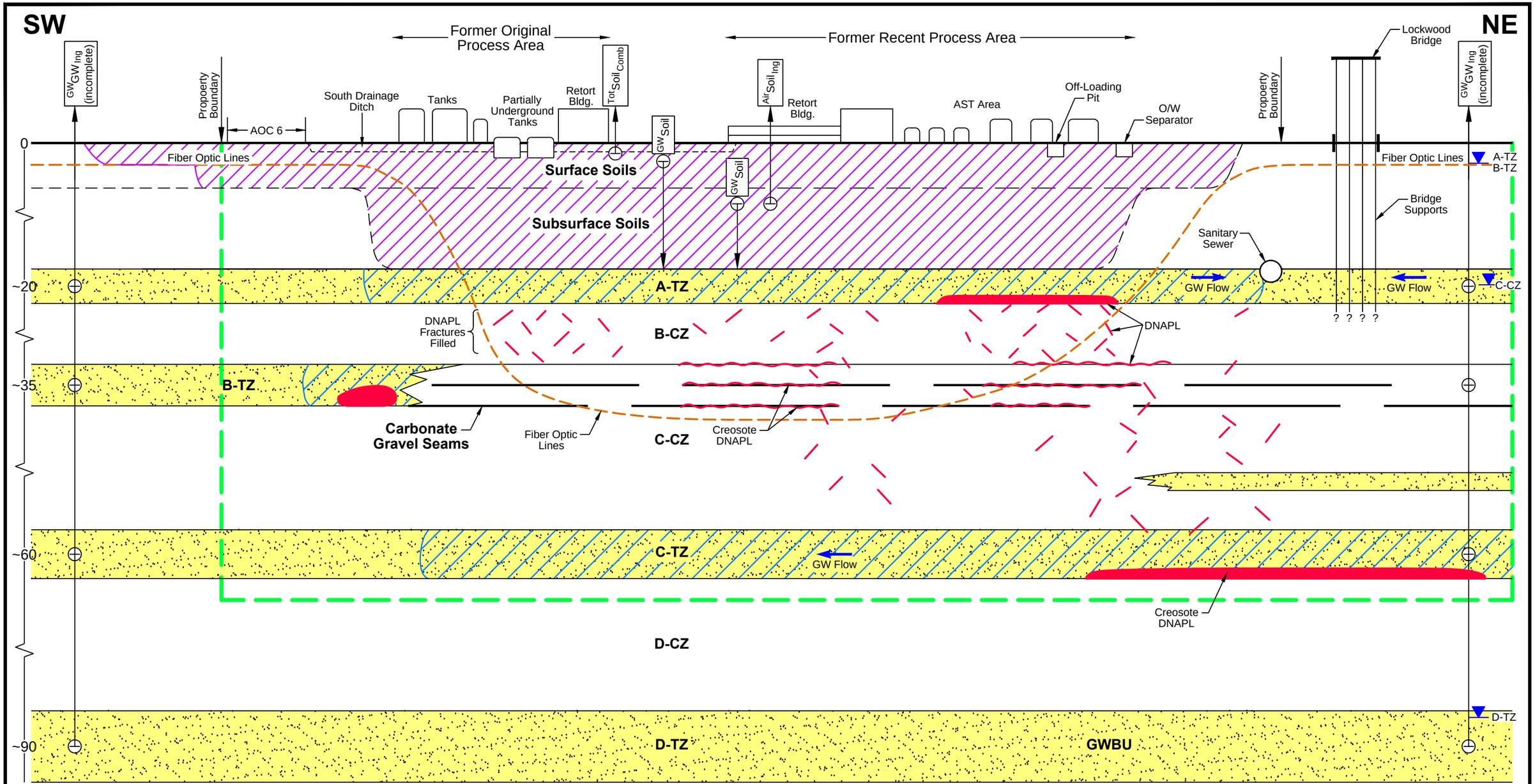
HOUSTON WOOD PRESERVING WORKS

Attachment 2G-2

PROPOSED TI ZONE

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS



UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 2G-3

CONCEPTUAL SITE MODEL
SW - NE

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: OCT., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

S

N

Englewood Intermodel Yard

Former HWPW

Off-Site Residents

Propoerty Boundary

$GW_{GW\ Ing}$ (incomplete)

Asphalt

~20-inch Concrete

Former Tank Farm

Ballast

Rail

$Air_{Soil\ Ing}$

Retort Bldg.

GW_{Soil}

AST Area

$Tot_{Soil\ Comb}$

Propoerty Boundary

Liberty Road

$GW_{GW\ Ing}$ (incomplete)

0

~20

~35

~60

~90

Surface Soils

Subsurface Soils

Surface Soils (Off-Site)

A-TZ

B-TZ

C-CZ

D-TZ

GWBU

A-TZ

B-CZ

C-CZ

C-TZ

D-CZ

D-TZ

GWBU

GWBU

DNAPL Fractures Filled

Carbonate Gravel Seams

Creosote DNAPL

Soil Affected Property

Groundwater Affected Property

TI Zone

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 2G-4

CONCEPTUAL SITE MODEL
S - N

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: OCT., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC

CONSULTING ENGINEERS AND SCIENTISTS

Institutional Control	RAP Worksheet 2.4 Page 28 of 28	
Associated Information: Appendices 4, 5	ID No.: SWR ID 31547	Report Date: November 21, 2014

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **Union Pacific (on-site Deed Notice) and 101 properties (including City of Houston right of way) (Restrictive Covenants) falling within the PMZ**

Repeat this worksheet for each different property for which an institutional control will be used. ***(*See Appendix 5 for full list of Worksheet 2.4 for each off-site property, map of properties, and summary table)***

Institutional Control	Type of Institutional Control[1]				Property Ownership		Anticipated Filing Date[2]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))	**X**				**X**		**Within 120 days of RAP approval**
Document use of physical or institutional control under Remedy Standard B §350.31(g))	**X**	**X***			**X**	**X***	**Within 720 days of RAP approval (off-site IC)**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(I))	**X**	**X***			**X**	**X***	**Within 720 days of RAP approval (off-site PMZ)**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))	**X**	**X***			**X**	**X***	**Within 120 days of RAP approval**

[1] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[2] Specify date or amount of time after RAP approval.

Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

Performance Measures

List and describe the performance measures for each environmental medium containing a PCLE zone that will be used to determine if reasonable progress is being made by the response action in a timely manner. Use these measures to document effectiveness of the response action in the RAER.

Surface/Subsurface Soils

For the impacted soils within the PCLE Zone to be excavated and relocated within the Area of Contamination, the effectiveness of the response action will be demonstrated by confirmation sampling from the excavation that indicates COC concentrations in remaining soils are below critical PCLs (commercial/industrial total soil combined). During excavation activities, measures will be conducted to ensure migration of impacted soils do not leave the Area of Contamination (Soil Affected Property). These measures will include silt fencing, dust monitoring and control, and adequate storm water protection and management during the construction activities.

For the area to be capped within the former HWPW, performance measures will include routine cap inspections to ensure that the cap has not been eroded and thereby exposing soils with COC concentrations greater than cPCLs. Vegetation on the cap will be maintained through a mowing program. For the Englewood Intermodal Yard, performance measures will include routine inspections of the concrete pavement to ensure cracks have not developed in the pavement. Cracks will be repaired in the pavement. The railroad ballast area will be maintained as part of normal railroad operations in the area. These operations will include track and tie maintenance, as well as maintenance of the ballast material for the functions of the rail lines. Inspections of the ballast will assess if areas of exposed soil are present within the soil PCLE Zone.

A cap inspection and maintenance program for both areas will be conducted to maintain the integrity of the cap and to ensure that it continues to meet its performance objectives. See RAP Worksheet 3.2.

Groundwater

Groundwater monitoring will be performed in conjunction with the PMZ (Standard B) response action proposed for the groundwater PCLE zone. Confirmation that the downgradient extent of the PCLE Zone does not expand outside the boundaries of the on-site and off-site PMZs will be provided by comparing concentrations of these COCs to the AALs or exceedance of a cPCL at a POE well as specified in Worksheet 2.1. In the event that an AAL or a cPCL in an alternate POE well is exceeded in an initial monitoring sample, a second confirmation sample will be collected within 60 days from the monitoring well where the initial unverified exceedance was observed and analyzed for the specific COC that exceeded its AAL. If the COC concentration in the second sample is greater than the AAL, a confirmed AAL exceedance will be concluded and further action will be required, unless an alternate source demonstration can explain the detection. Possible further actions for the site following a confirmed AAL exceedance may include modifications to the monitoring frequency or monitoring locations (e.g., installation of additional monitoring locations), re-evaluation of concentration trends in existing monitoring wells, or re-evaluation of the AALs in the context of overall COC data trends (see Appendix 7 for Mann-Kendall Analysis). The TCEQ will be promptly notified of any verified exceedances. Further details of the Sampling and Analysis Plan are provided in Worksheet 3.1 and Appendix 6.

NAPL Recovery

PBW will be concluding the 24-month DNAPL Recovery Pilot Study in January 2015. At that time, a long-term recovery program may be initiated pending the results of the pilot test. The preliminary results from the DNAPL recovery pilot test after the first 18 months (PBW, 2014) indicated the following:

- Once per month DNAPL recovery activities are resulting in an overall stable DNAPL thickness trend in the wells tested. However, wells showing increasing trends will continue to be evaluated over the next six months of the pilot test program.
- The current monthly recovery frequency appears to be effective with total DNAPL volume recovered becoming stable in the wells over time.

Performance measures for DNAPL recovery will be no significant DNAPL thickness increase in the wells pumped (compared to pre-test levels), and no migration of DNAPL to wells that had no previous indication of DNAPL present (in-well observations as well as NAPL noted in the boring log in the GWBU).

Potential Problems

Complete the table for the response action. When the response action consists of several components or multiple actions, complete one table for each major component or action.

Response Action Name/Designation: **Soil Consolidation and Cap**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Storm events during excavation and relocating impacted soils at the Site	Potential surface water/run-off impact		X	Develop storm water management plan for excavation and relocation activities, including a Storm Water Pollution and Prevention plan (SWPPP) and contingencies for storm water containment, silt fencing, and diversions around excavation areas.
Migration of dust during soil relocation	Potential migration of impacted soils		X	Develop a dust monitoring and suppression program for the excavation activities

General deterioration of the clay cap or concrete cover over time.	Exposure of COCs in capped soils, exposed to storm water, potentially windblown dust, worker exposure	X		UPRR will develop an inspection and maintenance program to identify and correct any deterioration of the vegetated clay cap for the HWPW area and repair or replace concrete in the Englewood Intermodal Yard. See RAP Worksheet 3.2.

Response Action Name/Designation: **PMZ/TI Zone**

List the potential problems that might be reasonably anticipated for the response action, describe the impact of each problem, and the response to the problem.

Description of the Potential Problem	Impact	Will this cause a response action failure?		Corrective Response
		Yes	No	
Exceedance of COC AAL at AMP or POE	Potential migration of groundwater PCLE Zone beyond on-site and off-site PMZ/TI Zones	X		Re-evaluate the groundwater concentrations to determine if the PCLE is migrating beyond the PCLE Zone. If migration confirmed, UPRR will evaluate response actions to prevent or mitigate the PCLE Zone outside of the on-site and off-site PMZs. The boundaries of the PMZs will also be evaluated.
DNAPL migration to wells that had no previous indication of DNAPL (in-well or soil boring observation)	Potential migration of NAPL/groundwater PCLE Zone beyond PMZ/TI Zones	X		Re-evaluate DNAPL recovery options to prevent lateral or vertical migration.

List the monitoring and sampling of COC concentrations or other parameters that will be conducted during the response action. Illustrate the monitoring or sampling locations in Attachment 3A. If statistics or geostatistics will be used, provide details in Appendix 7. If monitoring or observation wells will be constructed for the response action, provide well construction details in Attachment 2B if not previously provided.

Monitored Media	COC[1]	Other parameter (specify)	Sampling Method[2]	Sampling points or locations[3]	Depth/Height[4] (ft.)	Analytical or Field Screening Method	Sampling or Monitoring Frequency[5]
Surface Soil	Site Specific SVOCs: Benzo(a)anthracene Benzo(a)pyrene Dibenzofuran 1,2-Diphenylhydrazine 2,4-Dinitrotoluene Fluoranthene Phenanthrene		Bulk sampling	PCLE zone excavation; and perimeter of proposed soil cap area to confirm soil PCLE zone for cap	Sidewalls and base of excavation; and near the soil cap from 0-5 feet bgs.	US EPA 8260	One time
Subsurface Soil	None						
Groundwater	Site-Specific VOCs		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 8260	Semi-Annual
	Site-Specific SVOCs		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 8270	Semi-Annual
	Arsenic, lead		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 6010/6020	One-time to evaluate metals in groundwater.

Explain the reasons for the above-listed monitoring and sampling plan.

The monitoring and sampling plan for the groundwater PCLE zone was developed in accordance with PMZ monitoring procedures provided in

[1] Specify the COCs to be monitored in this media. List either type of COC (such as VOCs, metals) if all the COCs of that type will be monitored the same way.
[2] Describe the sampling or monitoring methods and QC procedures in Appendix 1 unless the proposed sampling or monitoring procedure is the same as the sampling or monitoring procedure described in the APAR.
[3] Specify the sampling or monitoring point, such as the specific monitor well or general sampling or monitoring location.
[4] Specify the depth or height of the sampling or monitoring points.
[5] Specify the frequency at which this monitoring or sampling will occur.

§350.33(f)(4)(D). As specified therein, AMPs were established at a hydraulically upgradient location within the PCLE zone for each unit (A-TZ, B-CZ/B-TZ, and C-TZ) and at locations continuing down the approximate central flow path to the downgradient extent of the on-site and off-site PMZ. These are the AMPs for which AALs were developed as detailed in Attachment 2E. Selected monitoring wells not located along the approximate central flow path will continue to be monitored to evaluate potential migration of the PCLE Zone at the upgradient, cross-gradient, and downgradient POEs. The four D-TZ monitoring wells will also be sampled to evaluate the potential for vertical migration of COCs to the underlying water-bearing zone. Semi-annual monitoring of the wells is proposed based on the stability of the PCLE zone and absence of potential receptors in the area. With the main source area proposed to be capped, monitoring wells within the capped area will be plugged and abandoned.

Additional POE wells are proposed to be installed in the B-CZ/B-TZ off-site (three wells) and in the C-TZ off-site (one well). Details of the well construction are provided in Attachment 2B.

ATTACHMENT 3A

PROPOSED GROUNDWATER MONITORING NETWORK

ATTACHMENT 3A TABLE 1 – PROPOSED GROUNDWATER MONITORING NETWORK
ATTACHMENT 3A TABLE 2 – ADDITIONAL MONITORING WELLS
ATTACHMENT 3A – PMZ GROUNDWATER MONITORING NETWORK

ATTACHMENT 3A - TABLE 1

PROPOSED GROUNDWATER MONITORING NETWORK
UPRR HOUSTON WOOD PRESERVING WORKS, HOUSTON, TEXAS

WELL NO.	AMP/POE Well	DATE INSTALLED	NORTHING	EASTING	TOP OF CASING ELEVATION (FT HVD)	TOTAL DEPTH (FT BGS)	Top Screen Interval (FT BGS)	Bottom Screen Interval (FT BGS)	Zone
A-TZ MONITORING WELLS									
MW-15A	POE	2/25/1997	728,755	3,166,931	50.41	30	12	26.1	A-TZ
MW-18A*	AMP	2/26/1997	728,839	3,168,227	51.57	35	18	32.5	A-TZ
MW-25A	AMP	3/7/2000	729,089	3,168,524	44.65	29	18.5	28.5	A-TZ
MW-26A	POE	3/7/2000	729,159	3,167,519	44.62	26	14.5	24.5	A-TZ
MW-35A	POE	2/21/2007	728,985	3,167,045	44.75	28	13	28	A-TZ
MW-36A	POE	2/22/2007	729,148	3,168,167	44.53	28	18	28	A-TZ
MW-44A	AMP	2/22/2007	729,021	3,168,349	45.11	28	18	28	A-TZ
MW-50A	POE	3/1/2007	727,501	3,167,958	46.96	25	15	25	A-TZ
MW-59A	POE	1/28/2009	728,155	3,168,358	44.18	21	11	21	A-TZ
MW-60A	POE	1/26/2009	728,825	3,168,823	46.79	28.5	18.5	28.5	A-TZ
MW-61A	POE	1/26/2009	728,336	3,168,630	44.67	22	12	22	A-TZ
MW-69A	POE	6/23/2010	728,136	3,168,234	45.71	18.5	8.5	18.5	A-TZ
MW-77A	POE	5/7/2014	727,672	3,166,981	49.05	25	13	23	A-TZ
B-CZ/B-TZ MONITORING WELLS									
MW-14	POE	2/27/1997	728,718	3,166,550	50.66	45	28	42.5	B-TZ
MW-33BR	AMP	12/19/2011	729,142	3,167,662	44.86	40	28	38	B-CZ
MW-36B	POE	6/24/2010	729,161	3,168,172	44.07	43	38	43	B-CZ
MW-38B	POE	12/31/2003	728,319	3,165,945	45.51	37	25.5	35.5	B-TZ
MW-39B	POE	12/16/2003	728,424	3,166,019	49.58	40	29.5	39.5	B-TZ
MW-59B	POE	6/26/2010	728,145	3,168,358	44.36	33	28	33	B-CZ
MW-62B	POE	1/21/2009	728,190	3,165,880	48.16	35	25	35	B-TZ
MW-63B	AMP	1/28/2009	729,361	3,167,652	44.48	36	31	36	B-CZ
MW-67B	POE	6/26/2010	729,782	3,167,588	43.93	40	35	40	B-CZ
MW-70B	AMP	12/14/2011	728,944	3,167,671	45.02	40	25	35	B-CZ
MW-80B	POE	5/8/2014	727,907	3,168,201	47.107	35	29	34	B-TZ
MW-81B	POE	5/11/2014	727,292	3,167,926	46.766	40	29	34	B-TZ
P-11	POE	3/25/1991	728,049	3,166,025	48.98	50	36.2	38.2	B-TZ
PMW-82B	POE	Proposed			TBD	~40	TBD	TBD	B-TZ
PMW-83B	POE	Proposed			TBD	~40	TBD	TBD	B-TZ
PMW-84B	POE	Proposed			TBD	~40	TBD	TBD	B-CZ
C-TZ MONITORING WELLS									
MW-15C	POE	4/25/1997	728,761	3,166,947	50.01	75	64	73.5	C-TZ
MW-17C	AMP	12/10/2003	728,779	3,167,446	50.17	70	59.5	69.5	C-TZ
MW-21C	POE	10/26/1998	727,730	3,165,884	49.05	72.5	62.5	72.5	C-TZ
MW-23C	AMP	10/14/1998	728,759	3,167,721	51.91	72.5	62.5	72.5	C-TZ
MW-28C	POE	4/12/2001	729,461	3,167,920	43.96	88	75	85	C-TZ
MW-34CR	AMP**	5/9/2014	728,982	3,168,227	46.47	70	60	70	C-TZ
MW-47C	POE	3/16/2007	728,725	3,168,535	45.61	71	61	71	C-TZ
MW-48C	POE	2/2/2004	728,417	3,168,241	44.68	72	60	70	C-TZ
MW-51C	POE	5/10/2014	726,935	3,166,894	47.48	80	62	72	C-TZ
MW-54C	POE	8/15/2006	729,218	3,168,766	44.99	72	60	70	C-TZ
MW-68C	AMP**	6/25/2010	729,164	3,167,346	44.8	70	60	70	C-TZ
MW-76C	AMP	5/7/2014	727,485	3,166,628	47.84	70	60	70	C-TZ
PMW-85C	POE	Proposed			TBD	~70	TBD	TBD	C-TZ

Notes:
POE - Point of Exposure Wells
AMP - Attenuation Monitoring Points (AMPs)
Monitoring well MW-18A is within the proposed soil cap area, well will be replaced
BGS=Below Ground Surface
HVD = Elevations relative to Houston Vertical Datum, Houston Monument System
Northing/Easting = Coordinates based on NAD 1927 Texas State Plane, South Central Zone, US Survey Feet
* - Well will be replaced with MW-18AR (current location within soil cap area and will be plugged)
** - AALs not calculated for these wells (upgradient and cross-gradient of primary source area), but will be monitored.

ATTACHMENT 3A - TABLE 2

ADDITIONAL MONITORING WELLS
UPRR HOUSTON WOOD PRESERVING WORKS, HOUSTON, TEXAS

WELL NO.	PURPOSE OF WELL	DATE INSTALLED	NORTHING	EASTING	TOP OF CASING ELEVATION (FT HVD)	TOTAL DEPTH (FT BGS)	Top Screen Interval (FT BGS)	Bottom Screen Interval (FT BGS)	Zone
A-TZ MONITORING WELLS									
MW-22A	Off-site PCLE	10/1/1998	727,876	3,165,677	46.07	25	10	20	A-TZ
MW-78A	DNAPL recovery	5/6/2014	727,953	3,167,512	48.68	30	15	25	A-TZ
B-CZ/B-TZ MONITORING WELLS									
MW-12B	DNAPL recovery	2/27/1997	728,328	3,166,004	50.02	45	32.5	42.5	B-TZ
MW-22B	Off-site PCLE	10/27/1998	727,871	3,165,678	45.86	38	27.5	37.5	B-TZ
MW-32B	DNAPL recovery	12/15/2011	728,918	3,167,400	44.73	40	26	36	B-TZ
MW-41B	DNAPL recovery	1/7/2003	728,176	3,166,003	49.37	40	29.5	39.5	B-TZ
MW-75B	DNAPL recovery	12/20/2011	728,066	3,168,022	47.18	40	32.2	37.2	B-TZ
C-TZ MONITORING WELLS									
MW-44C	DNAPL recovery	1/16/2004	729,021	3,168,349	45.03	70	57.5	67.5	C-TZ
MW-45C	DNAPL recovery	1/20/2004	729,155	3,168,512	44.73	70	58	68	C-TZ
MW-46C	DNAPL recovery	1/9/2004	729,121	3,168,576	44.94	72	60	70	C-TZ
D-TZ MONITORING WELLS									
MW-36D	Sentry monitoring	6/23/2010	729,162	3,168,180	44.33	110	100	110	D-TZ
MW-59D	Sentry monitoring	1/27/2009	728,114	3,168,365	44.22	118	108	118	D-TZ
MW-65D	Sentry monitoring	1/17/2009	729,512	3,168,331	44.55	110	100	110	D-TZ
MW-66D	Sentry monitoring	1/20/2009	729,137	3,169,381	46.51	103	93	103	D-TZ

Notes:
These monitroing wells are not part of the proposed monitoring network. Wells listed above are to evaluate DNAPL, PCLE Zone on west sideoff site, and sentry wells forr the D-TZ
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MW-45C	DNAPL recovery	1/20/2004	729,155	3,168,512	44.73	70	58	68	C-TZ
MW-46C	DNAPL recovery	1/9/2004	729,121	3,168,576	44.94	72	60	70	C-TZ
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MW-36D	Sentry monitoring	6/23/2010	729,162	3,168,180	44.33	110	100	110	D-TZ
MW-59D	Sentry monitoring	1/27/2009	728,114	3,168,365	44.22	118	108	118	D-TZ
MW-65D	Sentry monitoring	1/17/2009	729,512	3,168,331	44.55	110	100	110	D-TZ
MW-66D	Sentry monitoring	1/20/2009	729,137	3,169,381	46.51	103	93	103	D-TZ

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EXPLANATION

- UPRR Property Boundary
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
- Proposed Well for PMZ

Notes:

1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Houston-Galveston Area Council (HGAC) 2012 Aerial.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

PMW-83B
PMW-84B
PMW-85C
PMW-82B
MW-67B
MW-28C
MW-63B
MW-68C
MW-33BR
MW-26A
MW-35A
MW-32B
MW-70B
MW-36B
MW-36A
MW-34CR
MW-44A
MW-45C
MW-46C
MW-54C
MW-44C
MW-25A
MW-18AR
MW-60A
MW-47C
MW-15C
MW-15A
MW-14
MW-17C
MW-39B
MW-38B
MW-12B
MW-41B
MW-62B
P-11
MW-21C
MW-48C
MW-61A
MW-69A
MW-59A
MW-59B
MW-75B
MW-78A
MW-80B
MW-77A
MW-76C
MW-50A
MW-81B
MW-51C

Lucille
Fontinot
Lelia
Wyllie
Liberty Road
Wipprecht
Solo
Lavender
Clementine
Kashmere
Erastus
Cushing
Lockwood
Harlem
Sudan

(DNAPL)

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 3A

PMZ GROUNDWATER MONITORING NETWORK

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

Use this worksheet to describe the operation and maintenance (O&M) activities for each response action. In situations where the response action consists of more than one major component, for clarity one worksheet can be completed for each major component.

Response Action Name/Designation: **Remedy Std. B – Clay/Concrete Cap and PMZs/TIs**
List all portions of the response action to which this information applies.

Describe the O&M and inspection activities that will be required to operate and maintain response action components.

An inspection and maintenance program will be implemented for the clay cap and associated features of the clay cap within the former HWPW area, and the concrete pavement area within the Englewood Intermodal Yard. Inspections of the railroad ballast area between the former HWPW and Englewood Intermodal Yard will also be conducted to evaluate issues with the ballast continuing to serve as a physical barrier. Groundwater monitoring will be conducted within the PCLE zone, PMZ and adjacent areas. Regular sampling of the wells will occur on a semi-annual and annual basis depending on the wells. At that time the monitoring wells will be inspected for signs of damage, including well pads, casing, locks, and, protective covers. The total depth of wells will be measured annually.

The inspection and maintenance program for the capped areas is described on RAP Worksheet 5.0.

The groundwater monitoring program is provided on RAP Worksheet 3.1.

List and discuss the key operating parameters for a properly functioning response action. Address how changes in these parameters will result in operating changes, providing sufficient detail to explain how the operator will know the component is functioning properly.

Not applicable.

List the routine tasks required to operate the response action.

Not applicable.

List the routine tasks required to maintain the response action, including scheduled inspections, maintenance, and component replacement.

Routine tasks to be performed as part of the proposed response actions include the following:

1. Quarterly soil cap (HWPW), concrete cap, and railroad ballast inspections;
2. Semi-annual groundwater sampling and analysis, evaluation of monitoring data, and monitoring well inspection and repair (if needed).
3. DNAPL recovery from selected wells (frequency to be determined following 24-month pilot study).

Confirmation Sampling Plan	RAP Worksheet 4.0 Page 1 of 2	
Associated Information: Attachment 4A	ID No.: SWR ID 31547	Report Date: November 21, 2014

List the COCs and other parameters that will be sampled to confirm completion of the response action. Illustrate the monitoring or sampling locations in Attachment 4A. If monitoring or observation wells will be constructed for the response action, provide well construction details in Attachment 2B if not previously provided. If needed, describe the sample collection and handling methods, if not previously provided, in Appendix 6.

Media	COC[1]	Other parameter (specify)	Sampling Method	Sampling points[2]	Depth/height (ft.)	Analytical Method	Sampling Frequency
Surface Soil	Site Specific SVOCs: Benzo(a)anthracene Benzo(a)pyrene Dibenzofuran 1,2-Diphenylhydrazine 2,4-Dinitrotoluene Fluoranthene Phenanthrene		Bulk sampling	PCLE zone excavation within AOC	Sidewalls and base of excavation	US EPA 8260	One time
Subsurface Soil	None						
Groundwater	Site-Specific VOCs		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 8260	Semi-Annual and Annual
	Site-Specific SVOCs		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 8270	Semi-Annual and Annual
	Arsenic, lead		Same as APAR (low-flow sampling)	See Attachment 3A for list of wells	Middle of screened interval of monitoring well	US EPA 6010/6020	One-time to evaluate metals in groundwater.
Surface water							
Sediment							

[1] Specify either a specific COC or type of COC (such as VOCs, metals).
[2] Specify the sampling point to the degree it is known, (for example, MW-1, or near former boring #2).

Air							
Other media (specify)							

Explain the reasons for the above-listed sampling plan. Discuss statistical or geostatistical methodology(ies) which will be applied, if any, in the data collection process. Discuss any assumptions made in the statistical/geostatistical assessment, and how they will be met.

See explanation previously provided in Worksheet 3.1.

ATTACHMENT 4A

ATTACHMENT 4A – MAP OF CONFIRMATION SAMPLE POINTS (TO BE DEVELOPED FOLLOWING ADDITIONAL SOIL SAMPLING)

Post-Response Action Care	RAP Worksheet 5.0 Page 1 of 3	
Associated Information: Attachments 5A-5C	ID No.: 31547	Report date: November 21, 2014

Complete this worksheet only if Remedy Standard B will be used.

What is the proposed initial post-response action care period? (default 30 yr.) **30** years

If the proposed initial post-response action care period is less than 30 years, provide a technical justification in accordance with §350.33(h).

Soil Response Action

The initial post-response action care period for the clay cap (HWPW), concrete pavement (Englewood Intermodal Yard), and railroad ballast area is 30 years. Inspections and maintenance of the caps will be performed for an initial period of 30 years.

Groundwater Response Action

The post-response action care period for groundwater monitoring will be 30 years. However, if groundwater concentrations decrease to levels below cPCLs, a shorter post-response action care period may be proposed.

What is the foreseeable land use during the post-response action care period? Commercial/Industrial and Residential (off-site properties)

Describe how the future use of the property will not compromise the integrity of the physical controls, will not interfere with the function of the monitoring systems, will not pose a threat to human health or the environment, and will be in accordance with any institutional controls.

For the two soil response areas within the Site, the former HWPW area is inactive and UPRR will restrict access to the HWPW soil capped area to those performing inspections, monitoring or maintenance. Access to the HWPW area is limited by fencing. Signs will be posted stating that digging is prohibited on the capped area. For the concrete cap area within the Englewood Intermodal Yard, this area will continue to be used for the commercial/industrial intermodal operations. The Englewood Intermodal Yard is secured by fencing and security guards that limit access to the area to UPRR employees, contractors, and vendors to the yard. The concrete pavement that makes up the cap was designed for its current use (i.e., allow loading, unloading, transportation, and storage of container boxes). The railroad ballast area will continue to be used for railroad operations and will be maintained for those operations. UPRR Engineering Standards for Roadbase Section for Wood Tie Track Construction (UPRR, 2006) indicates that the recommended minimum ballast thickness is 15 inches, which will serve as the protective barrier for on-site workers from exposure to surface soils.

Institutional controls will be placed on all properties within the groundwater PLCE Zones to prohibit installation of groundwater wells and use of the shallow groundwater. This extends from the UPRR property (will be deed recorded commercial/industrial use only) to the off-site residential and City of Houston right of ways (ROWs) (Attachment 5A). The future use of the off-site properties will not affect the proposed response.

Briefly describe the proposed post-response action care activities. Describe the type of monitoring and/or inspections to be performed. Discuss the rationale for not including COC(s) analyzed during the response action, monitoring or sampling point location, frequency of monitoring and/or inspections, and the duration of the monitoring program.

The cap inspection and maintenance program will be developed to ensure the integrity of the cap and vegetative cover. The maintenance program will consist of the following:

VISUAL INSPECTIONS

Inspections will be performed on a quarterly basis and after all major storms. The inspections will focus on the following major issues:

1) Erosion of the cap (gullies, rills, or other erosional features on the cap surface or in drainages)
2) Sideslope sloughing (slippage)
3) Settling/subsidence
4) Vegetation deterioration
5) Damage from animals (i.e., rodents)
6) Groundwater monitoring equipment (wells) (semi-annual basis)

Locations where deficiencies are found shall be marked and repaired as soon as practicable.

MAINTAINING THE COVER AND VEGETATION

The cover and vegetation will be maintained by:

1) Preventing ponding
2) Maintaining design slopes and grades
3) Fertilizing, as necessary
4) Mowing, as necessary
5) Replanting, as necessary
6) Controlling animals (rodents, hogs) and insects

Routine repairs of the cover and maintenance of the slopes and grades will be performed to prevent ponding and drainage problems. Vegetation may require periodic application of fertilizer, mulch or seed. Mowing will be performed periodically to promote the growth of desired vegetation and to block the growth of trees or shrubs which could penetrate the cover soil with their roots.

EROSION CONTROL

Maintenance of the drainage and diversion portions of the cap will be performed. Erosion of soil by water and/or wind will be repaired as soon as practicable.

GROUNDWATER MONITORING

Groundwater monitoring will be conducted per the Groundwater Monitoring Plan described on RAP Worksheet 3.1. Sample data from the AMPs will be compared to the AALs, as well as data from the POE wells compared to the applicable cPCLs. The results of groundwater monitoring will be submitted annually in the PRACR. Groundwater monitoring will be performed as described in Worksheets 2.1, 3.0, and 4.0.

Will PRAC sampling procedures be the same as those as previously documented for monitoring and/ or confirmation sampling? ____ Yes **X** No

If no, provide in Appendix 6 a description of the monitoring or sampling collection procedures to be conducted during the post-response action care period.

Cost Estimate

Complete this portion of the form only if a physical control is proposed (installed hydraulic control system, slurry wall, cap, etc.). Provide in Attachment 5B a detailed cost estimate for a third party to operate and maintain the physical control during the PRAC period, based on current dollar amount.

Specify the physical control to which this information applies: HWPW Vegetated Clay Cap, Englewood Intermodal Yard Concrete Pavement, and Railroad Ballast (shown on Attachment 5A)

Complete this worksheet for each physical control that will be used as part of the response action.

What is the total estimated annual cost of O&M for the PRAC period? $42,000/year

What is the total estimated cost for a third party to perform PRAC activities? $1,260,000 (30-yrs)

Identify the type of financial assurance mechanism to be used, and the contact person managing fiduciary responsibility, if known.

UPRR will submit an appropriate financial assurance mechanism to TCEQ within 90 days of RAP approval.

Does the person meet the criteria and definition of a small business? (see §350.33(n)) ___ Yes **X** No

If yes and the person desires to pursue the reduced amount of financial assurance, provide a legally binding affidavit as Attachment 5C. Include in the affidavit the information requested in 30 TAC §350.33(l), (m), and (n). An example affidavit is attached in the instructions.

ATTACHMENT 5A

POST-RESPONSE ACTION CARE MONITORING MAP

EXPLANATION

- UPRR Property Boundary
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- Soil Affected Property
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
- Proposed Well for PMZ
- Railroad Ballast Cap Area
- Concrete Cap Area
- Extent of Soil Cap
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area

Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Houston-Galveston Area Council (HGAC) 2012 Aerial.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

Lucille
Fontinot
Lelia
Wipprecht
Solo
Lavender
Clementine
Erastus
Cushing
Lockwood
Harlem
Sudan
Kashmere
Liberty Road
Wylie

MW-67B
PMW-83B
PMW-84B
PMW-85C
MW-28C
MW-63B
MW-65D
MW-68C
MW-33BR
MW-26A
MW-36B
MW-36D
MW-44A (DNAPL)
MW-45C (DNAPL)
MW-46C (DNAPL)
MW-54C
MW-66D
PMW-82B
MW-35A
MW-32B (DNAPL)
MW-70B (DNAPL)
MW-34CR
MW-44C (DNAPL)
MW-25A
MW-18AR
MW-60A
MW-15C
MW-15A
MW-14
MW-17C
MW-47C
MW-39B
MW-38B
MW-12B (DNAPL)
MW-41B (DNAPL)
MW-62B
P-11
MW-48C
MW-61A
MW-59A
MW-59B
MW-59D
MW-69A
MW-75B (DNAPL)
MW-78A (DNAPL)
MW-80B
MW-22A
MW-22B
MW-21C
MW-77A
MW-76C
MW-50A
MW-81B
MW-51C

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED PROFESSIONAL GEOSCIENTIST

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 5A

POST-RESPONSE ACTION CARE MONITORING MAP

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

ATTACHMENT 5B

POST-RESPONSE ACTION CARE COSTS

ATTACHMENT 5B
Post-Response Action Care (PRAC) - Annual Operation and Maintenance Costs
Soil Cap (HWPW), Concrete Cap (Englewood Intermodal Yard), Railroad Ballast
Union Pacific Railroad Company - Houston Wood Preserving Works, Houston, TX

Capped Areas

HWPW Vegetated Soil Capped Area	Approx. 12.5	Acres
Englewood Intermodal Yard - Concrete Pavement Area	Approx. 42.5	Acres

Item	Estimated Quantity	Units	Unit Price	Total Cost
Site Inpections (Qtrly)	4	LS	$ 1,000	$ 4,000
Erosion Repairs	1	LS	$ 3,000	$ 2,000
Susidence Repairs	1	LS	$ 3,000	$ 3,000
Vegetation Control (mowing, cutting)	6	bi-monthly	$ 5,000	$ 30,000
Fertilization	1	LS	$ 1,000	$ 1,000
French Drain/Drainage Channel Repairs	1	LS	$ 1,000	$ 1,000
Concrete Repairs	1	LS	$ 1,000	$ 1,000
	Annual O&M (Year 1)			$42,000
	Annual O&M (Years 2 - 30)			$1,218,000
			Subtotal:	$1,260,000
			Total Estimated O&M Cost Soil Cap:	**$1,260,000**

Implementation Schedule	RAP Worksheet 6.0 Page 1 of 2	
	ID No.: SWR ID 31547	Report Date: November 21, 2014

Document the proposed schedule for implementing the response action. Include all major response action activities through the life of the project, including all removal, decontamination, and control actions, component installations, O&M, monitoring, and post-response action care activities.

Implementation of Response Action (specify component or action)	Start	Finish	Duration
Filing of deed recordation for UPRR-owned properties requiring commercial/industrial land use and prohibiting groundwater use. Deed recordation will also restrict excavation activities over capped areas. Filing of deed recordation for City of Houston ROW for prohibiting groundwater use.	Upon RAP approval	Within 120 days from RAP approval	120 days
Filing of restrictive covenants prohibiting groundwater use for off-site PMZ (if not all of the properties have ICs filed within 720 days of date RAP approved, UPRR will request an extension to the due date to complete the necessary off-site ICs).	Upon RAP approval	Within 720 days from RAP approval	720 days
Plugging of monitoring wells within the capped area, installation of additional monitoring wells at the POEs	Within 60 days of RAP approval	Within 120 days of RAP approval	60 Days
Additional soil sampling to confirm the soil excavation area within AOC 6/SWMU 2 and for the soil cap area in the Former HWPW	Within 60 days of RAP approval	Within 120 days of RAP approval	60 Days
Semi-Annual groundwater monitoring	Ongoing	Uncertain-subject to monitoring results	Uncertain – subject to monitoring results
DNAPL Recovery Pilot Test (24-month), testing may be continued beyond 24-month test period	Ongoing	January 2015 , may continue	24-month (but may continue)
HWPW Area Surface Soil Response Action (soil consolidation and cap construction, to be refined following additional soil sampling of HWPW area)	Within 120 days of RAP approval	Construction – 180 days	180 days
Englewood Intermodal Yard Area Surface Soil Response Action (soil consolidation and cap construction)	Complete	Complete	
Cap Inspection and Maintenance	Soil Cap – 180 days following construction; on-going for concrete cap	30 years	30 yr O&M

List the proposed schedule for report submittals. Add additional lines if more reports than listed will be needed to complete the response action.

Reports	Submittal date
Response Action Effectiveness Report (RAER)	
RAER submittal number 1 -	
RAER submittal number 2	
RAER submittal number 3	
Subsequent RAER submittals	

Response Action Completion Report (RACR) (Soil Response Action, Additional MW Install for PMZ)	**60 days following soil Response Action**
Post-Response Action Care Report (PRACR)	
PRACR submittal number 1	March 31, 2016
PRACR submittal number 2	March 31, 2017
PRACR submittal number 3	March 31, 2018
PRACR submittal number 4	March 31, 2019
PRACR submittal number 5	March 31, 2020
PRACR submittal number 6	March 31, 2021
PRACR submittal number 7	March 31, 2022
PRACR submittal number 8	March 31, 2023
PRACR submittal number 9	March 31, 2024
PRACR submittal number 10	March 31, 2025
PRACR submittal number 11	March 31, 2026
PRACR submittal number 12	March 31, 2027
PRACR submittal number 13	March 31, 2028
PRACR submittal number 14	March 31, 2029
PRACR submittal number 15	March 31, 2030
PRACR submittal number 16	March 31, 2031
PRACR submittal number 17	March 31, 2032
PRACR submittal number 18	March 31, 2033
PRACR submittal number 19	March 31, 2034
PRACR submittal number 20	March 31, 2035
PRACR submittal number 21	March 31, 2036
PRACR submittal number 22	March 31, 2037
PRACR submittal number 23	March 31, 2038
PRACR submittal number 24	March 31, 2039
PRACR submittal number 25	March 31, 2040
PRACR submittal number 26	March 31, 2041
PRACR submittal number 27	March 31, 2042
PRACR submittal number 28	March 31, 2043
PRACR submittal number 29	March 31, 2044
PRACR submittal number 30	March 31, 2045

***This schedule assumes RAP approval by March 31, 2015 and PMZ implementation (i.e., filing of required restrictive covenants) by September 30, 2015.**

LIST OF APPENDICES

APPENDIX 1

REFERENCES

ERM, 2000. *Affected Property Assessment Report (APAR)*, Houston Wood Preserving Works, Houston, Texas, June 10, 2000.

ERM, 2004. *Revised Affected Property Assessment Report (APAR)*, Houston Wood Preserving Works, Houston, Texas, June 10, 2004.

Kiilerich, O., Erik Arvin, 1996. Ground Water Contamination from Creosote Sites. NGWA Groundwater Monitoring and Remediation, Volume 16, Issue 1, pps 112-117, February

King, M.W.G., H. Malcolmson, J. Barker, 1994. Groundwater plume development from a complex organic mixture. In Proceedings: API/NGWA Conference – Petroleum Hydrocarbons and Organic Chemicals in Groundwater, Houston, Texas, November 2-4, 1994

Pastor, Behling & Wheeler, LLC (PBW), 2010. *Affected Property Assessment Addendum, Wood Preserving Works, Houston, Texas*.

PRC Environmental Management, Inc. (PRC EMI, 1993). *RCRA Facility Assessment Report*, Southern Pacific Transportation Company, Houston, Texas, October 1993.

U.S. Environmental Protection Agency (US EPA), 1993. *Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration*. Office of Solid Waste and Emergency Response Directive 9234.2-25. Interim Final. September 1993.

APPENDIX 2

DATA TABLES AND BORING LOGS

2A DATA TABLES

2B BORING LOGS

APPENDIX 2A

DATA TABLES

Table 4-1
SUMMARY OF SURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	SB-01	SB-02	SB-03	SB-04	SB-05	SB-06	SB-07	SB-08	SB-09	SB-11	SB-12
					Sample Date	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013	3/12/2013
					Sample Interval	4-5	3-5	3-5	3.5-5	1-4	2-4	3-5	2.25-4.5	1-4	2.5-4	2-4
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)																
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.00101	<0.00116	<0.0011	<0.00102	<0.00113	<0.00111	*<0.00747*	<0.00512	<0.00105	<0.00108	<0.001
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		<0.000706	<0.00081	<0.000772	<0.000711	<0.00079	<0.000779	0.0554	0.00372 J	<0.000738	0.00109 J	<0.0007
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00108	<0.00123	<0.00118	<0.00108	<0.0012	<0.00119	<0.00797	<0.00546	<0.00112	<0.00115	<0.00107
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		<0.00114	<0.00131	<0.00125	<0.00115	<0.00128	<0.00126	0.573	0.0288	<0.00119	0.00214	<0.00113
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		<0.00246	<0.00281	<0.00268	<0.00247	<0.00275	<0.00271	*<0.0182*	*<0.0124*	<0.00256	<0.00263	<0.00243
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.00155	<0.00177	<0.00169	<0.00156	<0.00173	<0.00171	0.379	<0.00784	<0.00162	0.00303	<0.00153
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		<0.00127	<0.00145	<0.00138	<0.00128	<0.00142	<0.0014	2.49	0.0394	<0.00132	0.0116	<0.00126
SVOCs (EPA Method 8270)																
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.0725	<0.104	<0.0594	<0.0366	<0.0406	<0.2	<0.134	*<1.84*	<0.0757	<0.194	<0.036
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.384	<0.55	<0.315	<0.194	<0.215	<1.06	1.42	<9.73	<0.401	<1.03	<0.19
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		*<0.162*	*<0.232*	*<0.132*	*<0.0815*	*<0.0905*	*<0.446*	*<0.299*	*<4.1*	*<0.169*	*<0.432*	*<0.0801*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		*<0.132*	*<0.189*	*<0.108*	*<0.0666*	*<0.0739*	*<0.365*	*<0.245*	*<3.35*	*<0.138*	*<0.353*	*<0.0655*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.0541	<0.0776	<0.0444	<0.0273	<0.0303	<0.15	<0.1	<1.37	<0.0566	<0.145	<0.0269
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		0.404 J	0.432 J	0.236 J	0.191 J	0.2 J	0.746 J	65.1	522	<0.128	<0.328	0.159
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.223*	*<0.319*	*<0.183*	*<0.112*	*<0.125*	*<0.615*	*<0.413*	*<5.65*	*<0.233*	*<0.596*	*<0.111*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		*<0.227*	*<0.326*	*<0.186*	*<0.115*	*<0.127*	*<0.628*	*<0.421*	*<5.76*	*<0.238*	*<0.608*	*<0.113*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		2.24	2.51	0.254	0.205	0.639	1.25	111	390	0.131	<0.172	0.22
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		0.16	0.558	0.16	<0.0226	0.16	0.208	3.9	13.6	0.414	<0.12	0.165
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		7.29	2.09	0.764	0.0574	0.943	1.2	288	648	0.572	<0.153	1.27
Benzo[a]anthracene	56-55-3	8270C_LL	2.36E+01	5.65E+00		1.63	4.99	1.35	0.165	2.2	2.87	39.9	87.2	0.956	2.04	0.372
Benzo[a]pyrene	50-32-8	8270C_LL	2.37E+00	5.64E-01		1.14	5.02	1.87	0.152 J	2.08	3.53	15.9	27.5	1.97	2.54	0.468
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.0635	*<0.0911*	<0.0521	<0.0321	<0.0356	*<0.175*	*<0.118*	*<1.61*	<0.0664	*<0.17*	<0.0315
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	5.63E+02	4.32E+01		14.8	<0.344	2.05	0.568	1.73	21.8	<0.445	<6.09	<0.251	7.48	<0.119
Chrysene	218-01-9	8270C_LL	2.36E+03	5.60E+02		2.7	9.66	2.15	0.242	3.14	3.78	46.4	109	1.73	3.05	0.688
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		0.611 J	0.65 J	0.22 J	<0.0402	0.26 J	0.587 J	51.3	372	<0.0832	<0.213	0.205 J
Di-n-butyl phthalate	84-74-2	8270C_LL	1.62E+04	4.40E+03		0.221	<0.166	0.247	<0.0585	<0.0649	1.6	<0.215	<2.94	<0.121	0.992	<0.0575
Fluoranthene	206-44-0	8270C_LL	2.48E+04	2.32E+03		9.81	23.1	2.24	0.395	4.69	6.66	296	534	2.67	3.35	1.46
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		2.38	1.67	0.274	0.173	0.752	1.17	136	465	<0.11	<0.282	0.269
Naphthalene	91-20-3	8270C_LL	1.90E+02	1.24E+02		<0.0604	0.868 J	0.446 J	0.081 J	0.273 J	0.616 J	161	2,010	<0.0631	<0.162	<0.03
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.132	<0.19	<0.109	<0.0668	<0.0742	<0.366	<0.246	*<3.36*	<0.138	<0.354	<0.0657
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.0846	<0.121	<0.0693	<0.0427	<0.0474	<0.234	<0.157	<2.14	<0.0884	<0.226	<0.042
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		*<0.179*	*<0.257*	*<0.147*	<0.0903	<0.1	*<0.494*	*<0.332*	*<4.54*	*<0.187*	*<0.479*	<0.0888
Phenanthrene	85-01-8	8270C_LL	9.28E+03	1.71E+03		8.02	6.86	1.26	0.548	3.27	5.09	389	1510	<0.231	2.11	1.2
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.19	<0.272	<0.156	<0.0957	<0.106	<0.524	<0.352	<4.81	<0.198	<0.508	<0.0941
Pyrene	129-00-0	8270C_LL	1.86E+04	1.70E+03		8.59	20.2	2.55	0.501	4.87	7.37	182	318	5.6	4.09	1.28
TPH (Method TX1005)																
>C12-C28	N/A	TX_1005	2.96E+02	--		186	299	268	95	<4.04	284	8,150	4,350	<4.03	342	<4.06
>C28-C35	N/A	TX_1005	2.96E+02	--		135	171	254	116	73.3	243	2,440	699	<4.03	610	<4.06
C6-C12	N/A	TX_1005	9.71E+01	--		<3.8	11.7	<3.78	<3.79	<3.78	<3.79	179	119	<3.77	<7.59	<3.8
C6-C35	N/A	TX_1005	2.96E+02	--		321	481	522	211	73.3	527	10,800	5,170	<7.43	952	<7.48
Total Metals (Method 6010B)																
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		11	12.8	21.7	60.5	21.4	40.7	40.3	1.35	3.04	22.6	2.29
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		890	1,850	1,780	449	1,220	2,840	1,920	17.7	67.1	2,400	25.6

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-1
SUMMARY OF SURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	IM-CPT-01	IM-CPT-02	IM-CPT-03	IM-CPT-04	IM-CPT-05	IM-CPT-06	IM-CPT-07	IM-CPT-08	IM-CPT-09	IM-CPT-10	IM-CPT-11
					Sample Date	2/11/2013	2/11/2013	2/11/2013	2/11/2013	2/12/2013	2/12/2013	2/12/2013	2/12/2013	2/12/2013	2/15/2012	2/12/2013
					Sample Interval	2-5	2.5-5	2.5-5	2.5-5	4-5	3-5	2.5-5	2.5-5	2.5-5	2-5	1.4-2.5
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)																
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.00105	<0.00105	<0.00108	<0.00108	<0.00221	<0.00105	<0.00107	<0.00102	<0.00111	<0.00104	<0.000926
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		<0.000738	<0.000736	<0.000755	<0.000759	<0.00155	<0.000732	<0.000749	<0.000717	0.000833 J	0.00095 J	<0.000648
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00112	<0.00112	<0.00115	<0.00116	<0.00236	<0.00112	<0.00114	<0.00109	<0.00118	<0.00111	<0.000988
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		<0.00119	<0.00119	<0.00122	<0.00123	<0.00251	<0.00119	<0.00121	<0.00116	0.00303 J	0.00289 J	<0.00105
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		0.0127 b	0.0202 b	0.0184 b	0.0182 b	<0.00539	<0.00255	<0.0026	0.00258 b	<0.00269	<0.00254	<0.00225
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.00162	<0.00161	<0.00165	<0.00166	<0.0034	<0.0016	<0.00164	<0.00157	<0.0017	0.00261 J	<0.00142
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		<0.00132	<0.00132	<0.00135	<0.00136	<0.00278	<0.00131	<0.00134	<0.00129	0.0199	0.018	<0.00116
SVOCs (EPA Method 8270)																
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.019	<0.00189	<0.0194	<0.00195	<0.0019	<0.188	<0.193	<0.0921	<0.199	*<0.939*	<0.00192
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.1	<0.01	<0.103	<0.0103	<0.01	<0.996	<1.02	<0.488	<1.05	<4.97	<0.0102
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		*<0.0422*	<0.00421	*<0.0432*	<0.00434	<0.00423	*<0.419*	*<0.429*	*<0.205*	*<0.443*	*<2.09*	0.0261
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		*<0.0345*	<0.00344	*<0.0353*	<0.00355	<0.00346	*<0.342*	*<0.351*	*<0.168*	*<0.362*	*<1.71*	0.0219
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.0142	<0.00141	<0.0145	<0.00146	<0.00142	<0.14	<0.144	<0.0688	<0.148	<0.701	<0.00143
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		0.0479	<0.0032	0.07 J	<0.0033	<0.00321	<0.318	0.477 J	<0.156	4.91	<1.59	<0.00324
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.0583*	*<0.00581*	*<0.0596*	*<0.00599*	*<0.00583*	*<0.578*	*<0.592*	*<0.283*	*<0.611*	*<2.89*	*<0.0059*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		<0.0594	<0.00593	<0.0608	<0.00611	<0.00595	*<0.59*	*<0.604*	*<0.289*	*<0.623*	*<2.94*	<0.00601
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		0.0227	<0.00168	0.062	<0.00173	<0.00169	0.508	0.951	<0.0819	12.3	<0.834	<0.0017
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		<0.0117	<0.00117	<0.012	0.00393	<0.00117	<0.116	<0.119	<0.0568	<0.123	<0.579	<0.00118
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		0.105	<0.00149	0.181	0.00565	<0.0015	1.34	5.06	<0.0728	11.4	3.57	0.0143
Benzo[a]anthracene	56-55-3	8270C_LL	2.36E+01	5.65E+00		0.0345 J	<0.00161	0.0733	0.0336	<0.00162	1.06	1.56	<0.0784	6.92	<0.8	0.00403
Benzo[a]pyrene	50-32-8	8270C_LL	2.37E+00	5.64E-01		0.0261 J	<0.00188	0.0632 J	0.0332	<0.00189	0.707 J	2.26	<0.0915	3.69	6.12 J	<0.00191
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.0166	<0.00166	<0.017	<0.00171	<0.00166	*<0.165*	*<0.169*	*<0.0807*	*<0.174*	*<0.823*	<0.00168
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	5.63E+02	4.32E+01		<0.0628	<0.00626	<0.0643	0.0143	<0.00629	<0.623	3.03	<0.305	2.9	<3.11	0.0227
Chrysene	218-01-9	8270C_LL	2.36E+03	5.60E+02		0.0453	<0.00119	0.0939	0.0457	<0.00119	0.967	1.79	<0.058	7.35	<0.591	0.00383
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		<0.0208	<0.00208	0.0381 J	<0.00214	<0.00208	<0.207	0.399 J	<0.101	8	<1.03	<0.00211
Di-n-butyl phthalate	84-74-2	8270C_LL	1.62E+04	4.40E+03		<0.0303	<0.00302	<0.031	<0.00312	<0.00303	<0.301	<0.308	<0.147	<0.318	<1.5	<0.00307
Fluoranthene	206-44-0	8270C_LL	2.48E+04	2.32E+03		0.0885 J	<0.00363	0.227	0.0661	<0.00364	2.49	4.9	<0.177	40.7	<1.8	<0.00368
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		<0.0276	<0.00275	0.0431	<0.00284	<0.00276	0.487	1.07	<0.134	17.1	<1.37	0.00462
Naphthalene	91-20-3	8270C_LL	1.90E+02	1.24E+02		<0.0158	<0.00157	0.0406 J	0.00423	<0.00158	<0.157	<0.16	<0.0767	7.07	<0.782	<0.0016
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.0346	<0.00345	<0.0355	<0.00356	<0.00347	<0.344	<0.352	<0.168	<0.363	*<1.72*	<0.0035
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.0221	<0.0022	<0.0226	<0.00227	<0.00221	<0.219	<0.225	<0.107	<0.232	<1.1	<0.00224
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		<0.0468	<0.00467	<0.0479	<0.00481	<0.00468	*<0.464*	*<0.475*	*<0.227*	*<0.491*	*<2.32*	<0.00474
Phenanthrene	85-01-8	8270C_LL	9.28E+03	1.71E+03		0.0613 J	<0.00577	0.182 J	0.0197	<0.0058	1.69 J	4.58	<0.281	0.0171	3.49 J	4.48
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.0496	<0.00495	<0.0508	<0.0051	<0.00497	<0.492	<0.504	<0.241	<0.52	<2.46	<0.00502
Pyrene	129-00-0	8270C_LL	1.86E+04	1.70E+03		0.094	<0.00213	0.235	0.0706	<0.00214	2.67	5.47	<0.104	27	3.3	0.0114
TPH (Method TX1005)																
>C12-C28	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C28-C35	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C6-C12	N/A	TX_1005	9.71E+01	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C6-C35	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (Method 6010B)																
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		3.95	1.17	1.38	2.13	3.18	17.5	1.9	1	12.4	9.73	7.66
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		8.03	7.22	15.2	9.15	15.3	1,490	8.78	10.4	1,240	420	9.28

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-1
SUMMARY OF SURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	IM-CPT-12	IM-CPT-13	IM-CPT-14	IM-CPT-15	IM-CPT-16	IM-CPT-17	IM-CPT-18	IM-CPT-19	IM-CPT-20	IM-CPT-21	IM-CPT-22
					Sample Date	2/13/2013	2/13/2013	2/14/2012	2/14/2012	2/13/2013	2/15/2012	2/14/2012	2/14/2012	2/14/2012	2/15/2012	2/15/2012
					Sample Interval	2.5-5	1.5-2.5	1.4-2.5	2-5	1.9-5	2.3-5	1.7-5	1.9-5	0-2.5	2.5-5	2.5-5
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)																
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.00132	0.00461 J	<0.00561	<0.00138	0.00486 J	<0.00208	<0.00101	<0.00102	<0.00102	<0.00104	<0.000953
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		0.00127 J	<0.000811	<0.00393	0.00164 J	<0.000811	0.00841 J	<0.000708	0.00118 J	<0.000714	0.00428 J	<0.000667
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00141	<0.00124	<0.00599	<0.00148	<0.00124	<0.00222	<0.00108	<0.00109	<0.00109	<0.0011	<0.00102
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		0.0019 J	<0.00131	<0.00636	<0.00157	<0.00131	0.0197	<0.00115	0.0247	<0.00116	0.106	<0.00108
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		0.00557 b	<0.00282	*<0.0137*	<0.00337	<0.00282	0.0142 J	<0.00246	<0.00248	<0.00248	<0.00252	<0.00232
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.00202	<0.00178	<0.00861	<0.00212	<0.00178	0.0111 J	<0.00155	0.00479 J	<0.00156	0.0159	<0.00146
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		0.00595 J	<0.00146	<0.00705	<0.00174	<0.00145	0.0646	0.00192 J	0.083	<0.00128	0.259	<0.0012
SVOCs (EPA Method 8270)																
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		*<2.37*	<0.209	<0.202	*<2.48*	<0.0208	*<1.87*	*<0.909*	*<1.83*	<0.0183	*<0.931*	<0.0856
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<12.6	<1.1	<1.07	<13.2	<0.11	<9.9	<4.82	<9.71	<0.0971	<4.93	<0.454
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		*<5.29*	*<0.465*	*<0.45*	*<5.54*	*<0.0464*	*<4.16*	*<2.03*	*<4.09*	*<0.0409*	*<2.07*	*<0.191*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		*<4.32*	*<0.38*	*<0.368*	*<4.52*	*<0.0379*	*<3.4*	*<1.66*	*<3.34*	*<0.0334*	*<1.7*	*<0.156*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<1.77	<0.156	<0.151	<1.86	<0.0156	<1.4	<0.679	<1.37	<0.0137	<0.695	<0.064
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		32.3	<0.353	2.3	11.1 J	<0.0352	55.6	2.27 J	<3.1	<0.031	83.5	<0.145
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<7.29*	*<0.641*	*<0.621*	*<7.64*	*<0.064*	*<5.74*	*<2.79*	*<5.64*	*<0.0564*	*<2.86*	*<0.263*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		*<7.44*	*<0.654*	*<0.634*	*<7.79*	<0.0653	*<5.86*	*<2.85*	*<5.75*	<0.0575	*<2.92*	*<0.269*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		77.9	<0.185	1.43	19.5	0.0426	6.54	2.66	4.07	<0.0163	66.2	<0.0761
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		<1.46	<0.129	<0.125	<1.53	<0.0129	<1.15	<0.561	<1.13	<0.0113	2.09	<0.0529
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		51.9	0.368	160	20.3	0.0477	41.3	70.9	7.13	0.063	50.2	0.251
Benzo[a]anthracene	56-55-3	8270C_LL	2.36E+01	5.65E+00		36.5	1.08	0.995	13.2	0.0746	8.5	2.37	6.73	0.145	11.5	<0.073
Benzo[a]pyrene	50-32-8	8270C_LL	2.37E+00	5.64E-01		14.4 J	1.88 J	<0.201	7.21 J	<0.0207	14.5 J	6.5 J	2.5 J	0.212	8.36 J	<0.0851
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		*<2.08*	*<0.183*	*<0.177*	*<2.18*	<0.0183	*<1.64*	*<0.797*	*<1.61*	<0.0161	*<0.816*	<0.0751
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	5.63E+02	4.32E+01		<7.87	12.7	<0.67	<8.23	0.0868	<6.19	<3.01	38.6	0.242	<3.09	<0.284
Chrysene	218-01-9	8270C_LL	2.36E+03	5.60E+02		37.7	1.35	2.43	20.5	0.0466	15.5	3.29	8	0.158	10.4	<0.0539
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		46.5	<0.229	2.53	15.8 J	<0.0229	<2.05	3.01 J	<2.01	<0.0201	48.1	<0.0941
Di-n-butyl phthalate	84-74-2	8270C_LL	1.62E+04	4.40E+03		<3.79	<0.333	<0.323	<3.97	<0.0333	<2.99	<1.45	<2.93	<0.0293	<1.49	<0.137
Fluoranthene	206-44-0	8270C_LL	2.48E+04	2.32E+03		171	2.11 J	4.21	80.6	0.133	<3.59	<1.75	19.3	0.279	67.4	<0.164
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		85.7	<0.304	8.77	30.3	<0.0303	11.3	7.79	5.24	<0.0267	61.6	<0.125
Naphthalene	91-20-3	8270C_LL	1.90E+02	1.24E+02		86.8	<0.174	1.71	28.4	<0.0174	7.6	1.93 J	<1.53	<0.0153	226	<0.0714
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		*<4.34*	<0.381	<0.369	*<4.54*	<0.0381	*<3.41*	*<1.66*	*<3.35*	<0.0335	*<1.7*	<0.156
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<2.77	<0.243	<0.236	<2.9	<0.0243	<2.18	<1.06	<2.14	<0.0214	<1.09	<0.0999
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		*<5.86*	*<0.515*	*<0.499*	*<6.13*	<0.0514	*<4.61*	*<2.24*	*<4.53*	<0.0453	*<2.3*	*<0.211*
Phenanthrene	85-01-8	8270C_LL	9.28E+03	1.71E+03		283	0.674 J	16.1	109	0.103	27.1	12.4	34.3	0.242	157	<0.262
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<6.21	<0.546	<0.529	<6.5	<0.0545	<4.89	<2.38	<4.8	<0.048	<2.44	<0.224
Pyrene	129-00-0	8270C_LL	1.86E+04	1.70E+03		122	3.13	3.53	65.9	0.13	47.4	5.33	21.9	0.299	41.4	0.179
TPH (Method TX1005)																
>C12-C28	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
>C28-C35	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C6-C12	N/A	TX_1005	9.71E+01	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C6-C35	N/A	TX_1005	2.96E+02	--		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (Method 6010B)																
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		37.1	27	31.9	1.68	32.5	3.01	16.9	12.6	2.49	0.815	2.19
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		2,430	2,360	1,330	63	5,460	151	751	1,170	118	8.08	10.2

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-2
SUMMARY OF SUBSURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	IM-CPT-01	IM-CPT-01	IM-CPT-02	IM-CPT-03	IM-CPT-04	IM-CPT-05	IM-CPT-06	IM-CPT-07	IM-CPT-08	IM-CPT-08	IM-CPT-09
					Sample Date	2/11/2013	2/11/2013	2/11/2013	2/11/2013	2/11/2013	2/12/2013	2/12/2013	2/12/2013	2/12/2013	2/12/2013	2/12/2013
					Sample Interval	10-12.5	17.5-20	12.5-15	12.5-13.5	10-12.5	7.5-10	13-15	7.5-10	5-7.5	15-16	5-7.5
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)																
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.00107	<0.00105	<0.00112	<0.00106	<0.00102	<0.000651	<0.00104	<0.000952	<0.00109	<0.00107	<0.00105
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		<0.000747	<0.000733	<0.000782	<0.000745	<0.000714	<0.000456	<0.00073	<0.000667	<0.000764	<0.000752	<0.000732
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00114	<0.00112	<0.00119	<0.00113	<0.00109	<0.000695	<0.00111	<0.00102	<0.00116	<0.00115	<0.00112
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		<0.00121	<0.00119	<0.00127	<0.00121	<0.00116	<0.000738	<0.00118	<0.00108	<0.00124	<0.00122	0.00119 J
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		0.0137 b	0.0146 b	0.025 b	0.0202 b	0.0217 b	<0.00158	0.0126 b	<0.00232	<0.00266	<0.00261	<0.00254
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.00164	<0.0016	<0.00171	<0.00163	<0.00157	<0.000999	<0.0016	<0.00146	<0.00167	<0.00165	<0.0016
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		<0.00134	<0.00131	<0.0014	<0.00134	<0.00128	<0.000818	<0.00131	<0.0012	0.00159 J	<0.00135	<0.00131
SVOCs (EPA Method 8270)																
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.00192	<0.00188	<0.00201	<0.00191	<0.0183	<0.0019	<0.00187	<0.00187	<0.0981	<0.00193	<0.188
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.0102	<0.00997	<0.0106	<0.0101	<0.0971	<0.01	<0.00992	<0.00989	<0.52	<0.0102	<0.995
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		<0.00427	<0.00419	<0.00448	<0.00426	*<0.0408*	<0.00422	0.0234	<0.00416	*<0.219*	<0.00431	*<0.419*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		<0.00349	<0.00343	<0.00366	<0.00348	*<0.0334*	<0.00345	0.0234	<0.0034	*<0.179*	<0.00352	*<0.342*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.00143	<0.00141	<0.0015	<0.00143	<0.0137	<0.00142	<0.0014	<0.00139	<0.0733	<0.00144	<0.14
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		<0.00324	<0.00318	<0.0034	<0.00323	<0.031	<0.00321	<0.00317	<0.00316	<0.166	<0.00327	18.6
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.0059*	*<0.00578*	*<0.00618*	*<0.00588*	*<0.0563*	*<0.00583*	*<0.00576*	*<0.00574*	*<0.302*	*<0.00594*	*<0.577*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		<0.00601	<0.0059	<0.0063	<0.00599	<0.0575	<0.00594	<0.00588	<0.00586	*<0.308*	<0.00606	*<0.589*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		<0.0017	<0.00167	<0.00179	<0.0017	0.345	<0.00168	<0.00167	<0.00166	<0.0872	<0.00172	30
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		<0.00118	<0.00116	<0.00124	<0.00118	<0.0113	<0.00117	<0.00116	<0.00115	<0.0606	<0.00119	0.806
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		<0.00152	<0.00149	<0.00159	<0.00151	0.0276	<0.0015	<0.00148	<0.00148	<0.0775	<0.00153	20.6
Benzo[a]anthracene	56-55-3	8270C_LL	2.98E+02	1.33E+02		<0.00163	<0.0016	<0.00171	<0.00163	0.0405	<0.00161	<0.0016	<0.00159	<0.0836	<0.00165	9.07
Benzo[a]pyrene	50-32-8	8270C_LL	5.73E+01	5.73E+01		<0.00191	<0.00187	<0.002	<0.0019	<0.0182	<0.00188	<0.00186	0.0117	<0.0975	<0.00192	4.77
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.00168	<0.00165	<0.00176	<0.00168	<0.0161	<0.00166	<0.00164	<0.00164	*<0.086*	<0.00169	*<0.165*
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	1.23E+03	1.23E+03		<0.00636	<0.00624	<0.00666	<0.00634	<0.0608	<0.00628	<0.00621	<0.00619	1.08	<0.00641	<0.623
Chrysene	218-01-9	8270C_LL	2.60E+04	1.16E+04		<0.00121	<0.00118	<0.00127	<0.0012	0.0387	<0.00119	<0.00118	<0.00118	<0.0618	<0.00122	9.17
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		<0.00211	<0.00207	<0.00221	<0.0021	<0.0201	<0.00208	<0.00206	<0.00205	<0.108	<0.00212	24.8
Di-n-butyl phthalate	84-74-2	8270C_LL	2.14E+04	1.53E+04		<0.00307	<0.00301	<0.00321	<0.00306	<0.0293	<0.00303	<0.003	<0.00299	<0.157	<0.00309	<0.3
Fluoranthene	206-44-0	8270C_LL	4.29E+04	1.44E+04		<0.00368	<0.00361	<0.00386	<0.00367	0.112 J	<0.00364	<0.0036	<0.00358	<0.188	<0.00371	49.2
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		<0.00279	<0.00274	<0.00293	<0.00278	0.0497	<0.00276	<0.00273	<0.00272	<0.143	<0.00282	36.4
Naphthalene	91-20-3	8270C_LL	1.93E+02	1.38E+02		<0.0016	<0.00157	<0.00167	<0.00159	<0.0153	<0.00158	<0.00156	<0.00156	<0.0818	<0.00161	15.9
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.0035	<0.00344	<0.00367	<0.00349	<0.0335	<0.00346	<0.00342	<0.00341	<0.179	<0.00353	<0.343
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.00224	<0.0022	<0.00234	<0.00223	<0.0214	<0.00221	<0.00219	<0.00218	<0.114	<0.00226	<0.219
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		<0.00474	<0.00465	<0.00496	<0.00472	<0.0453	<0.00468	<0.00463	<0.00461	*<0.242*	<0.00477	*<0.464*
Phenanthrene	85-01-8	8270C_LL	9.28E+03	3.11E+03		<0.00586	<0.00575	<0.00614	<0.00584	<0.056	<0.00579	<0.00573	0.00837	<0.3	<0.00591	59.9
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.00502	<0.00493	<0.00526	<0.005	<0.048	<0.00496	<0.0049	<0.00489	<0.257	<0.00506	<0.492
Pyrene	129-00-0	8270C_LL	2.50E+04	8.36E+03		<0.00217	<0.00213	<0.00227	<0.00216	0.129	<0.00214	<0.00212	0.00585	<0.111	<0.00218	32.9
Total Metals (Method 6010B)																
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		2.12	6.72	2.22	4.28	3.72	1.08	1.07	2.77	1.66	7.88	1.35
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		8.24	12.10	4.92	8.12	5.87	1.96	4.17	2.44	23.5	21.5	27.6

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-2
SUMMARY OF SUBSURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	IM-CPT-09	IM-CPT-10	IM-CPT-11	IM-CPT-12	IM-CPT-12	IM-CPT-13	IM-CPT-13	IM-CPT-14	IM-CPT-14	IM-CPT-15	IM-CPT-15
					Sample Date	2/12/2013	2/15/2012	2/12/2013	2/13/2013	2/13/2013	2/13/2013	2/13/2013	2/14/2012	2/14/2012	2/14/2012	2/14/2012
					Sample Interval	15-15.7	5-7.5	10-12.5	5-7.5	15-15.9	5-7.5	15-17.2	12.5-15	15-16.4	5-7.5	15-16.2
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)																
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.00104	<0.000999	<0.00107	<0.00109	0.00496 J	<0.00107	<0.00112	<0.00529	<0.00528	<0.00108	<0.00107
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		<0.000728	<0.000699	<0.000746	<0.000761	<0.000792	<0.000751	<0.000783	0.00766 J	0.023 J	<0.000757	0.00561 J
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00111	<0.00107	<0.00114	<0.00116	<0.00121	<0.00114	<0.00119	<0.00565	<0.00563	<0.00115	<0.00114
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		<0.00118	<0.00113	<0.00121	<0.00123	<0.00128	<0.00122	<0.00127	0.0505	0.159	<0.00123	0.0464
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		<0.00253	<0.00243	0.0029 b	0.00599 b	0.0074 b	0.00474 b	<0.00272	<0.0129	<0.0128	<0.00263	<0.00259
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.0016	<0.00153	<0.00163	<0.00167	<0.00174	<0.00164	<0.00172	0.0418	0.136	<0.00166	0.0177
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		<0.00131	<0.00125	<0.00134	<0.00137	<0.00142	<0.00135	<0.0014	0.154	0.478	<0.00136	0.0876
SVOCs (EPA Method 8270)																
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.00187	<0.0897	<0.182	<0.00195	<0.00203	<0.0963	<0.00201	<0.19	*<1.9*	<0.194	*<1.92*
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.00989	<0.475	<0.965	<0.0103	<0.0108	<0.51	<0.0107	4.94	<10.1	<1.03	<10.2
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		<0.00416	*<0.2*	*<0.406*	<0.00435	<0.00453	*<0.215*	<0.00448	*<0.424*	*<4.23*	*<0.432*	*<4.27*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		<0.0034	*<0.163*	*<0.332*	<0.00356	<0.0037	*<0.175*	<0.00366	*<0.347*	*<3.46*	*<0.353*	*<3.49*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.00139	<0.067	<0.136	<0.00146	<0.00152	<0.0719	<0.0015	<0.142	<1.42	<0.145	<1.43
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		<0.00316	<0.152	1.77 J	<0.0033	0.00903 J	<0.163	<0.0034	22.6	39.1	<0.328	17.3 J
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.00574*	*<0.276*	*<0.56*	*<0.00601*	*<0.00625*	*<0.296*	*<0.00619*	*<0.586*	*<5.84*	*<0.597*	*<5.89*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		<0.00586	*<0.281*	*<0.571*	<0.00613	<0.00637	*<0.302*	<0.00631	*<0.597*	*<5.95*	*<0.609*	*<6.01*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		0.00463	<0.0798	2.32	0.00901	0.0297	<0.0856	<0.00179	16.8	31.4	<0.173	21.6
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		<0.00115	<0.0554	<0.112	<0.00121	<0.00125	<0.0594	<0.00124	0.91	<1.17	<0.12	<1.18
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		0.00515	<0.0709	26	0.0124	0.0244	<0.0761	<0.00159	8.88	25.7	<0.153	8.11
Benzo[a]anthracene	56-55-3	8270C_LL	2.98E+02	1.33E+02		<0.00159	<0.0764	0.601	0.0089	0.0196	<0.082	0.00554	3.58	8.34	<0.165	4
Benzo[a]pyrene	50-32-8	8270C_LL	5.73E+01	5.73E+01		0.0118 J	<0.0892	<0.181	<0.00194	<0.00202	<0.0957	0.0134 J	1.24	<1.89	<0.193	<1.9
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.00164	*<0.0786*	*<0.16*	<0.00171	<0.00178	*<0.0844*	<0.00176	*<0.167*	*<1.66*	*<0.17*	*<1.68*
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	1.23E+03	1.23E+03		<0.00619	<0.297	<0.604	<0.00648	0.0123	<0.319	0.0247	<0.631	<6.29	<0.643	<6.35
Chrysene	218-01-9	8270C_LL	2.60E+04	1.16E+04		<0.00118	<0.0565	1.14	0.0117	0.0225	<0.0606	0.00587	3.94	11	<0.122	3.7
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		<0.00205	<0.0986	1.5	0.00247	0.0168 J	<0.106	<0.00221	19.2	37	<0.213	18 J
Di-n-butyl phthalate	84-74-2	8270C_LL	2.14E+04	1.53E+04		<0.00299	<0.143	<0.291	<0.00312	0.00422	<0.154	<0.00322	<0.305	<3.04	<0.31	<3.06
Fluoranthene	206-44-0	8270C_LL	4.29E+04	1.44E+04		0.00849	<0.172	1.79 J	0.0472	0.094	<0.185	<0.00386	22.8	46.4	<0.373	19.6
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		0.00564	<0.131	3.87	0.0106	0.0328	<0.14	<0.00293	17.5	44.5	<0.283	22
Naphthalene	91-20-3	8270C_LL	1.93E+02	1.38E+02		<0.00156	<0.0748	1.52 J	<0.00163	0.0208 J	<0.0802	<0.00168	92.8	168	<0.162	56.5
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.00341	<0.164	<0.333	<0.00357	<0.00371	<0.176	<0.00368	<0.348	*<3.47*	<0.355	*<3.5*
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.00218	<0.105	<0.212	<0.00228	<0.00237	<0.112	<0.00235	<0.222	<2.21	<0.226	<2.24
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		<0.00461	*<0.222*	*<0.45*	<0.00482	<0.00502	*<0.238*	<0.00497	*<0.47*	*<4.69*	*<0.479*	*<4.73*
Phenanthrene	85-01-8	8270C_LL	9.28E+03	3.11E+03		103	<0.274	0.0198	0.0585	0.133	<0.294	<0.00615	65.5	133	0.688	55.4
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.00489	<0.235	<0.477	<0.00511	<0.00532	<0.252	<0.00527	2.18	<4.97	<0.508	<5.02
Pyrene	129-00-0	8270C_LL	2.50E+04	8.36E+03		0.0127	<0.101	1.82	0.033	0.0746	<0.109	0.0136	15.3	30.8	<0.219	13.8
Total Metals (Method 6010B)																
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		1.04	7.24	28.2	1.09	10.7	1.57	4.02	4.8	2.68	1.74	3.03
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		4.31	43.8	1360	7.27	18.3	21.6	6.96	6.81	11.5	7.31	9.77

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-2
SUMMARY OF SUBSURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works - Englewood Intermodal Yard

					Sample Location	IM-CPT-16	IM-CPT-16	IM-CPT-17	IM-CPT-18	IM-CPT-19	IM-CPT-20	IM-CPT-21	IM-CPT-22
					Sample Date	2/13/2013	2/13/2013	2/15/2012	2/15/2012	2/14/2012	2/14/2012	2/15/2012	2/15/2012
					Sample Interval	10-12.5	15-17.5	13-15	12.5-14.3	7.5-10	5-7.5	7.5-10	7.5-10
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)													
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		0.00396 J	0.00451 J	<0.00147	<0.00107	<0.00109	<0.00107	<0.00108	<0.0011
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		0.00303 J	0.105	0.00117 J	<0.000751	<0.000761	<0.000746	0.0015 J	<0.000773
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.00113	0.0214	<0.00157	<0.00114	<0.00116	<0.00114	<0.00115	<0.00118
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		0.599	5.92	0.0876	<0.00122	<0.00123	<0.00121	0.118	<0.00125
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		0.00688 b	0.0102 b	<0.00358	<0.00261	<0.00264	<0.00259	<0.00262	0.00345 J
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		0.0454	0.178	0.0406	<0.00164	<0.00167	<0.00163	0.00211 J	<0.00169
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		1.53	16.9	0.328	<0.00135	<0.00136	<0.00134	0.259	<0.00139
SVOCs (EPA Method 8270)													
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.019	<0.209	<0.132	<0.00192	<0.00196	<0.00192	*<0.967*	<0.0991
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.1	<1.11	<0.7	<0.0102	<0.0104	<0.0102	<5.12	<0.525
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		*<0.0423*	*<0.466*	*<0.295*	<0.00429	<0.00436	<0.00427	*<2.15*	*<0.221*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		*<0.0346*	*<0.381*	1.47	<0.0035	<0.00356	<0.00349	*<1.76*	*<0.18*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.0142	<0.156	<0.0988	<0.00144	<0.00146	<0.00143	<0.722	<0.074
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		2.52	25.2	13.4	<0.00326	<0.00331	<0.00324	40.2	<0.168
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.0583*	*<0.643*	*<0.407*	*<0.00592*	*<0.00601*	*<0.00589*	*<2.97*	*<0.305*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		<0.0595	*<0.656*	*<0.415*	<0.00604	<0.00613	<0.00601	*<3.03*	*<0.311*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		2.44	18.1	12.4	<0.00171	0.0128	<0.0017	34.6	<0.0881
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		<0.0117	0.761	0.358	<0.00119	<0.00121	<0.00118	<0.597	<0.0612
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		0.919	12.4	6.01	0.0133	0.023	0.0022	22.8	0.195
Benzo[a]anthracene	56-55-3	8270C_LL	2.98E+02	1.33E+02		0.215	1.85	1.46	<0.00164	0.0147	<0.00163	6.1	<0.0844
Benzo[a]pyrene	50-32-8	8270C_LL	5.73E+01	5.73E+01		0.0797	<0.208	1.13	<0.00191	0.00704	<0.00191	6.74	<0.0985
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.0166	*<0.183*	*<0.116*	<0.00169	<0.00171	<0.00168	*<0.848*	*<0.0869*
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	1.23E+03	1.23E+03		<0.0629	<0.693	<0.438	<0.00638	0.0278	<0.00636	<3.21	<0.329
Chrysene	218-01-9	8270C_LL	2.60E+04	1.16E+04		0.229	1.57	1.25	<0.00121	0.0201	<0.00121	4.21	<0.0624
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		1.99	22.5	<0.145	<0.00211	0.0124	<0.00211	23.5	<0.109
Di-n-butyl phthalate	84-74-2	8270C_LL	2.14E+04	1.53E+04		<0.0303	<0.334	<0.211	<0.00308	<0.00313	<0.00307	<1.55	<0.158
Fluoranthene	206-44-0	8270C_LL	4.29E+04	1.44E+04		1.78	15.9	11	<0.00369	0.0727	<0.00368	27.5	<0.19
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		2.1	18.7	12	<0.0028	0.0247	<0.00279	30.8	0.76
Naphthalene	91-20-3	8270C_LL	1.93E+02	1.38E+02		9.4	118	52.2	<0.0016	<0.00163	<0.0016	143	<0.0826
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.0347	<0.382	<0.242	<0.00352	<0.00357	<0.0035	*<1.77*	<0.181
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.0221	<0.244	<0.154	<0.00225	<0.00228	<0.00224	<1.13	<0.116
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		<0.0469	*<0.516*	*<0.327*	<0.00475	<0.00483	<0.00473	*<2.39*	*<0.245*
Phenanthrene	85-01-8	8270C_LL	9.28E+03	3.11E+03		6.13	64.3	31.5	<0.00588	0.117	0.00853	67.7	1.11
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.0497	<0.547	<0.346	<0.00504	<0.00512	<0.00502	<2.53	<0.259
Pyrene	129-00-0	8270C_LL	2.50E+04	8.36E+03		1.26	10.8	6.73	<0.00217	0.0596	<0.00217	20.9	<0.112
Total Metals (Method 6010B)													
Arsenic	7440-38-2	6010B	5.90E+00	5.90E+00		1.43	1.39	2.82	1.03	1.99	1.16	1.31	1.41
Lead	7439-92-1	6010B	2.75E+02	2.75E+02		7.83	4.64	6.46	3.97	9.59	7.05	6.85	5.39

Notes:

1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.

NA - Not applicable

J = Estimated Value, < = Compound not detected at the detection limit.

Table 4-3
SUMMARY OF SURFACE SOIL SAMPLING RESULTS
UPRR Houston Wood Preserving Works

					Sample Location	SB-148	SB-149	SB-150	SB-151	SB-152	SB-153	SB-154	SB-155
					Sample Date	5/7/2014	5/7/2014	5/7/2014	5/7/2014	5/7/2014	5/7/2014	5/7/2014	5/7/2014
					Sample Interval	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
Constituent	CAS	Method	cPCL	RAL		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
VOCs (EPA Method 8260)													
1,2-Dichloroethane	107-06-2	8260B	3.07E-02	3.07E-02		<0.000708	<0.000767	<0.000693	<0.000685	<0.000902	<0.000817	<0.000712	<0.000754
Benzene	71-43-2	8260B	1.05E-01	1.05E-01		0.000529J	<0.000537	<0.000485	<0.00048	0.00534	<0.000572	<0.000498	<0.000527
Chlorobenzene	108-90-7	8260B	6.52E+00	6.52E+00		<0.000755	<0.000818	<0.000739	<0.000731	<0.000963	<0.000871	<0.000759	<0.000804
Ethylbenzene	100-41-4	8260B	4.37E+01	4.37E+01		<0.000803	<0.000869	<0.000785	<0.000777	<0.00102	<0.000926	<0.000807	<0.000854
Methylene Chloride	75-09-2	8260B	2.25E-02	2.25E-02		0.00259J	<0.00187	<0.00169	<0.00167	0.0043J	<0.00199	<0.00173	<0.00183
Toluene	108-88-3	8260B	4.32E+01	4.32E+01		<0.00109	<0.00118	<0.00106	<0.00105	0.00338J	<0.00125	<0.00109	<0.00116
Xylenes, Total	1330-20-7	8260B	7.32E+02	7.32E+02		<0.000889	<0.000962	<0.00087	<0.00086	0.00537	<0.00103	<0.000894	<0.000946
SVOCs (EPA Method 8270)													
1,2-Diphenylhydrazine	122-66-7	8270C_LL	5.09E-01	2.27E-01		<0.0533	<0.035	<0.053	<0.0523	<0.0888	<0.0681	<0.0881	<0.0711
2,4-Dimethylphenol	105-67-9	8270C_LL	5.27E+01	1.77E+01		<0.282	<0.185	<0.281	<0.277	<0.47	<0.361	<0.467	<0.376
2,4-Dinitrotoluene	121-14-2	8270C_LL	4.89E-02	2.18E-02		*<0.119*	*<0.078*	*<0.118*	*<0.117*	*<0.198*	*<0.152*	*<0.196*	*<0.158*
2,6-Dinitrotoluene	606-20-2	8270C_LL	4.02E-02	1.79E-02		*<0.0971*	*<0.0637*	*<0.0965*	*<0.0953*	*<0.162*	*<0.124*	*<0.16*	*<0.129*
2-Chloronaphthalene	91-58-7	8270C_LL	1.49E+04	4.99E+03		<0.0398	<0.0261	<0.0396	<0.0391	<0.0663	<0.0508	<0.0658	<0.0531
2-Methylnaphthalene	91-57-6	8270C_LL	3.78E+02	1.27E+02		<0.0902	<0.0592	<0.0896	<0.0885	0.155J	0.128J	0.235J	0.458J
4,6-Dinitro-2-methylphenol	534-52-1	8270C_LL	7.00E-03	2.34E-03		*<0.164*	*<0.108*	*<0.163*	*<0.161*	*<0.273*	*<0.209*	*<0.271*	*<0.218*
4-Nitrophenol	100-02-7	8270C_LL	2.65E-01	8.89E-02		*<0.167*	*<0.11*	*<0.166*	*<0.164*	*<0.278*	*<0.213*	*<0.276*	*<0.223*
Acenaphthene	83-32-9	8270C_LL	5.23E+03	1.75E+03		<0.0474	0.0685J	0.167J	0.0838J	0.169J	0.319J	0.318J	0.889
Acenaphthylene	208-96-8	8270C_LL	9.09E+03	3.05E+03		0.346J	0.358J	0.972	0.559	1.77	3.3	2.94	1.38
Anthracene	120-12-7	8270C_LL	1.03E+04	3.44E+03		0.709	0.702	1.93	0.72	2.95	6.19	5.32	3.66
Benzo[a]anthracene	56-55-3	8270C_LL	2.36E+01	5.65E+00		0.553	0.522	0.648	0.934	1.32	2.5	3.85	4.37
Benzo[a]pyrene	50-32-8	8270C_LL	2.37E+00	5.64E-01		0.426J	0.462	0.692	0.589	1.5	3.31	3.16	5.14
Bis(2-chloroethoxy)methane	111-91-1	8270C_LL	1.73E-01	7.70E-02		<0.0467	<0.0307	<0.0464	<0.0459	*<0.0778*	<0.0597	*<0.0772*	<0.0623
Bis(2-ethylhexyl) phthalate	117-81-7	8270C_LL	5.63E+02	4.32E+01		<0.177	<0.116	<0.176	<0.173	<0.294	0.469J	0.435J	<0.236
Chrysene	218-01-9	8270C_LL	2.36E+03	5.60E+02		0.805	0.641	0.648	1.3	1.72	3.14	5.22	4.99
Dibenzofuran	132-64-9	8270C_LL	7.44E+02	2.49E+02		<0.0586	0.0396J	0.088J	0.0762J	0.223J	0.196J	0.985	0.442J
Di-n-butyl phthalate	84-74-2	8270C_LL	1.62E+04	4.40E+03		<0.0852	<0.0559	<0.0847	<0.0836	<0.142	<0.109	<0.141	<0.114
Fluoranthene	206-44-0	8270C_LL	2.48E+04	2.32E+03		1.5	1.33	1.94	2.93	3.66	5.68	13.7	8.18
Fluorene	86-73-7	8270C_LL	6.65E+03	2.23E+03		<0.0777	0.0623J	0.155J	0.0896J	0.286J	0.418J	0.357J	0.716J
Naphthalene	91-20-3	8270C_LL	1.90E+02	1.24E+02		<0.0444	<0.0292	0.187J	<0.0436	0.449J	0.346J	0.139J	1.24
Nitrobenzene	98-95-3	8270C_LL	1.48E+00	4.94E-01		<0.0974	<0.0639	<0.0968	<0.0956	<0.162	<0.124	<0.161	<0.13
N-Nitrosodiphenylamine	86-30-6	8270C_LL	4.18E+01	1.87E+01		<0.0622	<0.0408	<0.0618	<0.061	<0.104	<0.0794	<0.103	<0.0829
Pentachlorophenol	87-86-5	8270C_LL	1.24E-01	1.24E-01		*<0.132*	<0.0864	*<0.131*	*<0.129*	*<0.219*	0.856J	0.561J	*<0.175*
Phenanthrene	85-01-8	8270C_LL	9.28E+03	1.71E+03		0.729	0.641	1.13	1.29	1.66	2.11	11.5	3.82
Phenol	108-95-2	8270C_LL	1.33E+02	4.46E+01		<0.14	<0.0916	<0.139	<0.137	<0.232	0.2J	<0.231	<0.186
Pyrene	129-00-0	8270C_LL	1.86E+04	1.70E+03		1.28	1.24	1.55	2.5	2.92	5.32	9.96	7.31

Notes:
1. Concentrations > cPCL are highlighted in orange.
2. Concentrations > RAL are highlighted in yellow.
3. NA - Not Applicable.
4. J - Estimated Value, < - Compound not detected at the detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

Constituent	CAS	Method	Residential Assessment Level	C/I Assessment Level	CPT-01	CPT-03	CPT-04	CPT-05	CPT-06	CPT-08	CPT-09
					2/19/2013	2/19/2013	2/18/2013	2/18/2013	2/18/2013	2/19/2013	2/13/2013
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds											
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.00014	<0.00014	<0.00014	<0.00014	0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	0.00011J	**<0.117**	**<0.0399**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.0733	<0.00646
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015	0.00015J	<0.00015	<0.00015	0.00015J	0.00015	0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015	<0.00296	0.000888J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03							
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.00026	<0.00026	0.000561J	<0.00026	0.000879J	0.08070	0.01460
Semi-Volatile Organic Compounds											
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00031J	0.00031J	<0.00031	<0.00031	0.00031	**0.636J**	0.00031J
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00013	0.00013J	<0.00013	<0.00013	0.00013J	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.000489	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00011J	0.00007	0.00007	0.000234J	**<0.456**	**<0.338**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00083	<0.00083	<0.00083	<0.00083	0.00083J	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	0.00056	0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00008	0.00008	0.00008	0.00008	<0.0551	<0.247	<0.224
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00006	<0.00006	<0.00006	0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.000123J	0.000326J	<0.00005	<0.00005	0.00270	0.0111J	0.0184J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00008	0.0000727J	<0.00008	<0.00008	0.000186J	0.00008	0.00008J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00157	<0.000848	<0.00104	<0.000664	<0.000922	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00008J	0.00008J	0.00008J	<0.00008	0.000169J	0.00008	0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.0834	<0.072
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00129	0.0013J	<0.00078	<0.000717	0.00011	<0.00011	0.00011J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.000973	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.017J	0.13400	0.12100
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.00008	0.000142J	<0.00008	<0.00008	0.000283J	**<3.56**	0.0609J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	0.00011	0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	0.00061	0.00061J
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.0000599J	0.000237J	0.000114J	0.00006	0.00143	0.06150	0.10100
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00004	<0.00004	0.00004J	<0.00004	0.00004J	0.00004	0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00011	0.000122J	0.00011	0.00011	0.000784	0.00011	0.0102J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-01A											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/11/2011	7/13/2011	1/31/2012	7/11/2012	1/9/2013	7/11/2013	1/8/2014	7/2/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**<0.0069**	0.0017J	0.0019J	<0.0009	<0.0009	**0.0068J**	<0.0005	**<0.012**	0.00125	<0.00193	0.00222J	**0.00865**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.05400	0.08500	0.04000	0.06800	0.07000	0.10000	0.02900	0.08400	0.11700	0.09800	0.00008	0.0848
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0007J	0.0005J	0.0005J	0.0005J	0.0011J	0.0011J	0.0005J	0.0017J	0.00222	0.00122	0.00006	0.00138
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0012J	0.0011J	0.00060	0.0017J	0.0021J	0.0029J	0.0005J	0.003J	0.000285J	0.00220	0.00005	0.00326
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.00330	0.00330	0.003J	0.00050	0.00050	0.00163	0.00037	0.000838J	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00580	0.0007J	0.0016J	0.0044J	0.00070	0.00540	0.0045J	0.02500	0.01410	0.00264	0.00008	0.0132
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												0.00012J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0024J	0.0037J	0.0017J	0.004J	0.0025J	0.00620	0.0012J	0.0047J	0.00602	0.00399	0.00007	0.0043
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.02800	0.04000	0.02200	0.04000	0.03900	0.05600	0.0013J	0.04100	0.05640	0.03230	0.00007	0.0369
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.0029J	0.0043J	0.00060	0.00060	0.00050	0.00050	0.00050	0.00219	0.01690	0.00008	0.074
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.001J	0.00050	0.00050	0.0011J	0.00050	0.002J	0.00050	0.0033J	0.00388	0.00109	0.00006	0.00537
Phenol	108-95-2	8270	7.33E+00	2.19E+01												<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.001J	0.0019J	0.0005	0.0021J	0.0011J	0.0028J	0.0005	0.0021J	0.00261	0.00165	0.00011	0.00204

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-02											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/11/2011	7/13/2011	1/30/2012	7/10/2012	1/9/2013	7/11/2013	1/8/2014	07/02/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.0008	**0.0025J**	<0.0009	<0.0009	<0.0009	0.0021J	<0.0005	<0.0005	**0.00318**	<0.000897	<0.00007	0.000509
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.01400	0.00090	0.00730	0.01800	0.00780	0.02600	0.00050	0.00880	0.03840	0.01790	0.00008J	0.00452
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	0.0005J	<0.0005	<0.0005	<0.0005	0.0005J	<0.0005	<0.0005	0.00057	0.000335J	0.00006J	0.0000979J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0007J	0.00060	0.0006J	0.00060	0.0006J	0.00050	<0.0005	0.0005J	0.00129	0.00130	0.00005J	0.000596
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.00330	0.00330	0.0021J	0.00050	0.00050	0.00087	0.00037	0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00070	0.0007J	0.00070	0.00070	0.00070	0.0038J	0.00050	0.0043J	0.01780	0.00734	0.00008J	0.00301
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00060	0.0011J	0.00050	0.00050	0.00050	0.0012J	0.00050	0.00050	0.00147	0.00069	0.00007J	0.000368J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.0039J	0.00060	0.0037J	0.01100	0.0049J	0.01500	0.00050	0.0043J	0.02010	0.00986	0.00007J	0.00357
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.01200	0.00060	0.00060	0.00060	0.0037J	0.00050	0.0033J	0.02110	0.00754	0.00008	0.00653
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00070	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00241	0.00078	0.00006J	0.000594
Phenol	108-95-2	8270	7.33E+00	2.19E+01												<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0009	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00087	0.000336J	0.00011J	0.000201J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-05						
					7/27/2011	2/2/2012	7/25/2012	2/5/2013	8/1/2013	1/15/2014	07/29/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds											
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	<0.0011	<0.0005	0.00011J	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	0.0013J	<0.001	0.00015J	<0.00015	0.00022J	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.00011			
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.00310	0.00310	<0.0015	<0.00026	0.00026	0.00058J	<0.00026
Semi-Volatile Organic Compounds											
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00005	<0.00005	<0.00005	0.00031	0.00031J	0.00031J	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00005	0.000085J	0.00005J	0.000468J	<0.00007	0.000187J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00005	0.00005J	<0.00005	<0.00056	0.00056J	0.00056J	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.0053	<0.00034	0.00005J	<0.00008	<0.000521	0.000194J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00005J	<0.00005	<0.00005	<0.00006	0.00006J	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00005	0.00005J	<0.00005	<0.000621	0.000427J	0.000411J	0.000153J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00005	0.00005	<0.00005	0.00008	0.00008J	0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00047	<0.0001	0.00019J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00005J	<0.00005	<0.00005	0.00008J	<0.00008	0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.0022	0.00011J	<0.00005	0.00008J	0.0000828J	0.000162J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00005J	<0.00005	0.000065J	<0.00011	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00011J	<0.00005	<0.00005	<0.00007	0.0000761J	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0012	0.00012J	<0.00005	<0.00007	0.000166J	0.000176J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.00005	<0.00087	<0.00005	<0.00133	0.000573J	0.000969J	0.00008J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00005	0.00011J	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00013J	0.00005	0.00005	0.000143J	0.00006	0.00051	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00005	<0.00005	<0.00005	0.000193J	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00014J	0.00005	0.00005	0.00011	0.000154J	0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-07											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/12/2011	7/12/2011	1/31/2012	7/11/2012	1/10/2013	7/11/2013	1/9/2014	07/03/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.0008	<0.0009	<0.0009	0.0009J	<0.0009	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00080	0.00090	0.00090	0.00090	0.00090	0.00050	0.00050	0.00050	0.00181	0.00008	0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00011J	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	0.000833J	<0.000749	<0.00005	0.000696
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.0049J	0.00330	0.00050	0.00050	0.00050	0.00037	0.00037	0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00070	0.00070	0.00070	0.00070	0.00070	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00060	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00007	0.00007	0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.000137J	0.00007	0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00008	0.000111J	0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00070	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00006	0.00006	0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01												<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0009	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00011	0.00011	0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-08											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/12/2011	7/12/2011	1/31/2012	7/11/2012	1/10/2013	7/11/2013	1/9/2014	07/03/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.0008	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00080	0.00090	0.00090	0.00090	0.00090	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	0.000439J	0.000101J	<0.000494	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.00330	0.00330	0.00050	0.00050	0.00050	0.00037	0.00037	0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00070	0.00070	0.00070	0.00070	0.00070	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00060	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00007	0.00007	0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00007	0.00007	0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00070	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00006	0.00006	0.0000637J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01												<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0009	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00011	0.00011	0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-09			
					7/27/2011	2/2/2012	7/25/2012	4/1/2013
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds								
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0005	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	<0.0011	<0.0005	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.0013	<0.001	0.00015J
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.001	<0.0005	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0031	<0.0031	<0.0015	0.00026J
Semi-Volatile Organic Compounds								
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00005	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00005	<0.00005	<0.00005	0.00031J
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00005	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00006	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00005	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00005J	0.00005	0.00005	0.000115J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00005	0.00056J
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00005	<0.00005	0.00005J	0.000188J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00005	<0.00005	<0.00005	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00036	<0.00005	<0.00005	0.000471J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00005	<0.00005	<0.00005	0.00008J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00005	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00005	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00018J	<0.0001	<0.00022	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00005	<0.00005	<0.00005	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00005	0.00005J	<0.00005	0.000126J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	0.000074J	0.000123J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00005	<0.00005	<0.00005	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00005	<0.00005	<0.00005	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.00005	<0.00005	<0.00005	0.00431J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00005	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.00005	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00005	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00005	0.00005	0.00005	0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00005	0.00005J	<0.00005	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00005	0.00005	0.00005	0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-10A											
					1/22/2009	7/22/2009	1/21/2010	7/13/2010	1/11/2011	7/13/2011	1/30/2012	7/10/2012	1/9/2013	7/11/2013	1/8/2014	07/15/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.0008	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	0.00007	<0.00178	<0.00007	**0.00262J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00080	0.00090	0.00090	0.00090	0.0017J	0.00050	0.00050	0.0016J	0.00008	0.03060	0.00008	0.0306
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00006	0.000385J	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	0.000468J	0.00036J	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.00330	0.00330	0.00050	0.00050	0.00050	0.00171	0.00037	0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00070	0.00070	0.00070	0.00070	0.00070	0.00050	0.00050	0.00050	0.00008	0.00866	0.00008	0.00862
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00060	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00007	0.000186J	0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00007	0.00631	0.00007	0.0111
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00008	0.19900	0.00008	0.199
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00070	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00006	0.00221	0.00006	0.00442J
Phenol	108-95-2	8270	7.33E+00	2.19E+01												
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0009	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00011	0.00011	0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-11A											
					1/22/2009	7/22/2009	1/21/2010	7/13/2010	1/11/2011	7/12/2011	1/30/2012	7/10/2012	1/9/2013	7/11/2013	1/8/2014	07/02/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.0008	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	0.00007J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00760	0.00090	0.00090	0.0028J	0.00090	0.00050	0.00050	0.00050	0.00175	0.00088	0.00008	0.00427
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0007J	0.0005J	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00006	0.00006J	0.00006J	0.000185J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.000499	0.00044J	<0.00005	0.00126
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00120	0.00330	0.00330	0.00330	0.00330	0.00050	0.00050	0.00050	0.00037	0.00037	0.00046J	0.00516
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00070	0.00070	0.00070	0.00070	0.00070	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	0.000618
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00												0.000109J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0012J	0.0011J	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00007	0.000221J	0.00007J	0.00215
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00007	0.00007	0.00007	0.00149
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00080	0.00060	0.00060	0.00060	0.00060	0.00050	0.00050	0.00050	0.00008	0.00008	0.00008	0.000343J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00070	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00006	0.00006	0.00006	0.000384J
Phenol	108-95-2	8270	7.33E+00	2.19E+01												<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0009	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00011	0.000115J	0.00011	0.00194

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-12A										
					2/4/2009	1/19/2010	6/22/2010	1/18/2011	7/26/2011	2/1/2012	7/19/2012	2/5/2013	7/31/2013	1/14/2014	07/25/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	0.0005J	<0.001	<0.001	0.0005J	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00073J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000237J	0.0000957J	0.00048J	0.000122J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0059	0.0029J	0.00056J	0.0014J	0.0015J	0.0042J	<0.0005	0.000521J	0.000774J	0.000257J	0.000403J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00130	0.00130	**0.0087J**	0.00015	0.00015	0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.00079J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	0.00015J	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.012J	0.0056J	0.0026J	0.0025J	0.00310	0.0048J	0.00150	0.00197J	0.00217J	0.00145J	0.00165J
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	0.00010	0.00010	0.00010	<0.00005	0.00005	0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00008	0.00008	0.00008	0.0001J	0.00005	0.00005	0.000056J	0.00031	0.00031	0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	0.00009	<0.00005	<0.00005	0.00005J	0.00013J	0.00013J	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.22000**	**0.15000**	**<0.15**	**0.03300**	**0.014J**	**0.06100**	**0.17J**	**<0.0477**	**<0.306**	**<0.0386**	**0.121**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	0.00008	<0.00008	<0.00008	0.00008J	0.00083J	0.00083J	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00056	0.00056	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.25	<0.19	<0.21	<0.19	<0.038	<0.13	<0.2	<0.253	0.428J	<0.342	0.292
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00360	0.00260	0.00190	0.00160	0.00005	0.00150	0.00150	0.00006	0.00006	0.00006J	0.00225
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00990	0.00930	0.01100	0.01200	0.00170	0.02800	0.02300	0.01790	0.02220	0.03250	0.0179
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00007	0.00007	0.00007	0.00082	0.00005	0.00005	0.00011J	0.000221J	0.000226J	0.00008J	0.000268J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	**<0.0003**	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00031	<0.0006	<0.0002	<0.00036	0.00017J	<0.0001	0.0001J	<0.00037	<0.00037	<0.00037	0.000679
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00007	0.00007	0.00007	0.00074	0.00005	0.00005	0.00013J	0.000186J	0.000231J	0.00008	0.000241J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**<0.18**	**<0.14**	**<0.18**	**<0.15**	<0.025	**<0.13**	**<0.16**	**0.17J**	**<0.317**	**<0.22**	**0.193**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00011	0.00011J	0.00011J	0.000797
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0061	<0.0059	<0.0064	<0.0086	<0.0017	<0.0031	<0.007	<0.0111	<0.0181	0.018J	0.0132
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.15J	<0.13	<0.16	<0.14	<0.025	<0.067	<0.15	0.17J	0.316J	0.245J	0.202
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<2.6**	**<1.7**	**<0.6**	<0.22	<0.05	**<1.5**	<0.36	0.0828J	**<0.661**	0.0338J	0.075
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009	0.00009J	0.00009J	0.00009J	0.00005J	0.00005J	<0.00005	0.00011J	0.00011J	0.00011J	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00005J	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00008J	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	0.00061J	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.10000	0.08700	0.09100	0.06100	0.01500	0.07800	0.12000	<0.13	0.23400	0.19200	0.162
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00007J	0.00007J	0.00007J	0.00007J	<0.00005	0.00005J	<0.00005	0.000101J	0.00004J	0.00004J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0025	0.0029	0.0025	0.0044	0.00068	0.0026	0.0036	0.00515	0.00818	0.00759J	0.00649

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-13										
					2/4/2009	1/19/2010	6/22/2010	1/18/2011	7/26/2011	2/2/2012	7/16/2012	2/5/2013	7/31/2013	1/14/2014	07/25/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	0.00050	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	0.000401J	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	0.00050	<0.0005	0.0005J	0.00130	<0.0013	0.001J	<0.00015	<0.00015	0.00015J	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	0.001J	<0.001	<0.001	0.00310	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	0.00011J	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00008	0.00008	<0.00008	<0.00008	0.00005	0.00005J	0.00005J	0.00031	0.00031	0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00005J	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00066	<0.00007	<0.00007	<0.00006	0.00006J	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00076	0.00007	0.000075J	0.00026	0.00005	0.000063J	<0.00007	<0.00007	0.000141J	0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00008J	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	0.00007J	<0.00007	<0.00007	0.00005	0.00005J	0.00005J	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.00011J	0.00009J	<0.00009	<0.00033	<0.00005	<0.00005	<0.00008	0.00008J	<0.00008	0.00008J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	0.00005J	0.00005J	0.00005J	<0.00006	0.0000715J	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0002	<0.00043	<0.00007	0.00007J	0.00037	0.000068J	0.00011J	<0.0011	<0.000878	<0.00005	0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	0.00007	<0.00007	0.00007	0.00005	0.00014J	0.00005	<0.00008	0.00008J	0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.000073J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00035	<0.0016	<0.0002	<0.0002	<0.00027	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	0.00007J	0.00007	<0.00007	0.00005	0.00017J	0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.00019J	<0.00008	<0.00008	<0.00034	0.000063J	0.00019J	<0.00008	<0.00008	<0.00008	0.00008J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	0.0001J	<0.00007	0.00005J	0.00005J	0.00005J	<0.00011	0.00011J	<0.00011	0.000122J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.000067J	0.00015J	0.00013J	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	0.000072J	<0.00035	<0.00005	0.00012J	<0.00007	<0.00007	<0.00007	0.00007J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.007	<0.0001	<0.0005	<0.00087	<0.00005	<0.00005	<0.00008	0.00008J	0.00008J	0.0039
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00007	0.00014J	0.00020	0.00007	0.00029	0.00015J	0.00049	<0.00006	0.00006	0.00006	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00007	0.00007	0.00007	0.00007	0.00011J	0.0002J	0.000089J	0.00011	0.00011	0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-15A										
					2/4/2009	1/18/2010	6/23/2010	1/17/2011	7/13/2011	2/2/2012	7/19/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	0.00100	0.00050	0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.0018J	0.0016J	0.0017J	0.00074J	0.0016J	0.0012J	0.0016J	<0.0016	<0.0013	<0.00106	0.00161
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	0.000121J	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0019J	0.0015J	0.0017J	<0.0005	0.0019J	0.0024J	0.0012J	0.00066J	0.000799J	0.000627J	0.00101
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00130	0.00130	0.00100	0.00015	0.00015	0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	0.00055J	<0.0005	<0.001	<0.001	<0.0005	0.000221J	0.000199J	0.00034J	0.000595J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0039J	0.0015J	0.0047J	0.00100	0.0038J	0.0073J	0.0097J	0.00417	0.00527	0.00337	0.00854
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	0.00010	0.00010	0.00010	0.00005	0.00005	0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00008	0.00008	0.00008	0.00008	0.00005	0.00059	0.00056	0.00200	0.00031	0.00031J	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.04400**	**0.03300**	**0.04200**	**0.03800**	**0.14J**	<0.001	**<0.046**	**<0.00997**	**<0.124**	**<0.0475**	**0.059**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00056	0.00056	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.17000	0.17J	<0.16	<0.27	<0.2	<0.13	<0.13	<0.141	0.332J	<0.3	0.205
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00170	0.00150	0.00097	0.00110	0.00097	0.00071	0.00120	0.00006	0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00300	0.00360	0.00490	0.00630	0.00530	0.00280	0.00460	0.00313	0.00850	0.0111J	0.00642
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00008J	0.00008	0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0026	<0.0002	<0.0002	<0.0016	0.0001J	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00008	0.00008	0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.047	<0.043	0.04800	<0.05	<0.078	<0.028	<0.046	<0.0416	**<0.104**	<0.0693	0.0572
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00029	0.00011J	0.00007	0.00007	0.00005	0.00005	0.00005	0.00011	0.000187J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0011	<0.0015	<0.002	<0.0023	<0.0021	<0.00094	<0.0015	<0.000885	<0.00361	<0.00007	0.00257
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.059J	0.06J	0.062J	0.076J	0.092J	0.043J	0.063J	0.05600	0.13900	0.11400	0.0822
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.048	0.00010	<0.036	<0.0023	<0.087	<0.008	<0.27	0.0501J	**0.526J**	<0.326	0.248
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009J	0.00009J	0.00009J	<0.00009	0.00005J	0.00005J	0.00005J	0.00011J	0.00011J	0.00011J	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00055	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	0.00008J	<0.00008	<0.00005	<0.00005	<0.00005	0.00061J	0.00061J	0.00061J	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00950	0.00740	0.01200	0.01900	0.03600	0.00560	0.01400	0.00792	0.05200	0.03750	0.0203
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00007J	0.00007J	0.0002J	<0.00007	0.00005J	0.00005J	0.00005J	0.00004	0.00004	0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00042	0.00062	0.00076	0.00095	0.00089	0.00053	0.00084	0.000496	0.00154	0.00011	0.00101

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-16							
					2/5/2009	1/18/2010	6/23/2010	1/18/2011	7/14/2011	2/1/2012	7/16/2012	1/30/2013
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds												
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00100	0.00100	0.00050	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**<0.048**	**<0.031**	**<0.058**	**0.025J**	**<0.068**	**0.025J**	**<0.056**	**<0.0376**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.00051J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.034	0.021J	<0.032	0.023J	0.038J	0.021J	<0.027	<0.0211
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.0005J	0.00050	0.00130	0.00130	0.00100	0.00015J
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0025J	0.0034J	0.01J	<0.0005	<0.001	<0.001	<0.007	0.00095J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.036J	0.027J	0.04J	0.025J	0.00310	0.00310	0.03400	0.03480
Semi-Volatile Organic Compounds												
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	0.00010	0.00010	0.00010	0.00005	0.00005	0.00005	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00390	0.00250	0.00540	0.00220	0.01200	0.00077	0.00540	0.00031J
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00009J	0.00009J	<0.00009	0.00009J	0.00005	0.00005J	0.00005J	0.00013J
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.13000**	**0.07900**	**0.04000**	**<0.038**	**0.08200**	**0.03400**	**<0.045**	**0.0467J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008J	0.00008J	<0.00008	0.00008J	0.00008J	0.00008J	0.00008J	0.00083J
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.24000	<0.21	<0.18	<0.21	0.23J	<0.21	<0.28	<0.281
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00440	0.00410	0.00310	0.00350	0.00320	0.00210	0.00280	0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01100	0.00840	0.00760	0.01200	0.01700	0.00340	0.01700	0.0182J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00014J	0.00011J	0.00007	0.00017J	0.00022	0.000059J	0.00013J	0.000339J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0005	<0.0002	<0.0002	<0.0002	0.0001J	<0.0001	<0.0001	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00014J	0.000088J	0.00007	0.00011J	0.00019J	0.000053J	0.0001J	0.000225J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.14000**	**0.12J**	<0.091	**0.13J**	**0.13J**	**0.098J**	**0.17J**	**<0.158**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00025	0.00007	0.00007	0.00007	0.000099J	0.00005	0.00005	0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0064	<0.0037	<0.0049	<0.0059	<0.006	<0.0021	<0.0059	<0.00836
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.08800	0.09600	0.08600	0.12J	0.14000	0.085J	0.15000	0.14700
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<4.1**	**1.90000**	**<1.4**	**<1.2**	**<1.8**	**<1.8**	**<2.1**	**1.81J**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009	0.00009J	0.00009	0.00009J	0.00005J	0.00005J	0.00005	0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	0.00009J	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00008J	0.00008J	0.00008J	<0.00008	0.000061J	<0.00005	0.00005	0.00061J
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.04000	0.03800	0.04200	0.04500	0.05800	0.04200	0.07000	0.06140
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00022J	0.00013J	0.00007J	0.000074J	0.000067J	0.00015J	0.000088J	0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.004	0.0027	0.0025	0.0034	0.005	0.0017	0.0034	0.0059

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-17											
					2/4/2009	1/18/2010	6/23/2010	1/17/2011	7/13/2011	2/1/2012	7/12/2012	2/14/2013	4/1/2013	7/30/2013	1/13/2014	07/17/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00100	0.00100	0.00050		0.00014	0.00014	0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**<0.65**	**<0.59**	**<0.65**	**<0.31**	**<0.45**	**<0.24**	**<0.46**		**<0.435**	**<0.174**	**<0.324**	**0.576**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.26	<0.26	<0.2	<0.21	<0.21	<0.23	<0.21		<0.217	<0.279	<0.251	0.209
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.0005J	0.00050	0.00130	0.00130	0.00100		0.00015	**0.11500**	0.00015	**0.0187J**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	**<1.1**	<1	<0.88	<0.97	<0.85	<0.74	<0.81		<0.878	<0.68	<0.931	0.93
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.55000	0.72000	0.61000	0.64000	0.54000	0.63000	0.69000		0.70200	0.69800	0.72400	0.641
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	0.00010	0.00010	0.00010	0.00005	0.00005	0.00005	<0.00038	<0.00011	0.00011J	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**2.60000**	**3.70000**	**13.00000**	**3.90000**	**2.70000**	**3.00000**	**4.00000**	**<7.93**	**<11.3**	**3.19J**	**6.75J**	**13.9**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00009	<0.00009	<0.00009	0.00009	0.00005	<0.00005	0.00005J	<0.00032	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	0.00007J	<0.00007	<0.00007	0.00007	0.00006	<0.00006	<0.00006	<0.00029	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00019	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**<0.27**	**<0.56**	**<0.39**	**0.97000**	**0.75000**	**<0.29**	**0.51000**	**<0.443**	**<1.04**	**<1.04**	**<0.857**	**0.636**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008	<0.00008	<0.00008	0.00008	0.00008	<0.00008	0.00008J	<0.00016	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00033J	0.00056	0.00056	0.00056J	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.094	<0.17	<0.071	<0.52	<0.22	<0.13	<0.14	<0.159	<0.36	<0.353	<0.315	0.195
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00410	0.00670	0.00300	0.00800	0.00690	0.00560	0.00500	<0.00016	<0.00006	0.0147J	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00990	0.01300	0.00750	0.12000	0.01400	0.00960	0.01400	0.00044J	0.00005J	0.0233J	0.0278J	0.0202J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00040	0.00007	0.00007	**0.03300**	0.00047	0.00005	0.00018J	0.00025	0.00008	0.00008	0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00014J	<0.00008	<0.00008	**<0.0097**	**<0.00027**	<0.00005	<0.00005	<0.00013	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00019	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	<0.0002	<0.0002	<0.0022	<0.0001	<0.0001	<0.00027	<0.00059	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00032	0.00007	0.00007	0.02500	0.00047	0.00005	0.00011J	0.00024J	0.00008J	0.00008	0.00008J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.07900	**0.15000**	0.06500	**0.47000**	**0.19000**	0.09300	**0.13000**	**0.133J**	**0.27500**	**0.25300**	**0.211J**	**0.148**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007	0.00007J	0.00007	0.00005	0.00005J	0.00005	<0.00187	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0035	<0.0037	<0.0022	<0.17	<0.0039	<0.0026	<0.0034	0.00031	<0.00007	0.00667J	<0.00007	0.00429J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.04700	0.07600	0.03900	0.42000	0.12000	0.05900	0.08200	0.0672J	0.146J	0.16500	0.16J	0.0943
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<9.7**	**16.00000**	**<15**	**<16**	**<19**	**<10**	**<14**	**15.30000**	**<25.2**	**<25.8**	**<21.3**	**15.4**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009	0.00009	0.00009	0.00009	0.00005	0.00005	0.00005	0.00020	0.00011	0.00011	0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	0.00009J	<0.00009	<0.00005	<0.00005	<0.00005	0.00033	<0.0001	0.00010	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00008	0.00008	0.00008	0.00008	0.00005	0.00005	0.00005	0.00096	0.00061	0.00061	0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.03800	0.06000	0.03300	**0.91000**	0.07800	0.04200	0.06300	0.0564J	0.124J	0.12300	0.0993J	0.0725
Phenol	108-95-2	8270	7.33E+00	2.19E+01	5.50000	**7.70000**	**19.00000**	3.60000	3.10000	3.70000	6.10000	**20.70000**	**22.20000**	1.54000	6.46000	**18.1**
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.002	0.0021	0.0012J	0.12	0.0019	0.0018J	0.0018	0.00033	0.00011	0.00011	0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-18A										
					2/5/2009	1/18/2010	6/24/2010	1/17/2011	7/13/2011	2/1/2012	7/11/2012	1/31/2013	7/29/2013	1/13/2014	07/16/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00100	0.00100	0.00050	0.00014	0.00405J	0.00014	0.00482J
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**<0.48**	**<0.51**	**<0.47**	**<0.55**	**<0.59**	**<0.28**	**<0.68**	**<0.636**	**<0.491**	**<0.239**	**0.483**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.017J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.52	<0.48	<0.54	<0.55	<0.39	<0.55	<0.3	<0.316	<0.398	<0.637	0.692
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00130	0.00130	0.00100	0.00015	**0.00976J**	0.00015	**0.0138J**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.23	<0.32	<0.45	<0.35	<0.23	<0.21	<0.21	<0.154	<0.239	0.0731J	0.416
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		**<0.059**		**<0.07**	**<0.028**	**<0.047**	<0.0005	**0.0181J**	**<0.029**	<0.00011	**0.02J**
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.98000	1.20000	1.20000	1.00000	0.73000	1.10000	0.51000	0.51900	0.99100	1.27000	1.3
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	0.00010	0.00010	0.00010	0.00005	0.00005	0.00005	0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**1.90000**	**4.50000**	**7.90000**	**9.60000**	**11.00000**	**5.80000**	**9.40000**	**11.80000**	**6.29J**	**2.95J**	**8.01**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.42000**	**<0.36**	**<0.4**	**<0.44**	**<0.7**	**0.23J**	**<0.64**	**<0.745**	**<0.819**	**<0.996**	**0.589**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00056	0.00056	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.19	<0.23	<0.25	<0.24	<0.36	<0.15	<0.3	<0.464	<0.493	<0.553	0.352
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00920	0.00620	0.00950	0.00720	0.01500	0.007J	0.00670	<0.0151	<0.00006	<0.00006	0.0155J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00900	0.00690	0.00750	0.00730	0.01300	0.00460	0.00900	0.02040	0.0204J	0.0226J	0.0192J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00008	0.00008	0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00033	<0.0002	<0.0002	<0.0002	<0.0001	0.0001J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00008	0.00008	0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.12000**	**0.15000**	**0.16000**	**0.15000**	**0.23000**	0.07500	**0.21000**	**<0.188**	**<0.279**	**<0.326**	**0.204**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007	0.00007J	0.00007	0.00005	0.00005J	0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0026	<0.0013	<0.0013	<0.0014	<0.0018	0.0013J	<0.0016	<0.00007	0.00007J	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.08900	0.09600	0.11000	0.09400	0.18000	0.05700	0.14000	0.13600	0.21400	0.26800	0.163
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**3.3J**	**<4.3**	**<6.1**	**<5.9**	**<7.3**	**<3.6**	**<7.8**	**<9.29**	**<11.8**	**<11.4**	**5.27**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009	0.00009	0.00009	0.00009	0.00005	0.00005	0.00005	0.00011	0.00011	0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	0.0001J	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00008	0.00008	0.00008	0.00008	0.00005	0.00005	0.00005	0.00061	0.00061	0.00061J	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.07800	0.06700	0.08200	0.06300	0.09800	0.04200	<0.083	0.101J	0.14400	<0.19	0.114
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00500	0.04300	0.00540	0.02000	0.06100	0.01100	0.12000	0.00004	0.00004	0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0013	0.00075	0.00063J	0.00085	0.0011	0.00077J	0.00081	0.00011	0.00011	0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-20A				MW-22A								
					7/14/2011	2/1/2012	7/16/2012	1/30/2013	2/3/2009	1/15/2010	6/29/2010	1/25/2011	7/21/2011	2/15/2012	7/18/2012	1/23/2014	07/30/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00100	0.00100	0.00050	0.00014	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**<0.098**	**<0.057**	**<0.089**	**<0.0746**	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0002	0.00296
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0005	<0.00012	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.077	<0.046	<0.1	<0.0619	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.000549	0.0403
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00130	0.00130	0.00100	0.00015	<0.0005	<0.0005	<0.0005	0.00050	<0.0013	<0.0013	0.00100	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.001	<0.022	<0.0028	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000307J	0.00925
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03													
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.057J	0.028J	0.08800	0.05490	<0.001	<0.001	<0.001	0.001J	<0.0031	0.0031J	0.00150	0.000834J	0.0569
Semi-Volatile Organic Compounds																	
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00005	0.00005J	0.00005	<0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.30000	0.07600	0.10000	0.119J	0.00008	<0.00008	<0.00008	0.00008J	<0.00005	0.00005J	0.00005	0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00005	<0.00013	0.00009J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00005J	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00006	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00005	<0.00008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.42000**	**<0.064**	**<0.36**	**<0.191**	0.00007	0.00007	0.00007	<0.00072	0.00005	0.00005	0.00005J	<0.00007	**0.00603**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00083	0.00008J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00008J	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00005	0.00005	0.00005	0.00056	<0.00007	<0.00007	<0.00007	0.00007J	<0.00005	0.00005J	0.00005	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.2	<0.15	<0.19	<0.12	0.00009J	<0.00009	<0.00009	0.00015J	<0.00005	0.00009J	<0.00005	0.00557J	0.0783
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00170	0.0015J	0.00150	<0.00006	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	0.00005	0.000742J	0.000943
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00580	0.00440	0.00420	0.00589J	<0.0002	<0.00007	<0.00007	0.00011J	<0.00005	0.000058J	0.00040	0.00005J	0.00265
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00005	0.00005	0.00005	0.00008	0.00015J	<0.00007	<0.00007	0.00007	0.00005J	0.00005	0.00011J	0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00005	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.0001	<0.0001	<0.00037	<0.00033	<0.0013	<0.0002	<0.0002	<0.0015	<0.0001	0.00011J	<0.00037	0.000703
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00005	0.00005	0.00005	0.00008J	0.00014J	<0.00007	<0.00007	0.00007	<0.00005	0.00005J	0.0001J	0.00008J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**<0.14**	<0.073	**<0.15**	<0.0799	<0.00008	<0.00008	<0.00008	0.00015J	<0.00005	0.000074J	<0.00005	<0.001	0.0224
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00005	0.00005J	0.00005	<0.00011	0.00017J	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	0.00005	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0007	0.00082J	<0.00061	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000086J	<0.00005	0.000362J	0.00247
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.11000	0.06000	0.11000	0.06610	<0.00007	<0.00007	<0.00007	0.0001J	<0.00005	0.00008J	<0.00005	0.000468J	0.0175
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<7.7**	**<0.96**	**<6.1**	**<43.9**	<0.0001	<0.0001	<0.0001	<0.0035	0.0001J	<0.00024	<0.00005	0.00008J	**0.792**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00005	0.00005	0.00005	0.00011	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.00005	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	0.00005	0.00061	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.00061J	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.03900	0.03000	0.04300	0.0217J	0.00007	0.00007	0.00007	0.00028	0.00005	0.0002J	0.00005	0.00006J	0.000604
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00005J	0.00005J	0.00005	0.00004	<0.00007	<0.00007	<0.00007	0.00017J	<0.00005	<0.00005	<0.00005	0.00004J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0004	0.00056J	0.0003	0.00011	0.00013J	0.00007	0.00007	0.00007	0.00005	0.000055J	0.00005	0.00011	0.00106

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-24AR									
					2/5/2009	1/14/2010	6/29/2010	1/25/2011	7/21/2011	2/9/2012	7/25/2012	2/12/2013	8/8/2013	1/23/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	0.001J	<0.0005	<0.00014	<0.00014	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000201J	<0.00012	<0.00018
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	0.00050	<0.0005	0.0005J	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	0.00022J
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	0.00058J
Semi-Volatile Organic Compounds														
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00013J	<0.00005	<0.00031	<0.00031	0.00031J
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00023	0.00007	0.00018J	0.00005	0.00005	<0.00005	<0.00007	<0.00007	0.0000924J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	0.00007J	0.00007J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	0.00056J
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00009	0.00009J	<0.00009	<0.00009	<0.00005	0.00005J	0.00005J	<0.00008	0.00008J	0.000146J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	0.00007J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.00006J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	0.00007	0.00007	0.00007	<0.00005	<0.00005	<0.00005	0.00008J	<0.00008	0.00008J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00031	<0.0002	<0.0002	<0.0002	<0.00089	<0.00048	<0.0001	<0.00037	<0.00037	0.000767J
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	0.00007J	<0.00007	0.00007J	<0.00005	<0.00005	<0.00005	0.00008J	<0.00008	0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.000084J	0.00011J	<0.00008	<0.00005	0.00005J	<0.00005	<0.00008	<0.00008	0.000164J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.0019	0.0001J	<0.00007	<0.00007	<0.00005	0.00017J	0.00005J	<0.00011	0.000168J	0.00011J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.00011J	<0.00007	<0.00007	<0.00005	0.000069J	<0.00005	<0.00007	<0.00007	0.000224J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000137J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.0001	<0.00036	<0.00081	<0.00005	<0.00005	<0.00005	0.00008J	<0.00008	0.00008J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00007	0.00018J	0.00007	0.0001J	0.00005	0.00005	0.00005	0.000089J	<0.00006	0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00007	0.00007	0.00007	0.00007	0.00005	0.000067J	0.00005	0.00011	0.00011	0.000172J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-25A										
					2/3/2009	1/15/2010	6/30/2010	1/26/2011	7/20/2011	2/8/2012	7/18/2012	2/6/2013	8/6/2013	1/22/2014	07/29/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	0.00050	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000497J	0.000121J	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0029J	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	0.001J	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.00074J	<0.0005	0.00050	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0047J	0.00100	0.00100	0.00100	0.00310	0.00310	<0.0015	0.00026J	0.00026J	0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00010	<0.0001	0.00010	<0.0001	0.00005J	<0.00005	<0.00005	<0.00011	<0.00011	0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00066	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	0.00007J	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.02400**	<0.00007	0.00007	<0.00007	0.00005	<0.00005	0.00005J	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00026	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	<0.00007	0.00007	<0.00007	0.00005	0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.034	<0.0014	<0.0012	<0.00054	<0.0042	<0.00053	<0.00005	0.000171J	0.000345J	<0.00356	0.0000912J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00040	0.00007J	0.00034J	<0.00007	0.000053J	<0.00005	<0.00005	<0.00006	<0.00006	0.00054	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00050	<0.00007	<0.00007	<0.00007	0.00005J	0.00005J	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00007	<0.00007	0.00007	0.00007J	<0.00005	0.00005J	0.00005	0.00008J	<0.00008	0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	0.00008	0.00012J	<0.00008	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00033	<0.0002	0.00020	<0.0002	<0.0001	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.018	<0.00008	<0.00034	<0.00008	<0.0013	0.0005J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007	0.00007J	<0.00007	0.00005	<0.00005	<0.00005	<0.00011	0.00011J	0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00057	0.000084J	0.000092J	<0.00007	0.00014J	<0.00005	<0.00005	<0.00007	<0.00007	<0.00106	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0049	<0.00007	<0.00007	<0.00007	0.00016J	0.00011J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<0.45**	<0.0001	<0.00024	0.00018J	<0.00005	0.00017J	<0.00005	0.00008J	0.00008J	0.00008J	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00009J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00008J	<0.00008	<0.00033	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00340	0.00007	0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00007J	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00036	0.00047	0.00015J	0.00007	0.0009	0.00005	0.00005	0.00011	0.000124J	0.000585	0.00018J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-26A														
					2/3/2009	1/13/2010	6/25/2010	1/24/2011	7/19/2011	8/25/2011	10/20/2011	2/15/2012	7/17/2012	2/6/2013	8/7/2013	10/14/2013	1/22/2014	07/24/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																		
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00050	<0.0005	<0.0005	<0.0005	<0.001			<0.001	<0.0005	<0.00014	<0.00014		<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	**<0.031**	**0.04200**	0.004J	<0.001	0.0005J	<0.00118	**<0.0097**	0.00391	0.000434J	0.000189J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001			<0.001	<0.0005	0.000176J	0.000297J		<0.00018	0.000205J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011			<0.0011	<0.0005	<0.00011	0.000815J		<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	<0.0005	<0.0005	0.00050	0.00130			<0.0013	0.001J	<0.00015	0.00015J		<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001			<0.001	<0.0005	<0.00015	0.00015J		<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03														<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.00100	0.00100	0.00100	0.00100	0.0045J			0.00310	0.00150	0.00026	0.00239J		0.00058	<0.00026
Semi-Volatile Organic Compounds																		
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	0.0001J	<0.0001	<0.0001	0.00005			0.00005J	<0.00005	<0.00011	<0.00011		<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00054	<0.00008	0.00008	0.00008J	0.00005			0.00005	0.00005	<0.00031	0.00031		0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00009J	<0.00009	<0.00009	<0.00009	<0.00005			<0.00005	0.0001J	<0.00013	<0.00013		<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006			<0.00006	<0.00006	<0.00008	<0.00008		<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005			<0.00005	<0.00005	<0.00008	<0.00008		<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00240	0.00007	0.00007	0.00031	0.00039			<0.00005	0.000056J	<0.00007	0.000414J		<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008J	<0.00008	0.00008	<0.00008	<0.00008			<0.00008	<0.00008	<0.00083	<0.00083		<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005			0.00005	0.00005	0.00056J	0.00056		<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.015	<0.0097	<0.005	<0.0039	<0.12			<0.0095	<0.0087	<0.0481	<0.141		<0.0699	0.0663
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00006	0.00014J	0.00007	0.00007	0.00047			0.00013J	0.00005	<0.00006	0.00006		0.00006	0.000486
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00079	0.00007	0.00020	0.000099J	0.00260			0.00025	0.00027	<0.00005	0.00228		0.00136	0.00141
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00016J	0.00007	<0.00007	0.00007	0.00005			0.00005J	0.00005	<0.00008	0.00008		0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005			<0.00005	<0.00005	<0.00008	<0.00008		<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	0.00005			<0.00005	<0.00005	<0.00013	<0.00013		<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00042	<0.0002	<0.0002	<0.00043	<0.0001			<0.0001	0.0002J	<0.00037	<0.00037		<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00018J	0.00007	0.0003J	0.00007J	0.00005			<0.00005	<0.00005	<0.00008	<0.00008		0.00008J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.0026	<0.00078	<0.00033	<0.00038	<0.021			<0.0014	<0.00084	0.00416J	<0.0151		<0.00008	0.00154
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007J	0.00007J	0.00007J	0.00005			0.00005	0.00005	<0.00011	0.00011		0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00091	<0.0003	<0.0004	<0.00036	<0.0048			<0.00049	<0.00092	<0.00007	<0.0062		<0.00306	0.00465
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0016	<0.00028	<0.00034	0.00017J	0.00570			<0.0006	<0.00041	0.00007	0.00611		0.0031J	0.00245
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0074	<0.0001	<0.0001	<0.0043	<0.0019			0.0001J	<0.00027	0.00008J	0.0066J		0.00008J	0.000419J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005			<0.00005	<0.00005	<0.00011	0.00011J		<0.00011	0.00394
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00023			<0.00005	<0.00005	<0.0001	<0.0001		<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005			<0.00005	<0.00005	<0.00061	0.00061J		<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00300	0.00021	0.00017J	0.00011J	0.00029			0.00005	0.00005	0.00006	0.00006		0.000147J	0.000155J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	0.00005J			<0.00005	<0.00005	<0.00004	0.00004J		<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00069	0.000092J	0.0002J	0.00013J	0.0031			0.00024	0.00051	0.00011	0.00322		0.00159	0.0022

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-28A										
					2/3/2009	1/13/2010	6/30/2010	1/25/2011	7/19/2011	2/16/2012	7/17/2012	2/7/2013	8/7/2013	1/22/2014	07/25/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	0.00050	<0.0013	0.0013J	0.001J	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	0.00100	<0.0031	0.00310	<0.0015	<0.00026	0.00026J	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00009J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	0.00007J	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00007	0.00007	<0.00064	0.00005	0.00005J	0.00015J	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	0.00007	<0.00005	0.00005J	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00009J	<0.00009	<0.00009	<0.0002	<0.00005	<0.00098	<0.00005	<0.00008	0.000368J	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00006J	<0.00007	<0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	0.00036	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00013J	0.00007J	<0.00007	0.00007	<0.00005	0.00005	0.00005	<0.00008	0.00008J	0.00008J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00011J	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0037	<0.0002	0.00020	<0.0002	<0.0001	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00013J	<0.00007	<0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.0005	<0.00005	0.00005J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00016J	<0.00007	<0.00007	0.00007J	<0.00005	0.00005J	<0.00005	<0.00011	0.00011J	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00012J	<0.00007	<0.00007	<0.00021	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.0003	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00017J	0.0001J	<0.0001	<0.0023	<0.00005	<0.00005	<0.0013	<0.00008	0.00008J	0.00008J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00032	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00007	0.00007	0.00007	0.00097	0.00005	0.00005	0.00005	0.00006	0.00006	0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00016J	0.00007	0.00007	0.00013J	0.00005	0.00011J	0.00005	0.00011	0.000246J	0.000105J	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-30A				MW-31A				MW-32A				
					7/14/2011	2/3/2012	7/12/2012	2/1/2013	7/14/2011	2/3/2012	7/12/2012	2/1/2013	2/3/2009	1/14/2010	7/1/2010	1/25/2011	7/19/2011
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00100	0.00100	0.00050	0.00014	0.00100	0.00100	0.00050	0.00014	0.00050	0.00050	0.00050	0.00050	**0.03000**
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**<0.14**	**<0.13**	**<0.14**	**<0.117**	**<0.14**	**<0.14**	**<0.11**	**<0.135**	**<0.69**	**<0.34**	**<1.5**	**<0.61**	**<1.4**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0005	<0.00012	<0.001	<0.001	<0.0005	<0.00012	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.12	<0.11	<0.13	<0.119	<0.19	<0.17	<0.18	<0.171	<0.34	<0.076	<0.45	<0.41	<0.31
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00130	0.00130	0.00100	**0.02110**	0.00130	0.00130	0.00100	**0.00971J**	0.00050	0.00050	0.0005J	0.00050	0.00130
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.51	<0.49	<0.54	<0.443	<0.37	<0.36	<0.31	<0.346	<0.74	<0.36	**<1.5**	<1	**<1.2**
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03													
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.32000	0.32000	0.32000	0.30200	0.63000	0.71000	0.63000	0.58300	0.88000	0.35000	1.30000	1.10000	0.87000
Semi-Volatile Organic Compounds																	
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00005	0.00005	0.00005	<0.00011	0.00005	0.00005	0.00005	<0.00011	0.00010	0.00010	0.00010	0.00010	0.00005
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**2.90000**	**3.00000**	**2.70000**	**2.94J**	**5.30000**	**5.10000**	**3.40000**	**4.45J**	**2.20000**	**2.10000**	**15.00000**	**2.30000**	**31.00000**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00005	<0.00013	0.00005	<0.00005	0.00005	<0.00013	0.00009	0.00009	0.00009	0.00009	0.00005
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00006	<0.00008	0.00006	<0.00006	<0.00006	<0.00008	0.00007	0.00007	0.00007	0.00007	0.00006
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00005	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**<0.85**	**<0.42**	**<0.67**	**<1.01**	**<1**	**<0.65**	**<0.83**	**<1.17**	**1.20000**	**0.30000**	**0.48000**	**6.90000**	**0.95J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00083	0.00008	<0.00008	0.00008J	<0.00083	0.00008	0.00008	0.00008	0.00008	0.00008
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00005	0.00005	0.00005	0.00056	0.00005	0.00005	0.00005	0.00056	0.00007	0.00007	0.00007	0.00007	0.00005
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.31	<0.23	0.24000	<0.436	<0.37	<0.3	<0.28	<0.488	<0.34	<0.13	<0.19	**<3.1**	<0.25
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00750	0.00640	0.00740	<0.00006	0.00760	0.00440	0.00320	<0.00006	0.00600	0.00190	0.00790	0.02700	0.00500
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01800	0.01300	0.01800	0.0391J	0.03200	0.02600	0.02600	0.056J	0.07700	0.05100	0.09300	0.91000	0.09000
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00005	0.00005	0.00005	0.00008	**0.00380**	0.00005	0.00023	0.00008	**0.00960**	**0.00670**	**0.01000**	**0.30000**	**0.03800**
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00005	<0.00008	**<0.00089**	<0.00005	<0.00005	<0.00008	**<0.003**	**<0.0023**	**<0.0067**	**<0.078**	**<0.019**
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00005	<0.00013	<0.00005	<0.00005	<0.00005	<0.00013	<0.00009	<0.00009	0.00009	<0.00009	<0.00005
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00010	<0.0001	<0.0001	<0.00037	0.00010	0.00010	0.00010	<0.00037	<0.00042	<0.0002	<0.0002	<0.0046	0.0001J
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00005	0.00005	0.00005	0.00008J	0.00310	0.00005	0.00017J	0.00008	0.00870	0.00640	0.00990	**0.28000**	0.03300
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.25000**	**0.21000**	**0.20000**	**0.308J**	**0.33000**	**0.26000**	**0.26000**	**0.36700**	**0.32000**	**0.14000**	**0.21000**	**3.20000**	**0.27000**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00005	0.00005	0.00020	<0.00011	0.00005	0.00005	0.00005	<0.00011	0.00007	0.00007	0.00007	0.00007	0.00005
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0041	<0.0031	<0.0038	<0.00007	<0.031	<0.0029	<0.0052	<0.00007	<0.098	<0.07	<0.09	**<2.5**	0.11000
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.18000	0.13000	0.14000	0.24700	0.24000	0.17000	0.17000	0.27300	0.22000	0.08700	0.13000	**2.50000**	0.18000
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**<15**	**<7.8**	**<12**	**<16.8**	**<21**	**<18**	**<17**	**<19.3**	**<16**	**<3.5**	**<11**	**<31**	**<21**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	0.00005	0.00005	0.00005	0.00011	0.00005	0.00005	0.00005	0.00011	0.00009	0.00009	0.00009	0.00009	0.00005
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.00005	0.00010	<0.00005	<0.00005	<0.00005	0.0001J	<0.00009	<0.00009	0.014J	<0.00009	<0.00005
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00033	0.00005	0.00005	0.00061	**0.07600**	**0.11000**	**0.09400**	0.00061	0.00008	0.00008	0.00008	0.00008	0.00005
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.12000	0.06400	0.10000	0.162J	0.24000	0.14000	0.13000	0.26800	0.45000	0.25000	0.19000	**8.90000**	0.35000
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.14000	0.01500	0.02000	0.0781J	0.60000	0.76000	0.29000	0.57900	1.40000	1.30000	**14.00000**	1.20000	**21.00000**
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0022	0.0021	0.0018	0.00011	0.018	0.0025	0.002	0.00011	0.062	0.043	0.047	**1.5**	0.072

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-32AR					
					2/9/2012	7/16/2012	2/6/2013	8/7/2013	1/21/2014	07/24/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds										
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	0.00100	0.0005J	0.00014J	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	**<0.023**	0.000475J	<0.0002	**0.0404**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	<0.0005	<0.0082	0.000296J	<0.00019	0.0208
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.0013J	0.001J	0.00015J	<0.00015	0.00022J	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.0005	<0.00338	0.000234J	<0.00017	0.000849J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.00310	0.00150	0.0176J	0.000873J	0.00058	0.0336
Semi-Volatile Organic Compounds										
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	0.00005	<0.00005	<0.00011	0.00011J	0.00011J	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00120	0.000061J	0.0172J	0.00031J	0.00031J	0.0722
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00005J	0.00005J	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.000088J	0.00019J	**0.011J**	<0.00007	0.00021J	**0.206**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008J	0.00008	<0.00083	<0.00083	0.00083J	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00005	0.00005	0.00056J	0.00056	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.0046	0.0029J	0.0232J	0.00625J	<0.0105	0.111
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00032	0.00005	0.00006J	0.000258J	0.00006J	0.00226
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00041	0.00026	0.00005J	0.000223J	0.000444J	0.00332
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00012J	0.00015J	0.00008	0.00008J	0.00008	0.000218J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	0.000452J
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00054	0.00014J	<0.00037	<0.00037	<0.00037	0.000621
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.000093J	0.00023J	0.00008J	0.00008J	0.0000774J	0.00016J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00096J	0.00170	0.00936J	<0.000515	<0.000664	0.05
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00005	0.000056J	<0.00011	0.00012J	0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.002	<0.003	0.00508J	<0.00102	<0.00124	0.00656
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0017	<0.0016	0.00932J	0.00105J	<0.00317	0.0516
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.00044	<0.0036	**<0.406**	0.00008J	<0.0087	**3.83**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	0.00011	0.00011J	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	0.00061	0.00061J	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00033	0.000055J	0.00768J	0.000112J	0.000101J	0.0111
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00012J	<0.00029	0.00004	0.00004J	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0041	0.0046	0.00011	0.000617	0.000625	0.00474

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-33A										
					2/3/2009	1/13/2010	6/29/2010	1/24/2011	7/19/2011	2/15/2012	7/17/2012	2/12/2013	8/7/2013	1/23/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	0.00050	0.00100	0.00100	<0.0005	0.00014	0.00014	0.00020	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00071J	0.0025J	0.0018J	**<0.0056**	**<0.009**	**<0.054**	0.0023J	**<0.00782**	**<0.165**	**<0.223**	0.00236
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	0.000185J	0.00021309J	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	0.0015J	0.0033J	<0.075	<0.0005	<0.0022	<0.109	<0.135	0.0014
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00050	0.00050	0.00050	0.00050	0.00130	0.00130	0.00100	0.00015	0.00015	0.00022J	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.019	<0.0005	<0.00015	<0.00639	<0.23	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.00100	0.00100	0.00100	0.0016J	0.00310	0.11000	0.00150	0.00223J	0.17200	0.188J	0.000632J
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	0.0001J	<0.0001	0.0001J	0.00005J	0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00008J	0.00008	0.00008	0.00270	0.00340	0.02900	0.00005	0.00623	**0.888J**	**<1.44**	0.0212
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	0.00009J	0.00009J	0.00009J	0.00009	0.00005J	0.00005J	0.00005	0.00013J	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	0.00006J	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00066	0.00090	0.00092	**0.00670**	**0.02200**	**0.03000**	0.0015J	**<0.00345**	**<0.195**	**0.263J**	**0.0216**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	0.00008J	0.00008J	0.00008J	0.00008J	0.00008J	0.00008J	0.00008	0.00083J	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00056	0.00056	0.00056J	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.013	<0.028	<0.012	<0.014	<0.037	<0.048	<0.019	<0.0279	<0.157	0.288J	0.046
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00006	0.00015J	0.00007	0.00014J	0.00018J	0.00030	0.00005	0.00006	0.00006J	0.00006J	0.00041J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0002J	0.00028	0.00021	0.00072	0.00130	0.00082	0.00260	0.00075	0.0049J	0.00005J	0.00132
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.0002J	0.00017J	0.00014J	0.00025	0.00019J	0.0001J	0.00043	0.000174J	0.00008	0.00008	0.000288J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00033	<0.0002	<0.0002	<0.00031	<0.0001	<0.0013	0.00014J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00012J	0.00012J	0.00009J	0.00016J	0.0001J	0.000061J	0.00033	0.000114J	0.00008J	0.00008J	0.000168J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00078	<0.0019	<0.0014	<0.0027	<0.0088	<0.019	<0.0049	<0.00262	<0.0728	**0.148J**	0.0164
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0022	<0.0013	<0.0012	<0.003	<0.0021	<0.0012	<0.0036	<0.00212	0.00385J	0.0703J	0.00395
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00067J	0.0015J	0.0012J	0.00270	0.00880	0.01500	0.0056J	0.00641	0.06680	0.145J	0.0146
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0028	<0.02	<0.0082	<0.095	<0.31	**<0.96**	<0.017	<0.112	**4.98J**	**5.82J**	**0.489**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	0.00009J	0.00005J	0.00005	<0.00005	0.00011	0.00011	0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00005	<0.00005	<0.00061	0.00061	0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00037	0.00032	0.00065	0.00480	0.00460	0.00380	0.00580	0.00049	0.0232J	0.18J	0.00427
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	0.00007J	<0.00005	0.00005	<0.00005	0.00004J	0.00004	0.203J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0024	0.0019	0.0016	0.0035	0.0025	0.0021	0.0035	0.00283	0.00011	0.00011	0.0043

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-35A										
					2/3/2009	1/14/2010	6/30/2010	1/27/2011	7/20/2011	2/15/2012	7/18/2012	2/7/2013	8/8/2013	1/24/2014	07/24/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	0.000367J	0.00021J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	0.00015J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	0.0015J	<0.0005	<0.0005	<0.0011	<0.0011	0.0015J	<0.00011	<0.00011	<0.00019	0.000473J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	0.00050	<0.0005	<0.0005	<0.0013	<0.0013	0.00100	0.00015J	<0.00015	0.00022J	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.00100	0.00100	0.00100	0.00100	0.00310	0.00310	0.00150	0.00026	0.000309J	0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	0.0001J	<0.0003	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	0.00008	0.00008	<0.00008	<0.00005	<0.00005	0.00005	0.00031J	<0.00031	0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00061	0.00007	0.00007	0.00005	0.00005J	0.0063J	0.000239J	<0.00007	0.00035J	0.000151J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	0.00007	0.00007	0.00007	0.00007J	0.00005J	0.00005J	0.00005	0.00056J	0.00056J	0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.0035	0.017J	<0.0077	<0.00069	<0.00091	<0.00041	<0.0072	<0.0196	<0.0181	0.0551J	0.0294
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00006	0.00011J	0.00007	0.00007	0.00005	0.00005J	0.00005	0.00006J	0.00006J	0.00075	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00007	0.00043	0.00035	0.00007J	0.00005J	<0.00005	0.00130	0.000389J	0.00005	0.00111	0.000601
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	0.00007	0.00007	0.00007	<0.00005	0.00005	0.00030	0.00008J	0.00008J	0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00024	<0.0002	<0.0002	<0.0004	<0.0001	0.0001J	0.00014J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	0.00008J	<0.00008	0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.0014	<0.005	<0.0026	0.00011J	0.00013J	0.00008J	<0.0043	0.000429J	0.000141J	<0.00177	0.00115
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007	0.000092J	0.00007	<0.00007	0.00005	<0.00005	0.00005	0.00011J	0.00011J	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00034	<0.0011	<0.00048	<0.00021	<0.00053	0.00007J	<0.0027	0.000109J	0.000365J	<0.000484	0.000782
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00062	<0.0028	<0.0014	0.000095J	0.00012J	<0.00005	<0.0029	<0.00007	<0.002	0.0149J	0.0071
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.19	<0.0017	<0.00028	<0.00005	<0.00027	<0.05	0.00286J	0.000557J	<0.00968	0.00293
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	0.00009J	<0.00009	<0.00009	<0.00005	<0.00005	0.00005J	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00007	0.00039	0.00007	0.00007	0.00005	0.00005	0.00680	0.000104J	<0.00006	0.00006	0.000449J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	0.00004J	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00025	0.00092	0.00031	0.00007	0.00029	0.00005	0.0016	0.000305J	0.000252J	0.000376J	0.000548

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-36A										
					2/3/2009	1/13/2010	6/29/2010	1/20/2011	7/19/2011	2/7/2012	7/17/2012	1/31/2013	8/6/2013	1/16/2014	07/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	0.00050	0.00050	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	0.00100	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	0.00058J	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00007	0.00030	0.00023	0.00007	0.00005	0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.00007J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00036	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	0.00008J	0.00008J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00007	0.00007	0.00007	<0.00007	<0.00005	<0.00005	0.00005	0.00008J	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00045	<0.0002	<0.0002	<0.0002	<0.0001	<0.0025	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	0.00008J	0.00008J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.0003	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00007J	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00011J	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00024	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0006	<0.0013	<0.0023	<0.0001	<0.00005	<0.00005	<0.0003	0.00008J	<0.00008	<0.00008	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00007	0.00039	0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00006	0.00006J	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00015J	0.00021	0.00007	0.00007	0.00005	0.00005	0.00005	0.00011	0.00011	0.000155J	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-38A											
					2/3/2009	1/14/2010	6/29/2010	1/25/2011	7/19/2011	8/25/2011	2/15/2012	7/18/2012	2/7/2013	8/8/2013	1/21/2014	07/25/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011		<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013		<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03										<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031		<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005		<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006		<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00044	<0.00007	0.00016J	0.000085J	<0.00005		<0.00005	0.00005	<0.00007	0.000115J	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008		<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.00024	<0.00009	<0.00009	0.00043		<0.00005	0.00005	<0.00008	0.00064	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	0.00023	0.0001J		<0.00005	0.00005J	0.0000712J	<0.00005	0.000103J	0.00005J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	0.00025		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	**0.00052**	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00042	0.00020	0.00020	0.00064	0.00010		0.00160	0.00023	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	0.00022		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	0.000083J	<0.00008	<0.00005	0.000055J	<0.00005	0.00005J	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.00017J		<0.00005	0.000052J	<0.00011	0.000145J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.00012J	<0.00007	0.00034	0.00014J		<0.00005	0.00005J	<0.00007	0.000164J	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	0.00005J	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00600	<0.0001	<0.0001	0.00059	0.00005		<0.00005	0.00005	<0.00008	0.00192J	0.00008J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	0.000067J		<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	0.0001J	<0.00005		0.00011J	0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.0001J	<0.00007	0.00021	0.00018J		<0.00005	0.00005J	<0.00011	0.000176J	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-44A										
					2/3/2009	1/13/2010	6/30/2010	1/26/2011	7/20/2011	2/15/2012	7/25/2012	2/12/2013	8/5/2013	1/17/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.003J	<0.0005	0.0026J	<0.0005	0.002J	0.0042J	0.0044J	0.00206	**0.00849**	**0.00727**	0.0042
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	0.000624J	0.00172	0.00067	0.000344J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000252J	0.00015J	0.000418J	0.000329J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005		<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0013J	<0.001	0.0026J	<0.001	<0.0031	0.0052J	0.0033J	0.00469	0.02070	0.00805	0.00561
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	0.00081	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00097	0.00012J	**0.00400**	<0.00007	0.00230	**0.00480**	**0.00950**	<0.00007	**0.10900**	**0.01060**	**0.00902**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.12000	0.13000	0.20000	0.02300	0.23000	0.21000	0.22000	0.07000	0.54600	0.39400	0.197
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00120	0.00079	0.00096	0.00140	0.00130	0.00100	0.00130	0.00276J	<0.00006	<0.00006	0.0014
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00460	0.00770	0.00670	0.00055	0.00580	0.00680	0.00400	<0.00005	0.01700	0.01700	0.00868
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	0.00014J
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00043	0.00020	0.00020	0.00048	0.00010	0.0001J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.05400	0.00870	0.00430	0.00072	0.00140	0.00100	0.00310	<0.00008	**0.13500**	**0.10700**	0.0159
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00320	0.00560	0.00600	0.00140	0.00950	0.00940	0.00650	0.00257J	0.01370	0.01540	0.00749
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.05600	0.06900	0.09700	0.00027	0.09400	0.11000	0.09100	0.00495	0.17200	0.17800	0.0987
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.02100	0.00010	0.16000	0.00035	0.04200	0.32000	0.39000	0.00008J	**1.72000**	0.235J	0.0163
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	0.0012
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00065	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.02000	0.00550	0.00250	<0.00007	0.00470	0.00730	0.00640	<0.00006	0.04160	0.04380	0.0217
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000062J	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00160	0.00320	0.00300	0.00100	0.00460	0.00540	0.00380	0.00139J	0.00732	0.00830	0.0041

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-49A										
					2/4/2009	1/21/2010	6/25/2010	1/20/2011	7/22/2011	2/7/2012	7/26/2012	2/7/2013	8/1/2013	1/16/2014	07/16/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.24000**	**0.20000**	**0.29000**	**0.05700**	**0.20000**	<0.001	**0.04200**	**0.11400**	**0.09400**	**0.05650**	**0.108**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.00530	0.0024J	<0.0005	0.0084J	<0.001	<0.001	0.0037J	**0.29900**	**0.47600**	**0.30400**	**0.211**
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.08400	0.08500	0.14000	0.04J	0.09400	<0.0011	0.03700	0.03210	0.04990	0.03310	0.0701
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	**0.0212**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.07700	0.08300	0.13000	0.021J	0.11000	<0.001	0.03100	0.03430	0.03470	0.02960	0.0593
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.20000	0.21000	0.34000	0.079J	0.20000	<0.0031	0.08200	0.07770	0.10600	0.06990	0.157
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**6.80000**	**0.86000**	**3.70000**	0.18000	**3.00000**	<0.00005	0.03700	**1.42000**	**0.90300**	**2.10000**	**1.23**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.60000**	**0.35000**	**0.44000**	**0.13000**	**0.27000**	<0.00005	<0.00005	**0.21800**	**0.21600**	**0.26700**	**0.293**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.32000	0.20000	0.21000	0.13000	0.13000	<0.00005	0.03300	0.13400	0.12600	0.18000	0.126
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00390	0.00320	0.00520	0.00180	0.00290	<0.00005	0.00062	<0.00006	<0.00006	0.00528J	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01000	0.00710	0.00990	0.00960	0.01100	<0.00005	0.00076	0.00824J	0.0119J	0.0132J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00066	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00024**	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00090	0.00020	<0.0002	0.00020	<0.0001	<0.0001	0.0001J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00060	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.21000**	**0.14000**	**0.16000**	0.07500	0.09000	<0.00005	0.00990	0.08510	0.08120	0.09020	0.0941
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00580	0.00250	0.00340	0.00380	0.00330	<0.00005	0.00180	<0.00007	<0.00007	0.00521J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.15000	0.11000	0.13000	0.07300	0.09200	<0.00005	0.01500	0.07170	0.06620	0.08640	0.0651
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**9.00000**	**5.10000**	**10.00000**	**1.80000**	**7.40000**	<0.00005	<0.00005	**2.88000**	**3.30000**	**5.86000**	**5.13**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.09600	0.07200	0.08600	0.06200	0.07000	<0.00005	0.00200	0.04550	0.06840	0.05640	0.0519
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	0.00077	0.00110	0.00580	0.00950	<0.00005	0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00460	0.00170	0.00180	0.00200	0.00160	<0.00005	0.00095	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-50A										
					2/4/2009	1/20/2010	6/25/2010	1/27/2011	7/28/2011	2/9/2012	7/24/2012	4/2/2013	8/9/2013	1/29/2014	8/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.000083J	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	0.00019J	<0.00005	<0.00005	**0.00390**	0.000107J	<0.00007	0.000264J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00290	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00060	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.0000972J	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.00015J	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00350	<0.0002	0.00020	0.00029	0.00010	0.00032	0.0001J	0.00051	0.000409J	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000157J	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00025	<0.00008	<0.00008	0.00011J	<0.00005	<0.00005	0.00240	<0.00008	<0.00008	0.000134J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000086J	0.000194J	0.000147J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00061	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00220	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00030	<0.0001	0.00010	0.00260	<0.00005	<0.00005	0.02000	<0.00008	0.000265J	0.00129	0.00071
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.000921J	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00031	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00450	0.000164J	<0.00006	0.0000703J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00038	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00031	0.000138J	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-51A										
					2/4/2009	1/20/2010	6/24/2010	1/20/2011	7/28/2011	2/15/2012	7/24/2012	4/2/2013	8/9/2013	1/29/2014	07/24/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03							<0.0005		<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	**0.00292**	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	0.00013J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	0.00013J	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.00017J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00034	0.00020	0.00020	0.00020	0.00010	<0.0001	0.00010	<0.00037	<0.00037	0.00121	0.000804
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	0.00013J	<0.00007	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	0.00012J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000051J	<0.00011	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00072	<0.00007	<0.00005	<0.00005	0.00012J	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00011J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00029	<0.0001	0.00087	0.0001J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000118J	0.000162J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00068	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	0.0000699J	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00037	<0.00007	<0.00005	<0.00005	0.000088J	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-52A				
					1/18/2010	7/14/2011	2/3/2012	7/12/2012	2/1/2013
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds									
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0005	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.0047J	0.0025J	0.0017J	**0.00530**	0.00461
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01		<0.001	<0.001	<0.0005	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.014J	0.01100	0.00530	0.00990	0.00677
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0013	<0.0013	<0.001	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.012J	0.00890	0.0034J	0.00840	0.00679
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		<0.001		<0.0005	0.000661J
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.044J	0.02500	0.011J	0.02100	0.01470
Semi-Volatile Organic Compounds									
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00460	0.00450	0.00340	0.02900	0.04790
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.54000**	**0.33000**	**0.09600**	**0.16000**	**0.16500**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.36000	0.26000	0.19000	0.15000	0.27100
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00450	0.00400	0.00240	0.00250	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.02200	0.04100	0.03600	0.02100	0.0231J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00047	0.00063	0.00031	0.00022	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	0.00017J	0.000066J	<0.00005	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00020	0.00010	0.00043	<0.0001	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00041	0.00060	0.00033	0.00028	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.28000**	**0.20000**	**0.14000**	**0.13000**	**0.17800**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01500	0.02400	0.01300	0.01700	0.02450
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.23000	0.18000	0.12000	0.11000	0.16700
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**3.90000**	**1.90000**	**0.77000**	**0.83000**	**0.87800**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.24000	0.22000	0.08100	0.12000	0.22600
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	0.000066J	0.000052J	0.00005J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00660	0.01100	0.00540	0.00710	0.0124J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-55A								
					2/4/2009	1/18/2010	7/14/2011	2/3/2012	7/12/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.19000**	**0.07200**	**0.07000**	**0.15000**	**0.17000**	**0.13300**	**0.14500**	**0.07150**	**0.0881**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.15000	0.20000	0.17000	0.20000	0.24000	0.22800	0.26000	0.20000	0.368
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	**0.0894J**	<0.00015	**0.0179J**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.44000	0.29000	0.24000	0.41000	0.39000	0.38500	0.43100	0.31100	0.409
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03							<0.00011		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.35000	0.47000	0.42000	0.48000	0.62000	0.57500	0.58400	0.48600	0.869
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**1.20000**	0.28000	**0.48000**	**1.80000**	**0.96000**	<0.00031	**0.95600**	**0.51900**	**0.463**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.63000**	**0.39000**	**0.33000**	**0.25000**	**0.31000**	<0.00007	**0.46800**	**0.46300**	**0.486**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.28000	0.19000	0.16000	0.14000	0.11000	0.05730	0.20700	0.25100	0.219
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00370	0.00280	0.00300	0.0019J	0.00170	0.00210	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.04700	0.02100	0.01600	0.01600	0.00750	0.00062	0.03360	0.083J	0.032
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.01000**	**0.00180**	**0.00140**	<0.00005	0.00034	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00690**	**0.00081**	**0.00062**	<0.00005	0.000081J	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00073	0.00020	<0.0001	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00990	0.00170	0.00140	<0.00005	0.00025	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.20000**	**0.13000**	**0.12000**	0.08400	0.07800	0.02650	<0.00008	**0.15J**	**0.14**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.05200	0.00810	0.00900	0.00440	0.00420	0.000459J	0.0148J	0.0595J	0.0175J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.16000	0.08300	0.08000	0.05700	0.04800	0.00213	0.09960	0.172J	0.1
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**17.00000**	**11.00000**	**8.60000**	**9.90000**	**9.70000**	0.00008J	**13.80000**	**11.70000**	**11.6**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00053	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.20000	0.08400	0.08300	0.04700	0.04500	<0.00006	0.07800	0.174J	0.0893
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.15000	0.02500	0.00380	0.07900	0.04600	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.03200	0.00520	0.00610	0.00410	0.00210	0.000223J	0.00729J	<0.00011	0.0101J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-57A										
					2/5/2009	1/20/2010	6/23/2010	1/18/2011	7/22/2011	2/2/2012	7/24/2012	2/11/2013	7/31/2013	1/15/2014	07/29/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.26000**	**0.17000**	**0.47000**	**0.23000**	**0.08400**	**0.14000**	**0.06400**	**0.13800**	**0.13700**	**0.10900**	**0.0412**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	0.000465J	0.000625J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.34000	0.32000	0.45000	0.29000	0.13000	0.22000	0.17000	0.24000	0.28300	0.19800	0.274
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	**0.014J**	<0.0005	<0.0013	<0.0013	<0.001	0.00367J	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.63000	0.13000	0.86000	0.38000	0.05500	0.23000	0.10000	0.24400	0.30800	0.19800	0.0355
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		<0.0005		<0.0005	<0.001	<0.001	0.0016J	<0.00011	<0.00011	0.00154	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.92000	0.60000	1.20000	0.68000	0.19000	0.40000	0.33000	0.59100	0.57200	0.45400	0.455
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**1.80000**	**3.00000**	**2.70000**	**2.00000**	**1.00000**	**1.70000**	0.20000	**1.62000**	**0.99400**	**7.91000**	0.0443J
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.73000**	**0.89000**	**3.50000**	**3.50000**	**13.00000**	**1.90000**	**3.10000**	**13.90000**	**1.50000**	**8.24000**	**0.616**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.24000	0.31000	**2.00000**	**1.90000**	**8.60000**	1.20000	**1.80000**	**8.56000**	0.99700	**5.69000**	0.335
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00560	0.00610	0.02000	0.02200	0.09100	0.01400	0.02400	<0.00006	<0.00006	<0.00006	0.00779
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.04400	0.02200	0.90000	0.62000	**8.40000**	0.34000	0.55000	3.09000	0.33700	2.02000	0.0557
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.01100**	0.00051	**0.15000**	**0.12000**	**0.45000**	**0.04700**	**0.07400**	**0.60500**	**0.0521J**	**0.36100**	**0.0072**
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00450**	0.00012J	**0.03700**	**0.02800**	**0.16000**	**0.01400**	**0.02400**	**0.165J**	<0.00008	**0.0962J**	**0.00385**
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	**0.0021**
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00200	0.00020	<0.0002	<0.0002	<0.0001	0.0016J	<0.0001	<0.00037	<0.00037	<0.00037	0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00940	0.00034	**0.14000**	0.11000	**0.53000**	0.04600	0.08900	**0.60200**	0.0482J	**0.36000**	0.00625
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.21000**	**0.17000**	**1.90000**	**1.70000**	**8.60000**	**0.86000**	**1.70000**	**7.28000**	**0.79900**	**4.69000**	**0.257**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.05400	0.00630	**1.40000**	**0.99000**	**6.00000**	0.48000	0.74000	**4.98000**	0.41200	**3.19000**	0.0561
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.08300	0.11000	**1.60000**	**1.40000**	**7.90000**	0.72000	**1.40000**	**6.54000**	0.71300	**4.16000**	0.21
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**16.00000**	**7.40000**	**20.00000**	**18.00000**	**71.00000**	**9.20000**	**22.00000**	**60.70000**	**13.50000**	**56.90000**	**7.27**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.22000	0.08800	**4.00000**	**3.50000**	**13.00000**	**2.00000**	**3.00000**	**17.00000**	**1.61000**	**13.10000**	0.271
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.05200	0.00990	0.04200	0.02000	<0.00005	0.00890	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.03800	0.00370	**0.84000**	0.67000	**3.30000**	0.34000	0.42000	**3.12000**	0.26400	**2.29000**	0.0308J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-58A										
					2/5/2009	1/20/2010	6/23/2010	1/19/2011	7/27/2011	2/3/2012	7/24/2012	2/11/2013	8/6/2013	1/29/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.05200**	**0.03800**	**0.07500**	**0.03400**	<0.001	**0.12000**	**0.16000**	**0.09430**	0.0000807J	<0.00008	**0.259**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	0.0093J	0.01J	0.0029J	<0.001	<0.001	0.0018J	0.00295	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.07900	0.06300	0.11000	0.03000	<0.0011	0.08500	0.09900	0.06480	<0.00011	<0.00011	0.167
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	0.0005J	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.022J	0.02J	0.04500	0.0059J	<0.001	0.043J	0.04100	0.01760	<0.00015	<0.00015	0.135
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		<0.0005		<0.0005	<0.001		**0.01100**	**0.00281**	<0.00011	<0.00011	**0.0101J**
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.10000	0.04J	0.15000	0.029J	<0.0031	0.23000	0.31000	0.12200	<0.00026	<0.00026	0.352
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.04700	0.09700	**0.61000**	**0.68000**	<0.00005	**1.10000**	**2.40000**	**0.95000**	<0.00031	<0.00031	**9.19**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.22000**	**0.10000**	**0.21000**	**0.05700**	<0.00005	**0.08200**	**0.00760**	**0.24300**	<0.00007	<0.00007	**0.373**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.31000	0.18000	0.28000	0.12000	<0.00005	0.16000	0.05700	0.20500	<0.00008	<0.00008	0.221
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00120	0.00130	0.00150	0.00072	<0.00005	0.00110	0.00110	<0.00006	<0.00006	<0.00006	0.00996J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00450	0.00980	0.01700	0.00510	0.00039	0.00550	0.00690	0.0245J	<0.00005	<0.00005	0.0126J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00072	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	**0.00027**	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	**0.0321J**	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00030	<0.0002	0.00020	0.00035	0.00071	<0.0001	0.00010	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00110	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.23000**	**0.14000**	**0.23000**	0.07900	0.00170	**0.13000**	0.00880	**0.12800**	<0.00008	<0.00008	**0.136**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00120	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00250	0.00580	0.00900	0.00490	0.00100	0.00360	0.00990	0.0102J	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.15000	0.12000	0.16000	0.06500	<0.00005	0.08000	0.02700	0.12000	<0.00007	<0.00007	0.109
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**2.40000**	**0.67000**	**1.50000**	**0.45000**	<0.00005	**2.20000**	0.06800	**2.96000**	0.00036J	<0.00008	**4.05**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00017J	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.04100	0.04900	0.06100	0.03700	<0.00005	0.03900	0.03600	0.05630	<0.00006	<0.00006	0.0702
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00029	0.00740	0.00650	0.00037	0.000077J	0.00380	0.00074	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00120	0.00340	0.00420	0.00220	0.00073	0.00220	0.00690	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-59A										
					2/5/2009	1/20/2010	6/24/2010	1/20/2011	7/18/2011	2/6/2012	7/27/2012	1/31/2013	8/1/2013	1/16/2014	07/30/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	0.000066J	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	0.00020	0.00180	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.00007J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	0.00030	0.00079	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00008J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.00026	0.00040	<0.00005	<0.00005	<0.00005	<0.00005	0.0000519J	0.000119J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	0.00015J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00060	0.00020	0.00020	0.00020	0.00010	0.00015J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	0.00014J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	0.00070	0.00099	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00008J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00077	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005J	<0.00011	0.000169J	0.000178J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00050	0.00120	0.00005J	<0.00005	<0.00005	<0.00007	<0.00007	0.000199J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00045	0.00084	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000176J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.0001	0.00047	0.00660	<0.00005	<0.00005	0.000051J	<0.00008	<0.00008	0.00008J	0.000219J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00170	0.00240	0.00005J	<0.00005	<0.00005	<0.00006	0.000075J	0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000065J	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00029	0.00059	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00012J	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-60A											
					2/4/2009	1/20/2010	6/24/2010	1/19/2011	7/18/2011	2/7/2012	7/23/2012	2/14/2013	4/2/2013	8/2/2013	1/15/2014	07/16/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005		<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001		<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.0005	<0.001	<0.001	<0.0005		<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015		<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00038	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00100	<0.00018	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00032	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00029	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00019	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00028	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00210	0.000146J	<0.00007	<0.00007	0.000143J	0.000516
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00016	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00033	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00045	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00120	<0.00016	<0.00008	<0.00008	0.000157J	0.000167J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00016	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00034	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	<0.00044	<0.00005	0.0000883J	0.000158J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00025	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00013	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00019	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00200	0.00020	<0.0002	0.00310	0.0001J	0.00023	0.0001J	<0.00059	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00024	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00035	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00099	<0.00016	<0.00008	<0.00008	0.000145J	0.000116J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00230	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005J	<0.00187	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00039	<0.00007	0.00030	0.00029	<0.00005	0.00028	0.00030	<0.00031	<0.00007	<0.00007	0.0000894J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00044	<0.00007	<0.00007	<0.00007	<0.00005	0.00016J	0.00089	<0.00012	<0.00007	<0.00007	0.000162J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00950	<0.0001	0.00150	<0.0001	<0.00005	<0.00005	0.02500	0.00043J	<0.00008	<0.00008	0.000668J	0.00653
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0002	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00033	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00096	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00110	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00150	<0.00029	<0.00006	<0.00006	0.000345J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000275J	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00029	<0.00007	0.0002J	0.00079	<0.00005	0.00130	0.00033	<0.00033	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-61A										
					2/3/2009	1/20/2010	7/1/2010	1/27/2011	7/21/2011	2/7/2012	7/27/2012	4/2/2013	8/1/2013	1/23/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00041	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00017J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00170	0.00020	0.00020	<0.0002	0.00023	0.00038	0.00027	<0.00037	<0.00037	0.00163J	0.000536
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.01100	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.0000806J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00660	<0.0001	0.0001J	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	0.00008J	0.00008J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00021	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00016J	<0.00006	0.0000586J	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-64A										
					2/4/2009	1/21/2010	7/14/2010	1/27/2011	7/27/2011	2/8/2012	7/25/2012	4/1/2013	8/6/2013	1/29/2014	07/29/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	0.000154J	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00014J	<0.00007	<0.00007	<0.00007	<0.00005	0.000053J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00029	<0.00009	<0.00009	<0.00009	<0.00005	0.00960	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	0.00050	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00016J	<0.00007	<0.00007	<0.00007	0.00036	<0.00005	<0.00005	0.000158J	<0.00005	<0.00005	0.000127J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00040	0.00020	0.00200	0.00049	0.00076	0.0001J	0.00021	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00012J	<0.00008	<0.00008	<0.00008	0.00130	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.02000	<0.00007	<0.00007	<0.00007	0.000079J	<0.00005	0.000084J	<0.00011	<0.00011	0.000117J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00076	<0.00007	<0.00007	<0.00007	0.00057	0.00021	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00018J	<0.00007	<0.00007	<0.00007	<0.00005	0.00012J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00092	<0.0001	<0.0001	<0.0001	<0.00005	0.00005	<0.00005	<0.00008	<0.00008	<0.00008	0.00008J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00055	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	0.000077J	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00063	<0.00007	<0.00007	<0.00007	0.00042	0.00013J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-69A									MW-77A	MW-78A	MW-79A
					7/15/2010	1/19/2011	7/21/2011	2/8/2012	7/24/2012	2/7/2013	8/6/2013	1/24/2014	07/16/2014	07/24/2014	07/24/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008	<0.00008	**0.0571**	**0.0485**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011	<0.00011	0.0637	0.0215
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.00015	<0.00015	0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.00015	0.1	0.076
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03			<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011	<0.00011	<0.00011	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.00026	0.158	0.0763
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00360	<0.00008	<0.00005	<0.00005	0.000078J	<0.00031	<0.00031	<0.00031	<0.00031	<0.00031	**6.66**	**6.11**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.00380**	0.000074J	<0.00005	<0.00005	0.00090	<0.00007	<0.00007	<0.00007	<0.00007	**0.0571**	**0.879**	**0.654**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00370	0.00025	<0.00005	<0.00005	0.00082	<0.00008	<0.00008	<0.00008	<0.00008	0.0456	0.497	0.427
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.0112J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00039	0.00024	<0.00005	<0.00005	0.00047	<0.00005	<0.00005	0.00050	<0.00005	<0.00005	0.105J	0.0673
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00049	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	**0.0336J**	**0.00985J**
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00590	0.00081	0.00086	0.0001J	0.00010	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00032	0.00011J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.0248J	0.00948J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00300	0.00022	<0.00005	<0.00005	0.00071	<0.00008	<0.00008	<0.00008	<0.00008	0.0229J	**0.411**	**0.342**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	0.000069J	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00250	0.00057	0.000059J	<0.00005	0.00045	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	0.165	0.0713
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00330	0.00036	<0.00005	<0.00005	0.00085	<0.00007	<0.00007	<0.00007	<0.00007	0.024	0.382	0.291
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.02600	0.00011J	<0.00005	0.00005	0.00005	0.00008J	<0.00008	0.00008J	0.00008J	**0.884**	**7.18**	**6.89**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00830	0.00120	<0.00005	<0.00005	0.00220	<0.00006	<0.00006	0.00006J	<0.00006	0.0262	0.604	0.355
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00690	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	0.192	1.13
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00220	0.00037	<0.00005	<0.00005	0.00033	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	0.0967J	0.0434

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-1
Summary of Groundwater Sampling Results - A-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	TW-56A				
					1/20/2010	7/14/2011	2/2/2012	7/11/2012	1/31/2013
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds									
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	**0.023J**	<0.001	<0.001	<0.0005	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.26000**	**0.27000**	**0.15000**	**0.26000**	**0.23800**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.001	<0.001	<0.0005	0.00412J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.36000	0.16000	0.06800	0.14000	0.20200
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0013	<0.0013	<0.001	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.32000	0.14000	0.028J	0.06900	0.03140
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	**0.0069J**	**0.01J**	**0.01600**	**0.0126J**
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.98000	0.61000	0.53000	0.43000	0.50000
Semi-Volatile Organic Compounds									
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**2.90000**	**6.80000**	**4.20000**	**3.80000**	**4.81000**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.15000**	**0.16000**	**0.11000**	**0.05200**	**0.123J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.07700	0.18000	0.19000	0.09500	0.25000
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00240	0.00400	0.00380	0.00280	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00350	0.02100	0.02000	0.00830	0.0338J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00099	**0.00140**	**0.0016J**	**0.00240**	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00031**	**0.00047**	**0.00051J**	**0.00080**	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00020	0.00010	<0.0001	<0.0001	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00084	0.00140	0.0018J	0.00220	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.04300	0.09000	0.04900	0.03800	**0.108J**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00045	<0.00005	<0.00005	<0.00005	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01000	0.02100	0.02000	0.02700	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.03300	0.09000	0.05800	0.04700	0.12J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**2.50000**	**2.30000**	**2.20000**	**0.81000**	**1.75000**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00013J	0.00076	<0.00005	0.00091	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.06000	0.17000	0.20000	0.07300	0.217J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.01400	<0.00005	0.00630	<0.00005	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00670	0.01200	0.01500	0.01800	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	CPT-01	MW-10B												
					2/19/2013	1/22/2009	7/22/2009	1/21/2010	7/13/2010	1/11/2011	7/13/2011	1/30/2012	7/10/2012	1/9/2013	7/11/2013	10/14/2013	1/8/2014	07/15/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																		
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014													
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.00008													
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012													
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011													
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015													
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.00015													
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03														
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.00026													
Semi-Volatile Organic Compounds																		
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00011													
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00031													
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00013													
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00008													
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00008													
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007													
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00083													
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00056													
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00008	0.09600	0.00090	0.05200	0.06900	0.09600	0.05400	0.10000	0.05400	0.12000	0.97700		0.00008	0.0777
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011J	<0.0005	0.00108	0.00986		0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0000891J	0.0043J	0.0029J	0.0025J	0.0038J	0.00680	0.0033J	0.00570	0.0032J	0.00546	0.03910		0.00005	0.00352J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00008													
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008													
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00013													
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00063	<0.0012	<0.0033	<0.0033	<0.0033	<0.0033	0.0013J	<0.0005	<0.0005	<0.00037	<0.00037		0.000408J	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00008													
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.03500	0.02300	0.01800	0.02500	0.03700	0.01900	0.03800	0.02000	0.04010	**0.30200**	0.03340	0.00008	0.0258
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00077	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011		0.000275J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.0039J	0.0022J	0.0017J	0.0026J	0.00540	0.0023J	0.0046J	0.0028J	0.00427	0.02740		0.00007J	0.00211J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	0.05100	0.00060	0.03100	0.04100	0.05900	0.03200	0.06000	0.03100	0.06520	0.46800		0.00007	0.0424
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.00008	0.0028J	0.00820	0.0037J	0.05600	0.07500	0.0018J	0.08400	0.004J	0.00399	0.20700		0.06460	0.125
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00011													
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.0001													
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00061													
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00006													
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00004	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00004	<0.00004		<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00011	0.002J	0.0013J	<0.0005	0.001J	0.0023J	0.0011J	0.002J	0.0011J	0.00146	0.01010		<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-11B											
					1/22/2009	7/22/2009	1/21/2010	7/13/2010	1/11/2011	7/12/2011	1/30/2012	7/10/2012	1/9/2013	7/11/2013	1/8/2014	07/02/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03												**0.0131**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.07200	0.12000	0.04800	0.11000	0.03900	0.08400	0.02500	0.10000	0.06310	0.10800	0.00008	0.0953
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	0.0015J	0.0013J	<0.0005	0.0012J	0.0012J	0.0011J	0.0013J	0.00136	0.00119	0.00006	0.00166
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0022J	0.0043J	0.0011J	0.00550	<0.0006	0.00540	<0.0005	0.00550	0.000168J	0.00321	0.00005	0.00375
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0012	<0.0033	<0.0033	<0.0033	<0.0033	<0.0005	<0.0005	<0.0005	0.00195	<0.00037	0.000493J	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.03100	0.05400	0.01200	0.04800	0.00600	0.03800	<0.0005	0.04000	0.00352	0.02310	0.00008	0.0199
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	0.000317J	0.000109J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0018J	0.0036J	0.0014J	0.0046J	0.0015J	0.0046J	0.0013J	0.00530	0.00307	0.00383	0.00007	0.00417
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.03200	0.05300	0.01300	0.05600	0.0038J	0.04600	<0.0005	0.05400	0.00205	0.03880	0.00007	0.0339
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0008	0.04800	<0.0006	0.00680	<0.0006	0.06000	<0.0005	0.004J	<0.00008	0.00535	0.000382J	0.0135
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00												0.012
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.0009	0.002J	<0.0005	0.0022J	<0.0005	0.0024J	<0.0005	0.0024J	0.00154	0.00196	0.00011	0.00213

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-14										
					2/4/2009	1/19/2010	6/22/2010	1/17/2011	7/26/2011	2/2/2012	7/16/2012	2/5/2013	7/31/2013	1/14/2014	07/18/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	0.000123J	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	**0.0788**
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00075	0.00064	0.00049	0.00039	0.00034	0.000064J	0.00030	0.000402J	0.000304J	0.000321J	0.000336J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00047	0.00043	0.00041	0.00033	0.00032	<0.00005	0.00030	0.00060	0.00055	0.00094	0.000619
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000069J	0.000277J	0.000198J	0.00005J	0.000139J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00081	0.00540	0.00020	0.00029	0.00047	<0.0001	0.00011J	<0.00037	<0.00037	<0.00037	0.000615
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00045	0.00040	0.00037	0.00030	0.00031	0.00012J	0.00032	0.000467J	0.000372J	0.000443J	0.000437J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00024	0.000055J	0.0000794J	0.000274J	0.0000744J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	0.00013J	<0.00007	0.000079J	<0.00005	<0.00005	0.000076J	<0.00007	<0.00007	0.00008J	0.0000901J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00320	0.00300	0.00220	0.00240	0.00140	0.00005	0.00005	0.00211	0.00216J	0.00008J	0.00143
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00035	0.00041	0.00044	0.00030	0.00033	0.00011J	0.00038	0.00048	0.00066	0.00006	0.000506
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	0.000398J	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00029	<0.00005	<0.00011	0.000164J	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-15B					
					2/2/2012	7/19/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds										
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	**0.0053J**	0.00220	0.00484	0.00101	0.00292
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	0.000124J	<0.00012	0.000136J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.02J	0.014J	0.00159	0.00399	0.00019J	0.00903
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.0005	<0.00015	0.000155J	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03						
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0031	<0.0015	0.000356J	0.00876	0.000876J	0.00464
Semi-Volatile Organic Compounds										
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.29000**	**0.02300**	0.00007	**0.00327**	**0.00325J**	**0.00622**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.17000	0.07500	0.04130	0.11400	0.13400	0.0653
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00110	0.00080	0.00099	<0.00006	0.00148J	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.03900	0.00710	0.00179	0.00581	0.00665	0.00517
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00016J	0.00017J	<0.00008	0.000218J	0.000868J	0.00031J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	0.0001J	<0.00037	<0.00037	<0.00037	0.000548
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00019J	0.00013J	<0.00008	0.000167J	<0.00008	0.000228J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.15000**	0.05200	0.01270	0.05890	0.05090	0.0272
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	0.000187J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01200	0.00620	0.00101	0.00615	0.01310	0.00736
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.08400	0.03600	0.01100	0.04590	0.04430	0.0231
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**2.50000**	**0.82000**	0.0569J	**0.94300**	0.24800	**0.452**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.08000	0.05200	0.00199	0.03760	0.02570	0.0204
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00005J	<0.00005	<0.00004	<0.00004	0.00141J	0.00112
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00500	0.00310	0.00051	0.00291	0.00569	0.00406

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-22B									
					2/3/2009	1/15/2010	6/29/2010	1/25/2011	7/21/2011	2/15/2012	7/18/2012	1/23/2014	07/30/2014	08/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0002	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	0.0042J	0.000304J	0.00185	0.00238
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00018	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	0.00880	0.00220	0.0255	0.0275
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00022	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	0.00053J	<0.0005	<0.001	<0.001	0.0033J	0.00133	0.00584	0.00752
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03										<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	0.0057J	0.00409	0.0362	0.0383
Semi-Volatile Organic Compounds														
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00014J	<0.00005	<0.00031	0.00107	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00044	0.00005	0.000414J	**0.00721**	**0.00663**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.02200	0.00016J	0.00930	0.00022	0.00300	0.06800	0.18000	0.02440	0.0762	0.123
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00034	<0.00007	0.00012J	<0.00007	<0.00005	0.00046	0.00180	0.00089	0.000641	0.00132
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00071	<0.00007	0.00031	<0.00007	0.00011J	0.00170	0.00670	0.00005	0.00292	0.00404
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00053	0.00022	0.00020	<0.0002	0.00041	0.00010	<0.0001	<0.00037	0.000672	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00510	0.00026	0.00190	<0.00008	0.00068	0.00790	0.04600	0.00784	0.0238	0.0409
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00018J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00110	0.00011J	0.00061	<0.00007	0.00019J	0.00220	0.00650	0.00187	0.00304	0.00282
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00180	<0.00007	0.00180	<0.00007	0.00049	0.00350	0.01900	0.00521	0.0198	0.0355
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00017J	0.00012J	0.00036	<0.0001	<0.00005	0.00320	0.03200	0.13J	**0.832**	**0.977**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00029	<0.00005	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00015J	<0.00007	<0.00007	<0.00005	0.00026	0.00270	0.00006	0.00053	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.0001J	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00047	<0.00007	0.00027	<0.00007	0.00012J	0.00100	0.00330	0.00088	0.00123	0.0023

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-24B								
					2/3/2009	1/14/2010	6/29/2010	1/25/2011	7/21/2011	2/9/2012	7/25/2012	2/12/2013	8/8/2013
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	0.02090
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	0.000099J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00015J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00046	0.00020	0.00020	<0.0002	0.00014J	0.00011J	0.0001J	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00015J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.0001	0.00083	<0.0001	<0.00005	<0.00005	0.00015J	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-32B				MW-33B						
					2/9/2012	7/16/2012	2/6/2013	1/21/2014	2/3/2009	1/13/2010	6/29/2010	1/24/2011	7/19/2011	2/15/2012	7/17/2012
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**2.60000**	<0.0005	0.00428	**0.23900**	**2.40000**	**1.20000**	**2.00000**	**1.00000**	**1.60000**	**2.00000**	**0.30000**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	0.00012J	<0.00018	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.53000	<0.0005	0.00561	0.25400	0.47000	0.41000	0.62000	0.36000	0.40000	0.46000	0.07000
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00022	**0.0096J**	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	**2.20000**	<0.0005	0.00261	0.54100	0.08400	0.019J	0.016J	0.0067J	<0.001	0.12000	0.02300
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.001	<0.001	<0.0005
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	1.50000	<0.0015	0.02030	0.74900	1.40000	1.20000	1.50000	0.85000	1.20000	0.82000	0.15000
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**46.00000**	0.00140	<0.00031	0.17800	<0.00008	0.00350	<0.00008	0.00290	0.00340	<0.00005	0.00740
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.53000**	0.00019J	<0.00007	**0.13700**	**1.90000**	**0.71000**	**0.51000**	**0.52000**	**1.60000**	**0.81000**	**0.55000**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.28000	0.01400	0.0416J	0.04270	0.41000	0.17000	0.09600	0.15000	0.41000	0.23000	0.09900
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00590	0.00085	<0.00006	<0.00006	0.00370	0.00160	0.00110	0.00150	0.00330	<0.00005	0.0014J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.05900	0.00480	<0.00005	0.14400	0.14000	0.01500	0.01100	0.02700	0.16000	0.05400	0.01100
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.00330**	**0.00330**	<0.00008	**0.01950**	**0.02200**	0.00019J	0.000073J	**0.00190**	**0.03200**	0.000074J	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	**0.00089**	<0.00008	**0.00649**	**0.00450**	<0.00008	<0.00008	**0.00073**	**0.00770**	<0.00005	<0.00005
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	0.00079	<0.00037	<0.00037	0.00031	**0.00800**	0.00020	0.00091	0.00010	0.0001J	<0.0001
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00420	0.00230	<0.00008	0.01800	0.02000	0.00018J	0.000092J	0.00180	0.02600	0.000073J	<0.00005
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.28000**	0.00120	<0.00008	0.04280	**0.46000**	**0.18000**	**0.13000**	**0.17000**	**0.53000**	**0.38000**	**0.15000**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.03000	0.03100	<0.00007	0.12100	0.20000	0.00330	0.00180	0.03300	0.28000	0.00490	0.01000
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.15000	0.00210	<0.00007	0.02820	0.26000	0.06800	0.04800	0.06900	0.31000	0.12000	0.05100
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**26.00000**	0.00005	<0.00008	**2.17000**	**20.00000**	**10.00000**	**2.20000**	**7.00000**	**13.00000**	**21.00000**	**7.30000**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00081	<0.00005
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.25000	0.00120	<0.00006	0.05480	0.72000	0.06600	0.04100	0.09000	**0.79000**	0.17000	0.09100
Phenol	108-95-2	8270	7.33E+00	2.19E+01	**38.00000**	0.000066J	<0.00004	0.03570	0.00300	<0.00007	0.00320	<0.00007	0.00100	0.00430	0.0014J
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.02000	0.04000	<0.00011	0.08410	0.13000	0.00160	0.00092	0.00700	0.17000	0.00250	0.00540

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-33BR			
					2/6/2013	8/7/2013	1/21/2014	07/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds								
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**1.61000**	**1.62000**	**0.83700**	**1.41**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012	<0.00012	0.000349J	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.47100	0.38900	0.12800	0.348
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	**0.011J**	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.15700	0.06450	0.00942	0.00638
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.92400	0.18200	0.12800	0.0649
Semi-Volatile Organic Compounds								
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.993J**	**0.19800**	**0.05580**	**0.277**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00008	0.04550	0.06250	0.0711
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00006	0.00006J	0.00087
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00005	<0.00005	0.00450	0.00564
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00008	<0.00008	<0.00008	0.000119J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00037	<0.00037	<0.00037	0.000722
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00008	<0.00008	<0.00008	0.000132J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.04980	0.07690	0.0868
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00011	<0.00011	<0.00011	0.00011J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00107J	0.00265
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	0.0181J	0.02870	0.035J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**14.90000**	**6.54000**	**1.68000**	**6.59**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00006	0.0141J	0.02380	0.0313J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00011	<0.00011	0.000734J	0.00126

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-35B										
					2/3/2009	1/14/2010	7/1/2010	1/27/2011	7/20/2011	2/15/2012	7/18/2012	2/7/2013	8/8/2013	1/24/2014	07/24/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.06200**	**0.06400**	**0.06800**	**0.06400**	**0.05600**	**0.07700**	**0.06400**	**0.06620**	**0.08550**	**0.06640**	**0.0539**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	0.000241J	0.000228J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.20000	0.20000	0.21000	0.22000	0.17000	0.19000	0.19000	0.22500	0.25800	0.18700	0.176
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	**0.02J**	<0.00015	**0.02340**	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0057J	<0.0005	0.00500	0.0045J	<0.001	0.0042J	<0.0005	0.00437J	0.00584J	0.00429	0.00377
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.15000	0.15J	0.17000	0.16000	0.12000	0.13000	0.13J	0.15300	0.17400	0.13200	0.114
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	**0.00120**	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.40000**	**0.47000**	**0.36000**	**0.41000**	**0.48000**	**0.18000**	**0.26000**	**0.295J**	**0.43100**	**0.53400**	**0.376**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.17000	0.22000	0.20000	0.19000	0.20000	0.08000	0.15000	0.173J	0.25800	0.305J	0.139
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00088	0.00130	0.00110	0.00120	0.00097	0.00063	0.00078	<0.00006	<0.00006	<0.00006	0.0015J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00560	0.00800	0.01500	0.01400	0.01600	0.00480	0.00640	<0.00005	0.0202J	<0.00005	0.0111
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00017J	0.00032	0.00022	0.00031	0.00021	0.00011J	0.00020	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	0.00014J	0.00012J	0.00014J	0.000069J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00052	0.00020	0.00020	0.00041	0.00010	0.00010	0.00018J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00015J	0.00028	0.00017J	0.00037	0.00025	0.0001J	0.00023	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.16000**	**0.23000**	**0.22000**	**0.20000**	**0.21000**	0.09700	**0.14000**	**0.161J**	**0.25200**	**0.256J**	**0.138**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00310	0.00530	0.00600	0.00650	0.00560	0.00260	0.00390	<0.00007	0.00756J	0.0698J	0.00692
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.06300	0.09200	0.11000	0.09000	0.09700	0.04800	0.06900	<0.00007	0.13800	0.167J	0.076
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**12.00000**	**14.00000**	**11.00000**	**4.80000**	**12.00000**	**7.40000**	**7.60000**	**8.83000**	**14.10000**	**13.10000**	**9.36**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.06100	0.08600	0.12000	0.07800	0.12000	0.05200	0.06600	0.0936J	0.14200	0.27J	0.0891
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00014J	<0.00004	<0.00004	0.129J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00170	0.00270	0.00250	0.00320	0.00270	0.00160	0.00190	<0.00011	<0.00011	<0.00011	0.00327J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-36B								
					7/15/2010	1/20/2011	7/19/2011	2/8/2012	7/17/2012	1/31/2013	8/6/2013	1/16/2014	07/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	0.0018J	0.0014J	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03			<0.001		<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.00007	<0.00007	0.00007J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.00023	0.00014J	0.00023	0.00016J	<0.00008	<0.00008	0.000463J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00035J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00012J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	**0.01000**	0.00020	0.00010	0.00010	0.00021	<0.00037	<0.00037	0.00044J	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000146J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00005	<0.00005	0.00011J	0.00008J	<0.00008	0.00008J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.00076	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00007	<0.00007	0.000434J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	<0.0001	<0.00005	0.00005	<0.00005	0.00008	0.0000895J	0.000825J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	<0.00006	<0.00006	0.00183	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	0.000089J	<0.00005	0.00026	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00046J	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-38B										
					2/3/2009	1/14/2010	6/29/2010	1/25/2011	7/18/2011	2/15/2012	7/18/2012	2/7/2013	8/8/2013	1/21/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00037	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005	<0.00007	<0.00007	0.000137J	0.00007J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.0001J	<0.00009	0.00047	<0.00009	<0.00005	0.0001J	0.00096	0.000226J	<0.00008	0.0000786J	0.00008J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00013J	<0.00007	<0.00007	0.00011J	0.00013J	0.00021	0.00005	0.000313J	<0.00005	0.000141J	0.00005J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.000072J	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00041	0.00020	0.00020	<0.0002	0.00010	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00005	<0.00008	<0.00008	0.0000923J	0.00008J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00017J	<0.00007	<0.00005	<0.00005	0.00005	<0.00007	<0.00007	0.000101J	0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00015J	<0.00007	<0.00005	<0.00005	0.00005	<0.00007	<0.00007	0.0000778J	0.00007J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00450	0.0001J	<0.0001	0.00031	<0.00005	0.00037	0.00005	<0.00008	<0.00008	0.000466J	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005	<0.00006	<0.00006	0.000304J	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00027	<0.00007	<0.00005	<0.00005	0.00005	<0.00011	<0.00011	<0.00011	0.000472J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-39B										
					2/4/2009	1/19/2010	6/22/2010	1/18/2011	7/26/2011	2/1/2012	7/19/2012	2/5/2013	7/31/2013	1/14/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	0.000086J	<0.00005	<0.00005	0.000069J	<0.00007	<0.00007	<0.00007	0.00007J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00022	0.00014J	0.00340	0.00039	0.00028	0.00110	0.00040	0.00076	0.00070	0.00115J	0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	0.000053J	<0.00005	<0.00005	0.00011J	0.0000676J	<0.00006	0.0000623J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00028	<0.00007	<0.00007	<0.00007	0.00040	<0.00005	0.0001J	0.00090	0.00077	0.00005J	0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00046	0.00070	<0.0002	0.00024	0.00092	0.0001J	0.0001J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00040	0.000067J	<0.00008	<0.00008	<0.00008	0.00008J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00140	<0.00007	0.00190	0.00013J	0.000079J	0.00110	0.00036	0.000112J	0.000418J	<0.00007	0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00025	0.00021	0.00048	0.00013J	0.00011J	0.00032	0.00019J	<0.00007	0.000216J	<0.00007	0.00007J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00052	0.00018J	<0.0001	0.00076	<0.00005	0.00005	0.00018J	<0.00042709	<0.00008	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	0.000853
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	0.000054J	<0.00005	<0.00005	<0.0001	0.000158J	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00025	<0.00007	0.00018J	<0.00005	<0.00005	0.00016J	<0.00006	0.0000912J	<0.00006	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00130	0.00018J	0.00200	<0.00007	0.00017J	0.00130	0.00052	0.000131J	0.00066	<0.00011	0.000818

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-40B										
					2/4/2009	1/19/2010	6/22/2010	1/18/2011	7/14/2011	2/3/2012	7/19/2012	2/5/2013	7/31/2013	1/14/2014	07/18/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.02600**	**0.02800**	**0.02600**	**0.01900**	**0.016J**	**0.013J**	**0.013J**	**0.01080**	**0.01150**	**0.01090**	**0.0103**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.001J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.10000	0.12000	0.12000	0.13000	0.08100	0.08000	0.08200	0.08170	0.07980	0.08400	0.0825
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.05000	0.05400	0.05000	0.04500	0.019J	0.028J	0.022J	0.01180	0.01730	0.01470	0.0154
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.20000	0.22000	0.22000	0.21000	0.12J	0.13J	0.14J	0.11600	0.12700	0.12000	0.126
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.01100	0.01400	0.00440	0.00033	0.00340	0.00400	0.00390	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.58000**	**0.49000**	**0.41000**	**0.27000**	**0.24000**	**0.20000**	**0.28000**	**0.30200**	**0.30900**	**0.35000**	**0.263**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.35000	0.33000	0.27000	0.25000	0.17000	0.20000	0.23000	0.31500	0.35000	0.40200	0.236
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00270	0.00250	0.00310	0.00250	0.00190	0.00220	0.00210	<0.00006	<0.00006	<0.00006	0.00335J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01600	0.00950	0.01700	0.01700	0.00970	0.01900	0.00700	0.0183J	0.019J	0.0247J	0.0142
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00028	0.0001J	<0.00007	0.00016J	<0.00005	0.000095J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.0002J	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00047	0.00350	<0.0002	0.00075	0.00010	0.00033	0.0001J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00023	0.00011J	<0.00007	0.00013J	<0.00005	0.00011J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.25000**	**0.17000**	**0.22000**	0.09200	**0.13000**	**0.15000**	**0.17000**	**0.20600**	**0.24200**	**0.25200**	**0.178**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00820	0.00670	0.00640	0.00680	0.00490	0.00420	0.00310	<0.00007	0.0104J	<0.00007	0.00562
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.20000	0.15000	0.17000	0.09300	0.13000	0.13000	0.15000	0.17500	0.21200	0.21700	0.183
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**9.70000**	**8.00000**	**6.80000**	**6.10000**	**4.00000**	**4.20000**	**6.00000**	**6.78000**	**7.73000**	**6.07000**	**4.24**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.16000	0.12000	0.15000	0.08300	0.11000	0.08000	0.10000	0.13700	0.15800	0.19700	0.111
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00430	0.00330	0.00350	0.00390	0.00210	0.00330	0.00190	<0.00011	<0.00011	<0.00011	0.00242J

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-42B							
					1/19/2010	7/14/2011	2/3/2012	7/19/2012	2/5/2013	8/1/2013	1/15/2014	07/18/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds												
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0011	<0.0011	<0.0005	0.00011J	<0.00011	<0.00019	0.000208J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0013	<0.0013	**0.0097J**	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	0.000349J
Semi-Volatile Organic Compounds												
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	0.00013J	<0.00005	<0.00005	<0.00031	<0.00031	0.00092	0.000577
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00005	0.000089J	0.00015J	0.000196J	0.000141J	0.000317J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00021	0.00005	0.00170	0.00081	0.00036J	<0.00008	0.000355J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	0.00036	<0.00005	<0.00005	0.000194J	0.000122J	0.000465J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00028	0.00010	<0.0001	0.00010	<0.00037	<0.00037	<0.00037	0.000513
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00037	0.00005J	0.00016J	0.000066J	0.000217J	0.000131J	0.000205J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00005	<0.00005	0.000062J	<0.00011	0.000108J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00059	0.00024	0.00085	0.00041	0.00064	0.000294J	0.000339J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00016J	0.00005	0.00050	0.00016J	<0.00007	0.000134J	0.000198J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00035	0.00005	0.00005	0.00190	0.00048	0.00288J	0.00242J	0.000426J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00005J	0.00012J	<0.00005	0.000356J	0.000122J	0.00050	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	0.000801
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00035	0.00014J	0.00044	0.00023	0.000369J	0.000127J	0.000234J	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-49B										
					2/4/2009	1/20/2010	6/24/2010	1/20/2011	7/22/2011	2/7/2012	7/23/2012	2/7/2013	8/1/2013	1/16/2014	07/16/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.00950**	**0.01300**	**0.10000**	**0.00570**	**0.05600**	**0.00560**	**0.11000**	**0.06310**	**0.46900**	**0.06910**	**0.346**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	0.0103J	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.00810	0.02400	0.01900	0.004J	0.00910	0.0042J	0.02300	0.01820	0.08250	0.04250	0.0847
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	**0.0212**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.01600	0.04500	0.07100	0.00720	0.03800	0.00570	0.08900	0.06330	0.34500	0.09100	0.31
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.02400	0.07000	0.04700	0.0066J	0.02000	0.008J	0.06000	0.05270	0.22200	0.11200	0.249
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.03100	0.01300	**1.20000**	0.18000	**0.59000**	0.19000	**6.30000**	**1.09000**	**21.40000**	**4.96000**	**13.6**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.14000**	<0.00007	0.00160	<0.00007	**0.00290**	**0.00950**	**0.18000**	**0.29700**	**0.22300**	**0.69100**	**0.276**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.09400	0.01700	0.01400	0.00067	0.00510	0.03400	0.14000	0.24800	0.09640	0.62200	0.117
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00160	0.00070	0.00063J	<0.00007	0.00019J	0.00070	0.00130	<0.00006	<0.00006	<0.00006	0.00432J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01900	0.00015J	<0.00007	0.00031	0.00093	0.00290	0.05600	0.08760	<0.00005	0.22100	0.013
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00035	<0.00007	<0.00007	<0.00007	0.00018J	<0.00005	**0.01300**	**0.0228J**	<0.00008	**0.0671J**	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	0.000057J	<0.00005	**0.00380**	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00029	0.00020	<0.0002	0.00020	0.00010	0.00069	0.00010	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00038	<0.00007	<0.00007	<0.00007	0.00016J	<0.00005	0.01500	0.0207J	<0.00008	0.0737J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.07100	0.00240	0.00260	0.00018J	0.00180	0.01900	**0.12000**	**0.20000**	<0.00008	**0.48400**	0.08
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00130	0.000083J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01400	0.00023	<0.00007	0.00019J	0.00110	0.00150	0.09300	0.16700	<0.00007	0.41500	0.00456J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.07100	0.00360	0.00160	0.00018J	0.00140	0.01900	0.13000	0.21700	0.04900	0.46400	0.0633
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**1.40000**	0.00044	0.23000	0.00010	0.13000	0.04700	**2.30000**	**1.58000**	**9.38000**	**6.75000**	**5.57**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.11000	0.00017J	<0.00007	0.00007	0.00250	0.00980	0.35000	0.46600	0.039J	**1.29000**	0.0458
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.00530	0.00044	0.00021	<0.00005	0.00630	<0.00004	<0.00004	0.0445J	0.0145
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00740	0.00020	<0.00007	0.00024	0.00066	0.00083	0.06200	0.10100	<0.00011	0.26200	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-55B						MW-57B					
					2/2/2012	7/12/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014	2/15/2012	7/24/2012	1/31/2013	7/31/2013	1/15/2014	07/29/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.78000**	**0.89000**	**0.88100**	**0.80900**	**0.64800**	**0.846**	**1.40000**	**1.50000**	**0.73300**	**1.49000**	**0.71600**	**1.25**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.13000	0.21000	0.16200	0.17300	0.13400	0.126	0.39000	0.42000	0.19300	0.50100	0.17400	0.371
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	**0.0213J**	**0.0517J**	<0.00015	**0.0155J**	<0.0013	**0.017J**	<0.00015	**0.0405J**	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.65000	0.90000	0.76000	0.78200	0.59700	0.591	**1.30000**	**1.40000**	0.69200	**1.62000**	0.63000	**1.33**
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.00011								**0.00299J**
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.39000	0.68000	0.62300	0.62400	0.48100	0.443	1.20000	1.10000	0.58900	1.40000	0.57400	1.16
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	**35.00000**	**30.00000**	**2.06000**	**25.20000**	**44.20000**	**35.6**	**6.30000**	**16.00000**	**13.80000**	**9.67000**	**19.80000**	**15**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.28000**	**0.64000**	**0.75700**	**0.86800**	**0.901J**	**0.512**	**0.92000**	**1.60000**	**1.75000**	**1.07000**	**0.89200**	**0.945**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.19000	0.26000	0.34700	<0.00008	<0.00008	0.19	0.35000	0.44000	0.93000	0.42300	0.52400	0.267
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00570	0.01000	<0.00006	<0.00006	<0.00006	<0.00006	0.00600	0.00870	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.01600	0.03000	0.0492J	0.0437J	<0.00005	0.027J	0.02300	0.05000	0.29200	0.0493J	0.0844J	0.0355J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.0011J	0.0012J	<0.00008	<0.00008	<0.00008	<0.00008	0.0011J	0.0012J	**0.0543J**	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.0019J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00005	0.0009J	<0.00008	<0.00008	<0.00008	<0.00008	0.00099J	0.0016J	0.0561J	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.15000**	**0.23000**	<0.00008	**0.30900**	<0.00008	**0.138**	**0.28000**	**0.38000**	**0.81400**	**0.32200**	**0.39200**	**0.226**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00470	0.01400	0.0153J	<0.00007	<0.00007	0.0119J	0.00810	0.01600	0.38700	0.0301J	0.0752J	0.0109J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.09000	0.15000	0.16600	0.195J	<0.00007	0.0816	0.09500	0.23000	0.65000	0.20800	0.29800	0.138
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**21.00000**	**24.00000**	**2.30000**	**21.90000**	**24.30000**	**13.5**	**24.00000**	**27.00000**	**18.90000**	**18.10000**	**10.60000**	**17**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	0.00069J	<0.00061	<0.00061	<0.00061	<0.00061	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.05700	0.13000	0.13000	0.228J	<0.00006	0.1	0.16000	0.24000	**1.39000**	0.24200	0.45600	0.127
Phenol	108-95-2	8270	7.33E+00	2.19E+01	**150.00000**	**130.00000**	0.09990	**103.00000**	**454.00000**	**127**	0.45000	1.00000	1.00000	0.64500	1.00000	0.495
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00420	0.00760	<0.00011	<0.00011	<0.00011	<0.00011	0.00750	0.01100	0.245J	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-59B								
					7/15/2010	1/20/2011	7/18/2011	2/6/2012	7/27/2012	1/31/2013	8/1/2013	1/16/2014	07/30/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	0.0000981J	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03			<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00005	0.25000	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	<0.00005	0.00170	<0.00005	<0.00008	<0.00008	<0.00008	0.000621
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	0.000054J	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00200	0.00020	0.00010	0.00068	0.00018J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	0.000201J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.000115J	0.000105J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000189J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00014J	0.0001J	<0.00005	0.00012J	0.00006J	0.00008J	0.00008J	0.00008J	0.00627
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	0.00011J	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	0.00025	<0.00005	<0.00006	<0.00006	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00020	<0.00007	<0.00005	0.00033	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	0.000062J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-62B											
					2/4/2009	1/21/2010	7/14/2010	1/27/2011	7/27/2011	8/25/2011	2/8/2012	7/26/2012	2/11/2013	8/2/2013	1/29/2014	07/29/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	0.0043J		<0.001	0.002J	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001		<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.00071J	<0.0005	<0.0005	<0.0005	0.04100		<0.0011	0.0021J	<0.00011	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013		<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	0.00950		<0.001	0.0012J	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	0.02500		<0.0031	0.0053J	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005		<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006		<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00012J	0.00160	0.00064	<0.00007	<0.00005		<0.00005	0.00005J	0.00007J	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008		<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00780	0.03900	0.00041	<0.00009	0.21000		0.02600	0.08500	0.000242J	<0.00008	<0.00008	0.000235J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	0.00066	<0.00007	<0.00007	0.00260		0.00130	0.00084	0.000112J	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00024	0.00110	<0.00007	<0.00007	0.01300		<0.00005	0.00320	0.00072	<0.00005	<0.00005	0.0000699J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00041	0.00020	0.00160	0.00022	0.00042		0.00010	0.00013J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00240	0.01300	0.00034	<0.00008	**0.15000**	**0.23000**	0.00012J	0.03800	0.000174J	<0.00008	<0.00008	0.0000916J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00065	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	0.00005J	<0.00011	0.000107J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00012J	0.00110	<0.00007	0.00014J	0.00790		0.00053	0.00400	0.00033J	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00120	0.01500	0.00016J	<0.00007	0.05800		0.00020	0.00870	<0.00007	<0.00007	<0.00007	0.000126J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00270	0.00028	0.00960	<0.0001	0.03500		0.00005	0.00560	0.00008J	<0.00008	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005		<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00087	0.00250	0.00025	<0.00007	0.03500		0.00014J	0.00260	0.00006	<0.00006	<0.00006	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		0.000053J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.00047	<0.00007	0.000077J	0.00330		0.00037	0.00210	0.000387J	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-63B									
					1/13/2010	6/30/2010	1/27/2011	7/19/2011	2/9/2012	7/18/2012	2/7/2013	8/7/2013	1/22/2014	07/24/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.21000**	**0.01500**	**0.01900**	**0.01900**	<0.001	0.0015J	**0.00952**	**0.08690**	**0.07620**	**0.108**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	0.000216J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.20000	0.07200	0.07100	0.04000	0.0012J	0.0014J	0.01650	0.03410	0.04180	0.151
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.01500	0.0016J	0.0018J	0.0017J	<0.001	0.0038J	0.00241	0.00015J	0.000399J	0.00257
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03										<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.08200	0.02000	0.01600	0.013J	<0.0031	<0.0015	0.00629	0.01130	0.01560	0.0535
Semi-Volatile Organic Compounds														
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	0.000056J	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.11000**	**0.03100**	**0.02500**	**0.01400**	**0.00290**	**0.00340**	**0.0104J**	0.00242	**0.00756**	**0.0302**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.02800	0.01300	0.01700	0.00530	0.00200	0.00230	0.00952J	0.00083	0.00274J	0.00754
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00051	0.00018J	<0.00007	0.000066J	0.00012J	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00068	0.00039	0.00110	0.00011J	0.00015J	0.00005J	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	0.00087	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	**0.00027**	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00020	0.00020	0.00060	0.00010	0.00096	0.00096	<0.00037	0.000381J	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	0.00079	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.02200	0.00800	0.01300	0.00410	0.00240	0.00260	0.00576J	0.00104	0.002J	0.00663
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00019J	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00011	0.000465J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00420	<0.00005	0.000091J	0.00005J	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00780	0.00410	0.00540	0.00190	0.00093	0.00110	<0.00007	0.000349J	0.00102J	0.00248J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**3.10000**	**0.67000**	**0.76000**	0.36000	0.02700	0.04400	0.25100	0.14600	0.37400	**1.69**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00005	0.00018J	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00340	0.00076	0.00440	0.00075	0.00072	0.00005	<0.00006	<0.00006	0.00133J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00005	0.00057	<0.00005	<0.00004	<0.00004	0.000889J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00290	<0.00005	0.000063J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-67B								
					7/15/2010	1/27/2011	7/20/2011	2/9/2012	7/17/2012	2/12/2013	8/8/2013	1/23/2014	07/24/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0015J	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03							<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0012J	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00005	0.00050	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	**0.00220**	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00005	0.00023	0.000062J	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00011J	<0.00009	<0.00005	0.00012J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00160	0.00220	0.00010	0.00042	0.00012J	<0.00037	<0.00037	<0.00037	0.00184
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00005	0.00013J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	0.000083J	<0.00005	<0.00005	<0.00005	<0.00011	0.000119J	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	0.0001J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	0.00062	<0.00005	0.00190	0.00049	<0.00008	0.000433J	0.00008J	0.000275J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00006	<0.00006	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	0.000089J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-68B						MW-70B			
					2/16/2012	7/16/2012	2/6/2013	8/8/2013	1/22/2014	07/24/2014	7/17/2012	2/7/2013	1/22/2014	07/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0005	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**2.70000**	**2.40000**	**2.35000**	**2.88000**	**1.50000**	**2.18**	**0.21000**	**2.01000**	**2.39000**	**2.55**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	0.0273J	<0.00012	0.000454J	<0.00012	<0.0005	0.0317J	0.00072	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.45000	0.49000	0.44900	0.55000	0.36400	0.403	0.05800	0.52400	0.62100	**0.742**
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	**0.10100**	<0.00022	<0.00015	<0.001	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.91000	0.93000	0.70100	0.62500	0.32900	0.538	0.22000	**1.65000**	**2.31000**	**2.76**
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.00011		**0.007J**				
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	1.20000	1.30000	1.04000	1.28000	0.85700	1.08	0.19000	1.51000	1.68000	2.11
Semi-Volatile Organic Compounds														
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.19000	0.27000	0.27300	<0.00031	**0.53600**	**0.445**	**2.60000**	<0.00031	**72.00000**	**50.8**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00006	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.66000**	**1.30000**	**0.95200**	**1.41000**	**1.10000**	**0.852**	**0.94000**	**1.21000**	**1.40000**	**1.31**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00008	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00005	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.15000	0.23000	0.26100	0.30400	0.26300	0.178	0.91000	0.51500	0.45400	0.374
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00230	0.00300	<0.00006	<0.00006	<0.00006	<0.00006	0.01100	0.0424J	<0.00006	0.0114J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.04600	0.03400	0.0194J	0.023J	0.0428J	0.0169J	0.09600	0.051J	0.0423J	0.0387J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.00600**	**0.00540**	<0.00008	<0.00008	**0.0123J**	<0.00008	**0.01600**	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00170**	**0.00160**	<0.00008	<0.00008	<0.00008	<0.00008	**0.00410**	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	**0.00680**	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00520	0.00500	<0.00008	<0.00008	0.00806J	<0.00008	0.01300	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.19000**	**0.30000**	**0.26000**	**0.32500**	**0.28400**	**0.198**	**0.69000**	**0.34500**	**0.35500**	**0.278**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.05000	0.04400	<0.00007	0.00764J	0.05200	0.00825J	0.28000	<0.00007	0.0105J	0.013J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.09600	0.13000	0.11800	0.15400	0.14900	0.0966	0.66000	0.211J	0.21700	0.186
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**14.00000**	**26.00000**	**11.80000**	**31.20000**	**17.00000**	**10.5**	**5.30000**	**17.30000**	**30.10000**	**18.1**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	0.00110	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00005	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.19000	0.24000	0.12000	0.13600	0.26300	0.106	**0.93000**	0.227J	0.17500	0.162
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.03500	0.05800	0.04210	0.07950	0.08620	0.00988J	0.07700	2.87000	3.86000	1.69
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.03100	0.02400	<0.00011	<0.00011	0.0341J	<0.00011	0.09400	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-71B						MW-72B			
					2/8/2012	7/18/2012	2/7/2013	8/7/2013	1/24/2014	07/28/2014	7/12/2012	2/1/2013	7/29/2013	1/15/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0005	<0.00014	<0.00014	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.01200**	0.0014J	**0.01240**	**0.10300**	**0.03900**	0.00155	**1.40000**	**1.45000**	**1.23000**	**0.93200**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.0005	<0.00012	<0.00012	0.00029J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0045J	0.00750	0.00541	0.03540	0.00793	<0.00011	0.31000	0.32100	0.33200	0.22400
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.00015	**0.29100**	<0.00022
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.00770	0.00780	0.01040	0.03550	0.00918	0.00423	**1.10000**	**1.18000**	**1.12000**	0.72400
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.00011						
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.01600	0.03300	0.01430	0.06150	0.02020	0.0126	0.88000	0.96000	0.92800	0.66100
Semi-Volatile Organic Compounds														
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00340	<0.00005	<0.00031	<0.00031	0.02250	<0.00031	**20.00000**	**98.10000**	**29.90000**	**182.00000**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00006	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.00760**	0.00005	0.000377J	**0.11400**	**0.04760**	<0.00007	**0.74000**	**1.39000**	**1.19000**	**3.37000**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00008	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00005	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00390	0.00005J	0.00440	0.03460	0.02120	0.000785	0.23000	0.58400	0.47600	**1.60000**
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00019J	<0.00005	0.000135J	<0.00006	0.00122	<0.00006	0.00730	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00056	0.00005J	0.000452J	0.00383J	0.00198	<0.00005	0.01700	0.0646J	0.033J	0.179J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.000081J	0.00011J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00012J	0.00014J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00010	0.00012J	<0.00037	<0.00037	<0.00037	<0.00037	<0.0001	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.000089J	0.00015J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00310	0.00005J	0.00244	0.02920	0.01750	<0.00008	**0.18000**	**0.35500**	**0.34800**	**1.21000**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00053	0.00005	0.000387J	<0.00007	0.00071	0.000149J	0.00340	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00200	0.00005	0.00168	0.0127J	0.01040	<0.00007	0.11000	0.25300	0.22400	0.7J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.05100	0.00005	0.0000937J	**2.07000**	**0.50400**	0.00008J	**16.00000**	**88.50000**	**25.00000**	**82.80000**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00022	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00005	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00250	0.00005	0.00127	0.0124J	0.00677	<0.00006	0.07900	0.26400	0.18200	**0.76000**
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00037	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	3.40000	**7.51000**	6.31000	**31.40000**
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00057	0.00005	0.000253J	<0.00011	0.000353J	<0.00011	0.0019J	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-73B						MW-74B				
					2/2/2012	7/16/2012	1/30/2013	7/30/2013	1/15/2014	07/18/2014	2/9/2012	7/26/2012	4/2/2013	1/29/2014	08/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	0.000678J	<0.0002	<0.00014	<0.001	<0.0005	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.00970**	<0.0005	0.000218J	0.000156J	<0.0002	0.00309	**0.35000**	**0.71000**	**0.55200**	**0.79500**	**0.652**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.001	<0.0005	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.00590	<0.0005	<0.00011	<0.00011	0.000437J	<0.00011	0.08600	0.14000	0.14700	0.20300	0.2
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.0013	<0.001	<0.00015	<0.00015	0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.01500	<0.0005	0.000336J	<0.00015	0.00058	<0.00015	0.32000	0.56000	0.53300	0.77400	0.741
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03						<0.00011					
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0059J	<0.0015	<0.00026	<0.00026	0.00133J	<0.00026	0.25000	0.38000	0.42700	0.55300	0.558
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.00700	0.00280	<0.00031	<0.00031	0.00095	<0.00031	**55.00000**	**41.00000**	**56.90000**	**525.00000**	**70.6**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00055J	0.00011J	<0.00007	0.0000878J	**0.01610**	<0.00007	**0.39000**	**0.43000**	**0.67300**	**5.52000**	**0.95J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.01200	0.00016J	0.00008J	0.000118J	0.01120	<0.00008	0.29000	0.21000	0.31J	**2.40000**	0.413J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0013J	<0.00005	0.0000696J	<0.00006	<0.00006	<0.00006	0.00580	0.00620	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00005	0.00012J	0.000186J	0.000245J	0.00462	0.00015J	0.03700	0.02400	<0.00005	0.282J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00005	0.000057J	<0.00008	<0.00008	**0.00131**	<0.00008	<0.00005	**0.00220**	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00008	<0.00008	**0.00039J**	<0.00008	<0.00005	**0.00085J**	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	0.00012J	<0.00037	<0.00037	0.0015J	0.000603	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00005	0.000096J	<0.00008	<0.00008	0.00119	<0.00008	<0.00005	0.0018J	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00078J	0.000067J	<0.00008	<0.00008	0.01020	<0.00008	**0.25000**	**0.19000**	**0.252J**	**1.84000**	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	0.000133J	0.000169J	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01000	0.000059J	0.000138J	<0.00007	0.00937	<0.00007	0.00440	0.01800	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00410	0.00021	<0.00007	0.0000805J	0.00951	<0.00007	0.17000	0.14000	0.196J	**1.34000**	0.263J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.0014J	0.00005	0.00008J	0.00008J	0.09060	<0.00008	**16.00000**	**10.00000**	**13.90000**	**139.00000**	**17.9**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00087J	0.000089J	<0.00006	0.000228J	0.03480	<0.00006	0.15000	0.15000	0.169J	**1.28000**	0.307J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00530	0.00015J	<0.00004	<0.00004	0.00052	<0.00004	**43.00000**	**38.00000**	**63.20000**	**420.00000**	**53.3**
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00770	<0.00005	<0.00011	<0.00011	0.00725	<0.00011	0.00500	0.01000	<0.00011	<0.00011	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-75B					MW-80B	MW-81B
					2/8/2012	7/26/2012	4/2/2013	1/29/2014	07/24/2014	08/28/2014	07/24/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds											
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.61000**	**0.85000**	**0.36900**	**0.50200**	**0.298**	0.0000898J	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.13000	0.10000	0.06900	0.07730	0.0737	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.51000	0.50000	0.28200	0.32800	0.273	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.41000	0.33000	0.24700	0.27600	0.255	<0.00026	<0.00026
Semi-Volatile Organic Compounds											
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.18000	**0.64000**	0.06950	**6.35000**	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.62000**	**0.60000**	**0.10100**	**3.18000**	**0.546**	0.000158J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.34000	0.26000	0.06970	**2.57000**	0.429	0.0000835J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.01300	0.00580	<0.00006	0.0672J	0.0121	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.03500	0.04500	0.00948J	0.60500	0.0626	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00064J	**0.00470**	<0.00008	**0.0667J**	**0.00748J**	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	**0.0013J**	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	0.00106	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00062J	0.00420	<0.00008	0.0704J	0.00677J	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.29000**	**0.23000**	0.05330	**1.56000**	**0.214**	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.01600	0.04000	0.01030	0.70800	0.0914	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.19000	0.17000	0.04250	**1.59000**	0.218	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**8.90000**	**9.30000**	0.21100	**27.10000**	**5.7**	0.00157	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.24000	0.27000	0.06060	**2.13000**	0.238	0.0000792J	0.0000944J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00660	0.00270	0.0069J	0.108J	<0.00004	0.00018J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00980	0.02600	0.00617J	0.41600	0.0537	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	P-10											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/12/2011	7/12/2011	1/31/2012	7/11/2012	1/10/2013	7/11/2013	1/9/2014	07/02/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03												0.0000718J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.0008	0.0009J	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	0.000102J	0.01
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00005	0.000133J	0.000323J	0.000375J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0012	<0.0033	<0.0033	<0.0033	<0.0033	<0.0005	<0.0005	<0.0005	0.00091	0.000492J	<0.00037	0.00127
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	0.00205
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	0.00042J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0008	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	0.00393
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0008	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00												0.000575
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	0.000318J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	P-11										
					2/4/2009	1/21/2010	6/22/2010	1/18/2011	7/27/2011	2/2/2012	7/26/2012	2/5/2013	8/1/2013	1/15/2014	07/29/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	0.000207J	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	0.000253J	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00023	0.00005J	0.000127J	<0.00007	0.000257J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00570	<0.00009	0.00370	<0.00009	0.00075	0.03000	0.01800	<0.00008	<0.00008	0.00951	0.000653
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	0.00020	0.0001J	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00015J	<0.00007	0.00012J	<0.00007	0.00012J	0.00160	0.00039	0.00025J	0.0000997J	0.00050	0.000119J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00022	0.00020	0.00020	0.00160	0.00018J	0.0001J	0.00021	0.00036J	0.000593J	0.00403	0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00024	<0.00008	0.000093J	<0.00008	0.00013J	0.00350	0.00059	0.000135J	<0.00008	0.00103	0.000176J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00042	<0.00007	0.000081J	0.00220	0.00048	<0.00007	<0.00007	0.000287J	0.0000771J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00180	<0.00007	0.00160	<0.00007	0.000082J	0.01100	0.00440	0.0000769J	<0.00007	0.00264	0.000344J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00270	<0.0001	0.00270	<0.0001	0.00013J	0.00170	0.00005	0.00066	<0.00008	0.05540	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00048	<0.00007	0.00053	<0.00007	0.000086J	0.00450	0.00055	0.0000854J	<0.00006	0.00189	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00015J	<0.00007	<0.00005	0.00130	0.00023	<0.00011	<0.00011	0.000274J	<0.00011

Notes:
1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	P-12											
					1/22/2009	7/22/2009	1/22/2010	7/14/2010	1/12/2011	7/12/2011	1/31/2012	7/11/2012	1/9/2013	7/11/2013	1/9/2014	07/02/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03												
Benzene	71-43-2	8260	5.00E-03	5.00E-03												
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01												
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01												
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03												
Toluene	108-88-3	8260	1.00E+00	1.00E+00												
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01												
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03												
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00												
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03												
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03												
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00												
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03		<0.0009										<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01												
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01												
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.0008	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.0007	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00005	<0.00005	0.0002J	0.000189J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03												
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04												
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03												
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0012	<0.0033	<0.0033	<0.0033	<0.0033	<0.0005	<0.0005	<0.0005	0.00142	0.00039J	0.000515J	0.000439J
Chrysene	218-01-9	8270	1.25E-01	2.80E-01												
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	0.00011J	0.000144J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.0008	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0008	<0.0006	<0.0006	<0.0006	<0.0006	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01												
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01												
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03												
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00		<0.0005										<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0026J	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	0.00189

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-2
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	TW-41B							
					1/19/2010	7/27/2011	2/1/2012	7/26/2012	2/5/2013	7/31/2013	1/16/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds												
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0005	<0.00008	0.000347J	<0.0002	0.000594J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	0.00750	<0.0011	<0.0005	<0.00011	0.00115	<0.00019	0.00501
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	0.0033J	<0.001	<0.0005	<0.00015	0.00015J	<0.00017	0.00116
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	0.0052J	<0.0031	<0.0015	<0.00026	0.000386J	<0.00058	0.0101
Semi-Volatile Organic Compounds												
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00005	<0.00005	0.00140	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	0.01500	<0.00005	0.00005J	<0.00007	0.000256J	0.00007J	0.0125
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.04100	<0.00005	0.03900	<0.00008	0.02520	<0.00008	0.142
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	0.00053	<0.00005	0.00041	0.0000751J	0.000409J	0.0000926J	0.00185
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	0.00220	0.00016J	0.00110	0.00098	0.00161	0.00093	0.00697
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	0.0000879J	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00110	0.00022	0.00010	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.02900	<0.00005	0.01600	<0.00008	0.01040	<0.00008	0.0845
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00005	<0.00005	0.00005J	<0.00011	0.00011J	0.000116J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.00220	<0.00005	0.00150	<0.00007	0.00153	0.000206J	0.00475
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00015J	0.02800	<0.00005	0.00540	0.0000917J	0.00386	<0.00007	0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00014J	0.04900	0.00005	0.00005	0.000156J	0.00309J	0.00008J	0.149
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.01900	<0.00005	<0.00005	<0.00006	0.00066	0.00006J	0.0573
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00005	0.000057J	0.00160	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.00095	<0.00005	0.00066	<0.00011	0.00070	0.000223J	0.00209

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-12C										
					2/4/2009	1/19/2010	6/22/2010	1/18/2011	7/26/2011	2/1/2012	7/19/2012	2/5/2013	7/31/2013	1/14/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	0.00011J	<0.00011	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	**0.209**
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00045	0.00024	0.00011J	0.00012J	0.000099J	<0.00005	0.000086J	0.000146J	0.000129J	0.000164J	0.00007J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00052	0.00019J	<0.00009	0.00012J	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008	<0.00008	0.00008J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.0000745J	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0003	0.00077	0.0002	<0.0002	0.0004	<0.0001	0.0001J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.0004	0.00014J	<0.00008	0.00011J	<0.00005	<0.00005	0.000054J	0.0000865J	0.0000857J	0.0000979J	0.00008J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00011J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00037	0.00014J	<0.00007	0.000099J	0.000071J	0.0001J	0.000082J	0.000149J	0.000102J	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.003	0.0017	<0.0001	0.00099	0.00048	0.00005	0.00052	0.000729	0.000585J	0.00008J	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	0.00015J	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00048	0.00015J	<0.00007	0.00011J	<0.00005	<0.00005	0.000059J	<0.00006	<0.00006	0.00006J	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-15C										
					2/4/2009	1/18/2010	6/23/2010	1/17/2011	7/13/2011	2/2/2012	7/19/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00096J	0.0012J	0.001J	0.00096J	<0.001	<0.001	<0.0005	0.000951J	0.000831J	0.000863J	0.000781J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.00068J	0.00058J	<0.0005	<0.0005	<0.0011	0.0017J	<0.0005	0.000408J	0.000203J	0.000275J	0.000219J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000323J	0.000263J	0.000305J	0.00019J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	0.000604J	0.000839J	0.000581J	0.000392J
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	**113**	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.000084J	<0.00007	<0.00007	<0.00007	<0.00005	0.000099J	0.00022	**0.35**	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.034	0.0097	0.013	0.032	0.016	0.041	0.042	0.13	0.0574	0.0912	0.0455
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00052	0.00041	0.00062	0.0011	0.0012	0.0013	0.002	<0.00006	0.00268	<0.00006	0.00342
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00078	0.00031	<0.00007	<0.00007	<0.00005	0.00021	0.00045	0.0191J	0.0000945J	<0.00005	0.000315J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0002	0.0002	0.00044	0.0001	<0.0001	0.0001J	<0.00037	<0.00037	<0.00037	0.000526
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.034	0.0075	0.005	0.018	0.0046	0.027	0.021	**0.116**	0.0141	0.0317	0.0102
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000059J	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0006	0.00029	0.0002J	0.0003	0.00031	0.0016	0.00079	<0.00007	0.000634	0.00158J	0.000763
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.0027	0.0011	0.00071	0.0017	0.00074	0.0025	0.0014	0.0769	0.00159	0.00224J	0.00135
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.0016	0.0001	0.0001	0.00091	0.00005	0.0011	0.0018	**89.7**	0.00008J	0.00008J	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00014J	<0.00007	<0.00007	0.00019J	0.0015	0.00038	0.0868	0.000354J	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	**61.8**	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00027	0.00012J	0.00011J	0.00015J	0.00018J	0.00093	0.00046	<0.00011	0.00037J	<0.00011	0.00043J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-17C											
					2/4/2009	1/18/2010	6/23/2010	1/17/2011	7/13/2011	2/1/2012	7/12/2012	2/14/2013	4/1/2013	7/30/2013	1/13/2014	07/17/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.03**	**0.0083**	**0.024**	**0.023**	**0.01**	**0.016J**	**0.013**		**0.0114**	**0.0162**	**0.00939**	**0.0132**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005		<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.17	0.053	0.2	0.21	0.021	0.19	0.17		0.161	0.225	0.123	0.0374
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001		0.00368J	**0.00786J**	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.008	0.0042J	0.0071	0.0081	0.0046J	0.0067J	0.0057		0.0049J	0.00743J	0.00471J	0.0073
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03												
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.25	0.046	0.33	0.42	0.029	0.22	0.21		0.217	0.27	0.141	0.0482
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00038	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.0028	0.044	0.0018	0.0035	**1.5**	<0.00005	0.039	0.0418J	<0.00031	<0.00031	<0.00031	**7.09**
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00032	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00029	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00019	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.085**	**0.063**	**0.099**	**0.075**	**0.0073**	**0.062**	**0.1**	**<0.173**	**0.176**	**0.151**	**0.144**	**0.0203J**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00016	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00033	0.00502	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.14	0.13	0.14	0.18	0.021	0.097	0.14	<0.194	0.216	0.239	0.218	0.0299
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0012	0.0013	0.0016	0.0017	0.00028	0.0011	0.0018	<0.00016	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.0084	0.0057	0.0071	0.015	0.0016	0.0048	0.008	<0.00044	0.011	0.0144J	0.0156J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00018J	0.00013J	0.00016J	0.0012	0.00017J	0.000091J	0.00022	<0.00025	0.00016J	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	**0.00027**	<0.00005	<0.00005	<0.00005	<0.00013	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00019	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0002	0.0002	0.0015	0.0001	0.0001	0.0048	<0.00059	0.00148	<0.00037	**0.0491J**	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00017J	0.00012J	0.00017J	0.001	<0.00005	0.00013J	0.00016J	<0.00024	0.000167J	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.13**	**0.11**	**0.13**	**0.19**	0.021	0.096	**0.14**	**0.16**	**0.185**	**0.199**	**0.184**	0.0255
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00187	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.007	0.0044	0.005	0.019	0.0018	0.002	0.0048	<0.00031	0.00784	0.007941J	0.00707J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.062	0.055	0.069	0.083	0.009	0.054	0.066	0.0785J	0.0989	0.103	0.0907	0.0118J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**3.4**	**2.2**	**3.4**	**4.1**	0.37	**3.3**	**4**	**0.988**	**5.9**	**4.4**	**6.24**	**0.772**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0002	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00033	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00096	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.078	0.058	0.08	0.076	0.014	0.0081	0.076	0.106J	0.12	0.12	0.11	0.0122J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.0013	0.14	<0.00007	0.00078	0.025	0.00014J	0.00005J	0.107J	<0.00004	<0.00004	<0.00004	**8.33**
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0033	0.0028	0.0026	0.009	0.00098	0.0025	0.0028	<0.00033	0.00356	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-18C										
					2/5/2009	1/19/2010	6/24/2010	1/17/2011	7/13/2011	2/1/2012	7/11/2012	1/31/2013	7/29/2013	1/13/2014	07/16/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**1.4**	**1.5**	**1**	**1.3**	**1.2**	**1.3**	**1.2**	**1.51**	**1.23**	**1.51**	**1.45**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.26	0.21	0.13	0.18	0.16	0.19	0.15	0.203	0.22	0.245	0.309
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	**0.0688J**	<0.00015	**0.0161J**
Toluene	108-88-3	8260	1.00E+00	1.00E+00	1	0.96	0.72	0.83	0.8	0.83	0.72	0.962	0.899	**1.07**	0.986
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	1.1	1	1	1	0.9	0.82	0.84	1.01	0.881	1.02	1.36
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	0.084	0.0081	0.0078	0.012	0.0031	0.01	0.00005	<0.00031	<0.00031	<0.00031	0.0325
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.95**	**0.46**	**0.2**	**0.31**	**0.34**	**0.16**	**0.46**	**0.977**	**0.871**	**1.06**	**0.778**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.18	0.17	0.082	0.14	0.12	0.062	0.13	0.32	0.265	0.317	0.246
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0036	0.0023	0.0015	0.0019	0.0023	0.0018J	0.0019	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.017	0.014	0.0076	0.015	0.013	0.012	0.008	0.0401J	0.0284	0.0414J	0.028
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00039	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00014J	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	<0.00008	<0.00008	**0.00035**	0.00015J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00023	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00033	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.0001J	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.16**	0.091	0.077	**0.13**	**0.11**	0.06	**0.14**	**0.288**	**0.225**	**0.276**	**0.207**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0047	0.0035	0.0023	0.0059	0.0042	0.0018J	0.0023	<0.00007	0.00865J	0.0191J	0.00957J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.081	0.052	0.034	0.051	0.052	0.028	0.055	0.132J	0.114	<0.00007	0.116
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**21**	**12**	**6.2**	**13**	**12**	**9.7**	**13**	**20.2**	**20.9**	**20.3**	**14.7**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	**0.026**	**0.041**	**0.02**	**0.064**	**0.076**	**0.085**	**0.075**	<0.00061	<0.00061	**0.188**	**0.164**
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.076	0.052	0.032	0.055	0.052	0.027	0.055	0.155J	0.127	0.177	0.122
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.031	0.059	0.026	0.043	0.048	0.027	0.075	0.0601J	0.0205J	0.0184J	0.0285
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0025	0.002	0.0012	0.0028	0.0017	0.001J	0.0011	<0.00011	<0.00011	<0.00011	0.00571J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-19C										
					2/4/2009	1/18/2010	6/23/2010	1/18/2011	7/14/2011	2/8/2012	7/12/2012	2/1/2013	7/30/2013	1/15/2014	07/17/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	**0.0056**	<0.0005	<0.0005	<0.001	0.005	<0.0005	0.000558J	0.00427	0.00028J	0.0000801J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	0.0018J	<0.0005	<0.0005	<0.0011	0.0031J	<0.0005	0.000793J	0.0114	0.000966J	0.000783J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	0.0076	<0.0005	<0.0005	<0.001	0.0085	<0.0005	0.00171	0.0155	0.00136	0.000578J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03					<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	0.0043J	<0.001	<0.001	<0.0031	0.0063J	<0.0015	0.00151J	0.0197	0.00207J	0.00179J
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	0.00024	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00016J	0.00125	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00025	0.0017	0.000079J	0.00015J	0.0012	<0.00005	0.00005J	0.00084	0.000114J	0.00142	0.000845
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00022	0.001	0.00012J	0.00015J	0.00067	0.0012	0.00017J	0.00008	0.00279	<0.00008	0.0007
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	0.00014J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	0.0001J	<0.00007	<0.00007	0.00015J	<0.00005	<0.00005	0.000115J	0.000269J	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	0.000111J	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0002	0.0002	0.00026	0.0001	0.0001	0.00014J	<0.00037	0.0012J	<0.00037	0.000646
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	0.000072J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00017J	0.00051	<0.00008	0.00013J	0.00005	0.00014J	0.00005J	0.000367J	0.000631	0.00116	0.000554
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00015J	<0.00011	0.000164J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00015J	0.00024	0.0021	0.0026	0.0016	<0.00005	0.0018	0.00257	0.000309J	0.00223	0.00169
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	0.00032	0.00028	0.00032	0.00005	<0.00005	0.00033	0.000605	<0.00007	0.000296J	0.000485
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.0077	0.09	0.0001	0.0061	0.014	0.00077	0.00005	0.0264J	0.00008J	0.0383	0.0198
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	0.00028	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00016J	<0.00007	<0.00007	0.00005	<0.00005	<0.00005	0.000166J	0.000201J	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005	0.00023J	0.024	0.000724J	0.00033J
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.0002	0.0012	0.0016	0.0014	<0.00005	0.0014	0.00207	0.000233J	0.00191	0.00178

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-21C										
					2/4/2009	1/21/2010	6/22/2010	1/19/2011	7/27/2011	2/2/2012	7/26/2012	2/5/2013	8/1/2013	1/16/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	0.00011J	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03								<0.00011			<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000067J	<0.00005	0.000271J	<0.00007	0.00007J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.00041	<0.00009	0.00034	<0.00005	<0.00005	<0.00005	0.000237J	<0.00008	0.00008J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.0000527J	<0.00005	0.000243J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000129J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	0.00013J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0002	0.0002	0.00062	0.00062	0.0001J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.0000812J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.000109J	<0.00008	0.00008J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005J	<0.00011	<0.00011	<0.00011	0.000184J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000528	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000291J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00039	<0.0001	<0.0001	<0.0001	<0.00005	0.00093	<0.00005	0.000429J	0.00008J	0.000523J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000184J	0.0000775J	0.00128	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.000355J	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-23C										
					2/4/2009	1/18/2010	6/23/2010	1/19/2011	7/22/2011	2/2/2012	7/12/2012	2/11/2013	7/31/2013	1/15/2014	08/28/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.017**	**0.012**	**0.0095J**	**0.0072J**	<0.001	<0.001	**0.0071**	**0.0111**	**0.0138**	**0.0126**	**0.00596J**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.001J		<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000279J	0.00146J	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.13	0.074	0.12	0.13	0.1	0.1	0.17	0.151	0.185	0.165	0.15
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	0.0005J	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0023J	0.0012J	<0.0005	<0.0005	<0.001	<0.001	0.0025J	0.00433	0.00819J	0.00728	0.00378J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.073	0.044	0.069J	0.059J	0.048J	0.039J	0.11	0.0884	0.0988	0.0959	0.0915
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	0.0035	0.0014J	0.028	<0.00031	<0.00031	<0.00031	0.202
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**2.6**	**0.75**	**2.7**	**1.2**	**1.3**	**0.65**	**28**	**1.38**	**1.16**	**4.52**	**18.3**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	**3.4**	1.2	**3.4**	**1.6**	**2**	0.89	**39**	**1.78**	**1.58**	**7.79**	**25.9**
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.017	0.01	0.03	0.012	0.015	0.0068	0.45	<0.00006	<0.00006	<0.00006	0.336
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	1.2	0.36	1.2	0.4	1.7	0.25	**16**	0.641	0.31	1.49	**8.74**
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.31**	**0.12**	**0.3**	**0.12**	**0.15**	**0.046**	**4.8**	**0.104**	**0.0905**	**0.5**	**2.63**
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.072**	**0.029**	**0.093**	**0.04**	**0.044**	**0.016**	**1.2**	**0.0283**	**0.0235J**	**0.119**	**0.73**
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.002	0.0002	<0.0002	0.0014	0.0019	<0.0001	**0.042**	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	**0.28**	0.093	**0.27**	0.099	**0.21**	0.044	**4.3**	0.103	0.0819	**0.476**	**2.24**
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**3.5**	**1.2**	**3.6**	**1.6**	**2.7**	**0.85**	**46**	**1.82**	**1.48**	**5.45**	**25.7**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	**3**	0.77	**3**	**0.99**	**1.8**	0.48	**34**	**1.09**	0.812	**4.42**	**20.4**
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	**2.5**	0.82	**2.6**	0.88	**2**	0.57	**32**	**1.19**	0.874	**3.78**	**20.5**
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**9.9**	**3.9**	**8.9**	**8.5**	**7.5**	**7.8**	**83**	**12.2**	**13.2**	**43.8**	**57.9**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	**8.8**	**2.7**	**8.2**	**3.6**	**3.8**	**1.9**	**130**	**3.48**	**2.8**	**18.2**	**59.4**
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.0011J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	**1.6**	0.59	**1.9**	0.6	**1.1**	0.35	**21**	**0.754**	0.515	**3.04**	**13.3**

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-24C								
					2/3/2009	1/14/2010	6/29/2010	1/25/2011	7/21/2011	2/9/2012	7/25/2012	2/12/2013	8/8/2013
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000218J	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000077J	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	0.00022	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00055	<0.0002	0.0002	<0.0002	0.00013J	0.0013	0.0001J	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00013J	0.0001	<0.0001	<0.0001	0.0002	<0.00005	0.00019J	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-25C								
					1/15/2010	1/26/2011	7/20/2011	2/8/2012	7/18/2012	2/6/2013	8/6/2013	1/22/2014	07/29/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	**0.11J**	**0.092**	**0.076**	**0.039J**	**0.03J**	**0.0304**	**0.0283**	**0.022**	**0.0119**
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.00653J	<0.00012	0.00034J	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.47	0.5	0.37	0.34	0.33	0.324	0.173	0.32	0.298
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.52	0.53	0.4	0.31	0.31	0.291	0.204	0.261	0.207
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03			<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	1.2	1.2	1	0.98	0.96	1.03	0.575	1.01	1.07
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	0.0051	<0.00005	<0.00005	<0.00031	<0.00031	0.372	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.76**	**1.4**	**1.3**	**0.92**	**0.9**	**0.8**	**1.32**	**1.46**	**0.943**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.21	0.55	0.28	0.26	0.21	0.261J	0.381	0.416	0.284
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.0027	0.0041	0.0029	0.0021	0.0021	<0.00006	<0.00006	<0.00006	0.00316
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.035	0.19	0.031	0.021	0.019	<0.00005	0.0377J	0.0372J	0.0209
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	**0.0027**	**0.047**	**0.0014**	0.00054	0.00086	<0.00008	<0.00008	<0.00008	0.000813
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.0014**	**0.013**	**0.00043**	0.00017J	0.0002	<0.00008	<0.00008	<0.00008	**0.000435J**
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	**0.0016**
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	<0.0002	0.0001	<0.0001	0.00012J	<0.00037	<0.00037	<0.00037	0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.0025	0.048	0.0012	0.00062	0.00086	<0.00008	<0.00008	<0.00008	0.000957
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	**0.22**	**0.52**	**0.29**	**0.26**	**0.22**	**0.174J**	**0.353**	<0.00008	**0.276**
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.041	0.32	0.02	0.011	0.0088	<0.00007	0.0149J	0.018J	0.0127
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.12	0.34	0.14	0.13	0.096	0.102J	0.163	<0.00007	0.129
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**9.8**	**18**	**19**	**15**	**13**	**10.7**	**19.7**	**19**	**10.7**
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.19	0.7	0.18	0.14	0.12	0.147J	0.187	0.222	0.14
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.026	0.003	0.0045	<0.00004	0.12	<0.00004	0.00177
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.022	0.24	0.0092	0.0047	0.0063	<0.00011	<0.00011	<0.00011	0.00769

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-27C										
					2/3/2009	1/14/2010	6/30/2010	1/27/2011	7/20/2011	2/9/2012	7/25/2012	2/12/2013	8/8/2013	1/24/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011		<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00026	0.00015J	0.00028	0.00019J	0.00011J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000431J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00038	0.0002	0.0002	0.00047	0.0001	0.00014J	0.0001	0.000652	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005J	<0.00011	0.000143J	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.00015J	<0.00007	<0.00007	0.00011J	<0.00005	<0.00005	<0.00007	0.000114J	0.0000881J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00025	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00037	0.0001J	0.00024	0.00015J	<0.00005	<0.00005	0.00019J	<0.00008	0.000353J	0.00008J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	0.00014J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	0.0000908J	0.00006J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.0001J	<0.00007	<0.00007	0.000064J	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-28C											MW-34C	MW-34CR
					2/3/2009	1/13/2010	6/30/2010	1/25/2011	7/19/2011	2/16/2012	7/17/2012	2/7/2013	8/7/2013	1/22/2014	07/25/2014	2/8/2012	07/29/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.001	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008	0.0014J	0.000154J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.001	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011	0.0039J	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.0013	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0026J	0.0013J	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	0.0041J	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											<0.00011		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	0.0077J	<0.00026
Semi-Volatile Organic Compounds																	
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	0.0002	<0.00008	0.000086J	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	0.00022	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00006	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.000097J	0.00024	0.000077J	0.000079J	<0.00005	<0.00005	0.00011J	<0.00007	<0.00007	0.0000741J	<0.00007	0.00011J	0.000255J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00008	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00005	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	0.00018J	0.00033	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00005	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0033	0.0002	0.0002	0.00063	0.0001	0.0001J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.0001	0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	0.00018J	<0.00008	<0.00008	0.00019J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.000071J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.000485J	<0.00011	<0.00011	<0.00005	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.00012J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	0.00017J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	0.00016J	0.00033	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	0.00011J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00057	0.0014	0.00035	0.00029	0.00005J	0.00005	0.00064	0.000163J	<0.00008	0.00008J	<0.00008	0.00005	0.00282
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00005	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	0.00034	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00005	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00013J	0.00033	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.0000739J	<0.00006	0.0001J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00063	0.0027	0.00075	0.0014	0.00054	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	0.000072J	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00007J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	0.00021	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-44C			MW-47C										
					7/20/2011	7/18/2012	2/6/2013	2/4/2009	1/20/2010	6/24/2010	1/19/2011	7/21/2011	2/7/2012	7/27/2012	2/7/2013	8/6/2013	1/17/2014	07/30/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																		
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	0.000964J	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	0.00293J	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	0.32	0.233	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	0.16	0.0895	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03														
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0031	0.84	0.688	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds																		
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00005	<0.00005	<0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00005	<0.00005	<0.00031	<0.00008	<0.00008	0.00011J	<0.00008	<0.00005	<0.00005	0.00042	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00005	<0.00005	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00006	<0.00006	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00005	<0.00005	<0.00008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00005	**62**	**1.15**	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	**0.0044**	<0.00005	0.000098J	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00083	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00056	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00012J	**31**	0.632J	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00017J	0.000058J	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.000097J	0.29	<0.00006	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00014J	**19**	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000074J	<0.00005	0.000107J	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	0.00017J	**3.5**	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000137J	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	**0.00022**	**0.87**	<0.00008	<0.00008	0.000099J	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	**0.000306J**	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00005	<0.00005	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0001	**0.013**	<0.00037	0.0036	0.0002	0.0002	<0.0002	0.0001J	**0.011**	<0.0001	0.000594	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	0.00032	**3.3**	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000127J	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00005	**38**	**0.453J**	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.000104J	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00005	<0.00005	<0.00011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00015J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00016J	**28**	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000289J	0.000186J	0.0000718J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00005	**26**	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00025	<0.00005	0.000116J	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00005J	**230**	**18**	0.00019J	<0.0001	0.00046	0.00021	<0.00005	0.0041	0.00046	0.00008J	<0.00008	0.000297J	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00005	<0.00005	<0.00011	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00005	<0.00005	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00008	0.0004	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.000081J	**88**	0.498J	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.0003	<0.00005	0.000406J	<0.00006	0.000185J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00005	<0.00005	<0.00004	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00044	0.00056	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00013J	**19**	<0.00011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00015J	<0.00005	0.000388J	0.000131J	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-48C											
					2/4/2009	1/21/2010	6/24/2010	7/15/2010	1/19/2011	7/18/2011	2/6/2012	7/24/2012	1/31/2013	8/1/2013	1/16/2014	07/16/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											<0.00018	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	0.0073	<0.00008	<0.00008	<0.00005	<0.00005	0.00014J	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	**0.18**	<0.00007	<0.00007	<0.00005	<0.00005	0.0013	<0.00007	<0.00007	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	0.073	<0.00009	<0.00009	<0.00005	<0.00005	0.0011	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	0.0014	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00012J	<0.00007	0.007	<0.00007	<0.00007	<0.00005	<0.00005	0.00077	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000066J	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00034	0.0002	<0.0002	0.0013	0.001	0.0001	<0.0001	0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000073J	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00025	<0.00008	0.065	<0.00008	<0.00008	<0.00005	<0.00005	0.00096	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000053J	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	0.00013J	0.0021	0.00019J	0.00019J	0.00005J	<0.00005	0.00095	<0.00007	0.000134J	0.000153J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.032	<0.00007	<0.00007	<0.00005	<0.00005	0.0011	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00052	0.0002J	**5**	<0.0001	<0.0001	<0.00005	<0.00005	0.0071	0.00008J	0.00008J	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	**0.019**	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00032	<0.00007	0.03	<0.00007	<0.00007	<0.00005	<0.00005	0.0034	<0.00006	<0.00006	<0.00006	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	0.024	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	0.0001J	0.001	0.00015J	0.00012J	0.00005J	<0.00005	0.00052	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-51C	MW-53C										
					07/24/2014	2/3/2009	1/13/2010	6/30/2010	1/26/2011	7/20/2011	2/9/2012	7/18/2012	2/6/2013	8/6/2013	1/22/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000644J	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.000104J	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.00015	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.00011											<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.00026	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.00011	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00031	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	<0.00007	0.000071J	<0.00007	<0.00007	<0.00005	0.00008J	0.00005J	<0.00007	<0.00007	0.000358J	0.00007J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00083	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00056	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00008	<0.00009	0.0002	0.00032	<0.00009	0.00032	0.0002J	<0.00005	<0.00008	<0.00008	0.000856J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00111	0.00072	0.0002	0.0002	0.00037	0.0001J	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000355J	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.000553	0.0012	0.0001	<0.0001	0.00015J	<0.00005	0.00066	0.00005	0.00008J	<0.00008	0.00008J	0.00008
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00011	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00061	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.000939J	0.00006J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.000628	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-54C										
					2/3/2009	1/21/2010	6/30/2010	1/26/2011	7/20/2011	2/8/2012	7/25/2012	2/12/2013	8/6/2013	1/23/2014	07/25/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	0.000128J	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0029J	<0.0005	0.0024J	<0.0005	0.0018J	0.0011J	0.0011J	0.000187J	0.00062J	0.000527	0.000282J
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0027J	<0.001	0.0011J	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	0.00076J	0.00062J	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.000098J	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	**0.13**	<0.00007	**0.0096**	0.00025	**0.022**	**0.0065**	**0.0054**	**0.00392**	**0.0173**	**0.0176**	**0.00834**
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.067	0.00016J	0.024	0.0023	0.039	0.035	0.022	0.0219	0.0749	0.062	0.0367
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	0.00072	<0.00007	0.00042	<0.00007	0.00045	0.00051	0.00039	<0.00006	<0.00006	0.00105	0.000526
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.003	<0.00007	0.005	0.00027	0.0029	0.0024	0.0019	0.00183	0.00389	0.00445	0.00261
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.0000993J	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00072	0.0002	0.0002	0.0016	0.0001J	<0.0001	0.00017J	<0.00037	<0.00037	<0.00037	<0.00037
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.0000758J	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.064	<0.00008	0.028	0.0018	0.046	0.047	0.029	0.0223	0.0878	0.0695	0.0471
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000064J	<0.00011	<0.00011	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.0032	<0.00007	0.0032	0.00016J	0.0034	0.0026	0.002	0.00246	0.00474	0.00575	0.00302
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.03	<0.00007	0.015	0.001	0.022	0.021	0.011	0.0092	0.0409	0.0321	0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	**1.1**	<0.0001	0.21	0.0055	**0.47**	0.35	0.15	0.0681	0.383J	0.315J	0.18
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00014J	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.042	<0.00007	0.024	0.0011	0.04	0.034	0.019	0.0128	0.04	0.042	0.0148
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.0018	<0.00007	0.0016	<0.00007	0.0017	0.0015	0.0013	0.00138	0.00248	0.00373	0.00169

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-3
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-68C										MW-76C	
					7/15/2010	1/25/2011	7/21/2011	2/16/2012	7/17/2012	2/6/2013	8/7/2013	1/22/2014	07/24/2014	8/28/2014	07/24/2014	10/3/2014
chemical_name	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds																
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.00014	<0.00014	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00081J	0.0021J	0.0032J	**0.0069**	**0.0079**	0.00134	0.00364	0.00225	**0.0073**	0.00118	0.000149J	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.00012J	<0.00012	<0.00018	<0.00012	<0.00012	<0.00012	
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	0.000363J	0.000517J	0.00024J	0.000419J	0.00014J	<0.00011	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.00015	<0.00015	
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	0.00067J	0.0011J	0.0019J	0.0023J	0.000632J	0.00015	0.00059	0.00138	0.000442J	0.000156J	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011	<0.00011	<0.00011	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.0031	<0.0031	<0.0015	0.000873J	0.000879J	<0.00058	0.000649J	<0.00026	<0.00026	
Semi-Volatile Organic Compounds																
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011		<0.00011	<0.000107
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	0.00012J	0.00031	0.00095	0.0014	<0.00031	<0.00031	0.000454J	<0.00031		<0.00031	<0.000301
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013		<0.00013	<0.000126
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008		<0.00008	<0.0000777
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008		<0.00008	<0.0000777
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	0.00016J	0.00024	0.00005J	**0.0025**	0.00132	0.000301J	**0.00331**	0.000188J		0.000392J	0.0000976J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083		<0.00083	<0.000806
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056		<0.00056	<0.000544
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	0.00013J	<0.00005	0.0013	0.000647	<0.00008	0.00183	0.000235J		0.000696	0.00024J
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006		<0.00006	<0.0000583
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	<0.00005	0.00089	<0.00005	<0.00005	0.00106	<0.00005		0.000234J	0.00011J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00005	<0.00005	0.00018J	<0.00008	<0.00008	0.000276J	<0.00008		<0.00008	<0.0000777
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000171J	<0.00008		<0.00008	**0.000276J**
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013		<0.00013	<0.000126
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00098	0.006	0.001	0.0001	0.0018	0.000637	0.00157J	<0.00037	<0.00037		0.000803	0.000714
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00005	<0.00005	0.00016J	<0.00008	<0.00008	0.000301J	<0.00008		<0.00008	<0.0000777
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	0.0002J	0.00005J	0.0018	0.000168J	<0.00008	0.00192	0.0000942J		0.000507	0.000159J
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00011J	<0.00011	0.000142J	<0.00011	<0.00011		<0.00011	0.000124J
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.0016	<0.00007	<0.00007	0.00233	<0.00007		0.000322J	0.000188J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.0001J	<0.00005	0.0012	0.00034J	0.000135J	0.00167	0.000155J		0.000778	0.000264J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00083	0.0014	0.0027	0.00005	0.015	0.0129	0.00643	0.0112	0.00274		0.00176	0.000506
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011		<0.00011	0.000124J
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0000971
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061		**0.00272**	<0.000592
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.00016J	<0.00005	0.005	0.000499	<0.00006	0.00585	<0.00006		0.00183	0.000611
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.0005	0.0039	0.0049	0.0074	0.000062J	<0.00004	<0.00004	<0.00004	<0.00004		0.00284	0.00163
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00086	<0.00011	<0.00011	0.0014	<0.00011		0.000194J	0.000161J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-4
Summary of Groundwater Sampling Results - D-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-36D								
					7/15/2010	1/26/2011	7/27/2011	2/14/2012	7/23/2012	2/11/2013	8/5/2013	1/21/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	0.00071J	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	0.0000895J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	0.00013J	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	0.000127J	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	0.00675
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03									
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds													
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	<0.00007	0.00013J	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000189J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00014J	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000105J	0.000224J
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	0.000213J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	0.000192J
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.005	0.00097	0.0012	0.0001	0.0001	<0.00037	<0.00037	<0.00037	0.00128
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00005	0.000078J	<0.00005	<0.00008	<0.00008	<0.00008	0.000347J
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00017J	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	<0.00007	<0.00007	0.00032	0.000052J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	0.000068J	0.00013J	0.000054J	<0.00007	<0.00007	0.000216J	0.00111
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000147J	0.0001J
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	<0.0001	0.00083	0.000061J	0.00005J	0.00005J	<0.00008	<0.00008	0.0011J	0.0000923J
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.000072J	0.000069J	<0.00005	<0.00006	<0.00006	0.000665	0.00102
Phenol	108-95-2	8270	7.33E+00	2.19E+01	0.00065	<0.00007	0.000056J	0.00023	<0.00005	<0.00004	<0.00004	<0.00004	0.00194
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	0.000053J	0.000087J	<0.00005	<0.00011	<0.00011	0.000159J	0.000881

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-4
Summary of Groundwater Sampling Results - D-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-59D										
					2/5/2009	1/20/2010	7/1/2010	1/20/2011	7/27/2011	2/14/2012	7/23/2012	2/11/2013	8/5/2013	1/23/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	0.000135J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.0011J	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.00064J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	0.000258J
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00015J	<0.00007	<0.00007	0.00046	<0.00005	<0.00005	0.000071J	<0.00007	0.00016J	<0.00007	0.000334J
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00015J	<0.00009	<0.00009	0.00095	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	0.00069	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	0.00027	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.006	0.0002	0.0002	0.0002	0.0011	0.0001	0.0001J	<0.00037	0.000805J	0.000425J	0.00306
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	0.00024	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00014J	<0.00008	<0.00008	0.0011	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.0029	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	<0.00007	<0.00007	<0.00007	0.0018	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.0000789J	0.00018J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00013J	<0.00007	<0.00007	0.00079	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.0019	<0.0001	0.0001	0.0034	<0.00005	<0.00005	0.00005	<0.00008	0.00226J	0.00008J	0.00576
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.0002	<0.00007	<0.00007	0.0037	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.00006J	0.00018J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	0.0011	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	0.000131J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-4
Summary of Groundwater Sampling Results - D-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-65D										
					2/5/2009	1/21/2010	7/1/2010	1/26/2011	7/27/2011	2/14/2012	7/23/2012	2/11/2013	8/5/2013	1/21/2014	08/28/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	0.0013J	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00019	<0.00011
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	0.00095J	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00012J	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.0000808J	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.00019J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.000078J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0000574J	<0.00005
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.0019	0.0002	0.0002	0.001	0.001	0.0001J	0.0001	0.000593	<0.00037	<0.00037	0.00244
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00016J	0.00012J	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00029	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000135J	0.000148J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.000097J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000117J	<0.00007
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00016J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.00051	0.00026	0.0001	0.00019J	<0.00005	<0.00005	0.00005J	<0.00008	<0.00008	0.000529J	0.00071
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00014J	<0.00007	<0.00007	<0.00007	0.000065J	<0.00005	<0.00005	<0.00006	0.000093J	0.000294J	<0.00006
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	0.0015	<0.00007	<0.00007	0.000051J	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5B-4
Summary of Groundwater Sampling Results - D-TZ Monitoring Wells
UPRR Houston Wood Preserving Works

			Residential Assessment Level	C/I Assessment Level	MW-66D										
					2/5/2009	1/20/2010	7/1/2010	7/27/2011	2/14/2012	7/23/2012	4/2/2013	8/5/2013	1/29/2014	08/28/2014	10/3/2014
Constituent	CAS	Method	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Volatile Organic Compounds															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00012	<0.00012	<0.00012	<0.00012	
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0005	<0.0005	<0.0011	<0.0011	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00015	<0.00015	
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015	
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00026	<0.00026	
Semi-Volatile Organic Compounds															
1,2-Diphenylhydrazine	122-66-7	8270	1.14E-03	2.56E-03	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.000107
2,4-Dimethylphenol	105-67-9	8270	4.04E-01	1.46E+00	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.000301
2,4-Dinitrotoluene	121-14-2	8270	1.34E-03	3.01E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.000126
2,6-Dinitrotoluene	606-20-2	8270	1.34E-03	3.01E-03	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.0000777
2-Chloronaphthalene	91-58-7	8270	1.96E+00	5.84E+00	<0.00012	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.0000777
2-Methylnaphthalene	534-52-1	8270	2.44E-03	7.30E-03	0.00062	<0.00007	<0.00007	<0.00005	<0.00005	0.000085J	<0.00007	<0.00007	<0.00007	0.000211J	<0.000068
4,6-Dinitro-2-methylphenol	91-57-6	8270	9.78E-02	2.92E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.000806
4-Nitrophenol	100-02-7	8270	4.04E-02	1.46E-01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.000544
Acenaphthene	83-32-9	8270	1.47E+00	4.38E+00	0.0004	<0.00009	<0.00009	<0.00005	<0.00005	0.000054J	<0.00008	<0.00008	0.000145J	0.000141J	<0.0000777
Acenaphthylene	208-96-8	8270	1.47E+00	4.38E+00	<0.00006	<0.00007	<0.00007	<0.00005	<0.00005	0.000081J	<0.00006	<0.00006	<0.00006	0.000411J	0.000206J
Anthracene	120-12-7	8270	7.33E+00	2.19E+01	0.00015J	<0.00007	<0.00007	0.00022	0.00027	0.00059	<0.00005	<0.00005	<0.00005	0.00304	0.00256
Benzo(a)anthracene	56-55-3	8270	1.25E-03	2.80E-03	<0.00007	<0.00007	<0.00007	0.00011J	0.00012J	0.00036	<0.00008	<0.00008	<0.00008	0.00041J	0.000245J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	0.00016J	0.00013J	**0.00067**	<0.00008	<0.00008	<0.00008	**0.000436J**	**0.000439J**
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.86E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.000126
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	**0.0064**	0.0002	0.0002	0.0019	0.0001J	0.0032	<0.00037	<0.00037	<0.00037	0.000585	0.000415J
Chrysene	218-01-9	8270	1.25E-01	2.80E-01	<0.00007	<0.00007	<0.00007	0.00046	0.00052	0.0018	<0.00008	<0.00008	<0.00008	0.00104	0.000582
Dibenzofuran	132-64-9	8270	9.78E-02	2.92E-01	0.00036	<0.00008	0.000083J	<0.00005	<0.00005	0.000066J	<0.00008	<0.00008	<0.00008	0.000133J	<0.0000777
Di-n-butylphthalate	84-74-2	8270	2.44E+00	7.30E+00	0.00044	0.000086J	<0.00007	0.000056J	<0.00005	0.00005J	<0.00011	<0.00011	<0.00011	0.000121J	<0.000107
Fluoranthene	206-44-0	8270	9.78E-01	2.92E+00	0.00026	<0.00007	<0.00007	0.00035	0.00057	0.0019	<0.00007	<0.00007	<0.00007	0.00116	0.000346J
Fluorene	86-73-7	8270	9.78E-01	2.92E+00	0.00033	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000143J	<0.000068
Naphthalene	91-20-3	8270	4.04E-01	1.46E+00	0.0058	<0.0001	0.0001J	<0.00005	<0.00005	0.00005	<0.00008	0.0000999J	0.000367J	0.00118	<0.0000777
Nitrobenzene	98-95-3	8270	4.04E-02	1.46E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.000107
N-Nitrosodiphenylamine	86-30-6	8270	1.86E-01	4.17E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0000971
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	0.000084J	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.000592
Phenanthrene	85-01-8	8270	7.33E-01	2.19E+00	0.00073	0.00012J	<0.00007	0.00011J	0.00011J	0.00058	<0.00006	<0.00006	0.000132J	0.000295J	0.0000729J
Phenol	108-95-2	8270	7.33E+00	2.19E+01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.0000388
Pyrene	129-00-0	8270	7.33E-01	2.19E+00	0.00017J	<0.00007	<0.00007	0.00036	0.00051	0.0019	<0.00011	<0.00011	<0.00011	0.00118	0.000388J

Notes:

1. Sampling locations shown on Figure 1A
2. Concentrations > RAL are **bold** type.
3. Concentrations > cPCL are highlighted.
4. Non-detected concentrations > RAL or cPCL are **bold** type.
5. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated March 25, 2009.
6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
7. J = Estimated value, < = Compound not detected at the specified detection limit.

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-01A	47.92	2-Sep-93	6.96			40.99
	47.92	21-Dec-93	3.28			44.67
	47.92	24-Mar-94	3.95			44
	47.92	22-Jun-94	5.30			42.65
	47.92	28-Sep-94	7.10			40.85
	47.92	13-Oct-94	7.26			40.69
	47.92	24-Jan-95	2.63			45.32
	47.92	11-Apr-95	2.61			45.34
	47.92	11-Jul-95	4.78			43.17
	47.92	23-Jan-96	5.67			42.28
	47.92	19-Jul-96	7.84			40.11
	47.92	17-Sep-96	8.33			39.62
	47.92	31-Oct-96	6.90			41.05
	47.92	22-Nov-96	8.63			39.32
	47.92	27-Dec-96	5.50			42.45
	47.92	22-Jan-97	3.41			44.54
	47.92	21-Feb-97	2.68			45.27
	47.92	25-Mar-97	2.96			44.99
	47.92	23-Apr-97	4.27			43.68
	47.92	24-Apr-97	4.47			43.48
	47.92	13-May-97	2.91			45.04
	47.92	20-Jun-97	4.88			43.07
	47.92	25-Jun-97	2.59			45.36
	47.92	1-Jul-97	4.04			43.91
	47.92	24-Jul-97	6.80			41.15
	47.92	16-Aug-97	7.84			40.11
	47.92	22-Aug-97	9.52			38.43
	47.92	25-Sep-97	6.02			41.93
	47.92	22-Oct-97	4.89			43.06
	47.92	25-Nov-97	4.88			43.07
	47.92	19-Dec-97	4.26			43.69
	47.92	20-Jan-98	3.10			44.85
	47.92	3-Mar-98	2.87			45.08
	47.92	18-Mar-98	2.68			45.27
	47.92	24-Apr-98	6.73			41.22
	47.92	21-May-98	6.89			41.06
	47.92	30-Jul-98	7.96			39.99
	47.92	25-Aug-98	6.87			41.08
	47.92	21-Sep-98	4.70			43.25
	47.92	26-Oct-98	5.98			41.97
	47.92	23-Nov-98	4.11			43.84
	47.92	29-Jan-99	3.01			44.94
	47.92	26-Feb-99	3.20			44.75
	47.92	16-Mar-99	3.71			44.24
	47.92	29-Apr-99	3.93			44.02
	47.92	1-Jun-99	3.98			43.97
	47.92	30-Jul-99	4.31			43.64
	47.92	27-Aug-99	4.11			43.84
	47.92	27-Sep-99	9.67			38.28
	47.92	29-Oct-99	10.67			37.28
	47.92	29-Dec-99	10.00			37.95
	47.92	4-Feb-00	12.71			35.24
	47.92	25-Feb-00	9.10			38.85
	47.92	27-Mar-00	7.38			40.57
	47.92	7-Apr-00	7.00			40.95
	47.92	31-May-00	7.15			40.8
	47.92	1-Jun-00	7.00			40.95
	47.92	28-Jul-00	7.11			40.84
	47.92	30-Aug-00	10.33			37.62
	47.92	19-Sep-00	11.56			36.39
	47.92	27-Oct-00	9.01			38.94
	47.92	21-Nov-00	8.49			39.46
	47.92	1-May-01	6.60			41.35
	47.92	1-Oct-01	6.85			41.1
	47.92	11-Mar-02	3.31			44.64
	47.92	23-Sep-02	3.23			44.72
	47.92	10-Mar-03	2.48			45.44
	47.92	23-Sep-03	4.29			43.63
	47.92	15-Mar-04	3.49			44.43
	47.92	13-Sep-04	8.26			39.66
	47.92	18-Jul-05	3.73			44.19
	47.92	4-Jan-06	8.54			39.38
	47.92	27-Jul-06	3.10			44.82
	47.92	23-Jan-07	2.26			45.66
	47.92	7-Mar-07	2.36			45.56
	47.92	27-Jul-07	4.05			43.87

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-01A	47.92	28-Jan-08	2.51			45.41
	47.92	16-Jul-08	7.21			40.71
	47.92	22-Jan-09	6.21			41.71
	47.92	22-Jul-09	6.96			40.96
	47.92	8-Jan-10	3.07			44.85
	47.92	12-Jul-10	3.87			44.05
	47.88	12-Jan-11	3.63			44.25
	47.88	13-Jul-11	9.94			37.94
	47.88	27-Jan-12	3.19			44.69
	47.88	10-Jul-13	9.96			37.92
	47.88	8-Jan-14	5.21			42.67
MW-02	47.97	2-Sep-93	7.45			40.58
	47.97	21-Dec-93	2.58			45.45
	47.97	24-Mar-94	4.08			43.95
	47.97	22-Jun-94	5.85			42.18
	47.97	28-Sep-94	7.05			40.98
	47.97	13-Oct-94	7.69			40.34
	47.97	24-Jan-95	2.12			45.91
	47.97	11-Apr-95	2.53			45.5
	47.97	11-Jul-95	5.34			42.69
	47.97	23-Jan-96	5.69			42.34
	47.97	19-Jul-96	8.28			39.75
	47.97	17-Sep-96	8.84			39.19
	47.97	31-Oct-96	7.11			40.92
	47.97	22-Nov-96	8.99			39.04
	47.97	27-Dec-96	5.42			42.61
	47.97	22-Jan-97	3.08			44.95
	47.97	21-Feb-97	2.60			45.43
	47.97	25-Mar-97	2.98			45.05
	47.97	23-Apr-97	4.60			43.43
	47.97	24-Apr-97	4.78			43.25
	47.97	13-May-97	2.89			45.14
	47.97	20-Jun-97	5.45			42.58
	47.97	25-Jun-97	2.59			45.44
	47.97	1-Jul-97	4.48			43.55
	47.97	24-Jul-97	7.42			40.61
	47.97	16-Aug-97	8.42			39.61
	47.97	22-Aug-97	9.20			38.83
	47.97	25-Sep-97	4.53			43.5
	47.97	22-Oct-97	4.95			43.08
	47.97	25-Nov-97	4.97			43.06
	47.97	19-Dec-97	4.33			43.7
	47.97	20-Jan-98	3.05			44.98
	47.97	3-Mar-98	2.88			45.15
	47.97	18-Mar-98	2.66			45.37
	47.97	24-Apr-98	7.09			40.94
	47.97	21-May-98	7.00			41.03
	47.97	30-Jul-98	8.11			39.92
	47.97	25-Aug-98	7.33			40.7
	47.97	21-Sep-98	4.18			43.85
	47.97	26-Oct-98	6.85			41.18
	47.97	23-Nov-98	4.63			43.4
	47.97	29-Jan-99	3.51			44.52
	47.97	26-Feb-99	3.61			44.42
	47.97	16-Mar-99	3.55			44.48
	47.97	29-Apr-99	3.76			44.27
	47.97	1-Jun-99	3.76			44.27
	47.97	30-Jul-99	4.61			43.42
	47.97	27-Aug-99	3.96			44.07
	47.97	27-Sep-99	10.12			37.91
	47.97	29-Oct-99	11.33			36.7
	47.97	29-Dec-99	10.66			37.37
	47.97	4-Feb-00	13.19			34.84
	47.97	25-Feb-00	9.57			38.46
	47.97	27-Mar-00	7.73			40.3
	47.97	7-Apr-00	7.30			40.73
	47.97	31-May-00	7.33			40.7
	47.97	1-Jun-00	7.31			40.72
	47.97	28-Jul-00	7.35			40.68
	47.97	30-Aug-00	10.55			37.48
	47.97	19-Sep-00	11.93			36.1
	47.97	27-Oct-00	9.04			38.99
	47.97	21-Nov-00	8.66			39.37
	47.97	1-May-01	6.91			41.12
	47.97	1-Oct-01	8.22			39.81
	47.97	11-Mar-02	3.33			44.7
	47.97	23-Sep-02	3.16			44.87
	47.97	10-Mar-03	2.54			45.43

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-02	47.97	23-Sep-03	3.29			44.68
	47.97	15-Mar-04	2.87			45.1
	47.97	13-Sep-04	8.71			39.26
	47.97	18-Jul-05	2.98			44.99
	47.97	4-Jan-06	8.77			39.2
	47.97	27-Jul-06	2.87			45.1
	47.97	23-Jan-07	2.34			45.63
	47.97	7-Mar-07	2.23			45.74
	47.97	27-Jul-07	4.40			43.57
	47.97	28-Jan-08	2.42			45.55
	47.97	16-Jul-08	7.72			40.25
	47.97	22-Jan-09	6.31			41.66
	47.97	22-Jul-09	7.56			40.41
	47.97	8-Jan-10	3.91			44.06
	47.97	12-Jul-10	4.37			43.6
	48.00	12-Jan-11	3.63			44.37
	48.00	13-Jul-11	10.28			37.72
	48.00	27-Jan-12	2.67			45.33
	48.00	10-Jul-13	10.58			37.42
	48.00	8-Jan-14	5.47			42.53
MW-03	48.34	2-Sep-93	8.17			40.17
	48.34	21-Dec-93	3.81			44.53
	48.34	24-Mar-94	4.74			43.6
	48.34	22-Jun-94	6.35			41.99
	48.34	28-Sep-94	7.56			40.78
	48.34	13-Oct-94	8.21			40.13
	48.34	24-Jan-95	3.18			45.16
	48.34	11-Apr-95	3.22			45.12
	48.34	11-Jul-95	7.90			40.44
	48.34	23-Jan-96	6.27			42.07
	48.34	19-Jul-96	8.77			39.57
	48.34	17-Sep-96	9.31			39.03
	48.34	31-Oct-96	7.61			40.73
	48.34	22-Nov-96	9.48			38.86
	48.34	27-Dec-96	6.14			42.2
	48.34	22-Jan-97	5.68			42.66
	48.34	21-Feb-97	3.13			45.21
	48.34	25-Mar-97	3.48			44.86
	48.34	23-Apr-97	5.17			43.17
	48.34	24-Apr-97	5.25			43.09
	48.34	13-May-97	3.41			44.93
	48.34	20-Jun-97	5.91			42.43
	48.34	25-Jun-97	3.11			45.23
	48.34	1-Jul-97	4.91			43.43
	48.34	24-Jul-97	7.90			40.44
	48.34	16-Aug-97	8.91			39.43
	48.34	22-Aug-97	9.65			38.69
	48.34	25-Sep-97	6.96			41.38
	48.34	22-Oct-97	5.50			42.84
	48.34	25-Nov-97	5.55			42.79
	48.34	19-Dec-97	5.10			43.24
	48.34	20-Jan-98	3.58			44.76
	48.34	3-Mar-98	3.37			44.97
	48.34	18-Mar-98	3.16			45.18
	48.34	24-Apr-98	7.54			40.8
	48.34	21-May-98	7.50			40.84
	48.34	30-Jul-98	8.44			39.9
	48.34	25-Aug-98	7.56			40.78
	48.34	21-Sep-98	5.28			43.06
	48.34	26-Oct-98	6.96			41.38
	48.34	23-Nov-98	5.11			43.23
	48.34	29-Jan-99	4.21			44.13
	48.34	26-Feb-99	4.32			44.02
	48.34	16-Mar-99	4.16			44.18
	48.34	29-Apr-99	4.33			44.01
	48.34	1-Jun-99	4.39			43.95
	48.34	30-Jul-99	5.88			42.46
	48.34	27-Aug-99	4.57			43.77
	48.34	27-Sep-99	10.48			37.86
	48.34	29-Oct-99	11.61			36.73
	48.34	29-Dec-99	10.11			38.23
	48.34	4-Feb-00	13.22			35.12
	48.34	25-Feb-00	9.14			39.2
	48.34	27-Mar-00	8.06			40.28
	48.34	7-Apr-00	7.64			40.7
	48.34	31-May-00	7.70			40.64
	48.34	1-Jun-00	7.66			40.68
	48.34	28-Jul-00	7.71			40.63

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-03	48.34	30-Aug-00	10.59			37.75
	48.34	19-Sep-00	12.29			36.05
	48.34	27-Oct-00	9.09			39.25
	48.34	21-Nov-00	9.11			39.23
	48.34	1-May-01	7.26			41.08
	48.34	1-Oct-01	7.57			40.77
	48.34	11-Mar-02	7.40			40.94
	48.34	23-Sep-02	4.60			43.74
	48.34	10-Mar-03	2.89			45.45
	48.34	23-Sep-03	3.74			44.6
	48.34	15-Mar-04	3.27			45.07
	48.34	13-Sep-04	9.03			39.31
	48.34	18-Jul-05	3.94			44.4
	48.34	4-Jan-06	9.13			39.21
	48.34	27-Jul-06	3.30			45.04
	48.34	7-Mar-07	2.62			45.72
	48.34	27-Jul-07	3.74			44.6
	48.34	30-Jan-08	2.85			45.49
	48.34	16-Jul-08	7.96			40.38
	48.34	4-Feb-09	7.18			41.16
	48.34	24-Jul-09	7.63			40.71
	48.34	8-Jan-10	5.06			43.28
	48.34	12-Jul-10	3.86			44.48
	48.34	12-Jan-11	3.71			44.63
	48.34	12-Jul-11	6.42			41.92
	48.34	26-Jan-12	--			
	48.34	9-Jul-12	4.06			44.28
	48.34	7-Jan-13	5.09			43.25
	48.34	22-Jul-13	8.24			40.1
	48.34	7-Jan-14	8.09			40.25
	48.34	15-Jul-14	8.78			39.56
MW-04	49.85	2-Sep-93	8.57			41.28
	49.85	21-Dec-93	5.42			44.43
	49.85	24-Mar-94	5.85			44
	49.85	22-Jun-94	6.77			43.08
	49.85	28-Sep-94	8.18			41.67
	49.85	13-Oct-94	8.93			40.92
	49.85	24-Jan-95	4.72			45.13
	49.85	11-Apr-95	4.57			45.28
	49.85	11-Jul-95	6.47			43.38
	49.85	23-Jan-96	7.85			42
	49.85	19-Jul-96	9.62			40.23
	49.85	17-Sep-96	10.09			39.76
	49.85	31-Oct-96	7.93			41.92
	49.85	22-Nov-96	10.62			39.23
	49.85	27-Dec-96	8.06			41.79
	49.85	22-Jan-97	6.07			43.78
	49.85	21-Feb-97	4.86			44.99
	49.85	25-Mar-97	5.16			44.69
	49.85	23-Apr-97	6.25			43.6
	49.85	24-Apr-97	6.45			43.4
	49.85	13-May-97	5.07			44.78
	49.85	20-Jun-97	6.69			43.16
	49.85	25-Jun-97	4.68			45.17
	49.85	1-Jul-97	5.91			43.94
	49.85	24-Jul-97	8.61			41.24
	49.85	16-Aug-97	9.62			40.23
	49.85	22-Aug-97	10.35			39.5
	49.85	25-Sep-97	8.13			41.72
	49.85	22-Oct-97	7.23			42.62
	49.85	25-Nov-97	7.25			42.6
	49.85	19-Dec-97	6.76			43.09
	49.85	20-Jan-98	5.40			44.45
	49.85	3-Mar-98	5.00			44.85
	49.85	18-Mar-98	4.82			45.03
	49.85	24-Apr-98	8.63			41.22
	49.85	21-May-98	9.30			40.55
	49.85	30-Jul-98	10.19			39.66
	49.85	25-Aug-98	9.05			40.8
	49.85	21-Sep-98	7.05			42.8
	49.85	26-Oct-98	8.12			41.73
	49.85	23-Nov-98	6.01			43.84
	49.85	29-Jan-99	5.19			44.66
	49.85	26-Feb-99	5.22			44.63
	49.85	16-Mar-99	6.21			43.64
	49.85	29-Apr-99	6.33			43.52
	49.85	1-Jun-99	6.39			43.46
	49.85	30-Jul-99	7.79			42.06

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-04	49.85	27-Aug-99	6.51			43.34
	49.85	27-Sep-99	11.32			38.53
	49.85	29-Oct-99	12.21			37.64
	49.85	29-Dec-99	11.52			38.33
	49.85	4-Feb-00	14.33			35.52
	49.85	25-Feb-00	10.63			39.22
	49.85	27-Mar-00	9.38			40.47
	49.85	7-Apr-00	9.09			40.76
	49.85	31-May-00	9.13			40.72
	49.85	1-Jun-00	9.10			40.75
	49.85	28-Jul-00	9.18			40.67
	49.85	30-Aug-00	12.17			37.68
	49.85	19-Sep-00	13.39			36.46
	49.85	27-Oct-00	10.69			39.16
	49.85	21-Nov-00	9.61			40.24
	49.85	1-May-01	8.41			41.44
	49.85	1-Oct-01	8.68			41.17
	49.85	11-Mar-02	5.41			44.44
	49.85	23-Sep-02	5.29			44.56
	49.85	10-Mar-03	4.36			45.49
	49.85	23-Sep-03	5.28			44.57
	49.85	15-Mar-04	4.80			45.05
	49.85	13-Sep-04	9.80			40.05
	49.85	18-Jul-05	5.84			44.01
	49.85	4-Jan-06	10.48			39.37
	49.85	27-Jul-06	5.30			44.55
	49.85	7-Mar-07	4.10			45.75
	49.85	27-Jul-07	5.36			44.49
	49.85	29-Jan-08	4.18			45.67
	49.85	16-Jul-08	8.66			41.19
	49.85	4-Feb-09	8.93			40.92
	49.85	24-Jul-09	9.27			40.58
	49.85	8-Jan-10	6.34			43.51
	49.85	12-Jul-10	5.02			44.83
	49.85	12-Jan-11	5.26			44.59
	49.85	12-Jul-11	8.06			41.79
	49.85	26-Jan-12	--			
	49.85	9-Jul-12	3.74			46.11
	49.85	7-Jan-13	4.62			45.23
	49.85	22-Jul-13	7.59			42.26
	49.85	7-Jan-14	7.16			42.69
	49.85	15-Jul-14	7.62			42.23
MW-05	49.24	2-Sep-93	4.90			44.34
	49.24	21-Dec-93	2.21			47.03
	49.24	24-Mar-94	2.30			46.94
	49.24	22-Jun-94	2.80			46.44
	49.24	28-Sep-94	3.90			45.34
	49.24	13-Oct-94	5.05			44.19
	49.24	24-Jan-95	1.36			47.88
	49.24	11-Apr-95	3.90			45.34
	49.24	11-Jul-95	5.33			43.91
	49.24	23-Jan-96	7.42			41.82
	49.24	19-Jul-96	8.61			40.63
	49.24	17-Sep-96	9.01			40.23
	49.24	31-Oct-96	7.84			41.4
	49.24	22-Nov-96	9.68			39.56
	49.24	27-Dec-96	7.66			41.58
	49.24	22-Jan-97	5.89			43.35
	49.24	21-Feb-97	4.45			44.79
	49.24	25-Mar-97	4.65			44.59
	49.24	23-Apr-97	5.53			43.71
	49.24	24-Apr-97	5.68			43.56
	49.24	13-May-97	4.39			44.85
	49.24	20-Jun-97	5.67			43.57
	49.24	25-Jun-97	3.97			45.27
	49.24	1-Jul-97	5.06			44.18
	49.24	24-Jul-97	7.46			41.78
	49.24	16-Aug-97	8.57			40.67
	49.24	22-Aug-97	9.20			40.04
	49.24	25-Sep-97	7.28			41.96
	49.24	22-Oct-97	6.70			42.54
	49.24	25-Nov-97	6.70			42.54
	49.24	19-Dec-97	6.26			42.98
	49.24	20-Jan-98	5.05			44.19
	49.24	4-Mar-98	4.54			44.7
	49.24	18-Mar-98	4.36			44.88

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-05	49.24	24-Apr-98	7.67			41.57
	49.24	21-May-98	8.80			40.44
	49.24	30-Jul-98	9.90			39.34
	49.24	25-Aug-98	8.86			40.38
	49.24	21-Sep-98	6.59			42.65
	49.24	26-Oct-98	7.77			41.47
	49.24	23-Nov-98	5.79			43.45
	49.24	29-Jan-99	4.88			44.36
	49.24	26-Feb-99	4.96			44.28
	49.24	16-Mar-99	5.81			43.43
	49.24	29-Apr-99	5.91			43.33
	49.24	1-Jun-99	5.99			43.25
	49.24	30-Jul-99	7.00			42.24
	49.24	27-Aug-99	6.13			43.11
	49.24	27-Sep-99	10.17			39.07
	49.24	29-Oct-99	11.65			37.59
	49.24	29-Dec-99	10.90			38.34
	49.24	4-Feb-00	13.77			35.47
	49.24	25-Feb-00	9.46			39.78
	49.24	27-Mar-00	8.62			40.62
	49.24	7-Apr-00	8.20			41.04
	49.24	31-May-00	8.26			40.98
	49.24	1-Jun-00	8.21			41.03
	49.24	28-Jul-00	8.26			40.98
	49.24	30-Aug-00	11.33			37.91
	49.24	19-Sep-00	12.33			36.91
	49.24	27-Oct-00	9.94			39.3
	49.24	21-Nov-00	9.21			40.03
	49.24	1-May-01	7.47			41.77
	49.24	1-Oct-01	7.79			41.45
	49.24	11-Mar-02	4.92			44.32
	49.24	23-Sep-02	4.76			44.48
	49.24	10-Mar-03	3.77			45.47
	49.24	23-Sep-03	4.61			44.63
	49.24	15-Mar-04	4.22			45.02
	49.24	13-Sep-04	8.58			40.66
	49.24	18-Jul-05	5.61			43.63
	49.24	4-Jan-06	9.76			39.48
	49.24	27-Jul-06	4.85			44.39
	49.24	7-Mar-07	5.94			43.3
	49.24	27-Jul-07	4.53			44.71
	49.24	29-Jan-08	3.71			45.53
	49.24	15-Jul-08	7.77			41.47
	49.24	4-Feb-09	8.33			40.91
	49.24	24-Jul-09	8.67			40.57
	49.24	8-Jan-10	6.06			43.18
	49.24	12-Jul-10	4.86			44.38
	49.24	12-Jan-11	5.06			44.18
	49.24	12-Jul-11	10.96			38.28
	49.24	2-Feb-12	4.9			44.34
	49.24	9-Jul-12	4.61			44.63
	49.24	7-Jan-13	7.58			41.66
	49.24	22-Jul-13	10.44			38.8
	49.24	7-Jan-14	6.92			42.32
	49.24	16-Jul-14	8.46			40.78
MW-07	48.86	2-Sep-93	8.09			40.77
	48.86	21-Dec-93	4.60			44.26
	48.86	24-Mar-94	5.06			43.8
	48.86	22-Jun-94	6.03			42.83
	48.86	28-Sep-94	7.52			41.34
	48.86	13-Oct-94	8.13			40.73
	48.86	24-Jan-95	3.81			45.05
	48.86	11-Apr-95	3.41			45.45
	48.86	11-Jul-95	5.74			43.12
	48.86	23-Jan-96	6.99			41.87
	48.86	19-Jul-96	8.89			39.97
	48.86	17-Sep-96	9.41			39.45
	48.86	31-Oct-96	8.04			40.82
	48.86	22-Nov-96	9.94			38.92
	48.86	27-Dec-96	7.30			41.56
	48.86	22-Jan-97	5.25			43.61
	48.86	21-Feb-97	4.00			44.86
	48.86	25-Mar-97	4.32			44.54
	48.86	23-Apr-97	5.51			43.35
	48.86	24-Apr-97	5.67			43.19
	48.86	13-May-97	4.26			44.6
	48.86	20-Jun-97	6.00			42.86

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-07	48.86	25-Jun-97	3.86			45
	48.86	1-Jul-97	5.21			43.65
	48.86	24-Jul-97	7.99			40.87
	48.86	16-Aug-97	8.92			39.94
	48.86	22-Aug-97	9.72			39.14
	48.86	25-Sep-97	7.50			41.36
	48.86	22-Oct-97	6.48			42.38
	48.86	25-Nov-97	6.50			42.36
	48.86	19-Dec-97	6.12			42.74
	48.86	20-Jan-98	4.52			44.34
	48.86	4-Mar-98	4.14			44.72
	48.86	18-Mar-98	3.94			44.92
	48.86	24-Apr-98	7.85			41.01
	48.86	21-May-98	8.61			40.25
	48.86	30-Jul-98	9.54			39.32
	48.86	25-Aug-98	8.63			40.23
	48.86	21-Sep-98	6.34			42.52
	48.86	26-Oct-98	7.56			41.3
	48.86	23-Nov-98	5.91			42.95
	48.86	29-Jan-99	4.71			44.15
	48.86	26-Feb-99	4.76			44.1
	48.86	16-Mar-99	5.32			43.54
	48.86	29-Apr-99	5.41			43.45
	48.86	1-Jun-99	5.49			43.37
	48.86	30-Jul-99	6.98			41.88
	48.86	27-Aug-99	5.61			43.25
	48.86	27-Sep-99	10.64			38.22
	48.86	29-Oct-99	11.56			37.3
	48.86	29-Dec-99	9.90			38.96
	48.86	4-Feb-00	14.21			34.65
	48.86	25-Feb-00	8.86			40
	48.86	27-Mar-00	8.62			40.24
	48.86	7-Apr-00	8.15			40.71
	48.86	31-May-00	8.21			40.65
	48.86	1-Jun-00	8.22			40.64
	48.86	28-Jul-00	8.29			40.57
	48.86	30-Aug-00	11.55			37.31
	48.86	19-Sep-00	12.65			36.21
	48.86	27-Oct-00	10.00			38.86
	48.86	21-Nov-00	9.46			39.4
	48.86	1-May-01	7.64			41.22
	48.86	1-Oct-01	8.00			40.86
	48.86	11-Mar-02	4.56			44.3
	48.86	23-Sep-02	4.69			44.17
	48.86	10-Mar-03	3.52			45.34
	48.86	23-Sep-03	4.70			44.16
	48.86	15-Mar-04	3.89			44.97
	48.86	13-Sep-04	9.04			39.82
	48.86	18-Jul-05	5.27			43.59
	48.86	4-Jan-06	9.91			38.95
	48.86	27-Jul-06	4.60			44.26
	48.86	23-Jan-07	3.46			45.4
	48.86	7-Mar-07	3.82			45.04
	48.86	27-Jul-07	4.94			43.92
	48.86	29-Jan-08	3.39			45.47
	48.86	16-Jul-08	7.94			40.92
	48.86	22-Jan-09	7.49			41.37
	48.86	24-Jul-09	NM			NM
	48.86	8-Jan-10	4.02			44.84
	48.86	12-Jul-10	4.72			44.14
	48.92	12-Jan-11	4.56			44.36
	48.92	12-Jul-11	10.91			38.01
	48.92	27-Jan-12	3.86			45.06
	48.92	10-Jul-13	10.62			38.30
	48.92	8-Jan-14	6.42			42.50
MW-08	49.33	2-Sep-93	8.18			41.19
	49.33	21-Dec-93	5.02			44.35
	49.33	24-Mar-94	5.53			43.84
	49.33	22-Jun-94	6.38			42.99
	49.33	28-Sep-94	7.72			41.65
	49.33	13-Oct-94	8.43			40.94
	49.33	24-Jan-95	4.15			45.22
	49.33	11-Apr-95	4.02			45.35
	49.33	11-Jul-95	5.95			43.42
	49.33	23-Jan-96	7.20			42.17
	49.33	19-Jul-96	9.06			40.31
	49.33	17-Sep-96	9.51			39.86
	49.33	31-Oct-96	7.99			41.38

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-08	49.33	22-Nov-96	9.98			39.39
	49.33	27-Dec-96	7.24			42.13
	49.33	22-Jan-97	5.25			44.12
	49.33	21-Feb-97	4.21			45.16
	49.33	25-Mar-97	4.48			44.89
	49.33	23-Apr-97	5.61			43.76
	49.33	24-Apr-97	5.76			43.61
	49.33	13-May-97	4.45			44.92
	49.33	20-Jun-97	6.09			43.28
	49.33	25-Jun-97	4.56			44.81
	49.33	1-Jul-97	5.06			44.31
	49.33	24-Jul-97	7.97			41.4
	49.33	16-Aug-97	8.05			41.32
	49.33	22-Aug-97	9.73			39.64
	49.33	25-Sep-97	7.57			41.8
	49.33	22-Oct-97	6.43			42.94
	49.33	25-Nov-97	6.48			42.89
	49.33	19-Dec-97	5.22			44.15
	49.33	20-Jan-98	4.70			44.67
	49.33	4-Mar-98	4.38			44.99
	49.33	18-Mar-98	4.18			45.19
	49.33	24-Apr-98	8.00			41.37
	49.33	21-May-98	8.45			40.92
	49.33	30-Jul-98	9.33			40.04
	49.33	25-Aug-98	8.46			40.91
	49.33	21-Sep-98	6.31			43.06
	49.33	26-Oct-98	7.66			41.71
	49.33	23-Nov-98	5.96			43.41
	49.33	29-Jan-99	4.80			44.57
	49.33	26-Feb-99	4.89			44.48
	49.33	16-Mar-99	5.45			43.92
	49.33	29-Apr-99	5.66			43.71
	49.33	1-Jun-99	5.66			43.71
	49.33	30-Jul-99	7.20			42.17
	49.33	27-Aug-99	5.85			43.52
	49.33	27-Sep-99	10.78			38.59
	49.33	29-Oct-99	11.76			37.61
	49.33	29-Dec-99	11.03			38.34
	49.33	4-Feb-00	14.66			34.71
	49.33	25-Feb-00	10.33			39.04
	49.33	27-Mar-00	8.75			40.62
	49.33	7-Apr-00	8.37			41
	49.33	31-May-00	8.40			40.97
	49.33	1-Jun-00	8.36			41.01
	49.33	28-Jul-00	8.40			40.97
	49.33	30-Aug-00	11.29			38.08
	49.33	19-Sep-00	12.82			36.55
	49.33	27-Oct-00	12.63			36.74
	49.33	21-Nov-00	9.64			39.73
	49.33	1-May-01	7.83			41.54
	49.33	1-Oct-01	8.05			41.32
	49.33	11-Mar-02	4.75			44.62
	49.33	23-Sep-02	4.69			44.68
	49.33	10-Mar-03	3.84			45.49
	49.33	23-Sep-03	4.73			44.6
	49.33	15-Mar-04	4.31			45.02
	49.33	13-Sep-04	9.31			40.02
	49.33	18-Jul-05	5.32			44.01
	49.33	4-Jan-06	10.63			38.7
	49.33	27-Jul-06	4.79			44.54
	49.33	22-Jan-07	3.81			45.52
	49.33	7-Mar-07	3.96			45.37
	49.33	27-Jul-07	5.06			44.27
	49.33	29-Jan-08	3.71			45.62
	49.33	16-Jul-08	8.32			41.01
	49.33	22-Jan-09	7.71			41.62
	49.33	24-Jul-09	NM			NM
	49.33	8-Jan-10	4.17			45.16
	49.33	12-Jul-10	4.96			44.37
	49.33	12-Jan-11	5.32			44.01
	49.33	12-Jul-11	11.24			38.09
	49.33	27-Jan-12	4.68			44.65
	49.33	10-Jul-13	11.07			38.26
	49.33	8-Jan-14	6.87			42.46
MW-09	49.26	2-Sep-93	7.43			41.86
	49.26	21-Dec-93	4.89			44.4
	49.26	24-Mar-94	4.92			44.37
	49.26	22-Jun-94	5.51			43.78

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-09	49.26	28-Sep-94	6.90			42.39
	49.26	13-Oct-94	7.66			41.63
	49.26	24-Jan-95	4.10			45.19
	49.26	11-Apr-95	3.74			45.55
	49.26	11-Jul-95	5.08			44.21
	49.26	23-Jan-96	7.09			42.2
	49.26	19-Jul-96	8.27			41.02
	49.26	17-Sep-96	8.58			40.71
	49.26	31-Oct-96	7.27			42.02
	49.26	22-Nov-96	9.17			40.12
	49.26	27-Dec-96	7.05			42.24
	49.26	22-Jan-97	5.42			43.87
	49.26	21-Feb-97	4.09			45.2
	49.26	25-Mar-97	4.17			45.12
	49.26	23-Apr-97	5.05			44.24
	49.26	24-Apr-97	5.21			44.08
	49.26	13-May-97	4.16			45.13
	49.26	20-Jun-97	5.32			43.97
	49.26	25-Jun-97	3.80			45.49
	49.26	1-Jul-97	4.57			44.72
	49.26	24-Jul-97	7.03			42.26
	49.26	16-Aug-97	8.26			41.03
	49.26	22-Aug-97	8.67			40.62
	49.26	25-Sep-97	6.99			42.3
	49.26	22-Oct-97	6.10			43.19
	49.26	25-Nov-97	6.12			43.17
	49.26	19-Dec-97	5.62			43.67
	49.26	20-Jan-98	4.60			44.69
	49.26	4-Mar-98	4.15			45.14
	49.26	18-Mar-98	4.02			45.27
	49.26	24-Apr-98	7.32			41.97
	49.26	21-May-98	8.10			41.19
	49.26	30-Jul-98	9.12			40.17
	49.26	25-Aug-98	8.41			40.88
	49.26	21-Sep-98	6.11			43.18
	49.26	26-Oct-98	7.61			41.68
	49.26	23-Nov-98	5.43			43.86
	49.26	29-Jan-99	4.60			44.69
	49.26	26-Feb-99	4.68			44.61
	49.26	16-Mar-99	5.46			43.83
	49.26	29-Apr-99	5.66			43.63
	49.26	1-Jun-99	5.66			43.63
	49.26	30-Jul-99	7.11			42.18
	49.26	27-Aug-99	5.86			43.43
	49.26	27-Sep-99	9.81			39.48
	49.26	29-Oct-99	10.63			38.66
	49.26	29-Dec-99	9.99			39.3
	49.26	4-Feb-00	12.44			36.85
	49.26	25-Feb-00	8.88			40.41
	49.26	27-Mar-00	8.22			41.07
	49.26	7-Apr-00	8.10			41.19
	49.26	31-May-00	8.15			41.14
	49.26	1-Jun-00	8.00			41.29
	49.26	28-Jul-00	8.11			41.18
	49.26	30-Aug-00	11.10			38.19
	49.26	19-Sep-00	11.91			37.38
	49.26	27-Oct-00	9.84			39.45
	49.26	21-Nov-00	8.89			40.4
	49.26	1-May-01	7.16			42.13
	49.26	1-Oct-01	7.39			41.9
	49.26	11-Mar-02	4.61			44.68
	49.26	23-Sep-02	4.45			44.84
	49.26	10-Mar-03	3.59			45.67
	49.26	23-Sep-03	4.31			44.95
	49.26	15-Mar-04	4.18			45.08
	49.26	13-Sep-04	8.39			40.87
	49.26	18-Jul-05	5.53			43.73
	49.26	4-Jan-06	9.46			39.8
	49.26	27-Jul-06	4.85			44.41
	49.26	7-Mar-07	5.58			43.68
	49.26	27-Jul-07	3.78			45.48
	49.26	29-Jan-08	3.52			45.74
	49.26	15-Jul-08	7.04			42.22
	49.26	4-Feb-09	8.01			41.25
	49.26	24-Jul-09	8.34			40.92
	49.26	8-Jan-10	5.89			43.37
	49.26	12-Jul-10	4.32			44.94

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-09	49.26	12-Jan-11	4.61			44.65
	49.26	12-Jul-11	10.71			38.55
	49.26	26-Jan-12	4.73			44.53
	49.26	9-Jul-12	4.23			45.03
	49.26	7-Jan-13	6.73			42.53
	49.26	22-Jul-13	9.16			40.1
	49.26	7-Jan-14	8.72			40.54
	49.26	16-Jul-14	8.17			41.09
MW-10A	49.86	28-Sep-94	8.69			41.21
	49.86	13-Oct-94	9.36			40.54
	49.86	24-Jan-95	4.62			45.28
	49.86	11-Apr-95	4.60			45.3
	49.86	11-Jul-95	7.00			42.9
	49.86	23-Jan-96	7.74			42.16
	49.86	19-Jul-96	9.98			39.92
	49.86	17-Sep-96	10.54			39.36
	49.86	31-Oct-96	7.94			41.96
	49.86	22-Nov-96	10.82			39.08
	49.86	27-Dec-96	7.81			42.09
	49.86	22-Jan-97	5.45			44.45
	49.86	21-Feb-97	4.63			45.27
	49.86	25-Mar-97	5.01			44.89
	49.86	23-Apr-97	6.39			43.51
	49.86	24-Apr-97	6.58			43.32
	49.86	13-May-97	4.93			44.97
	49.86	20-Jun-97	7.08			42.82
	49.86	25-Jun-97	4.58			45.32
	49.86	1-Jul-97	6.13			43.77
	49.86	24-Jul-97	9.11			40.79
	49.86	16-Aug-97	10.10			39.8
	49.86	22-Aug-97	10.81			39.09
	49.86	25-Sep-97	8.47			41.43
	49.86	22-Oct-97	7.02			42.88
	49.86	25-Nov-97	7.05			42.85
	49.86	19-Dec-97	6.89			43.01
	49.86	20-Jan-98	5.10			44.8
	49.86	3-Mar-98	4.87			45.03
	49.86	18-Mar-98	4.65			45.25
	49.86	24-Apr-98	8.84			41.06
	49.86	21-May-98	9.10			40.8
	49.86	30-Jul-98	10.23			39.67
	49.86	25-Aug-98	9.11			40.79
	49.86	21-Sep-98	6.82			43.08
	49.86	26-Oct-98	8.19			41.71
	49.86	23-Nov-98	6.12			43.78
	49.86	29-Jan-99	5.61			44.29
	49.86	26-Feb-99	5.69			44.21
	49.86	16-Mar-99	5.91			43.99
	49.86	29-Apr-99	6.11			43.79
	49.86	1-Jun-99	6.10			43.8
	49.86	30-Jul-99	7.70			42.2
	49.86	27-Aug-99	6.31			43.59
	49.86	27-Sep-99	11.73			38.17
	49.86	29-Oct-99	12.69			37.21
	49.86	29-Dec-99	12.00			37.9
	49.86	4-Feb-00	14.30			35.6
	49.86	25-Feb-00	11.44			38.46
	49.86	27-Mar-00	9.57			40.33
	49.86	7-Apr-00	9.27			40.63
	49.86	31-May-00	9.31			40.59
	49.86	1-Jun-00	9.10			40.8
	49.86	28-Jul-00	9.30			40.6
	49.86	30-Aug-00	12.09			37.81
	49.86	19-Sep-00	13.70			36.2
	49.86	27-Oct-00	10.69			39.21
	49.86	21-Nov-00	10.49			39.41
	49.86	1-May-01	8.64			41.26
	49.86	1-Oct-01	8.93			40.97
	49.86	11-Mar-02	5.30			44.6
	49.86	23-Sep-02	5.19			44.71
	49.86	10-Mar-03	4.43			45.43
	49.86	23-Sep-03	5.31			44.55
	49.86	15-Mar-04	4.69			45.17
	49.86	13-Sep-04	10.30			39.56
	49.86	18-Jul-05	5.57			44.29
	49.86	4-Jan-06	9.68			40.18

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-10A	49.86	27-Jul-06	5.01			44.85
	49.86	23-Jan-07	4.29			45.57
	49.86	7-Mar-07	4.13			45.73
	49.86	27-Jul-07	6.03			43.83
	49.86	28-Jan-08	4.22			45.64
	49.86	16-Jul-08	9.31			40.55
	49.86	22-Jan-09	8.27			41.59
	49.86	24-Jul-09	NM			NM
	49.86	8-Jan-10	4.64			45.22
	49.86	12-Jul-10	5.23			44.63
	49.82	12-Jan-11	5.72			44.10
	49.82	13-Jul-11	11.96			37.86
	49.82	12-Jul-11	12.07			37.75
	49.82	27-Jan-12	4.88			44.94
	49.82	10-Jul-13	12.07			37.75
	49.82	8-Jan-14	7.33			42.49
MW-10B	49.94	28-Sep-94	8.77			41.2
	49.94	13-Oct-94	9.45			40.52
	49.94	24-Jan-95	4.72			45.25
	49.94	11-Apr-95	4.72			45.25
	49.94	11-Jul-95	7.13			42.84
	49.94	23-Jan-96	7.84			42.13
	49.94	19-Jul-96	10.27			39.7
	49.94	17-Sep-96	10.64			39.33
	49.94	31-Oct-96	8.01			41.96
	49.94	22-Nov-96	10.93			39.04
	49.94	27-Dec-96	7.99			41.98
	49.94	22-Jan-97	5.72			44.25
	49.94	21-Feb-97	4.78			45.19
	49.94	25-Mar-97	5.13			44.84
	49.94	23-Apr-97	6.52			43.45
	49.94	24-Apr-97	6.71			43.26
	49.94	13-May-97	5.09			44.88
	49.94	20-Jun-97	7.21			42.76
	49.94	25-Jun-97	4.71			45.26
	49.94	1-Jul-97	6.27			43.7
	49.94	24-Jul-97	9.15			40.82
	49.94	16-Aug-97	10.19			39.78
	49.94	22-Aug-97	10.92			39.05
	49.94	25-Sep-97	8.69			41.28
	49.94	22-Oct-97	7.18			42.79
	49.94	25-Nov-97	7.21			42.76
	49.94	19-Dec-97	6.56			43.41
	49.94	20-Jan-98	5.25			44.72
	49.94	3-Mar-98	5.00			44.97
	49.94	18-Mar-98	4.79			45.18
	49.94	24-Apr-98	8.95			41.02
	49.94	21-May-98	9.30			40.67
	49.94	30-Jul-98	10.30			39.67
	49.94	25-Aug-98	9.20			40.77
	49.94	21-Sep-98	7.06			42.91
	49.94	26-Oct-98	8.31			41.66
	49.94	23-Nov-98	6.25			43.72
	49.94	29-Jan-99	5.71			44.26
	49.94	26-Feb-99	5.76			44.21
	49.94	16-Mar-99	6.05			43.92
	49.94	29-Apr-99	6.10			43.87
	49.94	1-Jun-99	6.10			43.87
	49.94	30-Jul-99	7.61			42.36
	49.94	27-Aug-99	6.33			43.64
	49.94	27-Sep-99	11.90			38.07
	49.94	29-Oct-99	12.60			37.37
	49.94	29-Dec-99	12.10			37.87
	49.94	4-Feb-00	14.29			35.68
	49.94	25-Feb-00	11.15			38.82
	49.94	27-Mar-00	9.67			40.3
	49.94	7-Apr-00	9.32			40.65
	49.94	31-May-00	9.38			40.59
	49.94	1-Jun-00	9.21			40.76
	49.94	28-Jul-00	9.33			40.64
	49.94	30-Aug-00	12.11			37.86
	49.94	19-Sep-00	13.77			36.2
	49.94	27-Oct-00	10.63			39.34
	49.94	21-Nov-00	10.64			39.33
	49.94	1-May-01	8.75			41.22
	49.94	1-Oct-01	9.12			40.85
	49.94	11-Mar-02	5.47			44.5
	49.94	23-Sep-02	5.40			44.57

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-10B	49.94	10-Mar-03	4.59			45.35
	49.94	23-Sep-03	5.58			44.36
	49.94	15-Mar-04	5.78			44.16
	49.94	13-Sep-04	10.41			39.53
	49.94	18-Jul-05	5.97			43.97
	49.94	4-Jan-06	10.75			39.19
	49.94	27-Jul-06	5.73			44.21
	49.94	23-Jan-07	4.45			45.49
	49.94	7-Mar-07	4.61			45.33
	49.94	27-Jul-07	6.15			43.79
	49.94	28-Jan-08	4.44			45.5
	49.94	16-Jul-08	9.42			40.52
	49.94	22-Jan-09	8.39			41.55
	49.94	24-Jul-09	NM			NM
	49.94	8-Jan-10	4.91			45.03
	49.94	12-Jul-10	5.33			44.61
	49.95	12-Jan-11	5.96			43.99
	49.95	13-Jul-11	12.07			37.88
	49.95	27-Jan-12	5.02			44.93
	49.95	10-Jul-13	12.18			37.77
	49.95	8-Jan-14	7.46			42.49
MW-11A	50.05	28-Sep-94	8.66			41.38
	50.05	13-Oct-94	9.35			40.69
	50.05	24-Jan-95	4.88			45.16
	50.05	11-Apr-95	4.81			45.23
	50.05	11-Jul-95	6.67			43.37
	50.05	23-Jan-96	8.01			42.03
	50.05	19-Jul-96	10.09			39.95
	50.05	17-Sep-96	10.56			39.48
	50.05	31-Oct-96	8.16			41.88
	50.05	22-Nov-96	10.98			39.06
	50.05	27-Dec-96	8.21			41.83
	50.05	22-Jan-97	6.06			43.98
	50.05	21-Feb-97	4.98			45.06
	50.05	25-Mar-97	5.32			44.72
	50.05	23-Apr-97	6.59			43.45
	50.05	24-Apr-97	6.77			43.27
	50.05	13-May-97	5.31			44.73
	50.05	20-Jun-97	7.15			42.89
	50.05	25-Jun-97	4.88			45.16
	50.05	1-Jul-97	6.29			43.75
	50.05	24-Jul-97	9.12			40.92
	50.05	16-Aug-97	10.11			39.93
	50.05	22-Aug-97	10.82			39.22
	50.05	25-Sep-97	8.70			41.34
	50.05	22-Oct-97	7.40			42.64
	50.05	25-Nov-97	7.41			42.63
	50.05	19-Dec-97	6.10			43.94
	50.05	20-Jan-98	5.49			44.55
	50.05	3-Mar-98	5.16			44.88
	50.05	18-Mar-98	4.96			45.08
	50.05	24-Apr-98	8.98			41.06
	50.05	21-May-98	9.40			40.64
	50.05	30-Jul-98	10.56			39.48
	50.05	25-Aug-98	9.32			40.72
	50.05	21-Sep-98	7.28			42.76
	50.05	26-Oct-98	8.43			41.61
	50.05	23-Nov-98	6.41			43.63
	50.05	29-Jan-99	5.31			44.73
	50.05	26-Feb-99	5.39			44.65
	50.05	16-Mar-99	6.32			43.72
	50.05	29-Apr-99	6.51			43.53
	50.05	1-Jun-99	6.57			43.47
	50.05	30-Jul-99	8.00			42.04
	50.05	27-Aug-99	6.79			43.25
	50.05	27-Sep-99	11.73			38.31
	50.05	29-Oct-99	12.81			37.23
	50.05	29-Dec-99	12.11			37.93
	50.05	4-Feb-00	14.33			35.71
	50.05	25-Feb-00	11.10			38.94
	50.05	27-Mar-00	9.66			40.38
	50.05	7-Apr-00	9.40			40.64
	50.05	31-May-00	9.50			40.54
	50.05	1-Jun-00	9.30			40.74
	50.05	28-Jul-00	9.47			40.57
	50.05	30-Aug-00	12.44			37.6
	50.05	19-Sep-00	13.74			36.3
	50.05	27-Oct-00	11.01			39.03

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-11A	50.05	21-Nov-00	10.69			39.35
	50.05	1-May-01	8.78			41.26
	50.05	1-Oct-01	9.12			40.93
	50.05	11-Mar-02	5.59			44.45
	50.05	23-Sep-02	5.60			44.44
	50.05	10-Mar-03	4.66			45.39
	50.05	23-Sep-03	5.73			44.32
	50.05	15-Mar-04	4.99			45.06
	50.05	13-Sep-04	10.28			39.77
	50.05	18-Jul-05	6.66			43.39
	50.05	5-Jan-06	10.85			39.2
	50.05	27-Jul-06	5.02			45.03
	50.05	23-Jan-07	4.54			45.51
	50.05	7-Mar-07	4.26			45.79
	50.05	27-Jul-07	6.09			43.96
	50.05	28-Jan-08	4.46			45.59
	50.05	16-Jul-08	9.25			40.8
	50.05	22-Jan-09	8.57			41.48
	50.05	24-Jul-09	NM			NM
	50.05	8-Jan-10	4.97			45.08
	50.05	12-Jul-10	5.51			44.54
	50.07	12-Jan-11	6.21			43.86
	50.07	12-Jul-11	12.02			38.05
	50.07	27-Jan-12	5.31			44.76
	50.07	10-Jul-13	12.01			38.06
	50.07	8-Jan-14	7.46			42.61
MW-11B	50.18	28-Sep-94	8.92			41.27
	50.18	13-Oct-94	9.59			40.6
	50.18	24-Jan-95	5.04			45.15
	50.18	11-Apr-95	5.01			45.18
	50.18	11-Jul-95	7.23			42.96
	50.18	23-Jan-96	8.20			41.99
	50.18	19-Jul-96	8.92			41.27
	50.18	17-Sep-96	10.83			39.36
	50.18	31-Oct-96	9.34			40.85
	50.18	22-Nov-96	11.23			38.96
	50.18	27-Dec-96	8.45			41.74
	50.18	22-Jan-97	6.28			43.91
	50.18	21-Feb-97	5.16			45.03
	50.18	25-Mar-97	5.51			44.68
	50.18	23-Apr-97	6.81			43.38
	50.18	24-Apr-97	6.99			43.2
	50.18	13-May-97	5.46			44.73
	50.18	20-Jun-97	7.40			42.79
	50.18	25-Jun-97	5.06			45.13
	50.18	1-Jul-97	6.52			43.67
	50.18	24-Jul-97	9.36			40.83
	50.18	16-Aug-97	10.36			39.83
	50.18	22-Aug-97	11.11			39.08
	50.18	25-Sep-97	8.96			41.23
	50.18	22-Oct-97	7.61			42.58
	50.18	25-Nov-97	7.63			42.56
	50.18	19-Dec-97	7.11			43.08
	50.18	20-Jan-98	5.70			44.49
	50.18	3-Mar-98	5.35			44.84
	50.18	18-Mar-98	5.14			45.05
	50.18	24-Apr-98	9.19			41
	50.18	21-May-98	9.61			40.58
	50.18	30-Jul-98	10.72			39.47
	50.18	25-Aug-98	9.48			40.71
	50.18	21-Sep-98	7.49			42.7
	50.18	26-Oct-98	8.57			41.62
	50.18	23-Nov-98	6.32			43.87
	50.18	26-Feb-99	5.32			44.87
	50.18	16-Mar-99	6.49			43.7
	50.18	29-Apr-99	6.66			43.53
	50.18	1-Jun-99	6.66			43.53
	50.18	30-Jul-99	8.12			42.07
	50.18	27-Aug-99	6.88			43.31
	50.18	27-Sep-99	12.04			38.15
	50.18	29-Oct-99	13.00			37.19
	50.18	29-Dec-99	12.33			37.86
	50.18	4-Feb-00	15.61			34.58
	50.18	25-Feb-00	11.49			38.7
	50.18	27-Mar-00	9.93			40.26
	50.18	7-Apr-00	9.54			40.65
	50.18	31-May-00	9.61			40.58
	50.18	1-Jun-00	9.51			40.68

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-11B	50.18	28-Jul-00	9.60			40.59
	50.18	30-Aug-00	12.76			37.43
	50.18	19-Sep-00	13.97			36.22
	50.18	27-Oct-00	11.23			38.96
	50.18	21-Nov-00	10.88			39.31
	50.18	1-May-01	5.97			44.22
	50.18	1-Oct-01	9.33			40.86
	50.18	11-Mar-02	5.80			44.39
	50.18	23-Sep-02	5.79			44.4
	50.18	10-Mar-03	4.85			45.33
	50.18	23-Sep-03	5.95			44.23
	50.18	15-Mar-04	5.16			45.02
	50.18	13-Sep-04	10.53			39.65
	50.18	18-Jul-05	5.45			44.73
	50.18	4-Jan-06	11.01			39.17
	50.18	27-Jul-06	5.26			44.92
	50.18	23-Jan-07	4.13			46.05
	50.18	7-Mar-07	4.42			45.76
	50.18	27-Jul-07	6.29			43.89
	50.18	28-Jan-08	4.69			45.49
	50.18	16-Jul-08	9.49			40.69
	50.18	22-Jan-09	8.72			41.46
	50.18	24-Jul-09	NM			NM
	50.18	8-Jan-10	5.15			45.03
	50.18	12-Jul-10	5.67			44.51
	50.23	12-Jan-11	6.37			43.86
	50.23	12-Jul-11	12.23			38.00
	50.23	27-Jan-12	5.38			44.85
	50.23	10-Jul-13	12.22			38.01
	50.23	8-Jan-14	7.82			42.41
MW-12A	49.96	25-Mar-97	5.52			44.44
	49.96	23-Apr-97	6.51			43.45
	49.96	24-Apr-97	6.66			43.3
	49.96	13-May-97	5.47			44.49
	49.96	20-Jun-97	6.81			43.15
	49.96	25-Sep-97	8.08			41.88
	49.96	22-Oct-97	7.10			42.86
	49.96	25-Nov-97	7.12			42.84
	49.96	19-Dec-97	6.96			43
	49.96	20-Jan-98	5.69			44.27
	49.96	4-Mar-98	4.52			45.44
	49.96	18-Mar-98	5.28			44.68
	49.96	24-Apr-98	8.70			41.26
	49.96	21-May-98	9.10			40.86
	49.96	25-Aug-98	10.05			39.91
	49.96	21-Sep-98	7.11			42.85
	49.96	26-Oct-98	9.11			40.85
	49.96	23-Nov-98	6.01			43.95
	49.96	29-Jan-99	5.44			44.52
	49.96	26-Feb-99	5.52			44.44
	49.96	16-Mar-99	6.21			43.75
	49.96	29-Apr-99	6.38			43.58
	49.96	1-Jun-99	6.31			43.65
	49.96	30-Jul-99	7.88			42.08
	49.96	27-Aug-99	6.56			43.4
	49.96	27-Sep-99	11.61			38.35
	49.96	29-Oct-99	12.79			37.17
	49.96	18-Nov-99	13.18			36.78
	49.96	29-Dec-99	12.03			37.93
	49.96	4-Feb-00	15.43			34.53
	49.96	25-Feb-00	11.34			38.62
	49.96	27-Mar-00	9.22			40.74
	49.96	7-Apr-00	8.80			41.16
	49.96	31-May-00	8.84			41.12
	49.96	1-Jun-00	8.81			41.15
	49.96	28-Jul-00	8.87			41.09
	49.96	30-Aug-00	11.76			38.2
	49.96	19-Sep-00	13.22			36.74
	49.96	27-Oct-00	10.54			39.42
	49.96	21-Nov-00	10.16			39.8
	49.96	1-May-01	8.60			41.36
	49.96	1-Oct-01	8.73			41.23
	49.96	11-Mar-02	6.01			43.95
	49.96	23-Sep-02	5.87			44.09
	49.96	10-Mar-03	5.37			44.59
	49.96	23-Sep-03	5.96			44
	49.96	15-Mar-04	5.54			44.42
	49.96	13-Sep-04	10.30			39.66

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-12A	49.96	18-Jul-05	7.01			42.95
	49.96	4-Jan-06	10.57			39.39
	49.96	27-Jul-06	6.60			43.36
	49.96	7-Mar-07	6.94			43.02
	49.96	27-Jul-07	5.79			44.17
	49.96	30-Jan-08	5.29			44.67
	49.96	15-Jul-08	9.19			40.77
	49.96	4-Feb-09	8.81			41.15
	49.96	24-Jul-09	9.13			40.83
	49.96	8-Jan-10	5.47			44.49
	49.96	12-Jul-10	9.72			40.24
	49.96	12-Jan-11	5.59			44.37
	49.96	12-Jul-11	12.46			37.5
	49.96	26-Jan-12	5.78			44.18
	49.96	9-Jul-12	5.96			44
	49.96	7-Jan-13	9.04			40.92
	49.96	22-Jul-13	11.64			38.32
	49.96	7-Jan-14	7.38			42.58
	49.96	16-Jul-14	9.82			40.14
MW-12B	50.02	25-Mar-97	5.60			44.42
	50.02	23-Apr-97	6.64			43.38
	50.02	24-Apr-97	6.74			43.28
	50.02	13-May-97	5.55			44.47
	50.02	20-Jun-97	7.01			43.01
	50.02	25-Sep-97	8.32			41.7
	50.02	22-Oct-97	7.25			42.77
	50.02	25-Nov-97	7.29			42.73
	50.02	19-Dec-97	6.86			43.16
	50.02	20-Jan-98	5.88			44.14
	50.02	4-Mar-98	5.64	44.08	1.72	44.38
	50.02	18-Mar-98	5.38	44.07	1.73	44.64
	50.02	9-Apr-98	7.87		0.98	42.15
	50.02	16-Apr-98	8.31		1.35	41.71
	50.02	24-Apr-98	8.72	43.82	1.98	41.3
	50.02	8-May-98	NM		0.50	NM
	50.02	12-May-98	NM		0.50	NM
	50.02	21-May-98	10.48			39.54
	50.02	25-May-98	NM		1.00	NM
	50.02	9-Jun-98	NM		1.00	NM
	50.02	16-Jun-98	NM		1.20	NM
	50.02	26-Jun-98	NM		1.50	NM
	50.02	2-Jul-98	NM		1.50	NM
	50.02	10-Jul-98	NM		2.00	NM
	50.02	14-Jul-98	NM		2.00	NM
	50.02	23-Jul-98	NM		2.00	NM
	50.02	5-Aug-98	NM		2.00	NM
	50.02	13-Aug-98	NM		2.00	NM
	50.02	18-Aug-98	NM		2.00	NM
	50.02	25-Aug-98	10.22			39.8
	50.02	15-Sep-98	NM		2.00	NM
	50.02	21-Sep-98	7.73			42.29
	50.02	30-Sep-98	NM		4.00	NM
	50.02	8-Oct-98	NM		4.00	NM
	50.02	16-Oct-98	NM		4.00	NM
	50.02	26-Oct-98	8.88			41.14
	50.02	6-Nov-98	NM		4.00	NM
	50.02	13-Nov-98	NM		1.49	NM
	50.02	19-Nov-98	NM		4.00	NM
	50.02	23-Nov-98	6.11			43.91
	50.02	16-Dec-98	NM		4.00	NM
	50.02	7-Jan-99	NM		4.00	NM
	50.02	15-Jan-99	NM		4.00	NM
	50.02	22-Jan-99	NM		4.00	NM
	50.02	26-Jan-99	NM		4.00	NM
	50.02	29-Jan-99	5.70			44.32
	50.02	4-Feb-99	NM		4.00	NM
	50.02	9-Feb-99	NM		3.00	NM
	50.02	26-Feb-99	5.83	39.95	5.85	44.19
	50.02	16-Mar-99	6.30	43.60	2.20	43.72
	50.02	29-Apr-99	6.44	38.90	6.90	43.58
	50.02	21-May-99	7.40	36.90	8.90	42.62
	50.02	27-May-99	7.38	36.90	8.90	42.64
	50.02	1-Jun-99	6.40	37.90	7.90	43.62
	50.02	10-Jun-99	7.36	36.90	8.90	42.66
	50.02	30-Jul-99	7.98			42.04
	50.02	27-Aug-99	6.61	38.90	6.90	43.41
	50.02	27-Sep-99	11.71	42.34	3.46	38.31

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-12B	50.02	29-Oct-99	12.76	41.84	3.96	37.26
	50.02	18-Nov-99	13.22			36.8
	50.02	29-Dec-99	12.01	41.84	3.96	38.01
	50.02	4-Feb-00	13.22	41.84	3.96	36.8
	50.02	25-Feb-00	11.44	41.84	3.96	38.58
	50.02	27-Mar-00	NM			NM
	50.02	7-Apr-00	8.73	41.81	3.99	41.29
	50.02	31-May-00	8.77	41.81	3.99	41.25
	50.02	1-Jun-00	8.73	41.81	3.99	41.29
	50.02	28-Jul-00	8.77	41.89	3.91	41.25
	50.02	30-Aug-00	11.66	41.82	3.98	38.36
	50.02	19-Sep-00	13.33	40.89	4.91	36.69
	50.02	27-Oct-00	11.75	41.80	4.00	38.27
	50.02	21-Nov-00	10.64	43.48	2.32	39.38
	50.02	1-May-01	8.71	43.46	2.34	41.31
	50.02	1-Oct-01	8.37		15.00	41.65
	50.02	14-Mar-02	6.37	36.99	8.81	43.65
	50.02	23-Sep-02	6.10	40.03	5.77	43.92
	50.02	10-Mar-03	5.45			44.57
	50.02	24-Sep-03	6.29	39.85	5.95	43.73
	50.02	15-Mar-04	5.63			44.39
	50.02	13-Sep-04	10.44	38.72	7.08	39.58
	50.02	18-Jul-05	7.14	38.40	7.40	42.88
	50.02	4-Jan-06	10.75	35.98	9.82	39.27
	50.02	27-Jul-06	6.07	35.74	10.06	43.95
	50.02	7-Mar-07	6.96	34.60	11.20	43.06
	50.02	27-Jul-07	5.36	33.45	12.35	44.66
	50.02	31-Jan-08	5.75	33.34	12.46	44.27
	50.02	15-Jul-08	9.38	38.88	6.92	40.64
	50.02	4-Feb-09	8.89	38.14	7.66	41.13
	50.02	24-Jul-09	9.18	38.51	7.29	40.84
	50.02	8-Jan-10	6.81	37.46	8.34	43.21
	50.02	27-May-10	7.29	39.5	6.30	42.73
	50.02	28-Jun-10	7.39	44.1	1.70	42.63
	50.02	12-Jul-10	7.47	44.25	1.55	42.55
	50.02	31-Aug-10	7.26	45.42	0.38	42.76
	50.02	12-Jan-11	7.01	45.39	0.41	43.01
	50.02	12-Jul-11	10.09	45.39	0.41	39.93
	50.02	8-Mar-12	6.87	40.2	5.60	43.15
	50.02	9-Jul-12	7.16	40.1	5.70	42.86
	50.02	7-Jan-13	9.17	39.86	5.94	40.85
	50.02	22-Jul-13	11.16	39.04	6.76	38.86
	50.02	7-Jan-14	11.34	45.12	0.68	38.68
	50.02	15-Jul-14	10.59	44.89	0.91	39.43
MW-12C	50.14	13-May-97	39.34			10.8
	50.14	20-Jun-97	38.94			11.2
	50.14	25-Sep-97	36.70			13.44
	50.14	22-Oct-97	36.09			14.05
	50.14	25-Nov-97	36.13			14.01
	50.14	19-Dec-97	35.34			14.8
	50.14	20-Jan-98	32.60			17.54
	50.14	4-Mar-98	31.56			18.58
	50.14	18-Mar-98	31.64			18.5
	50.14	24-Apr-98	31.06			19.08
	50.14	21-May-98	38.20			11.94
	50.14	25-Aug-98	31.00			19.14
	50.14	21-Sep-98	29.86			20.28
	50.14	26-Oct-98	30.12			20.02
	50.14	23-Nov-98	28.38			21.76
	50.14	29-Jan-99	27.61			22.53
	50.14	26-Feb-99	27.69			22.45
	50.14	16-Mar-99	28.00			22.14
	50.14	29-Apr-99	28.21			21.93
	50.14	1-Jun-99	28.20			21.94
	50.14	30-Jul-99	29.80			20.34
	50.14	27-Aug-99	28.41			21.73
	50.14	27-Sep-99	29.20			20.94
	50.14	29-Oct-99	29.78			20.36
	50.14	18-Nov-99	30.17			19.97
	50.14	29-Dec-99	29.09			21.05
	50.14	4-Feb-00	29.66			20.48
	50.14	25-Feb-00	30.32			19.82
	50.14	27-Mar-00	28.91			21.23
	50.14	7-Apr-00	27.40			22.74
	50.14	31-May-00	27.44			22.7
	50.14	1-Jun-00	27.43			22.71
	50.14	28-Jul-00	27.45			22.69

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-12C	50.14	30-Aug-00	33.61			16.53
	50.14	19-Sep-00	30.03			20.11
	50.14	27-Oct-00	33.94			16.2
	50.14	21-Nov-00	29.12			21.02
	50.14	1-May-01	26.85			23.29
	50.14	1-Oct-01	26.85			23.29
	50.14	11-Mar-02	25.59			24.55
	50.14	23-Sep-02	26.57			23.57
	50.14	10-Mar-03	24.85			25.29
	50.14	23-Sep-03	26.06			24.08
	50.14	15-Mar-04	24.31			25.83
	50.14	13-Sep-04	26.15			23.99
	50.14	18-Jul-05	26.23			23.91
	50.14	4-Jan-06	22.26			27.88
	50.14	27-Jul-06	25.28			24.86
	50.14	7-Mar-07	23.78			26.36
	50.14	27-Jul-07	22.05			28.09
	50.14	30-Jan-08	22.69			27.45
	50.14	15-Jul-08	24.41			25.73
	50.14	4-Feb-09	24.59			25.55
	50.14	24-Jul-09	24.91			25.23
	50.14	8-Jan-10	23.03			27.11
	50.14	12-Jul-10	23.91			26.23
	50.14	12-Jan-11	23.76			26.38
	50.14	12-Jul-11	25.98			24.16
	50.14	26-Jan-12	25.76			24.38
	50.14	9-Jul-12	24.59			25.55
	50.14	7-Jan-13	26.04			24.1
	50.14	22-Jul-13	27.09			23.05
	50.14	7-Jan-14	26.52			23.62
	50.14	16-Jul-14	25.15			24.99
MW-13	50.65	25-Mar-97	9.43			41.22
	50.65	23-Apr-97	9.87			40.78
	50.65	24-Apr-97	9.92			40.73
	50.65	13-May-97	9.30			41.35
	50.65	20-Jun-97	10.11			40.54
	50.65	25-Sep-97	10.75			39.9
	50.65	22-Oct-97	10.09			40.56
	50.65	25-Nov-97	10.11			40.54
	50.65	19-Dec-97	10.01			40.64
	50.65	20-Jan-98	9.32			41.33
	50.65	4-Mar-98	9.23			41.42
	50.65	18-Mar-98	8.90			41.75
	50.65	24-Apr-98	10.74			39.82
	50.65	21-May-98	12.11			38.54
	50.65	25-Aug-98	12.00			38.56
	50.65	21-Sep-98	10.13			40.43
	50.65	26-Oct-98	11.15			39.41
	50.65	23-Nov-98	9.22			41.34
	50.65	29-Jan-99	8.00			42.65
	50.65	26-Feb-99	8.11			42.54
	50.65	16-Mar-99	9.51			41.14
	50.65	29-Apr-99	9.79			40.86
	50.65	1-Jun-99	9.70			40.95
	50.65	30-Jul-99	11.01			39.64
	50.65	27-Aug-99	9.96			40.69
	50.65	27-Sep-99	12.84			37.81
	50.65	29-Oct-99	13.88			36.77
	50.65	17-Nov-99	14.00			36.65
	50.65	29-Dec-99	13.08			37.57
	50.65	4-Feb-00	15.61			35.04
	50.65	25-Feb-00	12.17			38.48
	50.65	27-Mar-00	10.95			39.7
	50.65	7-Apr-00	10.51			40.14
	50.65	31-May-00	10.57			40.08
	50.65	1-Jun-00	10.51			40.14
	50.65	28-Jul-00	10.54			40.11
	50.65	30-Aug-00	13.63			37.02
	50.65	19-Sep-00	14.57			36.08
	50.65	27-Oct-00	11.11			39.54
	50.65	21-Nov-00	11.44			39.21
	50.65	1-May-01	10.70			39.95
	50.65	1-Oct-01	10.31			40.34
	50.65	11-Mar-02	9.62			41.03
	50.65	23-Sep-02	9.17			41.48
	50.65	10-Mar-03	9.17			41.48
	50.65	23-Sep-03	9.14			41.51

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-13	50.65	15-Mar-04	9.30			41.35
	50.65	13-Sep-04	11.98			38.67
	50.65	18-Jul-05	10.25			40.4
	50.65	4-Jan-06	12.03			38.62
	50.65	27-Jul-06	8.82			41.83
	50.65	7-Mar-07	9.95			40.7
	50.65	27-Jul-07	8.90			41.75
	50.65	30-Jan-08	8.85			41.8
	50.65	15-Jul-08	10.89			39.76
	50.65	4-Feb-09	10.59			40.06
	50.65	23-Jul-09	11.07			39.58
	50.65	8-Jan-10	9.22			41.43
	50.65	12-Jul-10	11.12			39.53
	50.65	12-Jan-11	8.89			41.76
	50.65	12-Jul-11	12.96			37.69
	50.65	26-Jan-12	9.31			41.34
	50.65	9-Jul-12	9.14			41.51
	50.65	7-Jan-13	10.68			39.97
	50.65	22-Jul-13	12.13			38.52
	50.65	7-Jan-14	10.13			40.52
	50.65	16-Jul-14	11.04			39.61
MW-14	50.66	25-Mar-97	7.71			42.95
	50.66	23-Apr-97	8.31			42.35
	50.66	24-Apr-97	8.34			42.32
	50.66	13-May-97	7.83			42.83
	50.66	20-Jun-97	8.64			42.02
	50.66	25-Sep-97	9.95			40.71
	50.66	22-Oct-97	8.89			41.77
	50.66	25-Nov-97	8.86			41.8
	50.66	19-Dec-97	8.62			42.04
	50.66	20-Jan-98	8.08			42.58
	50.66	4-Mar-98	7.72			42.94
	50.66	18-Mar-98	7.66			43
	50.66	24-Apr-98	9.75			40.91
	50.66	21-May-98	11.00			39.66
	50.66	25-Aug-98	12.00			38.66
	50.66	21-Sep-98	9.41			41.25
	50.66	26-Oct-98	11.10			39.56
	50.66	23-Nov-98	8.08			42.58
	50.66	29-Jan-99	7.10			43.56
	50.66	26-Feb-99	7.21			43.45
	50.66	16-Mar-99	8.74			41.92
	50.66	29-Apr-99	8.93			41.73
	50.66	1-Jun-99	8.92			41.74
	50.66	30-Jul-99	10.44			40.22
	50.66	27-Aug-99	9.21			41.45
	50.66	27-Sep-99	12.56			38.1
	50.66	29-Oct-99	13.56			37.1
	50.66	17-Nov-99	13.63			37.03
	50.66	29-Dec-99	12.88			37.78
	50.66	4-Feb-00	14.22			36.44
	50.66	25-Feb-00	11.73			38.93
	50.66	27-Mar-00	10.54			40.12
	50.66	7-Apr-00	10.14			40.52
	50.66	31-May-00	10.17			40.49
	50.66	1-Jun-00	10.13			40.53
	50.66	28-Jul-00	10.17			40.49
	50.66	30-Aug-00	13.22			37.44
	50.66	19-Sep-00	14.27			36.39
	50.66	27-Oct-00	11.56			39.1
	50.66	21-Nov-00	11.17			39.49
	50.66	1-May-01	9.71			40.95
	50.66	1-Oct-01	10.64			40.02
	50.66	11-Mar-02	8.45			42.21
	50.66	23-Sep-02	7.90			42.76
	50.66	10-Mar-03	8.59			42.07
	50.66	23-Sep-03	7.70			42.96
	50.66	15-Mar-04	7.96			42.7
	50.66	13-Sep-04	11.05			39.61
	50.66	18-Jul-05	9.55			41.11
	50.66	4-Jan-06	11.83			38.83
	50.66	27-Jul-06	7.80			42.86
	50.66	7-Mar-07	8.96			41.7
	50.66	27-Jul-07	8.01			42.65
	50.66	30-Jan-08	7.66			43
	50.66	15-Jul-08	10.41			40.25
	50.66	4-Feb-09	10.27			40.39

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-14	50.66	23-Jul-09	10.67			39.99
	50.66	8-Jan-10	8.24			42.42
	50.66	12-Jul-10	10.54			40.12
	50.66	12-Jan-11	18.09			32.57
	50.66	12-Jul-11	12.93			37.73
	50.66	26-Jan-12	8.57			42.09
	50.66	9-Jul-12	8.61			42.05
	50.66	7-Jan-13	10.46			40.2
	50.66	22-Jul-13	11.91			38.75
	50.66	7-Jan-14	9.39			41.27
	50.66	16-Jul-14	10.58			40.08
MW-15A	50.41	25-Mar-97	8.22			42.19
	50.41	23-Apr-97	8.28			42.13
	50.41	24-Apr-97	8.51			41.9
	50.41	13-May-97	8.06			42.35
	50.41	20-Jun-97	8.64			41.77
	50.41	25-Sep-97	9.75			40.66
	50.41	22-Oct-97	9.09			41.32
	50.41	25-Nov-97	9.13			41.28
	50.41	19-Dec-97	8.89			41.52
	50.41	20-Jan-98	8.35			42.06
	50.41	4-Mar-98	8.09			42.32
	50.41	18-Mar-98	7.98			42.43
	50.41	24-Apr-98	9.57			40.84
	50.41	21-May-98	11.10			39.31
	50.41	25-Aug-98	11.78			38.63
	50.41	21-Sep-98	9.59			40.82
	50.41	26-Oct-98	10.69			39.72
	50.41	23-Nov-98	8.46			41.95
	50.41	29-Jan-99	7.11			43.3
	50.41	26-Feb-99	7.23			43.18
	50.41	16-Mar-99	9.17			41.24
	50.41	29-Apr-99	9.29			41.12
	50.41	1-Jun-99	9.29			41.12
	50.41	30-Jul-99	10.83			39.58
	50.41	27-Aug-99	9.39			41.02
	50.41	27-Sep-99	12.02			38.39
	50.41	29-Oct-99	13.11			37.3
	50.41	17-Nov-99	13.44			36.97
	50.41	29-Dec-99	12.49			37.92
	50.41	4-Feb-00	15.71			34.7
	50.41	25-Feb-00	11.34			39.07
	50.41	27-Mar-00	10.66			39.75
	50.41	7-Apr-00	10.20			40.21
	50.41	31-May-00	10.23			40.18
	50.41	1-Jun-00	10.22			40.19
	50.41	28-Jul-00	10.23			40.18
	50.41	30-Aug-00	13.34			37.07
	50.41	19-Sep-00	14.01			36.4
	50.41	27-Oct-00	11.77			38.64
	50.41	21-Nov-00	11.09			39.32
	50.41	1-May-01	9.85			40.56
	50.41	1-Oct-01	9.73			40.68
	50.41	11-Mar-02	8.81			41.6
	50.41	23-Sep-02	8.21			42.2
	50.41	10-Mar-03	7.76			42.65
	50.41	23-Sep-03	7.87			42.54
	50.41	15-Mar-04	7.94			42.47
	50.41	13-Sep-04	10.72			39.69
	50.41	18-Jul-05	9.33			41.08
	50.41	4-Jan-06	11.66			38.75
	50.41	27-Jul-06	7.92			42.49
	50.41	7-Mar-07	9.19			41.22
	50.41	27-Jul-07	7.88			42.53
	50.41	30-Jan-08	8.02			42.39
	50.41	15-Jul-08	10.26			40.15
	50.41	4-Feb-09	10.59			39.82
	50.41	23-Jul-09	11.01			39.4
	50.41	8-Jan-10	8.64			41.77
	50.41	12-Jul-10	10.81			39.6
	50.41	12-Jan-11	8.77			41.64
	50.41	12-Jul-11	12.78			37.63
	50.41	26-Jan-12	9.29			41.12
	50.41	9-Jul-12	5.92			44.49
	50.41	7-Jan-13	10.77			39.64
	50.41	22-Jul-13	12.21			38.2
	50.41	7-Jan-14	9.85			40.56
	50.41	16-Jul-14	10.65			39.76

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-15B	50.20	26-Jan-12	10.13			40.07
	50.20	9-Jul-12	8.32			41.88
	50.20	7-Jan-13	10.71			39.49
	50.20	22-Jul-13	11.97			38.23
	50.20	7-Jan-14	9.81			40.39
	50.20	15-Jul-14	10.36			39.84
MW-15C	50.01	13-May-97	33.46			16.55
	50.01	20-Jun-97	34.18			15.83
	50.01	25-Sep-97	33.77			16.24
	50.01	22-Oct-97	32.89			17.12
	50.01	25-Nov-97	32.95			17.06
	50.01	19-Dec-97	32.01			18
	50.01	20-Jan-98	29.90			20.11
	50.01	4-Mar-98	28.56			21.45
	50.01	18-Mar-98	28.53			21.48
	50.01	24-Apr-98	28.46			21.55
	50.01	21-May-98	35.00			15.01
	50.01	25-Aug-98	29.30			20.71
	50.01	21-Sep-98	28.15			21.86
	50.01	26-Oct-98	28.11			21.9
	50.01	23-Nov-98	26.50			23.51
	50.01	29-Jan-99	25.44			24.57
	50.01	26-Feb-99	25.51			24.5
	50.01	16-Mar-99	26.11			23.9
	50.01	29-Apr-99	26.33			23.68
	50.01	1-Jun-99	26.39			23.62
	50.01	30-Jul-99	27.99			22.02
	50.01	27-Aug-99	26.51			23.5
	50.01	27-Sep-99	27.46			22.55
	50.01	29-Oct-99	28.26			21.75
	50.01	17-Nov-99	28.55			21.46
	50.01	29-Dec-99	27.61			22.4
	50.01	4-Feb-00	28.11			21.9
	50.01	25-Feb-00	28.23			21.78
	50.01	27-Mar-00	27.45			22.56
	50.01	7-Apr-00	26.11			23.9
	50.01	31-May-00	26.13			23.88
	50.01	1-Jun-00	26.03			23.98
	50.01	28-Jul-00	26.14			23.87
	50.01	30-Aug-00	29.11			20.9
	50.01	19-Sep-00	28.67			21.34
	50.01	27-Oct-00	27.64			22.37
	50.01	21-Nov-00	27.56			22.45
	50.01	1-May-01	25.24			24.77
	50.01	1-Oct-01	25.40			24.61
	50.01	11-Mar-02	24.17			25.84
	50.01	23-Sep-02	25.35			24.66
	50.01	10-Mar-03	23.52			26.49
	50.01	23-Sep-03	24.88			25.13
	50.01	15-Mar-04	22.97			27.04
	50.01	13-Sep-04	24.80			25.21
	50.01	18-Jul-05	25.17			24.84
	50.01	4-Jan-06	26.23			23.78
	50.01	27-Jul-06	24.31			25.7
	50.01	7-Mar-07	22.76			27.25
	50.01	27-Jul-07	21.03			28.98
	50.01	30-Jan-08	21.80			28.21
	50.01	15-Jul-08	23.63			26.38
	50.01	4-Feb-09	23.73			26.28
	50.01	23-Jul-09	23.96			26.05
	50.01	8-Jan-10	21.88			28.13
	50.01	12-Jul-10	23.08			26.93
	50.01	12-Jan-11	23.04			26.97
	50.01	12-Jul-11	25.09			24.92
	50.01	26-Jan-12	24.37			25.64
	50.01	9-Jul-12	24.41			25.6
	50.01	7-Jan-13	25.21			24.8
	50.01	22-Jul-13	26.10			23.91
	50.01	7-Jan-14	25.26			24.75
	50.01	16-Jul-14	24.15			25.86
MW-16	51.51	25-Mar-97	7.41			44.1
	51.51	23-Apr-97	8.44			43.07
	51.51	24-Apr-97	8.52			42.99
	51.51	13-May-97	8.29			43.22
	51.51	20-Jun-97	8.41			43.1
	51.51	25-Sep-97	10.71			40.8
	51.51	22-Oct-97	9.53			41.98
	51.51	25-Nov-97	9.55			41.96

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-16	51.51	19-Dec-97	9.10			42.41
	51.51	20-Jan-98	8.60			42.91
	51.51	4-Mar-98	8.13			43.38
	51.51	18-Mar-98	8.59			42.92
	51.51	24-Apr-98	9.96			41.55
	51.51	21-May-98	11.43			40.08
	51.51	30-Jul-98	12.56			38.95
	51.51	25-Aug-98	11.53			39.98
	51.51	21-Sep-98	9.81			41.7
	51.51	26-Oct-98	10.44			41.07
	51.51	23-Nov-98	8.98			42.53
	51.51	29-Jan-99	7.12			44.39
	51.51	26-Feb-99	7.23			44.28
	51.51	16-Mar-99	10.06			41.45
	51.51	29-Apr-99	10.16			41.35
	51.51	1-Jun-99	10.16			41.35
	51.51	30-Jul-99	11.76			39.75
	51.51	27-Aug-99	10.33			41.18
	51.51	27-Sep-99	11.79			39.72
	51.51	29-Oct-99	12.93			38.58
	51.51	17-Nov-99	13.71			37.8
	51.51	29-Dec-99	12.20			39.31
	51.51	4-Feb-00	15.11			36.4
	51.51	25-Feb-00	11.10			40.41
	51.51	27-Mar-00	11.48			40.03
	51.51	7-Apr-00	11.09			40.42
	51.51	31-May-00	11.11			40.4
	51.51	1-Jun-00	11.00			40.51
	51.51	28-Jul-00	11.11			40.4
	51.51	30-Aug-00	13.10			38.41
	51.51	19-Sep-00	14.83			36.68
	51.51	27-Oct-00	11.66			39.85
	51.51	21-Nov-00	11.29			40.22
	51.51	1-May-01	9.92			41.59
	51.51	1-Oct-01	9.93			41.58
	51.51	11-Mar-02	9.12			42.39
	51.51	23-Sep-02	8.65			42.86
	51.51	10-Mar-03	7.74			43.77
	51.51	23-Sep-03	8.48			43.03
	51.51	15-Mar-04	8.09			43.42
	51.51	13-Sep-04	10.38			41.13
	51.51	18-Jul-05	10.42			41.09
	51.51	4-Jan-06	12.48			39.03
	51.51	27-Jul-06	9.37			42.14
	51.51	7-Mar-07	9.66			41.85
	51.51	27-Jul-07	7.85			43.66
	51.51	31-Jan-08	8.42	25.40	3.40	43.09
	51.51	15-Jul-08	10.16			41.35
	51.51	5-Feb-09	11.93			39.58
	51.51	23-Jul-09	12.67			38.84
	51.51	8-Jan-10	8.66			42.85
	51.51	12-Jul-10	10.31			41.2
	51.51	12-Jan-11	9.89			41.62
	51.51	12-Jul-11	12.98			38.53
	51.51	26-Jan-12	9.92			41.59
	51.51	9-Jul-12	9.68			41.83
	51.51	7-Jan-13	11.41			40.1
	51.51	22-Jul-13	12.39			39.12
	51.51	7-Jan-14	12.02			39.49
	51.51	15-Jul-14	9.69			41.82
MW-17	50.92	25-Mar-97	9.97			40.95
	50.92	23-Apr-97	10.41			40.51
	50.92	24-Apr-97	10.51			40.41
	50.92	13-May-97	10.32			40.6
	50.92	20-Jun-97	11.07			39.85
	50.92	25-Sep-97	12.39			38.53
	50.92	22-Oct-97	11.19			39.73
	50.92	25-Nov-97	11.21			39.71
	50.92	19-Dec-97	11.01			39.91
	50.92	20-Jan-98	10.25			40.67
	50.92	4-Mar-98	9.93			40.99
	50.92	18-Mar-98	9.94			40.98
	50.92	9-Apr-98	11.32			39.6
	50.92	16-Apr-98	11.52			39.4
	50.92	24-Apr-98	11.80			39.12
	50.92	8-May-98	NM			NM
	50.92	12-May-98	NM			NM

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-17	50.92	21-May-98	13.30			37.62
	50.92	25-May-98	NM			NM
	50.92	9-Jun-98	NM			NM
	50.92	16-Jun-98	NM			NM
	50.92	26-Jun-98	NM			NM
	50.92	2-Jul-98	NM			NM
	50.92	10-Jul-98	NM			NM
	50.92	14-Jul-98	NM			NM
	50.92	23-Jul-98	NM			NM
	50.92	5-Aug-98	NM			NM
	50.92	13-Aug-98	NM			NM
	50.92	25-Aug-98	13.78			37.14
	50.92	15-Sep-98	NM			NM
	50.92	21-Sep-98	11.49			39.43
	50.92	30-Sep-98	NM			NM
	50.92	8-Oct-98	NM			NM
	50.92	16-Oct-98	NM			NM
	50.92	26-Oct-98	12.22			38.7
	50.92	6-Nov-98	NM			NM
	50.92	13-Nov-98	NM			NM
	50.92	19-Nov-98	NM			NM
	50.92	23-Nov-98	10.21			40.71
	50.92	16-Dec-98	NM			NM
	50.92	7-Jan-99	NM			NM
	50.92	15-Jan-99	NM			NM
	50.92	22-Jan-99	NM			NM
	50.92	26-Jan-99	NM			NM
	50.92	29-Jan-99	10.88			40.04
	50.92	4-Feb-99	NM			NM
	50.92	9-Feb-99	NM			NM
	50.92	26-Feb-99	10.93			39.99
	50.92	16-Mar-99	11.18			39.74
	50.92	29-Apr-99	11.00			39.92
	50.92	21-May-99	11.25			39.67
	50.92	27-May-99	11.31			39.61
	50.92	1-Jun-99	11.07			39.85
	50.92	10-Jun-99	11.28			39.64
	50.92	30-Jul-99	12.67			38.25
	50.92	27-Aug-99	11.27			39.65
	50.92	27-Sep-99	14.67			36.25
	50.92	29-Oct-99	15.11			35.81
	50.92	17-Nov-99	16.08			34.84
	50.92	29-Dec-99	14.43			36.49
	50.92	4-Feb-00	17.21			33.71
	50.92	25-Feb-00	13.63			37.29
	50.92	27-Mar-00	13.08	32.60	0.70	37.84
	50.92	7-Apr-00	12.63	32.30	1.00	38.29
	50.92	31-May-00	12.67	32.30	1.00	38.25
	50.92	1-Jun-00	12.61	32.30	1.00	38.31
	50.92	28-Jul-00	12.69	32.30	1.00	38.23
	50.92	30-Aug-00	15.56			35.36
	50.92	19-Sep-00	16.24	32.20	1.10	34.68
	50.92	27-Oct-00	14.10			36.82
	50.92	21-Nov-00	13.12			37.8
	50.92	1-May-01	11.82	32.44	0.86	39.1
	50.92	1-Oct-01	12.55	32.30	1.00	38.37
	50.92	14-Mar-02	10.91	31.79	1.51	40.01
	50.92	23-Sep-02	10.48			40.44
	50.92	10-Mar-03	9.76			41.16
	50.92	24-Sep-03	10.59	32.85	0.45	40.33
	50.92	15-Mar-04	10.15			40.77
	50.92	13-Sep-04	13.09			37.83
	50.92	18-Jul-05	12.06	32.90	0.40	38.86
	50.92	4-Jan-06	13.90	32.90	0.40	37.02
	50.92	27-Jul-06	10.71	33.28	0.02	40.21
	50.92	7-Mar-07	10.91	33.00	0.30	40.01
	50.92	27-Jul-07	9.33	33.02	0.28	41.59
	50.92	31-Jan-08	10.00	31.17	2.13	40.92
	50.92	15-Jul-08	12.95	33.08	0.23	37.97
	50.92	4-Feb-09	12.64	Trace	Trace	38.28
	50.92	12-Jul-10	12.96			37.96
	50.92	8-Jan-10	10.62			40.3
	50.92	12-Jul-10	12.96			37.96
	50.92	12-Jan-11	11.06			39.86
	50.92	12-Jul-11	14.93			35.99
	50.92	26-Jan-12	11.2			39.72

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-17	50.92	9-Jul-12	11.02			39.9
	50.92	7-Jan-13	13.14			37.78
	50.92	22-Jul-13	14.62			36.3
	50.92	7-Jan-14	12.36			38.56
	50.92	15-Jul-14	12.54			38.38
MW-17C	50.17	15-Mar-04	22.75			27.42
	50.17	13-Sep-04	24.56			25.61
	50.17	18-Jul-05	25.02			25.15
	50.17	4-Jan-06	26.07			24.1
	50.17	27-Jul-06	24.15			26.02
	50.17	7-Mar-07	22.51			27.66
	50.17	27-Jul-07	20.93			29.24
	50.17	30-Jan-08	21.74			28.43
	50.17	15-Jul-08	23.65			26.52
	50.17	4-Feb-09	23.72			26.45
	50.17	23-Jul-09	24.08			26.09
	50.17	8-Jan-10	21.98			28.19
	50.17	12-Jul-10	23.03			27.14
	50.17	12-Jan-11	23.16			27.01
	50.17	12-Jul-11	25.11			25.06
	50.17	26-Jan-12	24.27			25.9
	50.17	9-Jul-12	24.32			25.85
	50.17	7-Jan-13	24.76			25.41
	50.17	22-Jul-13	25.89			24.28
	50.17	7-Jan-14	25.06			25.11
	50.17	15-Jul-14	23.98			26.19
MW-18A	51.57	25-Mar-97	15.41			36.16
	51.57	23-Apr-97	15.80			35.77
	51.57	13-May-97	14.92			36.65
	51.57	20-Jun-97	16.02			35.55
	51.57	25-Sep-97	15.15			36.42
	51.57	22-Oct-97	16.38			35.19
	51.57	25-Nov-97	16.37			35.2
	51.57	19-Dec-97	16.11			35.46
	51.57	20-Jan-98	15.49			36.08
	51.57	4-Mar-98	15.19			36.38
	51.57	18-Mar-98	14.28			37.29
	51.57	24-Apr-98	17.53			34.04
	51.57	21-May-98	18.41			33.16
	51.57	30-Jul-98	18.59			32.98
	51.57	25-Aug-98	16.95			34.62
	51.57	21-Sep-98	16.39			35.18
	51.57	26-Oct-98	15.77			35.8
	51.57	23-Nov-98	16.26			35.31
	51.57	29-Jan-99	17.02			34.55
	51.57	26-Feb-99	17.11			34.46
	51.57	29-Apr-99	16.01			35.56
	51.57	1-Jun-99	16.11			35.46
	51.57	30-Jul-99	17.55			34.02
	51.57	27-Aug-99	16.39			35.18
	51.57	27-Sep-99	19.13			32.44
	51.57	29-Oct-99	20.50			31.07
	51.57	17-Nov-99	21.63			29.94
	51.57	29-Dec-99	19.83			31.74
	51.57	4-Feb-00	23.71			27.86
	51.57	25-Feb-00	18.80			32.77
	51.57	27-Mar-00	17.98			33.59
	51.57	7-Apr-00	17.61			33.96
	51.57	31-May-00	17.65			33.92
	51.57	1-Jun-00	17.60			33.97
	51.57	28-Jul-00	17.67			33.9
	51.57	30-Aug-00	20.30			31.27
	51.57	19-Sep-00	19.54			32.03
	51.57	27-Oct-00	18.75			32.82
	51.57	21-Nov-00	16.52			35.05
	51.57	1-May-01	17.91	27.85	7.94	33.66
	51.57	1-Oct-01	17.47			34.1
	51.57	11-Mar-02	16.68			34.89
	51.57	23-Sep-02	15.30			36.27
	51.57	10-Mar-03	15.77			35.8
	51.57	23-Sep-03	25.08			26.49
	51.57	15-Mar-04	15.58			35.99
	51.57	13-Sep-04	18.32			33.25
	51.57	18-Jul-05	14.88			36.69
	51.57	4-Jan-06	17.96			33.61
	51.57	27-Jul-06	14.15			37.42
	51.57	7-Mar-07	17.32			34.25
	51.57	27-Jul-07	15.22			36.35

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-18A	51.57	30-Jan-08	15.63			35.94
	51.57	15-Jul-08	17.43			34.14
	51.57	5-Feb-09	18.67			32.9
	51.57	23-Jul-09	19.03			32.54
	51.57	8-Jan-10	16.51			35.06
	51.57	12-Jul-10	18.11			33.46
	51.57	12-Jan-11	15.82			35.75
	51.57	12-Jul-11	19.02			32.55
	51.57	26-Jan-12	16.9			34.67
	51.57	9-Jul-12	15.06			36.51
	51.57	7-Jan-13	18.39			33.18
	51.57	22-Jul-13	18.74			32.83
	51.57	7-Jan-14	18.06			33.51
	51.57	16-Jul-14	18.14			33.43
MW-18C	51.47	13-May-97	29.45			22.02
	51.47	20-Jun-97	30.37			21.1
	51.47	25-Sep-97	31.53			19.94
	51.47	22-Oct-97	30.71			20.76
	51.47	25-Nov-97	30.75			20.72
	51.47	19-Dec-97	30.10			21.37
	51.47	20-Jan-98	28.30			23.17
	51.47	4-Mar-98	27.03			24.44
	51.47	18-Mar-98	26.81			24.66
	51.47	9-Apr-98	27.04			24.43
	51.47	16-Apr-98	27.03			24.44
	51.47	24-Apr-98	27.25			24.22
	51.47	8-May-98	NM			NM
	51.47	12-May-98	NM			NM
	51.47	21-May-98	27.68			23.79
	51.47	25-May-98	NM			NM
	51.47	9-Jun-98	NM			NM
	51.47	16-Jun-98	NM			NM
	51.47	26-Jun-98	NM			NM
	51.47	2-Jul-98	NM			NM
	51.47	10-Jul-98	NM			NM
	51.47	14-Jul-98	NM			NM
	51.47	23-Jul-98	NM			NM
	51.47	30-Jul-98	28.40			23.07
	51.47	5-Aug-98	NM			NM
	51.47	13-Aug-98	NM			NM
	51.47	25-Aug-98	28.88			22.59
	51.47	15-Sep-98	NM			NM
	51.47	21-Sep-98	27.94			23.53
	51.47	30-Sep-98	NM			NM
	51.47	8-Oct-98	NM			NM
	51.47	16-Oct-98	NM			NM
	51.47	26-Oct-98	27.62			23.85
	51.47	6-Nov-98	NM			NM
	51.47	11-Nov-98	26.85		0.67	24.62
	51.47	19-Nov-98	NM			NM
	51.47	23-Nov-98	26.21			25.26
	51.47	16-Dec-98	NM			NM
	51.47	7-Jan-99	NM			NM
	51.47	15-Jan-99	NM			NM
	51.47	22-Jan-99	NM			NM
	51.47	26-Jan-99	NM			NM
	51.47	29-Jan-99	25.36			26.11
	51.47	4-Feb-99	NM			NM
	51.47	9-Feb-99	NM			NM
	51.47	26-Feb-99	25.41			26.06
	51.47	29-Apr-99	26.33			25.14
	51.47	21-May-99	25.75			25.72
	51.47	27-May-99	25.76			25.71
	51.47	1-Jun-99	26.38			25.09
	51.47	10-Jun-99	25.68			25.79
	51.47	30-Jul-99	25.61			25.86
	51.47	27-Aug-99	26.51			24.96
	51.47	27-Sep-99	27.28			24.19
	51.47	29-Oct-99	27.95			23.52
	51.47	17-Nov-99	28.42			23.05
	51.47	29-Dec-99	27.26			24.21
	51.47	4-Feb-00	27.84			23.63
	51.47	25-Feb-00	27.83			23.64
	51.47	27-Mar-00	27.48			23.99
	51.47	7-Apr-00	25.80			25.67
	51.47	31-May-00	25.83			25.64
	51.47	1-Jun-00	25.81			25.66

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-18C	51.47	28-Jul-00	25.86			25.61
	51.47	30-Aug-00	28.42			23.05
	51.47	19-Sep-00	28.77	80.44	0.97	22.7
	51.47	27-Oct-00	28.69			22.78
	51.47	21-Nov-00	27.67			23.8
	51.47	1-May-01	25.20			26.27
	51.47	1-Oct-01	25.59			25.8
	51.47	14-Mar-02	24.35			27.12
	51.47	25-Sep-02	25.45			26.02
	51.47	10-Mar-03	23.60			27.87
	51.47	24-Sep-03	25.15			26.32
	51.47	15-Mar-04	24.23			27.24
	51.47	13-Sep-04	25.12	78.22	1.70	26.35
	51.47	18-Jul-05	25.50	66.20	0.30	25.97
	51.47	4-Jan-06	26.71			24.76
	51.47	27-Jul-06	24.80			26.67
	51.47	7-Mar-07	23.11			28.36
	51.47	27-Jul-07	24.80			26.67
	51.47	30-Jan-08	22.64			28.83
	51.47	15-Jul-08	24.43			27.04
	51.47	5-Feb-09	24.34			27.13
	51.47	23-Jul-09	24.61			26.86
	51.47	8-Jan-10	22.56			28.91
	51.47	12-Jul-10	23.77			27.7
	51.47	12-Jul-11	25.87			25.6
	51.47	26-Jan-12	26.82			24.65
	51.47	12-Jan-11	24.03			27.44
	51.47	9-Jul-12	24.82			26.65
	51.47	7-Jan-13	25.61			25.86
	51.47	22-Jul-13	26.76			24.71
	51.47	7-Jan-14	25.68			25.79
	51.47	16-Jul-14	24.60			26.87
MW-19C	53.05	23-Nov-98	28.84			24.21
	53.05	29-Jan-99	28.21			24.84
	53.05	26-Feb-99	28.28			24.77
	53.05	16-Mar-99	28.31			24.74
	53.05	29-Apr-99	28.56			24.49
	53.05	1-Jun-99	28.48			24.57
	53.05	30-Jul-99	30.00			23.05
	53.05	27-Aug-99	28.61			24.44
	53.05	27-Sep-99	29.72			23.33
	53.05	29-Oct-99	30.46			22.59
	53.05	17-Nov-99	30.76			22.29
	53.05	29-Dec-99	29.44			23.61
	53.05	4-Feb-00	30.22			22.83
	53.05	25-Feb-00	29.93			23.12
	53.05	27-Mar-00	29.80			23.25
	53.05	7-Apr-00	28.40			24.65
	53.05	31-May-00	28.44			24.61
	53.05	1-Jun-00	28.33			24.72
	53.05	28-Jul-00	28.37			24.68
	53.05	30-Aug-00	29.99			23.06
	53.05	19-Sep-00	30.97			22.08
	53.05	27-Oct-00	28.49			24.56
	53.05	21-Nov-00	29.88			23.17
	53.05	1-May-01	27.61	71.55	3.56	25.44
	53.05	1-Oct-01	27.84			25.21
	53.05	11-Mar-02	26.68			26.37
	53.05	23-Sep-02	27.66			25.39
	53.05	10-Mar-03	25.77			27.28
	53.05	23-Sep-03	27.21			25.84
	53.05	15-Mar-04	25.36			27.69
	53.05	13-Sep-04	27.20			25.85
	53.05	18-Jul-05	27.71			25.34
	53.05	4-Jan-06	28.78			24.27
	53.05	27-Jul-06	26.91			26.14
	53.05	7-Mar-07	25.22			27.83
	53.05	27-Jul-07	23.71			29.34
	53.05	31-Jan-08	24.57			28.48
	53.05	15-Jul-08	26.38			26.67
	53.05	4-Feb-09	26.44			26.61
	53.05	23-Jul-09	26.81			26.24
	53.05	9-Jan-10	24.47			28.58
	53.05	12-Jul-10	25.67			27.38
	53.05	12-Jan-11	25.86			27.19
	53.05	12-Jul-11	27.81			25.24
	53.05	26-Jan-12	26.74			26.31

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-19C	53.05	9-Jul-12	27.26			25.79
	53.05	7-Jan-13	27.73			25.32
	53.05	22-Jul-13	28.58			24.47
	53.05	7-Jan-14	27.71			25.34
	53.05	15-Jul-14	26.65			26.40
MW-20A	50.43	23-Nov-98	8.31			42.116
	50.43	29-Jan-99	8.70			41.726
	50.43	26-Feb-99	8.81			41.616
	50.43	16-Mar-99	9.26			41.166
	50.43	29-Apr-99	9.33			41.096
	50.43	1-Jun-99	9.30			41.126
	50.43	30-Jul-99	10.91			39.516
	50.43	27-Aug-99	9.56			40.866
	50.43	27-Sep-99	10.79			39.636
	50.43	29-Oct-99	11.96			38.466
	50.43	17-Nov-99	13.06			37.366
	50.43	29-Dec-99	11.11			39.316
	50.43	4-Feb-00	14.89			35.536
	50.43	25-Feb-00	10.33			40.096
	50.43	27-Mar-00	10.79			39.636
	50.43	7-Apr-00	10.41			40.016
	50.43	31-May-00	10.46			39.966
	50.43	1-Jun-00	10.41			40.016
	50.43	28-Jul-00	10.47			39.956
	50.43	30-Aug-00	12.56			37.866
	50.43	19-Sep-00	13.68			36.746
	50.43	27-Oct-00	11.01			39.416
	50.43	21-Nov-00	10.64			39.786
	50.43	1-May-01	9.40			41.03
	50.43	1-Oct-01	10.42			40.01
	50.43	11-Mar-02	8.59			41.836
	50.43	23-Sep-02	8.51			41.916
	50.43	10-Mar-03	7.42			43.006
	50.43	23-Sep-03	7.95			42.476
	50.43	15-Mar-04	7.72			42.706
	50.43	13-Sep-04	10.22			40.206
	50.43	18-Jul-05	9.88			40.546
	50.43	4-Jan-06	11.72			38.706
	50.43	27-Jul-06	8.59			41.836
	50.43	7-Mar-07	8.91			41.516
	50.43	27-Jul-07	7.63			42.796
	50.43	30-Jan-08	7.91			42.516
	50.43	15-Jul-08	10.05			40.376
	50.43	4-Feb-09	10.18			40.246
	50.43	23-Jul-09	10.47			39.956
	50.43	9-Jan-10	8.23			42.196
	50.43	12-Jul-10	10.62			39.806
	50.43	12-Jan-11	8.76			41.666
	50.43	12-Jul-11	12.53			37.896
	50.43	26-Jan-12	11.61			38.816
	50.43	9-Jul-12	9.18			41.246
	50.43	7-Jan-13	10.66			39.766
	50.43	22-Jul-13	12.17			38.256
	50.43	7-Jan-14	11.62			38.806
	50.43	15-Jul-14	9.83			40.60
MW-21C	49.05	23-Nov-98	27.83			21.223
	49.05	29-Jan-99	27.11			21.943
	49.05	26-Feb-99	27.26			21.793
	49.05	16-Mar-99	27.42			21.633
	49.05	29-Apr-99	27.99			21.063
	49.05	1-Jun-99	27.80			21.253
	49.05	30-Jul-99	29.00			20.053
	49.05	27-Aug-99	27.99			21.063
	49.05	27-Sep-99	28.43			20.623
	49.05	29-Oct-99	29.12			19.933
	49.05	18-Nov-99	29.25			19.803
	49.05	29-Dec-99	10.89			38.163
	49.05	4-Feb-00	28.94			20.113
	49.05	25-Feb-00	11.43			37.623
	49.05	27-Mar-00	28.13			20.923
	49.05	7-Apr-00	26.79			22.263
	49.05	31-May-00	26.83			22.223
	49.05	1-Jun-00	26.83			22.223
	49.05	28-Jul-00	26.88			22.173
	49.05	30-Aug-00	29.91			19.143
	49.05	19-Sep-00	29.15			19.903
	49.05	27-Oct-00	30.21			18.843
	49.05	21-Nov-00	28.33			20.723

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-21C	49.05	1-May-01	26.01			23.04
	49.05	1-Oct-01	26.05			23
	49.05	11-Mar-02	24.80			24.253
	49.05	23-Sep-02	25.50			23.553
	49.05	10-Mar-03	23.82			25.233
	49.05	23-Sep-03	25.08			23.973
	49.05	15-Mar-04	23.48			25.573
	49.05	13-Sep-04	25.44			23.613
	49.05	18-Jul-05	25.33			23.723
	49.05	4-Jan-06	26.44			22.613
	49.05	27-Jul-06	24.55			24.503
	49.05	7-Mar-07	22.91			26.143
	49.05	27-Jul-07	21.29			27.763
	49.05	29-Jan-08	22.09			26.963
	49.05	15-Jul-08	23.31			25.743
	49.05	4-Feb-09	24.03			25.023
	49.05	24-Jul-09	24.29			24.763
	49.05	9-Jan-10	21.89			27.163
	49.05	12-Jul-10	23.01			26.043
	49.05	12-Jan-11	23.21			25.843
	49.05	12-Jul-11	25.09			23.963
	49.05	26-Jan-12	24.48			24.573
	49.05	9-Jul-12	23.39			25.663
	49.05	7-Jan-13	25.17			23.883
	49.05	22-Jul-13	26.49			22.563
	49.05	7-Jan-14	25.94			23.113
	49.05	15-Jul-14	24.61			24.44
MW-22A	46.07	23-Nov-98	NM			NM
	46.07	29-Jan-99	2.10			43.969
	46.07	26-Feb-99	2.21			43.859
	46.07	16-Mar-99	2.65			43.419
	46.07	29-Apr-99	2.71			43.359
	46.07	1-Jun-99	2.68			43.389
	46.07	30-Jul-99	4.12			41.949
	46.07	27-Aug-99	2.81			43.259
	46.07	27-Sep-99	8.53			37.539
	46.07	29-Oct-99	10.23			35.839
	46.07	18-Nov-99	9.92			36.149
	46.07	29-Dec-99	9.56			36.509
	46.07	4-Feb-00	12.31			33.759
	46.07	25-Feb-00	8.72			37.349
	46.07	27-Mar-00	6.30			39.769
	46.07	7-Apr-00	6.03			40.039
	46.07	31-May-00	6.12			39.949
	46.07	1-Jun-00	6.00			40.069
	46.07	28-Jul-00	6.13			39.939
	46.07	30-Aug-00	9.09			36.979
	46.07	19-Sep-00	10.12			35.949
	46.07	27-Oct-00	8.64			37.429
	46.07	21-Nov-00	7.69			38.379
	46.07	1-May-01	5.15			40.92
	46.07	1-Oct-01	5.49			40.58
	46.07	11-Mar-02	2.34			43.729
	46.07	23-Sep-02	2.11			43.959
	46.07	10-Mar-03	1.68			44.389
	46.07	23-Sep-03	2.30			43.769
	46.07	15-Mar-04	2.05			44.019
	46.07	14-Sep-04	6.89			39.179
	46.07	18-Jul-05	3.65			42.419
	46.07	6-Jan-06	7.29			38.779
	46.07	27-Jul-06	1.65			44.419
	46.07	7-Mar-07	NM			NM
	46.07	27-Jul-07	2.84			43.229
	46.07	29-Jan-08	1.05			45.019
	46.07	14-Jul-08	5.33			40.739
	46.07	3-Feb-09	5.24			40.829
	46.07	23-Jul-09	5.91			40.159
	46.07	9-Jan-10	1.32			44.749
	46.07	12-Jul-10	6.52			39.549
	46.07	12-Jan-11	3.21			42.859
	46.07	11-Jul-11	8.39			37.679
	46.07	27-Jan-12	0.98			45.089
	46.07	10-Jul-12	1.74	63.88		44.326
	46.07	8-Jan-13	3.09			42.979
	46.07	22-Jul-13	NM			NM
	46.07	7-Jan-14	3.81			42.259
	46.07	15-Jul-14	3.22			42.85

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-22B	45.86	23-Nov-98	2.25			43.606
	45.86	29-Jan-99	2.28			43.576
	45.86	26-Feb-99	2.34			43.516
	45.86	16-Mar-99	2.42			43.436
	45.86	29-Apr-99	2.56			43.296
	45.86	1-Jun-99	2.60			43.256
	45.86	30-Jul-99	4.31			41.546
	45.86	27-Aug-99	2.83			43.026
	45.86	27-Sep-99	8.45			37.406
	45.86	29-Oct-99	10.11			35.746
	45.86	18-Nov-99	9.75			36.106
	45.86	29-Dec-99	9.43			36.426
	45.86	4-Feb-00	12.56			33.296
	45.86	25-Feb-00	8.63			37.226
	45.86	27-Mar-00	6.00			39.856
	45.86	7-Apr-00	5.64			40.216
	45.86	31-May-00	5.69			40.166
	45.86	1-Jun-00	5.61			40.246
	45.86	28-Jul-00	5.67			40.186
	45.86	30-Aug-00	8.57			37.286
	45.86	19-Sep-00	9.94			35.916
	45.86	27-Oct-00	7.03			38.826
	45.86	21-Nov-00	7.63			38.226
	45.86	1-May-01	4.93			40.93
	45.86	1-Oct-01	5.40			40.46
	45.86	11-Mar-02	1.75			44.106
	45.86	23-Sep-02	2.11			43.746
	45.86	10-Mar-03	1.02			44.836
	45.86	23-Sep-03	2.99			42.866
	45.86	15-Mar-04	1.20			44.656
	45.86	14-Sep-04	NM			NM
	45.86	18-Jul-05	NM			NM
	45.86	6-Jan-06	7.05			38.806
	45.86	27-Jul-06	1.58			44.276
	45.86	7-Mar-07	NM			NM
	45.86	27-Jul-07	2.85			43.006
	45.86	29-Jan-08	0.85			45.006
	45.86	14-Jul-08	5.45			40.406
	45.86	3-Feb-09	4.78			41.076
	45.86	23-Jul-09	5.39			40.466
	45.86	9-Jan-10	3.27			42.586
	45.86	12-Jul-10	6.21			39.646
	45.86	12-Jan-11	0.37			45.486
	45.86	11-Jul-11	8.32			37.536
	45.86	27-Jan-12	0.06			45.796
	45.86	10-Jul-12	1.27			44.586
	45.86	8-Jan-13	NM			NM
	45.86	22-Jul-13	NM			NM
	45.86	7-Jan-14	4.14			41.716
	45.86	15-Jul-14	3.79			42.07
MW-23C	51.91	23-Nov-98	27.41			24.504
	51.91	29-Jan-99	26.80			25.114
	51.91	26-Feb-99	26.88			25.034
	51.91	16-Mar-99	26.93			24.984
	51.91	29-Apr-99	27.09			24.824
	51.91	1-Jun-99	27.00			24.914
	51.91	30-Jul-99	29.55			22.364
	51.91	27-Aug-99	27.29			24.624
	51.91	27-Sep-99	28.40			23.514
	51.91	29-Oct-99	29.11			22.804
	51.91	17-Nov-99	29.49			22.424
	51.91	29-Dec-99	28.46			23.454
	51.91	4-Feb-00	28.96			22.954
	51.91	25-Feb-00	28.96			22.954
	51.91	27-Mar-00	28.61			23.304
	51.91	7-Apr-00	27.10			24.814
	51.91	31-May-00	27.15			24.764
	51.91	1-Jun-00	27.11			24.804
	51.91	28-Jul-00	27.15			24.764
	51.91	30-Aug-00	29.96			21.954
	51.91	19-Sep-00	29.77			22.144
	51.91	27-Oct-00	28.44			23.474
	51.91	21-Nov-00	28.61			23.304
	51.91	1-May-01	26.26			25.65
	51.91	1-Oct-01	26.50		0.60	25.41
	51.91	11-Mar-02	25.33			26.584
	51.91	23-Sep-02	26.43			25.484
	51.91	10-Mar-03	24.53			27.384

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-23C	51.91	23-Sep-03	25.95			25.964
	51.91	15-Mar-04	24.15			27.764
	51.91	13-Sep-04	25.97			25.944
	51.91	18-Jul-05	26.46			25.454
	51.91	4-Jan-06	27.53			24.384
	51.91	7-Mar-07	23.96			27.954
	51.91	27-Jul-07	22.41			29.504
	51.91	31-Jan-08	23.22	75.98	1.71	28.694
	48.89[1]	4-Feb-09	22.11	72.05	1.47	26.78
	48.89[1]	23-Jul-09	22.93	73.01	0.51	25.961
	48.89[1]	9-Jan-10	20.29	71.8	1.72	28.601
	48.89[1]	27-May-10	22.81	71.5	2.02	26.081
	48.89[1]	28-Jun-10	22.93	72.15	1.37	25.961
	48.89[1]	12-Jul-10	21.41	72.4	1.12	27.481
	48.89[1]	31-Aug-10	21.61	72.65	0.87	27.281
	48.89[1]	12-Jan-11	21.7	71.25	1.45	27.191
	48.89	12-Jul-11	23.11	70.65	2.05	25.782
	48.89	26-Jan-12	22.81	71.57	1.13	26.082
	48.89	9-Jul-12	22.31	71.45	1.25	26.582
	48.89	7-Jan-13	23.32	71.06	1.64	25.572
	48.89	22-Jul-13	24.38			24.512
	48.89	7-Jan-14	23.51	70.8	2.30	25.382
	48.89	15-Jul-14	24.06	70.96	2.14	24.83
MW-24A	45.79	27-Mar-00	7.87			37.92
	45.79	7-Apr-00	7.63			38.16
	45.79	31-May-00	7.65			38.14
	45.79	1-Jun-00	7.43			38.36
	45.79	28-Jul-00	7.60			38.19
	45.79	30-Aug-00	10.44			35.35
	45.79	19-Sep-00	10.57			35.22
	45.79	27-Oct-00	NM			NM
	45.79	21-Nov-00	7.09			38.7
	45.79	1-May-01	6.72			39.07
	45.79	1-Oct-01	7.81			37.98
	45.79	11-Mar-02	3.91			41.88
	45.79	23-Sep-02	5.04			40.75
	45.79	10-Mar-03	2.76			43.03
	45.79	23-Sep-03	4.66			41.13
	45.79	15-Mar-04	3.10			42.69
	45.79	14-Sep-04	8.24			37.55
	45.79	18-Jul-05	6.03			39.76
	45.79	6-Jan-06	8.93			36.86
	45.79	27-Jul-06	4.21			41.58
	45.79	7-Mar-07	3.86			41.93
	45.79	30-Jan-08	NM			NM
MW-24AR	45.65	5-Feb-09	5.18			40.47
	45.65	23-Jul-09	7.36			38.29
	45.65	9-Jan-10	3.72			41.93
	45.65	12-Jul-10	4.29			41.36
	45.65	13-Jan-11	3.58			42.07
	45.65	11-Jul-11	6.38			39.27
	45.65	27-Jan-12	4.59			41.06
	45.65	10-Jul-12	4.38			41.27
	45.65	8-Jan-13	5.59			40.06
	45.65	23-Jul-13	10.14	71.06		35.51
	45.65	8-Jan-14	7.11			38.54
MW-24B	46.06	27-Mar-00	11.91			34.15
	46.06	7-Apr-00	11.60			34.46
	46.06	31-May-00	11.63			34.43
	46.06	1-Jun-00	11.51			34.55
	46.06	28-Jul-00	11.69			34.37
	46.06	30-Aug-00	13.91			32.15
	46.06	19-Sep-00	14.72			31.34
	46.06	27-Oct-00	12.44			33.62
	46.06	21-Nov-00	11.38			34.68
	46.06	1-May-01	10.71			35.35
	46.06	1-Oct-01	11.75			34.31
	46.06	11-Mar-02	9.01			37.05
	46.06	23-Sep-02	9.69			36.37
	46.06	10-Mar-03	7.83			38.23
	46.06	23-Sep-03	8.98			37.08
	46.06	15-Mar-04	7.33			38.73
	46.06	14-Sep-04	9.24			36.82
	46.06	18-Jul-05	9.54			36.52
	46.06	6-Jan-06	11.86			34.2
	46.06	27-Jul-06	10.50			35.56
	46.06	7-Mar-07	8.88			37.18

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-24B	46.06	27-Jul-07	9.85			36.21
	46.06	28-Jan-08	7.37			38.69
	46.06	14-Jul-08	11.41			34.65
	46.06	3-Feb-09	11.18			34.88
	46.06	23-Jul-09	12.26			33.8
	46.06	9-Jan-10	9.89			36.17
	46.06	12-Jul-10	12.82			33.24
	46.06	13-Jan-11	11.1			34.96
	46.06	11-Jul-11	14.09			31.97
	46.06	27-Jan-12	11.36			34.7
	46.06	10-Jul-12	10.49			35.57
	46.06	8-Jan-13	12.96			33.1
	46.06	23-Jul-13	8.49			37.57
MW-24C	46.05	27-Mar-00	25.77			20.28
	46.05	7-Apr-00	24.27			21.78
	46.05	31-May-00	24.30			21.75
	46.05	1-Jun-00	24.22			21.83
	46.05	28-Jul-00	24.26			21.79
	46.05	30-Aug-00	27.34			18.71
	46.05	19-Sep-00	26.59			19.46
	46.05	27-Oct-00	27.64			18.41
	46.05	21-Nov-00	25.43			20.62
	46.05	1-May-01	23.90			22.15
	46.05	1-Oct-01	23.71			22.34
	46.05	11-Mar-02	22.40			23.65
	46.05	23-Sep-02	23.04			23.01
	46.05	10-Mar-03	21.71			24.34
	46.05	23-Sep-03	23.04			23.01
	46.05	15-Mar-04	21.45			24.6
	46.05	14-Sep-04	22.45			23.6
	46.05	18-Jul-05	22.19			23.86
	46.05	6-Jan-06	23.57			22.48
	46.05	27-Jul-06	22.61			23.44
	46.05	7-Mar-07	21.07			24.98
	46.05	27-Jul-07	19.62			26.43
	46.05	28-Jan-08	19.43			26.62
	46.05	14-Jul-08	20.63			25.42
	46.05	3-Feb-09	21.68			24.37
	46.05	23-Jul-09	23.07			22.98
	46.05	9-Jan-10	20.46			25.59
	46.05	12-Jul-10	20.44			25.61
	46.05	13-Jan-11	20.26			25.79
	46.05	11-Jul-11	21.59			24.46
	46.05	27-Jan-12	21.23			24.82
	46.05	10-Jul-12	20.81			25.24
	46.05	8-Jan-13	22.42			23.63
	46.05	23-Jul-13	23.81			22.24
MW-25A	44.65	27-Mar-00	9.15			35.5
	44.65	7-Apr-00	8.79			35.86
	44.65	31-May-00	8.81			35.84
	44.65	1-Jun-00	8.86			35.79
	44.65	28-Jul-00	8.84			35.81
	44.65	30-Aug-00	11.43			33.22
	44.65	19-Sep-00	11.12			33.53
	44.65	27-Oct-00	10.09			34.56
	44.65	21-Nov-00	8.10			36.55
	44.65	1-May-01	8.94			35.71
	44.65	1-Oct-01	8.81			35.84
	44.65	11-Mar-02	7.23			37.42
	44.65	23-Sep-02	5.65			39
	44.65	10-Mar-03	5.84			38.81
	44.65	23-Sep-03	5.35			39.3
	44.65	15-Mar-04	5.75			38.9
	44.65	14-Sep-04	7.00			37.65
	44.65	18-Jul-05	6.42			38.23
	44.65	6-Jan-06	9.29			35.36
	44.65	27-Jul-06	5.10			39.55
	44.65	7-Mar-07	4.76			39.89
	44.65	27-Jul-07	4.22			40.43
	44.65	28-Jan-08	4.25			40.4
	44.65	14-Jul-08	8.59			36.06
	44.65	3-Feb-09	8.90			35.75
	44.65	23-Jul-09	8.71			35.94
	44.65	9-Jan-10	6.84			37.81
	44.65	12-Jul-10	7.78			36.87
	44.65	12-Jan-11	6.26			38.39

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-25A	44.65	11-Jul-11	10.22			34.43
	44.65	27-Jan-12	5.24			39.41
	44.65	10-Jul-12	4.56			40.09
	44.65	8-Jan-13	8.62			36.03
	44.65	23-Jul-13	9.37			35.28
	44.65	8-Jan-14	8.92			35.73
	44.65	16-Jul-14	8.61			36.04
MW-25C	44.49	27-Mar-00	19.92			24.57
	44.49	7-Apr-00	19.50			24.99
	44.49	31-May-00	19.56			24.93
	44.49	1-Jun-00	19.51			24.98
	44.49	28-Jul-00	19.54			24.95
	44.49	30-Aug-00	22.14			22.35
	44.49	19-Sep-00	21.30	66.73	0.90	23.19
	44.49	27-Oct-00	20.63			23.86
	44.49	21-Nov-00	27.63			16.86
	44.49	1-May-01	18.14			26.35
	44.49	1-Oct-01	18.29		0.40	26.2
	44.49	14-Mar-02	17.39	64.32	4.13	27.1
	44.49	23-Sep-02	17.81	61.41	6.00	26.68
	44.49	10-Mar-03	16.73			27.76
	44.49	23-Sep-03	22.35			22.14
	44.49	15-Mar-04	16.15			28.34
	44.49	14-Sep-04	17.00	60.14	2.56	27.49
	44.49	18-Jul-05	15.57			28.92
	44.49	6-Jan-06	18.49			26
	44.49	27-Jul-06	15.32	60.64	2.03	29.17
	44.49	7-Mar-07	15.87	59.82	2.18	28.62
	44.49	27-Jul-07	14.25	60.61	1.04	30.24
	44.49	28-Jan-08	14.91	60.88	0.67	29.58
	44.49	14-Jul-08	17.24	60.95	0.60	27.25
	44.49	3-Feb-09	15.97	TRACE	TRACE	28.52
	44.49	23-Jul-09	16.39			28.1
	44.49	9-Jan-10	13.68	61.45	0.65	30.81
	44.49	27-May-10	16.09			28.4
	44.49	28-Jun-10	16.26			28.23
	44.49	12-Jul-10	16.05			28.44
	44.49	31-Aug-10	16.21			28.28
	44.49	12-Jan-11	16.29			28.2
	44.49	11-Jul-11	18.81			25.68
	44.49	27-Jan-12	17.29			27.2
	44.49	10-Jul-12	16.53			27.96
	44.49	8-Jan-13	18.34			26.15
	44.49	23-Jul-13	18.74			25.75
	44.49	8-Jan-14	18.23			26.26
	44.49	16-Jul-14	18.66			25.83
MW-26A	44.62	27-Mar-00	7.40			37.22
	44.62	7-Apr-00	6.99			37.63
	44.62	31-May-00	7.10			37.52
	44.62	1-Jun-00	7.00			37.62
	44.62	28-Jul-00	7.11			37.51
	44.62	30-Aug-00	9.69			34.93
	44.62	19-Sep-00	11.43			33.19
	44.62	27-Oct-00	8.11			36.51
	44.62	21-Nov-00	8.24			36.38
	44.62	1-May-01	6.01			38.61
	44.62	1-Oct-01	6.34			38.28
	44.62	11-Mar-02	4.05			40.57
	44.62	23-Sep-02	4.29			40.33
	44.62	10-Mar-03	2.84			41.78
	44.62	23-Sep-03	4.84			39.78
	44.62	15-Mar-04	3.30			41.32
	44.62	14-Sep-04	6.80			37.82
	44.62	18-Jul-05	6.72			37.9
	44.62	6-Jan-06	9.34			35.28
	44.62	27-Jul-06	4.42			40.2
	44.62	7-Mar-07	4.70			39.92
	44.62	27-Jul-07	3.98			40.64
	44.62	29-Jan-08	2.37			42.25
	44.62	14-Jul-08	7.87			36.75
	44.62	3-Feb-09	6.89			37.73
	44.62	23-Jul-09	7.88			36.74
	44.62	9-Jan-10	4.31			40.31
	44.62	12-Jul-10	8.12			36.5
	44.62	13-Jan-11	2.38			42.24
	44.62	11-Jul-11	10.27			34.35
	44.62	27-Jan-12	3.09			41.53
	44.62	10-Jul-12	2.77			41.85
	44.62	8-Jan-13	7.27			37.35
	44.62	23-Jul-13	9.72			34.9
	44.62	8-Jan-14	6.33			38.29
	44.62	16-Jul-14	7.64			36.98

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-27A	44.90	1-May-01	6.41			38.49
	44.90	1-Oct-01	5.31			39.59
	44.90	11-Mar-02	4.21			40.69
	44.90	23-Sep-02	3.31			41.59
	44.90	10-Mar-03	4.05			40.85
	44.90	23-Sep-03	3.24			41.66
	44.90	15-Mar-04	2.99			41.91
	44.90	14-Sep-04	5.09			39.81
	44.90	18-Jul-05	4.45			40.45
	44.90	6-Jan-06	4.55			40.35
	44.90	27-Jul-06	4.26			40.64
	44.90	7-Mar-07	3.01			41.89
	45.04	27-Jul-07	2.12			42.92
	45.04	28-Jan-08	1.88			43.16
	45.04	14-Jul-08	4.57			40.47
	45.04	3-Feb-09	4.27			40.77
	45.04	23-Jul-09	4.36			40.68
	45.04	9-Jan-10	3.69			41.35
	45.04	12-Jul-10	5.31			39.73
	45.04	12-Jan-11	3.76			41.28
	45.04	12-Jul-11	6.72			38.32
	45.04	26-Jan-12				NM
	45.04	10-Jul-12	well covered			NM
	45.04	7-Jan-13	well covered			NM
	45.04	23-Jul-13	NM			NM
	45.04	-	-			
MW-27C	45.04	1-May-01	17.82			27.22
	45.04	1-Oct-01	17.82			27.22
	45.04	11-Mar-02	16.36			28.68
	45.04	23-Sep-02	16.49			28.55
	45.04	10-Mar-03	18.68			26.36
	45.04	23-Sep-03	16.89			28.15
	45.04	15-Mar-04	14.35			30.69
	45.04	14-Sep-04	14.49			30.55
	45.04	18-Jul-05	16.12			28.92
	45.04	6-Jan-06	18.07			26.97
	45.04	27-Jul-06	17.13			27.91
	45.04	7-Mar-07	15.47			29.57
	44.90	27-Jul-07	14.85			30.05
	45.04	28-Jan-08	14.31			30.73
	45.04	14-Jul-08	17.51			27.53
	45.04	3-Feb-09	15.76			29.28
	45.04	23-Jul-09	16.38			28.66
	45.04	9-Jan-10	14.82			30.22
	45.04	12-Jul-10	16.12			28.92
	45.04	12-Jan-11	15.84			29.2
	45.04	11-Jul-11	18.17			26.87
	45.04	27-Jan-12	17.14			27.9
	45.04	10-Jul-12	16.56			28.48
	45.04	8-Jan-13	17.04			28
	45.04	23-Jul-13	18.61			26.43
	45.04	8-Jan-14	18.12			26.92
	45.04	16-Jul-14	16.94			28.10
MW-28A	43.86	1-May-01	7.45			36.41
	43.86	1-Oct-01	8.26			35.6
	43.86	11-Mar-02	4.90			38.96
	43.86	23-Sep-02	5.71			38.15
	43.86	10-Mar-03	3.11			40.75
	43.86	23-Sep-03	5.81			38.05
	43.86	14-Sep-04	9.34			34.52
	43.86	18-Jul-05	7.52			36.34
	43.86	6-Jan-06	9.32			34.54
	43.86	27-Jul-06	5.54			38.32
	43.86	7-Mar-07	5.06			38.8
	43.86	27-Jul-07	2.86			41
	43.86	29-Jan-08	2.61			41.25
	43.86	14-Jul-08	8.74			35.12
	43.86	3-Feb-09	8.36			35.5
	43.86	23-Jul-09	8.94			34.92
	43.86	9-Jan-10	4.54			39.32
	43.86	12-Jul-10	8.66			35.2
	43.86	12-Jan-11	3.87			39.99
	43.86	11-Jul-11	11.43			32.43
	43.86	27-Jan-12	2.66			41.2
	43.86	10-Jul-12	4.52			39.34
	43.86	8-Jan-13	8.11			35.75
	43.86	23-Jul-13	10.78			33.08
	43.86	8-Jan-14	7.71			36.15
	43.86	16-Jul-14	8.19			35.67

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-28C	43.96	1-May-01	17.14			26.82
	43.96	1-Oct-01	17.51			26.45
	43.96	11-Mar-02	16.29			27.67
	43.96	23-Sep-02	17.75			26.21
	43.96	10-Mar-03	15.84			28.12
	43.96	23-Sep-03	17.48			26.48
	43.96	15-Mar-04	15.56			28.4
	43.96	14-Sep-04	17.20			26.76
	43.96	18-Jul-05	16.60			27.36
	43.96	6-Jan-06	17.61			26.35
	43.96	27-Jul-06	17.73			26.23
	43.96	7-Mar-07	15.59			28.37
	43.96	27-Jul-07	12.90			31.06
	43.96	29-Jan-08	14.35			29.61
	43.96	14-Jul-08	16.26			27.7
	43.96	3-Feb-09	16.03			27.93
	43.96	23-Jul-09	16.53			27.43
	43.96	9-Jan-10	14.89			29.07
	43.96	12-Jul-10	15.89			28.07
	43.96	12-Jan-11	18.37			25.59
	43.96	11-Jul-11	18.16			25.8
	43.96	27-Jan-12	16.12			27.84
	43.96	10-Jul-12	16.79			27.17
	43.96	8-Jan-13	17.62			26.34
	43.96	23-Jul-13	18.87			25.09
	43.96	8-Jan-14	17.59			26.37
	43.96	16-Jul-14	16.98			26.98
MW-29A	46.59	1-May-01	5.01			41.58
	46.59	1-Oct-01	5.38			41.21
	46.59	11-Mar-02	1.51			45.08
	46.59	23-Sep-02	1.65			44.94
	46.59	10-Mar-03	1.42			45.17
	46.59	23-Sep-03	1.50			45.09
	46.59	15-Mar-04	1.85			44.74
	46.59	14-Sep-04	6.35			40.24
	46.59	18-Jul-05	3.12			43.47
	46.59	6-Jan-06	6.57			40.02
	46.59	27-Jul-06	1.44			45.15
	46.59	7-Mar-07	1.95			44.64
	46.59	27-Jul-07	2.49			44.1
	46.59	28-Jan-08	1.28			45.31
	46.59	14-Jul-08	4.14			42.45
	46.59	3-Feb-09	3.50			43.09
	46.59	23-Jul-09	4.09			42.5
	46.59	9-Jan-10	1.76			44.83
	46.59	12-Jul-10	3.62			42.97
	46.59	13-Jan-11	3.07			43.52
	46.59	11-Jul-11	7.14			39.45
	Plugged					NM
	46.59	10-Jul-12	4.17			42.42
	46.59	8-Jan-13	4.91			41.68
	46.59	23-Jul-13	--			--
MW-29B	46.26	1-May-01	19.01			27.25
	46.26	1-Oct-01	19.41			26.85
	46.26	11-Mar-02	18.04			28.22
	46.26	23-Sep-02	18.82			27.44
	46.26	10-Mar-03	17.21			29.05
	46.26	23-Sep-03	18.09			28.17
	46.26	15-Mar-04	17.10			29.16
	46.26	14-Sep-04	17.76			28.5
	46.26	18-Jul-05	18.11			28.15
	46.26	6-Jan-06	18.83			27.43
	46.26	27-Jul-06	18.41			27.85
	46.26	7-Mar-07	17.21			29.05
	46.26	27-Jul-07	15.49			30.77
	46.26	28-Jan-08	15.32			30.94
	46.26	14-Jul-08	18.23			28.03
	46.26	3-Feb-09	17.72			28.54
	46.26	23-Jul-09	16.19			30.07
	46.26	9-Jan-10	16.02			30.24
	46.26	12-Jul-10	19.29			26.97
	46.26	13-Jan-11	17.73			28.53
	46.26	11-Jul-11	20.06			26.2
	Plugged					NM
	46.26	10-Jul-12	9.71			36.55
	46.26	8-Jan-13	9.92			36.34
	46.26	23-Jul-13	--			--

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-29C	46.46	1-May-01	25.51			20.95
	46.46	1-Oct-01	25.04			21.42
	46.46	11-Mar-02	23.51			22.95
	46.46	23-Sep-02	24.10			22.36
	46.46	10-Mar-03	22.71			23.75
	46.46	23-Sep-03	23.48			22.98
	46.46	15-Mar-04	22.24			24.22
	46.46	14-Sep-04	24.12			22.34
	46.46	18-Jul-05	23.75			22.71
	46.46	6-Jan-06	25.12			21.34
	46.46	27-Jul-06	23.35			23.11
	46.46	7-Mar-07	22.38			24.08
	46.46	27-Jul-07	20.42			26.04
	46.46	28-Jan-08	21.08			25.38
	46.46	14-Jul-08	22.38			24.08
	46.46	3-Feb-09	22.86			23.6
	46.46	23-Jul-09	22.81			23.65
	46.46	9-Jan-10	20.71			25.75
	46.46	12-Jul-10	21.32			25.14
	46.46	13-Jan-11	20.39			26.07
	46.46	11-Jul-11	23.17			23.29
	Plugged					NM
	46.46	10-Jul-12	20.69			25.77
	46.46	8-Jan-13	21.27			25.19
	46.46	23-Jul-13	--			--
MW-30A	50.45	15-Mar-04	9.71			40.74
	50.45	13-Sep-04	12.76			37.69
	50.45	18-Jul-05	11.80			38.65
	50.45	4-Jan-06	13.52			36.93
	50.45	27-Jul-06	10.45			40
	50.45	7-Mar-07	10.98			39.47
	50.45	27-Jul-07	9.49			40.96
	50.45	30-Jan-08	9.62			40.83
	50.45	15-Jul-08	12.52			37.93
	50.45	4-Feb-09	13.01			37.44
	50.45	23-Jul-09	13.71			36.74
	50.45	9-Jan-10	10.87			39.58
	50.45	12-Jul-10	12.61			37.84
	50.45	12-Jan-11	10.06			40.39
	50.45	12-Jul-11	14.76			35.69
	50.45	26-Jan-12	10.78			39.67
	50.45	9-Jul-12	11.13			39.32
	50.45	8-Jan-13	12.91			37.54
	50.45	23-Jul-13	14.16			36.29
	50.45	8-Jan-14	13.81			36.64
	50.45	15-Jul-14	12.10			38.35
MW-31A	52.08	15-Mar-04	10.97			41.11
	52.08	13-Sep-04	13.00			39.08
	52.08	18-Jul-05	13.05			39.03
	52.08	4-Jan-06	14.77			37.31
	52.08	27-Jul-06	11.83			40.25
	52.08	7-Mar-07	12.43			39.65
	52.08	27-Jul-07	10.83			41.25
	52.08	31-Jan-08	10.99			41.09
	52.08	15-Jul-08	13.68			38.4
	52.08	4-Feb-09	14.23			37.85
	52.08	23-Jul-09	14.73			37.35
	52.08	9-Jan-10	12.31			39.77
	52.08	12-Jul-10	14.06			38.02
	52.08	12-Jan-11	11.62			40.46
	52.08	12-Jul-11	15.92			36.16
	52.08	26-Jan-12	12.24			39.84
	52.08	9-Jul-12	12.79			39.29
	52.08	8-Jan-13	14.14			37.94
	52.08	23-Jul-13	16.24			35.84
	52.08	8-Jan-14	15.96			36.12
	52.08	15-Jul-14	13.19			38.89
MW-32A	43.77	15-Mar-04	1.00			42.77
	43.77	14-Sep-04	6.03	29.00	3.48	37.74
	43.77	18-Jul-05	5.82	26.56	5.92	37.95
	43.77	6-Jan-06	6.93	24.92	7.57	36.84
	43.77	27-Jul-06	12.96	25.71	6.74	30.81
	43.77	7-Mar-07	4.03	25.26	7.19	39.74
	43.77	27-Jul-07	1.95	30.76	1.70	41.82
	43.77	28-Jan-08	2.18			41.59
	43.77	14-Jul-08	6.14	26.25	6.20	37.63
	43.77	3-Feb-09	5.71	26.29	6.16	38.06
	43.77	23-Jul-09	6.29	26.51	5.94	37.48
	43.77	9-Jan-10	3.55	25.41	7.04	40.22
	43.77	27-May-10	5.86	26.2	6.25	37.91
	43.77	28-Jun-10	6.02	29.1	3.35	37.75

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-32A	43.77	12-Jul-10	6.12	29.45	3.00	37.65
	43.77	31-Aug-10	5.43	30.67	1.78	38.34
	43.77	13-Jan-11	2.63	29.15	3.30	41.14
	43.77	11-Jul-11	5.92	28.82	3.63	37.85
	Plugged					
MW-32AR	44.56	27-Jan-12	3.22			41.34
	44.56	10-Jul-12	3.73			40.83
	44.56	8-Jan-13	6.64			37.92
	44.56	23-Jul-13	9.42			35.14
	44.56	8-Jan-14	5.64			38.92
	44.56	16-Jul-14	6.74			37.82
MW-32B	44.41	27-Jan-12	3.11	30.52	5.77	41.3
	44.41	10-Jul-12	3.81	30.16	6.13	40.6
	44.41	8-Jan-13	6.34	30.02	6.38	38.07
	44.41	23-Jul-13	7.14			37.27
	44.41	8-Jan-14	6.72	34.82	1.58	37.69
	44.41	16-Jul-14	6.72	34.29	2.11	37.69
MW-33A	44.25	15-Mar-04	3.90			40.35
	44.25	14-Sep-04	7.85			36.4
	44.25	18-Jul-05	6.35			37.9
	44.25	6-Jan-06	8.00			36.25
	44.25	27-Jul-06	4.73			39.52
	44.25	7-Mar-07	5.22			39.03
	44.25	27-Jul-07	3.48			40.77
	44.25	29-Jan-08	3.34			40.91
	44.25	14-Jul-08	7.42	25.19	0.03	36.83
	44.25	3-Feb-09	7.28			36.97
	44.25	23-Jul-09	7.63			36.62
	44.25	9-Jan-10	4.79			39.46
	44.25	12-Jul-10	7.61			36.64
	44.25	13-Jan-11	3.19			41.06
	44.25	11-Jul-11	9.87			34.38
	44.25	27-Jan-12	2.69			41.56
	44.25	10-Jul-12	3.86			40.39
	44.25	8-Jan-13	6.76			37.49
	44.25	23-Jul-13	9.83			34.42
	44.25	8-Jan-14	6.71			37.54
	44.25	16-Jul-14	7.09			37.16
MW-33B	44.35	7-Mar-07	4.21			40.04
	44.35	27-Jul-07	3.72			40.53
	44.35	29-Jan-08	2.37	39.12	3.37	41.88
	44.35	14-Jul-08	5.74	37.44	5.05	38.51
	44.35	3-Feb-09	9.28	36.91	5.58	34.97
	44.35	23-Jul-09	NM			NM
	44.35	9-Jan-10	4.61	35.21	7.28	39.74
	44.35	27-May-10	6.82			37.53
	44.35	28-Jun-10	6.91			37.44
	44.35	12-Jul-10	7.02			37.33
	44.35	31-Aug-10	7.22			37.13
	44.35	13-Jan-11	3.11	29.7		41.24
	44.35	11-Jul-11	10.19	29.75		34.16
	Plugged					
MW-33BR	44.35	27-Jan-12	4.07			40.28
	44.35	10-Jul-12	2.59			41.76
	44.35	8-Jan-13	3.86			40.49
	44.35	23-Jul-13	9.68			34.67
	44.35	8-Jan-14	7.41			36.94
	44.35	16-Jul-14	6.72			37.63
MW-34C	45.31	15-Mar-04	17.40			27.91
	45.31	14-Sep-04	18.82			26.49
	45.31	18-Jul-05	19.41	65.29	7.19	25.9
	45.31	6-Jan-06	20.54	65.27	8.38	24.77
	45.31	27-Jul-06	18.55	63.84	8.61	26.76
	45.31	9-Apr-07	16.34	62.06	10.39	28.97
	45.31	27-Jul-07	NM			NM
	45.31	29-Jan-08	16.32			28.99
	45.31	15-Jul-08	18.13	43.49	29.01	27.18
	45.31	5-Feb-09	18.08	61.79	10.71	27.23
	45.31	23-Jul-09	NM			NM
	45.31	9-Jan-10	16.41	69.20	3.30	28.9
	45.31	12-Jul-10	NM			NM
	45.31	12-Jan-11	16.41	64.90		28.9
	45.31	11-Jul-11	19.08	65.26		26.23
	45.31	8-Feb-12	18.41			26.9
	45.31	10-Jul-12	NM			NM
	45.31	8-Jan-13	NM			NM
	45.31	23-Jul-13	NM			NM
MW-34CR	46.47	16-Jul-14	19.17			27.30
MW-35A	45.31	7-Mar-07	3.49			41.82
	45.31	27-Jul-07	3.05			42.26
	45.31	29-Jan-08	1.82			43.49
	45.31	14-Jul-08	6.21			39.1
	45.31	3-Feb-09	5.54			39.77
	45.31	23-Jul-09	5.76			39.55

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-35A	45.31	9-Jan-10	4.14			41.17
	45.31	12-Jul-10	6.04			39.27
	45.31	13-Jan-11	2.46			42.85
	45.31	11-Jul-11	8.44			36.87
	45.31	27-Jan-12	1.35			43.96
	45.31	10-Jul-12	2.33			42.98
	45.31	8-Jan-13	5.37			39.94
	45.31	23-Jul-13	9.18			36.13
	45.31	8-Jan-14	5.06			40.25
	45.31	15-Jul-14	6.51			38.80
MW-35B	44.83	7-Mar-07	3.31			41.52
	44.83	27-Jul-07	3.29			41.54
	44.83	29-Jan-08	1.95			42.88
	44.83	14-Jul-08	6.40			38.43
	44.83	3-Feb-09	5.79			39.04
	44.83	23-Jul-09	6.42			38.41
	44.83	9-Jan-10	3.51			41.32
	44.83	12-Jul-10	6.39			38.44
	44.83	13-Jan-11	2.96			41.87
	44.83	11-Jul-11	8.67			36.16
	44.83	27-Jan-12	1.59			43.24
	44.83	10-Jul-12	2.74			42.09
	44.83	8-Jan-13	6.09			38.74
	44.83	23-Jul-13	9.22			35.61
	44.83	8-Jan-14	5.31			39.52
	44.83	15-Jul-14	6.75			38.08
MW-36A	44.53	7-Mar-07	8.71			35.82
	44.53	27-Jul-07	6.54			37.99
	44.53	29-Jan-08	5.59			38.94
	44.53	14-Jul-08	9.33			35.2
	44.53	3-Feb-09	10.69			33.84
	44.53	23-Jul-09	12.03			32.5
	44.53	9-Jan-10	9.23			35.3
	44.53	12-Jul-10	9.14			35.39
	44.53	13-Jan-11	8.62			35.91
	44.53	11-Jul-11	12.16			32.37
	44.53	27-Jan-12	6.82			37.71
	44.53	10-Jul-12	6.68			37.85
	44.53	8-Jan-13	7.61			36.92
	44.53	23-Jul-13	11.36			33.17
	44.53	8-Jan-14	9.23			35.3
	44.53	16-Jul-14	8.62			35.91
MW-36B	44.07	12-Jul-10	1.32			42.75
	44.07	13-Jan-11	9.71			34.36
	44.07	11-Jul-11	11.57			32.5
	44.07	27-Jan-12	0.46			43.61
	44.07	10-Jul-12	6.64			37.43
	44.07	8-Jan-13	6.71			37.36
	44.07	23-Jul-13	9.39			34.68
	44.07	8-Jan-14	4.09			39.98
	44.07	16-Jul-14	3.61			40.46
MW-36D	44.33	12-Jul-10	85.39			-41.06
	44.33	13-Jan-11	85.03			-40.7
	44.33	11-Jul-11	85.33			-41
	44.33	27-Jan-12	85.62			-41.29
	44.33	10-Jul-12	85.17			-40.84
	44.33	8-Jan-13	85.37			-41.04
	44.33	23-Jul-13	85.93			-41.6
	44.33	8-Jan-14	85.32			-40.99
	44.33	16-Jul-14	84.77			-40.44
MW-38A	46.39	7-Mar-07	3.26			43.13
	46.39	27-Jul-07	3.08			43.31
	46.39	29-Jan-08	1.85			44.54
	46.39	14-Jul-08	5.84			40.55
	46.39	3-Feb-09	5.15			41.24
	46.39	23-Jul-09	5.06			41.33
	46.39	9-Jan-10	2.27			44.12
	46.39	12-Jul-10	6.42			39.97
	46.39	13-Jan-11	1.76			44.63
	46.39	11-Jul-11	8.16			38.23
	46.39	27-Jan-12	1.8			44.59
	46.39	10-Jul-12	2.52			43.87
	46.39	8-Jan-13	4.62			41.77
	46.39	23-Jul-13	8.34			38.05
	46.39	8-Jan-14	4.77			41.62
	46.39	15-Jul-14	6.20			40.19
MW-38B	45.51	15-Mar-04	1.07			44.44
	45.51	14-Sep-04	6.10			39.41
	45.51	18-Jul-05	2.41			43.1
	45.51	6-Jan-06	6.33			39.18
	45.51	27-Jul-06	1.27			44.24
	45.51	7-Mar-07	2.38			43.13
	45.51	27-Jul-07	2.25			43.26
	45.51	29-Jan-08	0.61			44.9
	45.51	14-Jul-08	4.86			40.65

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-38B	45.51	3-Feb-09	4.33			41.18
	45.51	23-Jul-09	4.47			41.04
	45.51	9-Jan-10	1.44			44.07
	45.51	12-Jul-10	5.72			39.79
	45.51	13-Jan-11	0.68			44.83
	45.51	11-Jul-11	7.82			37.69
	45.51	27-Jan-12	0.85			44.66
	45.51	10-Jul-12	0.74			44.77
	45.51	8-Jan-13	3.97			41.54
	45.51	23-Jul-13	7.51			38
	45.51	8-Jan-14	3.47			42.04
	45.51	15-Jul-14	5.50			40.01
MW-39B	49.58	15-Mar-04	5.48			44.1
	49.58	13-Sep-04	10.02			39.56
	49.58	18-Jul-05	7.21			42.37
	49.58	4-Jan-06	10.37			39.21
	49.58	27-Jul-06	6.08			43.5
	49.58	7-Mar-07	6.91			42.67
	49.58	27-Jul-07	5.74			43.84
	49.58	30-Jan-08	6.34			43.24
	49.58	15-Jul-08	8.96			40.62
	49.58	4-Feb-09	8.60			40.98
	49.58	24-Jul-09	9.13			40.45
	49.58	8-Jan-10	5.61			43.97
	49.58	12-Jul-10	9.31			40.27
	49.58	12-Jan-11	5.64			43.94
	49.58	12-Jul-11	11.97			37.61
	49.58	26-Jan-12	5.84			43.74
	49.58	9-Jul-12	5.77			43.81
	49.58	7-Jan-13	8.68			40.9
	49.58	22-Jul-13	11.17			38.41
	49.58	7-Jan-14	7.23			42.35
	49.58	16-Jul-14	9.46			40.12
MW-40B	49.59	15-Mar-04	5.46			44.13
	49.59	13-Sep-04	9.72			39.87
	49.59	18-Jul-05	7.19			42.4
	49.59	4-Jan-06	10.25			39.34
	49.59	27-Jul-06	6.18			43.41
	49.59	7-Mar-07	6.81			42.78
	49.59	27-Jul-07	5.00			44.59
	49.59	30-Jan-08	5.23			44.36
	49.59	15-Jul-08	8.76			40.83
	49.59	4-Feb-09	8.57			41.02
	49.59	24-Jul-09	9.06			40.53
	49.59	8-Jan-10	5.37			44.22
	49.59	12-Jul-10	9.17			40.42
	49.59	12-Jan-11	5.81			43.78
	49.59	12-Jul-11	11.46			38.13
	49.59	26-Jan-12	5.68			43.91
	49.59	9-Jul-12	5.74			43.85
	49.59	7-Jan-13	8.63			40.96
	49.59	22-Jul-13	11.06			38.53
	49.59	7-Jan-14	7.24			42.35
	49.59	16-Jul-14	9.27			40.32
MW-41B	49.37	15-Mar-04	4.66			44.71
	49.37	13-Sep-04	9.76	35.01	9.80	39.61
	49.37	18-Jul-05	5.96	32.23	12.58	43.41
	49.37	4-Jan-06	10.03	32.21	12.60	39.34
	49.37	27-Jul-06	5.65	29.55	15.26	43.72
	49.37	7-Mar-07	4.41	29.13	15.68	44.96
	49.37	27-Jul-07	5.27	12.00	32.81	44.1
	49.37	22-Feb-08	5.04	25.14	19.67	44.7
	49.37	15-Jul-08	8.87	25.09	19.72	40.5
	49.37	4-Feb-09	8.93	23.79	21.02	40.44
	49.37	24-Jul-09	9.46	23.91	20.90	39.91
	49.37	8-Jan-10	5.92	23.65	21.16	43.45
	49.37	27-May-10	6.13	25.45	19.36	43.24
	49.37	28-Jun-10	6.21	38.2	6.61	43.16
	49.37	12-Jul-10	6.32	38.45	6.36	43.05
	49.37	31-Aug-10	6.26	39.22	5.59	43.11
	49.37	12-Jan-11	6.02	39.6	5.21	43.35
	49.37	12-Jul-11	8.86	39.75	5.06	40.51
	49.37	8-Mar-12	6.31	20.67	24.14	43.06
	49.37	9-Jul-12	8.23			41.14
	49.37	7-Jan-13	9.09	41.13	3.68	40.28
	49.37	22-Jul-13	10.31	39.29	5.52	39.06
	49.37	7-Jan-14	9.06	39.17	5.64	40.31
	49.37	15-Jul-14	8.62	37.86	6.95	40.75
MW-42B	50.52	7-Mar-07	7.31			43.21
	50.52	27-Jul-07	5.74			44.78
	50.52	30-Jan-08	6.62			43.9
	50.52	15-Jul-08	8.73			41.79
	50.52	4-Feb-09	9.32			41.2

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-42B	50.52	24-Jul-09	9.61			40.91
	50.52	8-Jan-10	6.02			44.5
	50.52	12-Jul-10	7.13			43.39
	50.52	12-Jan-11	6.33			44.19
	50.52	12-Jul-11	11.76			38.76
	50.52	26-Jan-12	6.62			43.9
	50.52	9-Jul-12	6.81			43.71
	50.52	7-Jan-13	9.23			41.29
	50.52	22-Jul-13	11.08			39.44
	50.52	7-Jan-14	8.02			42.5
	50.52	15-Jul-14	7.37			43.15
MW-44A	45.11	7-Mar-07	10.86			34.25
	45.11	27-Jul-07	7.46			37.65
	45.11	30-Jan-08	8.44			36.67
	45.11	14-Jul-08	10.75			34.36
	45.11	3-Feb-09	12.55			32.56
	45.11	23-Jul-09	12.76			32.35
	45.11	9-Jan-10	10.23			34.88
	45.11	12-Jul-10	11.24			33.87
	45.11	12-Jan-11	9.63			35.48
	45.11	11-Jul-11	12.59			32.52
	45.11	27-Jan-12	9.27			35.84
	45.11	10-Jul-12	10.11			35
	45.11	8-Jan-13	11.01			34.1
	45.11	23-Jul-13	12.24			32.87
	45.11	8-Jan-14	11.91			33.2
	45.11	16-Jul-14	11.32			33.79
MW-44C	45.03	15-Mar-04	17.54			27.49
	45.03	14-Sep-04	18.35			26.68
	45.03	18-Jul-05	18.90	64.77	5.35	26.13
	45.03	6-Jan-06	20.03	66.50	5.37	25
	45.03	27-Jul-06	18.47	63.35	6.75	26.56
	45.03	7-Mar-07	16.02	62.30	7.75	29.01
	45.03	27-Jul-07	14.83	65.45	5.50	30.2
	45.03	29-Jan-08	15.95			29.08
	45.03	14-Jul-08	17.91	64.95	6.18	27.12
	45.03	3-Feb-09	16.72	64.15	6.98	28.31
	45.03	23-Jul-09	17.12	64.05	6.75	27.91
	45.03	9-Jan-10	15.57	63.81	6.99	29.46
	45.03	27-May-10	16.67	64.7	6.10	28.36
	45.03	28-Jun-10	16.77	67.85	2.95	28.26
	45.03	12-Jul-10	16.91	70.35	0.45	28.12
	45.03	31-Aug-10	16.89	70.63	0.17	28.14
	45.03	12-Jan-11	16.77	70.05	0.75	28.26
	45.03	11-Jul-11	19.31	70.05	0.75	25.72
	45.03	27-Jan-12	17.91	63.88	6.92	27.12
	45.03	10-Jul-12	17.61	63.7	7.10	27.42
	45.03	8-Jan-13	19.02	62.94	7.86	26.01
	45.03	23-Jul-13	20.36	70.26	0.54	24.67
	45.03	8-Jan-14	19.67	70.42	0.38	25.36
	45.03	16-Jul-14	18.72	69.31	1.49	26.31
MW-45C	44.73	15-Mar-04	17.15			27.58
	44.73	14-Sep-04	17.82	61.66	9.02	26.91
	44.73	18-Jul-05	18.38	60.76	9.89	26.35
	44.73	6-Jan-06	19.51	62.87	8.87	25.22
	44.73	27-Jul-06	17.92	61.64	8.94	26.81
	44.73	7-Mar-07	15.95	60.81	9.79	28.78
	44.73	27-Jul-07	14.38			30.35
	44.73	29-Jan-08	14.86	61.39	9.46	29.87
	44.73	14-Jul-08	17.22	61.25	9.88	27.51
	44.73	3-Feb-09	17.00	61.24	9.61	27.73
	44.73	23-Jul-09	17.46	61.30	9.55	27.27
	44.73	9-Jan-10	14.98	61.56	9.29	29.75
	44.73	27-May-10	16.31	61.1	9.75	28.42
	44.73	28-Jun-10	16.42	63.45	7.40	28.31
	44.73	12-Jul-10	16.61	68.8	2.05	28.12
	44.73	31-Aug-10	16.46	69.62	1.23	28.27
	44.73	12-Jan-11	16.31	69.1	1.75	28.42
	44.73	11-Jul-11	18.29	69.3	1.55	26.44
	44.73	8-Mar-12	16.31	70.6	0.25	28.42
	44.73	10-Jul-12	20.69	70.21	0.64	24.04
	44.73	8-Jan-13	21.39	69.91	0.69	23.34
	44.73	23-Jul-13	22.72	70.39	0.21	22.01
	44.73	8-Jan-14	22.13	70.35	0.25	22.6
	44.73	16-Jul-14	21.32	69.91	0.69	23.41
MW-46C	44.94	15-Mar-04	16.16	ND	ND	28.78
	44.94	14-Sep-04	17.97	ND	ND	26.97
	44.94	18-Jul-05	18.50	69.05	3.78	26.44
	44.94	13-Jan-06	19.66	70.20	3.22	25.28
	44.94	27-Jul-06	17.96	68.89	3.90	26.98
	44.94	7-Mar-07	16.01	69.32	3.43	28.93
	44.94	27-Jul-07	14.54	69.31	3.59	30.4
	44.94	30-Jan-08	15.68	70.81	2.00	29.26

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-46C	44.94	14-Jul-08	17.38	69.97	2.84	27.56
	44.94	3-Feb-09	16.78	69.28	3.53	28.16
	44.94	23-Jul-09	17.59	69.35	3.55	27.35
	44.94	9-Jan-10	14.53	68.74	4.16	30.41
	44.94	27-May-10	16.26	69.4	3.50	28.68
	44.94	28-Jun-10	16.39	70.85	2.05	28.55
	44.94	12-Jul-10	16.29	72.25	0.65	28.65
	44.94	31-Aug-10	16.13	72.46	0.44	28.81
	44.94	12-Jan-11	15.96	71.75	1.15	28.98
	44.94	11-Jul-11	18.07	71.65	1.25	26.87
	44.94	26-Jan-12	16.54	ND	ND	28.4
	44.94	10-Jul-12	20.34	72.8	0.10	24.6
	44.94	8-Jan-13	21.18	71.31	1.59	23.76
	44.94	23-Jul-13	21.96	72.16	0.74	22.98
	44.94	8-Jan-14	21.81	72.55	0.35	23.13
	44.94	16-Jul-14	20.86	71.39	1.51	24.08
MW-47C	45.61	27-Jul-07	16.62			28.99
	45.61	29-Jan-08	16.04			29.57
	45.61	14-Jul-08	18.15			27.46
	45.61	4-Feb-09	18.39			27.22
	45.61	23-Jul-09	18.61			27
	45.61	9-Jan-10	16.46			29.15
	45.61	12-Jul-10	18.33			27.28
	45.61	12-Jan-11	17.86			27.75
	45.61	11-Jul-11	19.94			25.67
	45.61	26-Jan-12	18.77			26.84
	45.61	9-Jul-12	18.17			27.44
	45.61	8-Jan-13	19.47			26.14
	45.61	23-Jul-13	20.61			25
	45.61	8-Jan-14	19.57			26.04
	45.61	16-Jul-14	19.02			26.59
MW-48C	44.68	15-Mar-04	17.31			27.37
	44.68	14-Sep-04	18.60			26.08
	44.68	18-Jul-05	19.17			25.51
	44.68	6-Jan-06	20.33			24.35
	44.68	27-Jul-06	18.73			25.95
	44.68	7-Mar-07	16.52			28.16
	44.68	27-Jul-07	15.22			29.46
	44.68	29-Jan-08	16.32			28.36
	44.68	14-Jul-08	17.63			27.05
	44.68	4-Feb-09	17.97			26.71
	44.68	24-Jul-09	18.39			26.29
	44.68	9-Jan-10	15.81			28.87
	44.68	12-Jul-10	17.42			27.26
	44.68	12-Jan-11	17.52			27.16
	44.68	11-Jul-11	19.58			25.1
	44.68	26-Jan-12	18.52			26.16
	44.68	9-Jul-12	17.12			27.56
	44.68	8-Jan-13	18.26			26.42
	44.68	23-Jul-13	20.17			24.51
	44.68	8-Jan-14	19.19			25.49
	44.68	16-Jul-14	18.38			26.30
MW-49A	46.18	7-Mar-07	12.91			33.27
	46.18	27-Jul-07	8.86			37.32
	46.18	31-Jan-08	12.02			34.16
	46.18	15-Jul-08	12.99			33.19
	46.18	4-Feb-09	13.29			32.89
	46.18	24-Jul-09	13.71			32.47
	46.18	9-Jan-10	11.07			35.11
	46.18	12-Jul-10	11.62			34.56
	46.18	12-Jan-11	10.82			35.36
	46.18	11-Jul-11	12.31			33.87
	46.18	26-Jan-12	9.48			36.7
	46.18	9-Jul-12	9.79			36.39
	46.18	8-Jan-13	11.31			34.87
	46.18	23-Jul-13	11.92			34.26
	46.18	8-Jan-14	11.56			34.62
	46.18	16-Jul-14	10.57			35.61
MW-49B	46.22	4-Feb-09	11.65			34.57
	46.22	24-Jul-09	11.93			34.29
	46.22	9-Jan-10	9.73			36.49
	46.22	12-Jul-10	11.36			34.86
	46.22	12-Jan-11	8.04			38.18
	46.22	11-Jul-11	12.29			33.93
	46.22	26-Jan-12	10.74			35.48
	46.22	9-Jul-12	7.38			38.84
	46.22	8-Jan-13	11.27	33.56	1.19	34.95
	46.22	23-Jul-13	11.83	33.91	0.84	34.39
	46.22	8-Jan-14	11.24			34.98
	46.22	16-Jul-14	9.62			36.60
MW-50A	46.96	7-Mar-07	8.16			38.8
	46.96	27-Jul-07	4.70			42.26
	46.96	31-Jan-08	5.68			41.28
	46.96	16-Jul-08	7.99			38.97

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-50A	46.96	4-Feb-09	9.31			37.65
	46.96	24-Jul-09	9.49			37.47
	46.96	9-Jan-10	7.02			39.94
	46.96	12-Jul-10	8.74			38.22
	46.96	12-Jan-11	5.61			41.35
	46.96	11-Jul-11	9.86			37.1
	46.96	26-Jan-12	7.21			39.75
	46.96	9-Jul-12	4.63			42.33
	46.96	8-Jan-13	5.91			41.05
	46.96	23-Jul-13	7.13			39.83
	46.96	8-Jan-14	6.71			40.25
	46.96	16-Jul-14	6.29			40.67
MW-51A	47.80	7-Mar-07	6.96			40.84
	47.80	27-Jul-07	5.45			42.35
	47.80	31-Jan-08	5.92			41.88
	47.80	15-Jul-08				NM
	47.80	4-Feb-09	9.98			37.82
	47.80	24-Jul-09	10.34			37.46
	47.80	9-Jan-10	7.83			39.97
	47.80	12-Jul-10	9.16			38.64
	47.80	12-Jan-11	8.56			39.24
	47.80	11-Jul-11	12.74			35.06
	47.80	26-Jan-12	7.33			40.47
	47.80	9-Jul-12	7.26			40.54
	47.80	8-Jan-13	7.62			40.18
	47.80	23-Jul-13	10.54			37.26
	47.80	8-Jan-14	10.21			37.59
	47.80	16-Jul-14	8.51			39.29
MW-51C	47.48	16-Jul-14	22.21			25.27
MW-52A	51.91	7-Mar-07	13.66			38.25
	51.91	27-Jul-07	11.76			40.15
	51.91	31-Jan-08	12.60			39.31
	51.91	15-Jul-08	14.42			37.49
	51.91	5-Feb-09	15.52			36.39
	51.91	23-Jul-09	16.39			35.52
	51.91	9-Jan-10	12.57			39.34
	51.91	12-Jul-10	14.19			37.72
	51.91	12-Jan-11	9.06			42.85
	51.91	12-Jul-11	16.53			35.38
	51.91	26-Jan-12	12.99			38.92
	51.91	9-Jul-12	12.43			39.48
	51.91	7-Jan-13	14.94			36.97
	51.91	22-Jul-13	16.29			35.62
	51.91	7-Jan-14	16.01			35.9
	51.91	15-Jul-14	15.39			36.52
MW-53C	45.49	7-Mar-07	16.12			29.37
	45.49	27-Jul-07	14.55			30.94
	45.49	29-Jan-08	15.12			30.37
	45.49	14-Jul-08	16.86			28.63
	45.49	3-Feb-09	16.69			28.8
	45.49	23-Jul-09	17.62			27.87
	45.49	9-Jan-10	15.19			30.3
	45.49	12-Jul-10	15.71			29.78
	45.49	12-Jan-11	16.58			28.91
	45.49	11-Jul-11	18.61			26.88
	45.49	27-Jan-12	17.54			27.95
	45.49	10-Jul-12	17.73			27.76
	45.49	8-Jan-13	18.14			27.35
	45.49	23-Jul-13	19.28			26.21
	45.49	8-Jan-14	21.12			24.37
	45.49	16-Jul-14	17.37			28.12
MW-54C	44.99	7-Mar-07	15.74			29.25
	44.99	27-Jul-07	14.63			30.36
	44.99	28-Jan-08	15.28			29.71
	44.99	14-Jul-08	16.68			28.31
	44.99	3-Feb-09	16.87			28.12
	44.99	23-Jul-09	17.84			27.15
	44.99	9-Jan-10	15.46			29.53
	44.99	12-Jul-10	16.49			28.5
	44.99	12-Jan-11	16.46			28.53
	44.99	11-Jul-11	18.23			26.76
	44.99	27-Jan-12	17.42			27.57
	44.99	10-Jul-12	17.36			27.63
	44.99	8-Jan-13	17.81			27.18
	44.99	23-Jul-13	18.89			26.1
	44.99	8-Jan-14	18.14			26.85
	44.99	16-Jul-14	17.49			27.50
MW-55A	52.01	4-Feb-09	13.79			38.22
	52.01	23-Jul-09	14.06			37.95
	52.01	9-Jan-10	10.83			41.18
	52.01	12-Jul-10	12.72			39.29
	52.01	12-Jan-11	10.13			41.88
	52.01	12-Jul-11	15.18			36.83
	52.01	26-Jan-12	11.71			40.3
	52.01	9-Jul-12	12.29			39.72

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
	52.01	7-Jan-13	13.34			38.67
	52.01	22-Jul-13	14.19			37.82
	52.01	7-Jan-14	12.73			39.28
	52.01	15-Jul-14	11.30			40.71
MW-55B	52.04	26-Jan-12	13.28			38.76
	52.04	9-Jul-12	13.93			38.11
	52.04	7-Jan-13	13.73			38.31
	52.04	22-Jul-13	14.59			37.45
	52.04	7-Jan-14	12.89			39.15
	52.04	15-Jul-14	12.49			39.55
MW-57A	47.72	5-Feb-09	12.73		0.00	34.99
	47.72	23-Jul-09	12.91		0.00	34.81
	47.72	9-Jan-10	9.78		0.00	37.94
	47.72	12-Jul-10	8.56	24.55	2.55	39.16
	47.72	12-Jan-11	9.83	22.76	4.14	37.89
	47.72	12-Jul-11	13.88	22.79	4.11	33.84
	47.72	26-Jan-12	10.54	22.78	4.12	37.18
	47.72	9-Jul-12	9.72	22.65	4.25	38
	47.72	7-Jan-13	10.61	22.14	4.76	37.11
	47.72	22-Jul-13	13.21	23.05	3.85	34.51
	47.72	7-Jan-14	11.79	26.15	0.75	35.93
	47.72	15-Jul-14	10.42	26.09	0.81	37.30
MW-57B	50.90	26-Jan-12	28.83	42.51	0.44	22.07
	50.90	9-Jul-12	27.93	42.45	0.50	22.97
	50.90	7-Jan-13	28.63	41.36	1.59	22.27
	50.90	22-Jul-13	16.34	41.67	1.28	34.56
	50.90	7-Jan-14	15.04			35.86
	50.90	15-Jul-14	15.71			35.19
MW-58A	47.76	5-Feb-09	14.55			33.21
	47.76	23-Jul-09	14.04			33.72
	47.76	9-Jan-10	12.29			35.47
	47.76	12-Jul-10	14.03			33.73
	47.76	12-Jan-11	11.88			35.88
	47.76	12-Jul-11	16.16			31.6
	47.76	26-Jan-12	12.26			35.5
	47.76	9-Jul-12	11.62			36.14
	47.76	7-Jan-13	11.91			35.85
	47.76	22-Jul-13	13.71			34.05
	47.76	7-Jan-14	13.26			34.5
	47.76	15-Jul-14	13.06			34.70
MW-59A	44.18	5-Feb-09	10.71			33.47
	44.18	23-Jul-09	9.96			34.22
	44.18	9-Jan-10	8.62			35.56
	44.18	12-Jul-10	9.97			34.21
	44.18	12-Jan-11	8.06			36.12
	44.18	11-Jul-11	10.54			33.64
	44.18	26-Jan-12	6.36			37.82
	44.18	9-Jul-12	7.63			36.55
	44.18	8-Jan-13	9.09			35.09
	44.18	23-Jul-13	9.76			34.42
	44.18	8-Jan-14	9.34			34.84
	44.18	16-Jul-14	9.17			35.01
MW-59B	44.36	12-Jul-10	7.43			36.93
	44.36	12-Jan-11	6.89			37.47
	44.36	11-Jul-11	11.03			33.33
	44.36	26-Jan-12	4.44			39.92
	44.36	9-Jul-12	7.48			36.88
	44.36	8-Jan-13	9.36			35
	44.36	23-Jul-13	9.94			34.42
	44.36	8-Jan-14	9.52			34.84
	44.36	16-Jul-14	8.67			35.69
MW-59D	44.22	5-Feb-09	84.17			-39.95
	44.22	23-Jul-09	83.53			-39.31
	44.22	9-Jan-10	81.73			-37.51
	44.22	12-Jul-10	82.16			-37.94
	44.22	12-Jan-11	82.83			-38.61
	44.22	11-Jul-11	82.89			-38.67
	44.22	26-Jan-12	82.93			-38.71
	44.22	9-Jul-12	82.36			-38.14
	44.22	8-Jan-13	82.81			-38.59
	44.22	23-Jul-13	83.04			-38.82
	44.22	8-Jan-14	83.14			-38.92
	44.22	16-Jul-14	82.67			-38.45
MW-60A	46.79	4-Feb-09	9.56			37.23
	46.79	23-Jul-09	9.71			37.08
	46.79	9-Jan-10	7.72			39.07
	46.79	12-Jul-10	8.61			38.18
	46.79	12-Jan-11	5.82			40.97
	46.79	11-Jul-11	9.86			36.93
	46.79	26-Jan-12	4.34			42.45
	46.79	9-Jul-12	5.42			41.37
	46.79	8-Jan-13	6.91			39.88
	46.79	23-Jul-13	10.42			36.37
	46.79	8-Jan-14	8.06			38.73
	46.79	16-Jul-14	7.29			39.50
MW-61A	44.67	3-Feb-09	8.35			36.32
	44.67	23-Jul-09	8.47			36.2
	44.67	9-Jan-10	6.49			38.18

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
MW-61A	44.67	12-Jul-10	8.09			36.58
	44.67	12-Jan-11	6.56			38.11
	44.67	11-Jul-11	9.67			35
	44.67	26-Jan-12	2.48			42.19
	44.67	9-Jul-12	4.55			40.12
	44.67	8-Jan-13	6.72			37.95
	44.67	23-Jul-13	9.16			35.51
	44.67	8-Jan-14	7.04			37.63
	44.67	16-Jul-14	6.34			38.33
MW-62B	48.16	4-Feb-09	6.99			41.17
	48.16	24-Jul-09	7.39			40.77
	48.16	8-Jan-10	5.13			43.03
	48.16	12-Jul-10	5.79			42.37
	48.16	12-Jan-11	4.21			43.95
	48.16	12-Jul-11	11.06			37.1
	48.16	26-Jan-12	3.18			44.98
	48.16	9-Jul-12	4.87			43.29
	48.16	8-Jan-13	5.92			42.24
	48.16	23-Jul-13	7.01			41.15
	48.16	8-Jan-14	6.52			41.64
	48.16	15-Jul-14	6.06			42.10
MW-63B	44.48	5-Feb-09	31.54			12.94
	44.48	23-Jul-09	9.52			34.96
	44.48	9-Jan-10	1.34			43.14
	44.48	12-Jul-10	5.71			38.77
	44.48	13-Jan-11	7.13			37.35
	44.48	11-Jul-11	4.21			40.27
	44.48	27-Jan-12	2.96			41.52
	44.48	10-Jul-12	1.32			43.16
	44.48	8-Jan-13	8.54			35.94
	44.48	23-Jul-13	9.43			35.05
	44.48	8-Jan-14	7.72			36.76
	44.48	16-Jul-14	7.03			37.45
MW-64A	48.31	4-Feb-09	9.02			39.29
	48.31	24-Jul-09	9.13			39.18
	48.31	9-Jan-10	6.52			41.79
	48.31	12-Jul-10	6.82			41.49
	48.31	12-Jan-11	4.77			43.54
	48.31	12-Jul-11	8.17			40.14
	48.31	26-Jan-12	4.81			43.5
	48.31	9-Jul-12	5.93			42.38
	48.31	7-Jan-13	7.03			41.28
	48.31	22-Jul-13	8.79			39.52
	48.31	7-Jan-14	8.39			39.92
	48.31	15-Jul-14	7.72			40.59
MW-65D	44.55	5-Feb-09	86.72			-42.17
	44.55	23-Jul-09	86.47			-41.92
	44.55	9-Jan-10	84.39			-39.84
	44.55	12-Jul-10	84.39			-39.84
	44.55	12-Jan-11	83.96			-39.41
	44.55	11-Jul-11	85.81			-41.26
	44.55	27-Jan-12	85.76			-41.21
	44.55	8-Jan-13	85.81			-41.26
	44.55	23-Jul-13	85.83			-41.28
	44.55	8-Jan-14	85.78			-41.23
	44.55	16-Jul-14	84.91			-40.36
MW-66D	46.51	5-Feb-09	86.18			-39.67
	46.51	23-Jul-09	85.82			-39.31
	46.51	9-Jan-10	84.02			-37.51
	46.51	12-Jul-10	84.86			-38.35
	46.51	12-Jan-11	NM			NM
	46.51	11-Jul-11	84.93			-38.42
	46.51	26-Jan-12	84.88			-38.37
	46.51	9-Jul-12	85.02			-38.51
	46.51	8-Jan-13	86.09			-39.58
	46.51	23-Jul-13	86.42			-39.91
	46.51	8-Jan-14	86.09			-39.58
	46.51	16-Jul-14	85.26			-38.75
MW-67B	43.93	12-Jul-10	5.76			38.17
	43.93	13-Jan-11	10.62			33.31
	43.93	11-Jul-11	17.64			26.29
	43.93	27-Jan-12	9.87			34.06
	43.93	10-Jul-12	11.19			32.74
	43.93	8-Jan-13	11.72			32.21
	43.93	23-Jul-13	10.69			33.24
	43.93	8-Jan-14	10.64			33.29
	43.93	16-Jul-14	11.22			32.71
MW-68B	44.63	27-Jan-12	1.16			43.47
	44.63	10-Jul-12	3.82			40.81
	44.63	8-Jan-13	6.76			37.87
	44.63	23-Jul-13	10.33			34.3
	44.63	8-Jan-14	5.82			38.81
	44.63	16-Jul-14	7.41			37.22
MW-68C	44.80	12-Jul-10	16.52			28.28
	44.80	13-Jan-11	16.92			27.88
	44.80	11-Jul-11	19.34			25.46
	44.80	27-Jan-12	17.66			27.14

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
	44.80	10-Jul-12	17.96			26.84
	44.80	8-Jan-13	19.39			25.41
	44.80	23-Jul-13	19.87			24.93
	44.80	8-Jan-14	19.29			25.51
	44.80	16-Jul-14	18.39			26.41
MW-69A	45.71	12-Jul-10	11.81			33.9
	45.71	12-Jan-11	11.16			34.55
	45.71	11-Jul-11	NM			--
	45.71	26-Jan-12	10.44			35.27
	45.71	9-Jul-12	4.21			41.5
	45.71	8-Jan-13	5.31			40.4
	45.71	23-Jul-13	7.34			38.37
	45.71	8-Jan-14	7.02			38.69
	45.71	16-Jul-14	6.34			39.37
MW-70B	44.86	27-Jan-12	6.51	34.26	1.21	38.35
	44.86	10-Jul-12	6.06	34.17	1.30	38.8
	44.86	8-Jan-13	6.67	34.02	1.68	38.19
	44.86	23-Jul-13	8.22	34.07	1.63	36.64
	44.86	8-Jan-14	7.89	35.51	0.14	36.97
	44.86	16-Jul-14	6.16	34.71	0.94	38.70
MW-71B	44.59	27-Jan-12	7.08			37.51
	44.59	10-Jul-12	8.16			36.43
	44.59	8-Jan-13	4.09			40.5
	44.59	23-Jul-13	8.61			35.98
	44.59	8-Jan-14	16.36			28.23
	44.59	16-Jul-14	16.02			28.57
MW-72B	51.97	26-Jan-12	38.76			13.21
	51.97	9-Jul-12	27.27			24.7
	51.97	7-Jan-13	20.08			31.89
	51.97	22-Jul-13	18.39			33.58
	51.97	7-Jan-14	17.31			34.66
	51.97	15-Jul-14	16.91			35.06
MW-73B	51.42	26-Jan-12	25.48			25.94
	51.42	9-Jul-12	25.03			26.39
	51.42	7-Jan-13	26.11			25.31
	51.42	22-Jul-13	26.87			24.55
	51.42	7-Jan-14	26.19			25.23
	51.42	15-Jul-14	25.14			26.28
MW-74B	47.58	26-Jan-12	7.63			39.95
	47.58	9-Jul-12	7.15			40.43
	47.58	8-Jan-13	9.62			37.96
	47.58	23-Jul-13	11.72			35.86
	47.58	8-Jan-14	9.59			37.99
	47.58	16-Jul-14	9.01			38.57
MW-75B	46.78	26-Jan-12	9.07	35.26	1.84	37.71
	46.78	9-Jul-12	9.32	35.2	1.90	37.46
	46.78	8-Jan-13	10.16	34.13	2.97	36.62
	46.78	23-Jul-13	9.74	35.71	1.39	37.04
	46.78	8-Jan-14	10.13	36.72	0.43	36.65
	46.78	16-Jul-14	11.41	35.71	1.44	35.37
MW-76C	47.84	16-Jul-14	22.68			25.16
MW-77A	49.05	16-Jul-14	6.62			42.43
MW-78A	48.68	16-Jul-14	8.02	28.72	1.38	40.66
MW-79A	48.95	16-Jul-14	7.26			41.69
MW-80B	47.11	16-Jul-14	5.29			41.82
MW-81B	46.77	16-Jul-14	6.47			40.30
P-10	47.69	2-Sep-93	6.87			40.85
	47.69	21-Dec-93	3.32			44.4
	47.69	24-Mar-94	3.88			43.84
	47.69	22-Jun-94	4.98			42.74
	47.69	28-Sep-94	6.38			41.34
	47.69	13-Oct-94	7.07			40.65
	47.69	24-Jan-95	2.67			45.05
	47.69	11-Apr-95	2.59			45.13
	47.69	11-Jul-95	4.69			43.03
	47.69	23-Jan-96	5.84			41.88
	47.69	19-Jul-96	10.04			37.68
	47.69	17-Sep-96	8.34			39.38
	47.69	31-Oct-96	6.97			40.75
	47.69	22-Nov-96	8.84			38.88
	47.69	27-Dec-96	6.20			41.52
	47.69	22-Jan-97	4.10			43.62
	47.69	21-Feb-97	2.86			44.86
	47.69	25-Mar-97	3.19			44.53
	47.69	23-Apr-97	4.42			43.3
	47.69	24-Apr-97	4.57			43.15
	47.69	13-May-97	3.14			44.58
	47.69	20-Jun-97	4.94			42.78
	47.69	25-Jun-97	2.74			44.98
	47.69	1-Jul-97	4.13			43.59
	47.69	24-Jul-97	7.91			39.81
	47.69	16-Aug-97	7.86			39.86
	47.69	22-Aug-97	8.67			39.05
	47.69	25-Sep-97	6.54			41.18
	47.69	22-Oct-97	5.36			42.36
	47.69	25-Nov-97	5.36			42.36
	47.69	19-Dec-97	4.72			43
P-10	47.69	20-Jan-98	3.40			44.32

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
	47.69	29-Jan-98	3.11			44.61
	47.69	18-Mar-98	2.84			44.88
	47.69	24-Apr-98	6.80			40.92
	47.69	21-May-98	7.35			40.37
	47.69	30-Jul-98	8.23			39.49
	47.69	25-Aug-98	7.34			40.38
	47.69	21-Sep-98	5.25			42.47
	47.69	26-Oct-98	6.11			41.61
	47.69	23-Nov-98	4.10			43.62
	47.69	26-Feb-99	3.21			44.51
	47.69	16-Mar-99	4.21			43.51
	47.69	29-Apr-99	4.53			43.19
	47.69	1-Jun-99	4.53			43.19
	47.69	30-Jul-99	6.00			41.72
	47.69	27-Aug-99	4.72			43
	47.69	27-Sep-99	9.58			38.14
	47.69	29-Oct-99	10.61			37.11
	47.69	29-Dec-99	11.55			36.17
	47.69	4-Feb-00	13.71			34.01
	47.69	25-Feb-00	10.44			37.28
	47.69	27-Mar-00	7.53			40.19
	47.69	7-Apr-00	7.09			40.63
	47.69	31-May-00	7.14			40.58
	47.69	1-Jun-00	7.11			40.61
	47.69	28-Jul-00	7.15			40.57
	47.69	30-Aug-00	10.15			37.57
	47.69	19-Sep-00	11.56			36.16
	47.69	27-Oct-00	8.66			39.06
	47.69	21-Nov-00	9.64			38.08
	47.69	1-May-01	6.52			41.2
	47.69	1-Oct-01	6.85			40.87
	47.69	11-Mar-02	3.41			44.31
	47.69	23-Sep-02	3.54			44.18
	47.69	10-Mar-03	2.43			45.26
	47.69	23-Sep-03	1.61			46.08
	47.69	15-Mar-04	2.85			44.84
	47.69	13-Sep-04	7.99			39.7
	47.69	18-Jul-05	4.20			43.49
	47.69	4-Jan-06	8.58			39.11
	47.69	27-Jul-06	3.46			44.23
	47.69	23-Jan-07	2.36			45.33
	47.69	7-Mar-07	NM			NM
	47.69	27-Jul-07	3.75			43.94
	47.69	29-Jan-08	2.30			45.39
	47.69	16-Jul-08	6.91			40.78
	47.69	22-Jan-09	6.35			41.34
	47.69	23-Jul-09	NM			NM
	47.69	8-Jan-10	4.06			43.63
	47.69	12-Jul-10	2.06			45.63
	47.73	12-Jan-11	4.13			43.60
	47.73	12-Jul-11	9.84			37.89
	47.73	27-Jan-12	3.12			44.61
	47.73	10-Jul-13	10.79			36.94
	47.73	8-Jan-14	5.51			42.22
P-11	48.98	2-Sep-93	7.87			41.15
	48.98	21-Dec-93	4.57			44.45
	48.98	24-Mar-94	5.04			43.98
	48.98	22-Jun-94	6.19			42.83
	48.98	28-Sep-94	7.40			41.62
	48.98	13-Oct-94	8.14			40.88
	48.98	24-Jan-95	3.90			45.12
	48.98	11-Apr-95	3.77			45.25
	48.98	11-Jul-95	5.69			43.33
	48.98	23-Jan-96	6.81			42.21
	48.98	19-Jul-96	7.81			41.21
	48.98	17-Sep-96	9.15			39.87
	48.98	31-Oct-96	7.52			41.5
	48.98	22-Nov-96	9.46			39.56
	48.98	27-Dec-96	6.64			42.38
	48.98	22-Jan-97	4.70			44.32
	48.98	21-Feb-97	3.88			45.14
	48.98	25-Mar-97	4.09			44.93
	48.98	23-Apr-97	5.27			43.75
	48.98	24-Apr-97	5.41			43.61
	48.98	13-May-97	4.12			44.9
	48.98	20-Jun-97	5.79			43.23
	48.98	25-Jun-97	3.83			45.19
	48.98	1-Jul-97	5.01			44.01
	48.98	24-Jul-97	7.56			41.46
	48.98	16-Aug-97	8.74			40.28
	48.98	22-Aug-97	9.37			39.65
	48.98	25-Sep-97	7.24			41.78
	48.98	22-Oct-97	5.98			43.04
	48.98	25-Nov-97	6.00			43.02

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
P-11	48.98	19-Dec-97	5.52			43.5
	48.98	20-Jan-98	4.30			44.72
	48.98	4-Mar-98	4.08			44.94
	48.98	18-Mar-98	3.92			45.1
	48.98	24-Apr-98	7.61			41.41
	48.98	21-May-98	8.10			40.92
	48.98	30-Jul-98	9.21			39.81
	48.98	25-Aug-98	8.44			40.58
	48.98	21-Sep-98	5.91			43.11
	48.98	26-Oct-98	7.59			41.43
	48.98	23-Nov-98	5.41			43.61
	48.98	29-Jan-99	4.11			44.91
	48.98	26-Feb-99	4.22			44.8
	48.98	16-Mar-99	4.96			44.06
	48.98	29-Apr-99	5.15			43.87
	48.98	1-Jun-99	5.15			43.87
	48.98	30-Jul-99	6.66			42.36
	48.98	27-Aug-99	5.23			43.79
	48.98	27-Sep-99	10.49			38.53
	48.98	29-Oct-99	11.91			37.11
	48.98	29-Dec-99	11.12			37.9
	48.98	4-Feb-00	12.13			36.89
	48.98	25-Feb-00	10.46			38.56
	48.98	27-Mar-00	8.32			40.7
	48.98	7-Apr-00	7.91			41.11
	48.98	31-May-00	7.96			41.06
	48.98	1-Jun-00	7.93			41.09
	48.98	28-Jul-00	7.97			41.05
	48.98	30-Aug-00	10.88			38.14
	48.98	19-Sep-00	12.32			36.7
	48.98	27-Oct-00	10.94			38.08
	48.98	21-Nov-00	9.77			39.25
	48.98	1-May-01	7.48			41.54
	48.98	1-Oct-01	7.74			41.28
	48.98	11-Mar-02	4.51			44.51
	48.98	23-Sep-02	4.46			44.56
	48.98	10-Mar-03	3.69			45.29
	48.98	23-Sep-03	4.54			44.44
	48.98	15-Mar-04	4.51			44.47
	48.98	13-Sep-04	9.14			39.84
	48.98	18-Jul-05	5.27			43.71
	48.98	4-Jan-06	9.56			39.42
	48.98	27-Jul-06	4.54			44.44
	48.98	7-Mar-07	NM			NM
	48.98	27-Jul-07	4.61			44.37
	48.98	30-Jan-08	2.71			46.27
	48.98	15-Jul-08	7.93			41.05
	48.98	4-Feb-09	7.82			41.16
	48.98	24-Jul-09	7.74			41.24
	48.98	8-Jan-10	5.67			43.31
	48.98	12-Jul-10	6.78			42.2
	48.98	12-Jan-11	4.21			44.77
	48.98	12-Jul-11	11.51			37.47
	48.98	26-Jan-12	4.25			44.73
	48.98	7-Jan-13	7.96			41.02
	48.98	22-Jul-13	10.96			38.02
	48.98	7-Jan-14	6.52			42.46
	48.98	16-Jul-14	8.87			40.11
P-12	48.78	2-Sep-93	7.02			41.8
	48.78	21-Dec-93	4.30			44.52
	48.78	24-Mar-94	4.45			44.37
	48.78	22-Jun-94	5.06			43.76
	48.78	28-Sep-94	6.46			42.36
	48.78	13-Oct-94	7.19			41.63
	48.78	24-Jan-95	3.63			45.19
	48.78	11-Apr-95	3.25			45.57
	48.78	11-Jul-95	4.62			44.2
	48.78	23-Jan-96	6.62			42.2
	48.78	19-Jul-96	8.64			40.18
	48.78	17-Sep-96	8.12			40.7
	48.78	31-Oct-96	6.81			42.01
	48.78	22-Nov-96	8.70			40.12
	48.78	27-Dec-96	6.57			42.25
	48.78	22-Jan-97	4.93			43.89
	48.78	21-Feb-97	3.61			45.21
	48.78	25-Mar-97	3.70			45.12
	48.78	23-Apr-97	4.58			44.24
	48.78	24-Apr-97	4.74			44.08
	48.78	13-May-97	3.69			45.13
	48.78	20-Jun-97	4.86			43.96
	48.78	25-Jun-97	3.35			45.47

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
P-12	48.78	1-Jul-97	4.11			44.71
	48.78	24-Jul-97	6.58			42.24
	48.78	16-Aug-97	7.80			41.02
	48.78	22-Aug-97	8.22			40.6
	48.78	25-Sep-97	6.54			42.28
	48.78	22-Oct-97	5.66			43.16
	48.78	25-Nov-97	5.70			43.12
	48.78	19-Dec-97	5.13			43.69
	48.78	20-Jan-98	4.15			44.67
	48.78	4-Mar-98	3.78			45.04
	48.78	18-Mar-98	3.61			45.21
	48.78	24-Apr-98	6.90			41.92
	48.78	21-May-98	7.80			41.02
	48.78	30-Jul-98	8.15			40.67
	48.78	25-Aug-98	8.31			40.51
	48.78	21-Sep-98	5.64			43.18
	48.78	26-Oct-98	7.66			41.16
	48.78	23-Nov-98	5.65			43.17
	48.78	29-Jan-99	4.20			44.62
	48.78	26-Feb-99	4.31			44.51
	48.78	16-Mar-99	4.99			43.83
	48.78	29-Apr-99	5.10			43.72
	48.78	1-Jun-99	5.10			43.72
	48.78	30-Jul-99	6.75			42.07
	48.78	27-Aug-99	5.34			43.48
	48.78	27-Sep-99	9.36			39.46
	48.78	29-Oct-99	10.11			38.71
	48.78	29-Dec-99	9.44			39.38
	48.78	4-Feb-00	12.10			36.72
	48.78	25-Feb-00	8.63			40.19
	48.78	27-Mar-00	7.76			41.06
	48.78	7-Apr-00	7.35			41.47
	48.78	31-May-00	7.39			41.43
	48.78	1-Jun-00	7.34			41.48
	48.78	28-Jul-00	7.37			41.45
	48.78	30-Aug-00	10.66			38.16
	48.78	19-Sep-00	11.45			37.37
	48.78	27-Oct-00	10.94			37.88
	48.78	21-Nov-00	8.93			39.89
	48.78	1-May-01	6.70			42.12
	48.78	1-Oct-01	6.93			41.89
	48.78	11-Mar-02	4.15			44.67
	48.78	23-Sep-02	3.90			44.92
	48.78	10-Mar-03	3.13			45.65
	48.78	23-Sep-03	3.86			44.92
	48.78	15-Mar-04	NM			NM
	48.78	13-Sep-04	7.93			40.85
	48.78	18-Jul-05	5.06			43.72
	48.78	4-Jan-06	8.98			39.8
	48.78	27-Jul-06	4.35			44.43
	48.78	22-Jan-07	3.19			45.59
	48.78	7-Mar-07	NM			NM
	48.78	27-Jul-07	4.22			44.56
	48.78	29-Jan-08	3.03			45.75
	48.78	16-Jul-08	6.78			42
	48.78	22-Jan-09	6.99			41.79
	48.78	24-Jul-09	NM			NM
	48.78	8-Jan-10	4.13			44.65
	48.78	12-Jul-10	3.93			44.85
	48.80	12-Jan-11	4.83			43.97
	48.80	12-Jul-11	10.02			38.78
	48.80	27-Jan-12	4.52			44.28
	48.80	9-Jul-12	5.15			43.65
	48.80	10-Jul-13	9.73			39.07
	48.80	8-Jan-14	6.41			42.39

Table 5D
GROUNDWATER MEASUREMENTS
UPRR Houston Wood Preserving Works

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
TW-01		27-Jul-07	8.45			
		31-Jan-08	8.17			
		23-Jul-09	12.16			
		8-Jan-10	10.03			
		12-Jul-10	NM			
TW-02		27-Jul-07	11.64	10.04[2]	1.57[2]	
		31-Jan-08	10.96	9.81[2]	1.15[2]	
		15-Jul-08	11.42			
		4-Feb-09	12.31			
		24-Jul-09	NM			
		8-Jan-10	NM			
		12-Jul-10	NM			
TW-41B	49.67	4-Feb-09	8.44			41.23
	49.67	24-Jul-09	8.34			41.33
	49.67	8-Jan-10	4.86			44.81
	49.67	12-Jul-10	6.12			43.55
	49.67	12-Jan-11	5.17			44.5
	49.67	12-Jul-11	12.02			37.65
	49.67	26-Jan-12	5.27			44.4
	49.67	9-Jul-12	6.23			43.44
	49.67	7-Jan-13	8.54			41.13
	49.67	22-Jul-13	11.53			38.14
	49.67	7-Jan-14	7.32			42.35
	49.67	16-Jul-14	9.65			40.02
TW-55A	49.67	9-Jul-12	13.44			36.23
TW-56A	51.89	5-Feb-09	17.48			34.41
	51.89	23-Jul-09	17.17			34.72
	51.89	8-Jan-10	14.53			37.36
	51.89	12-Jul-10	15.78			36.11
	51.89	12-Jan-11	14.09			37.8
	51.89	12-Jul-11	17.89			34
	51.89	26-Jan-12	15.06			36.83
	51.89	7-Jan-13	16.92			34.97
	51.89	22-Jul-13	18.12			33.77
	51.89	7-Jan-14	-			-
	51.89	15-Jul-14	16.05			35.84

APPENDIX 2B

SOIL AND GROUNDWATER WELL BORING LOGS
CPT/ROST LOGS

Union Pacific Railroad

Log of Boring: MW-34CR

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/9/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	70
Driller's License:	58141	Northing:	728982.3594
Field Supervisor:	Patrick Ferrell	Easting:	3168226.8542
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	46.9

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			0.0/0.0	NR	(0 - 10) No Recovery, NR, concrete cored and soils removed to 10' by hydrovac to clear for utilities.
10		3.1	10.0/10.0	CL	(10 - 19.9) SILTY CLAY, CL, grey with dark brown and orange mottling between 10.0' to 12.4', orange mottling continues to 16.3', be comes red-brown and grey at 18.0' with few black streaks, carbonate nodules present at 12.5', 16.5', and 19.8', dry, firm to hard with low plasticity, no odors.
		3.3			
15		3			
		4.2			
20		7.8		SP	(19.9 - 27.7) SAND, SP, grey and tan becomes brown below 25.6', medium to fine grained, saturated at 20.0', no visible staining, mild creosote odor between 23.0' to 27.7'.
		15.4	10.0/10.0		
25		21.1			
		20.4		CL	(27.7 - 56.8) SILTY CLAY, CL, red-brown with few black streaks, fractured seams at 29.4' and 29.9', no odor, dry and hard. Fractures seen in dark brown clay at 30.1' with black/dark staining and mild odor, clay becomes grey at 32.8' with orange mottling beginning at 33.7' and increasing with depth to 37.4' where it becomes primarily orange. Some carbonate nodules with black staining at 36.5' to 37.2' and large carbonate nodule clast at 39.2' (8 cm diameter). Orange-red clay with some black streaks continues with mild odor to 46.0' with a visible sheen on carbonate nodules at 43.0'. Slickenslide fractures at 41.9', and 46.4', clay is grey along the fractures, but red-orange above and below fractures, dry, very hard with no plasticity. Carbonate nodule lenses noted at 53.3' to 53.4', 55.4' to 55.5', no staining or odors.
30		14.1			
		16.1	10.0/10.0		
35		15.7			
		15.4			
40		16.4			
		13.2	10.0/10.0		
45		12.4			
		9.1			
50		7.1			
		3.1	10.0/10.0		
55		3.2			
		2.3		CH	(56.8 - 59.4) SANDY CLAY, CH, red-brown and orange, fine grained with no odors or staining, moist, soft with low to medium plasticity.
60		17.4		CL	(59.4 - 60.5) SILTY CLAY, CL, red-brown and orange with few black streaks, no odors, dry, very hard with no plasticity.
		19.3			(60.5 - 64.2) SANDY CLAY, CH, red-brown, trace carbonate nodules at 63.2', sheen visible at 62.4' to 62.7', and 63.7' to 64.0', heavy odor, some thin clay lenses at 63.2' and 63.3', moist and soft with low plasticity.
65		20.1	10.0/10.0	SM	(64.2 - 68.4) SILTY SAND, SM, fine grained, orange-brown with slight creosote odor, but no visible staining, few clasts (2-4 cm diameter at 68.4'), moist.
		14.7		CL	(68.4 - 70) SILTY CLAY, CL, orange-brown, some fine grained sand present, no staining, clay lenses present at 69.1' to 69.6', moist, firm with low plasticity.
70					

PBW

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Tel (512) 671-3434 Fax (512) 671-3446

Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities.
8-inch sonic isolation casing advanced to 30' then removed during grouting.
6-inch sonic casing advanced to 70', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 54.0) Portland/Bentonite Grout
(54.0 - 57.0) Bentonite Pellets
(57.0 - 70.0) 20/40 Silica Sand

Well Materials
(0 - 60.0) Casing, 4" FJT Stainless Steel
(60.0 - 70.0) Screen, 4" FJT Stainless Steel,
0.01 slot

TOC Elevation (ft AMSL)
46.47

Union Pacific Railroad

Log of Boring: MW-51C

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/10/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	80
Driller's License:	58141	Northing:	726934.5814
Field Supervisor:	Patrick Ferrell	Easting:	3166894.3552
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	47.7

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 10) No Recovery, NR, soils removed to 10' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		3.1			(10 - 17.1) SILTY CLAY, CL, grey with trace orange mottling that increases with depth, trace black streaks (no odor), carbonate nodule seam at 14.8' to 15.1', 15.6' to 15.8', dry, firm with low plasticity.
		3	10.0/10.0	CL	
15		2.4			
				SM	(17.1 - 18.3) SILTY SAND, SM, grey with orange and few black streaks, very fine grained, no odor, dry.
		2.7			(18.3 - 36.7) SILTY CLAY, CL, red-brown with grey mottling, carbonate nodules at 18.8'. Becomes grey with orange mottling at 19.3' to 25.9', with carbonate seams at 25.0' to 25.4', 26.1' to 28.0', carbonate gravel is black between 27.4' to 27.8' with no odor. Orange mottling incrases beyond 28.0' with trace small carbonate nodules below 30.0' (no lenses or seams), dry, very hard with no plasticity.
20		1.9			
		1.9	10.0/10.0		
25		1.7			
		1.8			
30		2.1			
		1.8			
35		1.7	10.0/10.0	CL	
		2			(36.7 - 42.4) SILTY CLAY, CL, red-brown with some grey mottling and carbonate seams at 37.9', 38.5', 38.95' and 39.5', dry, very hard with no plasticity.
40		1.3			
		1.5			(42.4 - 45.8) SANDY SILTY CLAY, CL, red-brown, very fine grained, dry to moist, soft with no plasticity.
45		1.4	10.0/10.0		
		1.9			(45.8 - 54.2) SILTY CLAY, CL, red-brown with trace grey mottling, dry, very hard (driller noted that it required >1000 psi to remove sample from core barrel), no plasticity, staining or odors.
50		1.7			
		1.7			
55		1.7	10.0/10.0	SM	(54.2 - 57.9) SILTY SAND, SM, red-brown, fine grained, homogeneous with no odors or staining, wet, very soft, no plasticity.
		1.2		CL	(57.9 - 59.7) SILTY CLAY, CL, red-brown, moist, very hard with no to low plasticitiy, no staining or odors.
60		2.1			(59.7 - 63.7) CLAYEY SAND, SP, red-brown, very fine grained with some cohesives, moist to wet, very soft with low plasticity, no staining or odors.
		1.8			
65		1.6	10.0/10.0	SP	(63.7 - 72.2) SAND, SP, red-brown, medium grained, wet, very soft with no plasticity, thin clayey zones at 69.4' to 69.7', becomes red-brown and tan at 69.8'.
		1.7			
70		1.6			
		1.4			(72.2 - 80) SILTY CLAY, CL, red-brown, becomes red-brown and grey at 74.1', becomes grey with black streaks at 76.2' (no odor), and brown below 77.0', dry, firm to hard with no plasticity.
75		1.6	10.0/10.0	CL	
		1.7			
80					

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities.
8-inch sonic isolation casing advanced to 20' then removed during grouting.
6-inch sonic casing advanced to 72', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 57.0) Portland/Bentonite Grout
(57.0 - 60.0) Bentonite Pellets
(60.0 - 72.0) 20/40 Silica Sand
(72.0 - 80.0) Bentonite Pellets

Well Materials
(0 - 62.0) Casing, 2" FJT Sch 40 PVC
(62.0 - 72.0) Screen, 2" FJT Sch 40 PVC, 0.01 slot

TOC Elevation (ft AMSL)
47.48

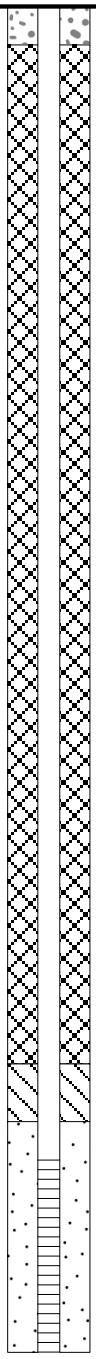
Union Pacific Railroad

Log of Boring: MW-76C

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/7/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	70
Driller's License:	58141	Northing:	727485.1524
Field Supervisor:	Patrick Ferrell	Easting:	3166628.2572
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	48.17

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 10) No Recovery, NR, concrete cored and soils removed to 10' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		3			(10 - 19.4) SILTY CLAY, CL, grey with trace orange mottling, few iron nodules and large (2 to 5 cm diameter) calcareous nodules to 14.6', orange mottling increases after 14.6' and continues to 18.2' where it becomes tan-grey and red with abundant iron nodules between 18.4' to 18.6'.
		2.8			
15			10.0/10.0	CL	
		2.9			
		3.4			
20				SP	(19.4 - 21.1) SAND, SP, tan and red-brown with abundant calcareous nodules between 20.2 and 21.1, wet.
		1.2			(21.1 - 47.2) SILTY CLAY, CL, tan with some orange mottling which increases with depth, becomes red-orange with black streaks at 33.5', carbonate gravel seams between 35.4' to 35.7', moist carbonate gravel seams between 37.3' to 37.7', 38.1' to 38.3', 39.2' to 39'6, and 40.4' to 40.7', dry, very hard with no plasticity.
		1.4			
25			10.0/10.0		
		1.7			
		1.1			
30		3.4			
		3.2		CL	
35			10.0/10.0		
		2.1			
		3			
40		2.2			
		1.9			
45			10.0/10.0		
		1			
		1.2		SP	(47.2 - 48) SAND, SP, medium grained with large cobbles (3 to 6 cm in diameter) at the bottom of interval, dry to moist.
50		1.7			(48 - 54.4) SILTY CLAY, CL, red-brown, with carbonate seam between 49.4' to 49.5', and trace carbonate nodules throughout, dry, very very hard with no plasticity.
		1.4			
55			10.0/10.0	CL	(54.4 - 60.8) SANDY CLAY, CL, red-brown, approximately 35% sand and 65% clay, carbonate seam between 58.2' to 58.4', clay content decreases with depth, moist, soft with low to medium plasticity.
		2.1			
		2.1			
60		1.4			(60.8 - 68) CLAYEY SAND, SP, orange-brown, very fine grained, saturated, trace calcareous nodules between 65.8' to 65.9'.
		0.9			
65			10.0/10.0	SP	
		0.8			
		0.8		CL SP	(68 - 68.2) SILTY CLAY, CL, orange-brown, dry, very hard with no plasticity.
70					(68.2 - 70) SAND, SP, brown-orange, medium grained, very homogeneous, moist.

PBW

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities, approximately 8 to 12 inches of concrete.
8-inch sonic isolation casing advanced to 25' then removed during grouting.
6-inch sonic casing advanced to 70', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 55.0) Portland/Bentonite Grout
(55.0 - 58.0) Bentonite Pellets
(58.0 - 70.0) 20/40 Silica Sand

Well Materials
(0 - 60.0) Casing, 2" FJT Sch 40 PVC
(60.0 - 70.0) Screen, 2" FJT Sch 40 PVC,
0.01 slot

TOC Elevation (ft AMSL)
47.84

Union Pacific Railroad

Log of Boring: MW-77A

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/7/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	25
Driller's License:	58141	Northing:	727671.8914
Field Supervisor:	Patrick Ferrell	Easting:	3166981.4842
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	49.41

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 10) No Recovery, NR, concrete cored and soils removed to 10' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		3.2	10.0/10.0	CL	(10 - 16.4) SILTY CLAY, CL, grey with orange mottling, becomes grey-green at 13.3' with abundant black and some calcareous nodules between 10.5' and 13.3', calcareous nodules are abundant between 10.5' to 10.7' and 11.5' to 12.4', no odor, dry, firm with medium plasticity.
		2.9			
15		2.6			
		13.2		SW	(16.4 - 22.1) SAND, SW, grey with trace black staining and mild odor, grades from a finer grained to a medium grained sand with depth, becomes wet at 18.6'.
20		6.8	5.0/5.0		
		3.7		CL	(22.1 - 25) SILTY CLAY, CL, grewy with orange-brown mottling, no visible staining or odors present, dry, very hard with no plasticity.
25					

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities, approximately 8 to 12 inches of concrete.
6-inch sonic casing advanced to 25', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 9.0) Portland/Bentonite Grout
(9.0 - 11.0) Bentonite Pellets
(11.0 - 23.0) 20/40 Silica Sand
(23.0 - 25.0) Bentonite Pellets

Well Materials
(0 - 13.0) Casing, 4" FJT Sch 40 PVC
(13.0 - 23.0) Screen, 4" FJT Sch 40 PVC,
0.01 slot

TOC Elevation (ft AMSL)
49.05

Union Pacific Railroad

Log of Boring: MW-78A

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/6/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	30
Driller's License:	58141	Northing:	727952.5744
Field Supervisor:	Patrick Ferrell	Easting:	3167512.1962
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	48.89

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 8) No Recovery, NR, concrete cored and soils removed to 8' by hydrovac to clear for utilities.
5			2.0/10.0	NR	
10				CL	(8 - 14.8) SILTY CLAY, CL, grey with some orange mottling, creosote mixed with water around the core, no staining in the sample, strong odor, dry, firm with low plasticity.
15			10.0/10.0	SP	(14.8 - 24.9) SAND, SP, grey, medium grained becomes wet at 16.3', with light staining and strong odor beyond 17', saturated with creosote between 22.8' and 23.8', small clayey zone between 23.8' to 24.2'.
20					
25			9.0/10.0	CL	(24.9 - 25.9) SILTY CLAY, CL, grey and red-brown, dry, very hard with no plasticity. (25.9 - 30) SILTY CLAY, CL, grey to brown, creosote staining within fractures and seeping out of pores/matrix, dry, very hard with no plasticity.
30					

PBW

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities, approximately 8 to 12 inches of concrete.
6-inch sonic casing advanced to 25', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 10.0) Portland/Bentonite Grout
(10.0 - 13.0) Bentonite Pellets
(13.0 - 25.0) 20/40 Silica Sand
(25.0 - 30.0) Bentonite Pellets

Well Materials
(0 - 15.0) Casing, 4" FJT Sch 40 PVC
(15.0 - 25.0) Screen, 4" FJT Sch 40 PVC,
0.01 slot

TOC Elevation (ft AMSL)
48.677

Union Pacific Railroad

Log of Boring: MW-79A

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/7/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	30
Driller's License:	58141	Northing:	728237.1364
Field Supervisor:	Patrick Ferrell	Easting:	3167665.8862
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	49.34

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 9.8) No Recovery, NR, concrete cored and soils removed to 9.8' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		501	10.0/10.0	CL	(9.8 - 15.6) SILTY CLAY, CL, grey with orange mottling, dry, hard with no plasticity, calcareous nodules between 10.7' to 11.0' with creosote staining in fracture seams and strong odor.
		803			
15		758		SP	(15.6 - 27.3) SAND, SP, medium grained, grey with creosote staining throughout, heavy staining begins at 19.0' and becomes saturated with creosote at 22.0' to 27.0', very strong odor, wet.
		346			
20		287	10.0/10.0		
		146			
25		58			
		51		CL	(27.3 - 30) SILTY CLAY, CL, red-brown between 27.3' to 27.9', then becomes grey to 28.2' and grey with tan-brown below 28.2', some staining in fractures with a strong creosote odor, dry.
30					

PBW

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities, approximately 8 to 12 inches of concrete.
6-inch sonic casing advanced to 27', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 12.0) Portland/Bentonite Grout
(12.0 - 14.0) Bentonite Pellets
(14.0 - 27.0) 20/40 Silica Sand
(27.0-30.0) Bentonite Pellets

Well Materials
(0 - 17.0) Casing, 4" FJT Sch 40 PVC
(17.0 - 27.0) Screen, 4" FJT Sch 40 PVC,
0.01 slot

TOC Elevation (ft AMSL)
48.946

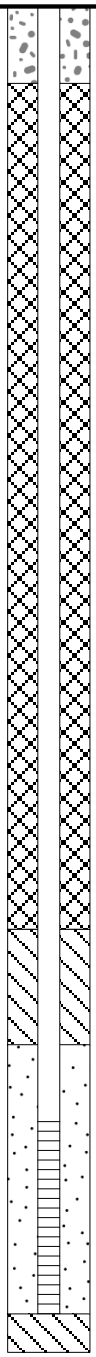
Union Pacific Railroad

Log of Boring: MW-80B

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/8/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	35
Driller's License:	58141	Northing:	727906.7414
Field Supervisor:	Patrick Ferrell	Easting:	3168200.8792
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	47.24

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 10) No Recovery, NR, concrete cored and soils removed to 10' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		8.6	9.0/10.0	CL	(10 - 18.5) SILTY CLAY, CL, grey with trace, small calcareous nodules, trace orange and dark grey mottling between 16.4' to 18.2', dry and firm.
		6.4			
15		5.8			
		3.1			
20		3.2		SP	(18.5 - 23.7) SAND, SP, grey, medium grained, with some orange and brown streaks between 18.5' and 19.1', clay content increases near 22.2' with few calcareous nodules, moist to wet, firm to soft.
		4.1	9.0/10.0	CL	(23.7 - 30.2) SILTY CLAY, CL, grey, becomes red-brown and grey at 24.3' with a wet small sand lense between 25.6' to 25.9', dry and firm.
25		2.9			
		2.3			
30		2.3	5.0/5.0		(30.2 - 35) SILTY CLAY, CL, red-brown with black and grery streaks, carbonate gravel seams between 30.6' to 30.9', 31.1' to 31.3', 31.4' to 31.8', 33.0' to 33.4', and 33.8' to 34.4'.
		2.1			
35					

PBW

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities, approximately 8 to 12 inches of concrete.
8-inch sonic isolation casing advanced to 25' then removed during grouting.
6-inch sonic casing advanced to 34', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 24.0) Portland/Bentonite Grout
(24.0 - 27.0) Bentonite Pellets
(27.0 - 34.0) 20/40 Silica Sand
(34.0 - 35.0) Bentonite Pellets

Well Materials
(0 - 29.0) Casing, 2" FJT Stainless Steel
(29.0 - 34.0) Screen, 2" FJT Stainless Steel, 0.01 slot

TOC Elevation (ft AMSL)
47.107

Union Pacific Railroad

Log of Boring: MW-81B

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	5/11/2014	Drilling Method:	Roto Sonic
Drilling Company:	Walker-Hill	Borehole Diameter (in.):	10
Driller:	Tim Beach	Total Depth (ft):	40
Driller's License:	58141	Northing:	727291.7534
Field Supervisor:	Patrick Ferrell	Easting:	3167925.9062
Sampling Method:	4"x10' Barrel	Ground Elev. (ft AMSL):	47.05

Depth (ft)	Well Materials	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0					(0 - 10) No Recovery, NR, soils removed to 10' by hydrovac to clear for utilities.
5			0.0/0.0	NR	
10		2			(10 - 16.1) SILTY CLAY, CL, grey with some orange mottling which increases with depth, some black streaks, calcareous gravel at 12.2' to 12.4', and 14.6' to 14.9', dry, firm with no plasticity.
		1.8		CL	
15		2.3	8.5/10.0		(16.1 - 17.5) SANDY CLAY, CL, grey with orange mottling, dry to moist, soft with low to no plasticity.
		2.1		SP	(17.5 - 18.5) SAND, SP, grey, medium grained, with some black and dark grey streaks, no odor, moist.
20				NR	(18.5 - 21) No Recovery, NR, likely sand.
		1.4		SP	(21 - 23.2) SAND, SP, grey, medium grained, with some black and dark grey streaks, no odor, moist.
		1.7			(23.2 - 29.8) SILTY CLAY, CL, grey with orange mottling, becomes red-brown at 28.8' with grey calcareous seams at 29.6', dry, very very hard with no plasticity.
25		2.4	9.0/10.0		
		2.1			
30		1.2		CL	(29.8 - 33.6) SANDY SILTY CLAY, CL, grey-brown with some orange mottled zones, carbonate gravel zones at 31.2' and 32.6', moist, soft with low plasticity.
		1.3			(33.6 - 40) SILTY CLAY, CL, grey and red-brown, very tight, carbonate seams at 36.6', 36.9', 37.8' and 39.4', dry, very very hard with no plasticity.
35		1.6	8.5/10.0		
		1.2			
40					

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Notes:
Top 10 feet drilled out (DO) with a hydrovac to clear for utilities.
8-inch sonic isolation casing advanced to 25' then removed during grouting.
6-inch sonic casing advanced to 40', then removed during grouting.

Annular Materials
(0.0 - 2.0) Concrete
(2.0 - 24.0) Portland/Bentonite Grout
(24.0 - 27.0) Bentonite Pellets
(27.0 - 34.0) 20/40 Silica Sand
(34.0-40.0) Bentonite Pellets

Well Materials
(0 - 29.0) Casing, 2" FJT Stainless Steel
(29.0 - 34.0) Screen, 2" FJT Stainless Steel,
0.01 slot

TOC Elevation (ft AMSL)
46.766

Union Pacific Railroad

Log of Boring: CPT-01-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/11/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727093
Field Supervisor:	Carolyn Sexton	Easting:	3165988
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	0.5		FILL	FILL, gravel and silt, unconsolidated.
2				
3		4.3/5		SILTY CLAY, CL, dark gray brown, slightly moist, slightly firm.
4	0.5			
5				SILTY CLAY, CL, with SAND, gray, dark gray/orange mottling, carbonate gravels 7.1 to 16.2', increasing sand with depth, slightly moist, firm.
6	0.9			
7		5/5		
8				
9	1.8			
10				
11	2.5		CL	
12				
13		3.7/5		
14	0.9			
15				
16	1.2			CLAY, CL, gray, some oxididation staining, moist, slightly firm. (No recovery from 18.8 to 20'.)
17				
18		3.8/5		
19	1.5			
20				

PBW

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Notes:
Samples collected at 2-5', 10-12.5', and 17.5-20'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-02-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/11/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727176
Field Supervisor:	Carolyn Sexton	Easting:	3166585
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–2	1.3	5.1/5	FILL	FILL, gravel and silt, unconsolidated.
2–5	1.4		CL	SILTY CLAY, CL, dark gray brown, slightly moist, firm.
5–7.5	1.4	4.8/5	CL	SILTY CLAY, CL, with SAND,light gray, wet, soft.
7.5–10	1.6		CL	
10–12.5	3.5	5/5	CL	
12.5–15	11.3		CL	CLAY, CL, gray, red mottling, silt filled root casts.
15–16	2.8	4.3/5	SP	SAND, SP, gray, wet, soft.
16–19.3	2.9		CL	SILTY CLAY, CL, light tan, some orange mottling, slightly moist, firm. (No recovery from 19.3 to 20'.)
19.3–20				

PBW

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Notes:
Samples collected at 2-5' and 12.5-15'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-03-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/11/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727268
Field Supervisor:	Carolyn Sexton	Easting:	3167047
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	2.9		FILL	FILL, dark gray brown, gravel, silt, clay, dry, unconsolidated.
2		5.1/5		
3	6.3		ML	CLAYEY SILT, SM, dark gray brown, slightly moist, firm, low plasticity.
4				
5	3.9		CL	SANDY CLAY, CL,reddish tan, fine grained, moist, soft.
6				
7		4.8/5		SANDY/SILTY CLAY, CL, light gray, abundant carbonate nodules, orange modeling, slightly moist, firm.
8	3.1			
9				
10				
11	2.5			
12		4.7/5		
13	5.2			
14			SC	CLAYEY SAND, SC, gray, fine grained, wet, soft.
15				
16	5.3			
17		5/5		
18	6.2			
19				
20				

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Notes:
Samples collected at 2-5' and 12.5-13.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-04-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/11/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727554
Field Supervisor:	Carolyn Sexton	Easting:	3167957
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	-		CON	CONCRETE.
2			FILL	FILL, gravel base material, unconsolidated.
3	2.6	2.8/5		SILTY CLAY, CL, dark green gray, moist, slightly firm, low plasticity, mottled dark gray brown and orange.
4				
5				
6	1.5			SILTY CLAY, CL, with GRAVEL, dark gray brown, moist, soft, low plasticity, mottled green gray.
7		3/5		
8				
9	-		CL	
10				
11	1.8			SILTY CLAY, CL with SAND, light gray, mloist, slightly moist, firm, low plasticity, orange mottling.
12				
13	1.4	3.4/5		SANDY CLAY, CL, light green gray, very fine grained, moist, slightly firm, medium plasticity clay.
14				
15				
16	1.6			CLAYEY SAND, SC, light gray to green, fine grained, moderately sorted, unconsolidated, wet, soft. (No recovery from 18.6 to 20'.)
17		3.6/5		
18	1.8		SC	
19				
20				

PBW

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Notes:
Samples collected at 2-5' and 10-12.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-05-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/11/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727674
Field Supervisor:	Carolyn Sexton	Easting:	3168198
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1				
2	-	1/5	CON	CONCRETE.
3				
4				
	1.4			SILTY CLAY, CL, dark gray, slightly moist, firm.
5				
	2.1			SILTY CLAY, CL, light gray, abundant carbonate clasts, slightly moist, firm.
6				
7		5/5		
	2.7		CL	
8				
9				
10				
	1.2			SILTY/SANDY CLAY, CL, gray, very fine grained, orange mottling, moist, slightly firm.
11				
12				
		3.2/5		SILTY SAND, SP, with CLAY, tan, fine grained, orange staining, moist, firm. (No recovery from 13.2 to 15'.)
13				
			SP	
14				
15				

PBW

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Notes:
Samples collected at 4-5' and 7.5-10'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-06-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/12/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728014
Field Supervisor:	Carolyn Sexton	Easting:	3168174
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0	-	1.5/5	CON	CONCRETE.
4	6.6		FILL	FILL, gray to dark brown, gravel, silt, clay, glass.
5	0	4.8/5	CL	SILTY CLAY, CL, dark brown to light gray, abundant carbonate clasts, gray green and orange mottling, slightly moist, firm to hard, becomes sandy with depth.
10	0	4.6/5		
14	0		SC	CLAYEY SAND, SC, with SILT, green tan, very fine grained, moist, firm.
16	0	4/5	CL	SAND, SP, green gray, fine grained, wet, unconsolidated. (No recovery from 19 to 20'.)
18	0			
20				

PBW

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Notes:
Samples collected at 3-5', and 13-15'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-07-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/12/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728043
Field Supervisor:	Carolyn Sexton	Easting:	3168045
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	-	2.6/5	CON	CONCRETE.
2				
3	33.8		FILL	FILL, black, gravel base, silt, glass fragements, unconsolidated.
4			SM	SANDY SILT, SM, with CLAY, dark gray, very fine grained, moist, firm, low plasticity.
5				
6	11.6	4.7/5	CL	SANDY CLAY, CL, light gray, fine grained, abundant carbonate gravels and clasts, slighty moist, firm, increasing sand and orange mottling with depth.
7				
8	18.6			
9				
10				
11	12.9	3/5		
12				
13	17.4			SILTY/SANDY CLAY, gray, some pink and green staining, fine grained, moist, slightly firm, low plasticity, no mottling, slight odor.
14				
15				
16	15.3	3.6/5	SP	SAND, SP, light greenish gray, fine to medium grained, subrounded, moderately sorted, wet, unconsolidated, slight odor. (No recovery from 18.6 to 20'.)
17				
18				
19				
20				

PBW

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Notes:
Samples collected at 2-5', and 7.5-10'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-08-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/12/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727834
Field Supervisor:	Carolyn Sexton	Easting:	3167778
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–2	-	2.7/5	CON	CONCRETE.
2–4	143		FILL	FILL, black, pebbles, sand, silt, wood.
4–5			SP	SAND, SP, brown, fine to medium grained, wet, unconsolidated.
5–10	98	5/5	CL	SILTY CLAY, CL, with SAND, dark gray brown to light green gray, tan sand, orange mottling, increasing sand with depth, moist, firm.
10–14	48, 13.2, 62	4.9/5	CL	(continued)
14–15	0		SC	SANDY, SILTY CLAY, SC, green gray, orange mottling.
15–18.5	114	3.5/5	SP	SAND, SP, green gray, fine to medium grained, wet, unconsolidated. (No recovery from 18.5 to 20'.)
18.5–20				

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Notes:
Samples collected at 2.3-5', 5-7.5', and 15-16'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-09-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/12/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727640
Field Supervisor:	Carolyn Sexton	Easting:	3167397
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			CON	CONCRETE.
1	101	4.4/5	FILL	FILL, whitish gray, dark gray brown, and black, gravel, silt, clay, glass and trash.
2				
3				
4	88			
5				
6	6	4.8/5	CL	SANDY/SILTY CLAY, CL, dark gray, carbonate clasts, increasing orange mottling and sand with depth, lighter gray with depth, moist, firm.
7				
8				
9	23			
10				
11	38	4.2/5		
12				
13				
14	25		SC	CLAYEY SAND, SC, green gray, fine grained, mottled orange, moist, firm.
15				
16		3.3/5	SP	SILTY SAND, SP, light brown, wet, very soft no odor. (No recovery from 18.3 to 20'.)
17	23			
18				
19				
20				

PBW

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Notes:
Samples collected at 2-5', 5-7.5', and 15-15.7'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-10-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/15/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728116
Field Supervisor:	Carolyn Sexton	Easting:	3167847
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	-		CON	CONCRETE.
2		3/5	FILL	FILL, black, gravel, sand, glass.
3	133		SP	SAND, SP, tan, coarse grained, moderately sorted, slightly moist, hydrocarbon staining and odor.
4			SM	CLAYEY SILT, SM, with SAND, dark gray brown, moist, soft.
5				
6	1474		CL	SILTY CLAY, CL, green gray, orange red and black mottling, abundant carbonate clasts, hydrocarbon odor and staining throughout.
7		4.7/5		
8				
9	1468			
10				
11	1449			
12				
13		4.6/5		SANDY CLAY, CL, green gray, medium to fine grained, some orange mottling, hydrocarbon staining, moist slightly soft to firm.
14	824			
15			SP	SAND, SP, green gray, fine to medium grained, moist, soft. (No recovery from 14.6 to 15'.)

PBW

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Notes:
Samples collected at 2-5' and 5-7.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-11-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/12/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727835
Field Supervisor:	Carolyn Sexton	Easting:	3167467
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			CON	CONCRETE
1	166			
2		3.6/5	FILL	FILL, black, gravel, white sand, sheen at base.
3				
4	68			
5			CL	SANDY CLAY, CL, dark brown black, fine grained, slightly moist, firm.
6	13.6			
7		5.1/5		SANDY CLAY, CL, with SILT, green gray, abundant carbonate clasts, orange mottling, slightly moist, firm.
8				
9	5.1			
10				
11	14.4			
12		2.8/5		
13				
14	-			
15			SP	SAND, SP, green gray, fine to medium grained, wet, slightly soft. (No recovery from 18.6 to 20'.)
16				
17	1.6	3.6/5		
18				
19				
20				

PBW

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, TX 78664
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Notes:
Samples collected at 1.4-2.5' and 10-12.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-12-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/13/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727698
Field Supervisor:	Carolyn Sexton	Easting:	3167220
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			CON	CONCRETE.
1	0			
2		3.6/5	FILL	FILL, white sand and gravel, black gravel and silt, glass, wet 3.2-3.9, unconsolidated.
3				
4	2		SM	SANDY SILT, SM, with CLAY, hydrocarbon staining and odor to 4.2, moist, soft.
5				
6	0		CL	SILTY CLAY, CL, with SAND, dark gray brown to gray tan, caronate nodule at 4.3, orange mottling, some fine sant at base, moist, firm to hard.
7		4.7/5		
8	0			
9				
10				
11	-			
12		0/5		
13	-			
14				
15				
16	0		SP	SILTY SAND, SP, green gray, some mottling, moist, slightly firm.
17		2.6/5		SAND, green gray, no mottling, moist, soft. (No recovery from 17.6 to 20'.)
18				
19				
20				

PBW

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Notes:
Samples collected at 2-5', 5-7.5', and 15-15.9'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-13-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/13/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727591
Field Supervisor:	Carolyn Sexton	Easting:	3167015
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			CON	CONCRETE.
1	MAX			
2		2.4/5	FILL	FILL, black, gravel, sand, silt, glass, moist, no odor.
3	1023			
4			ML	CLAYEY, SANDY SILT, ML, dark gray brown, slightly moist, slightly firm to hard.
5				SANDY CLAY, CL, green gray, carbonate clasts, orange mottling with depth, slightly moist, firm.
6	68			
7		5.1/5		
8				
9	0			
10			CL	
11	12.4			
12				
13		4.1/5		
14	0			
15				
16	10.8			
17				
18	9.5	3.3/5	SP	SAND, SP, green gray, wet, soft. (No recovery from 18.3 to 20'.)
19				
20				

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Notes:
Samples collected at 1.5-2.5', 5-7.5', and 15-17.2'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-14-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/14/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728000
Field Supervisor:	Carolyn Sexton	Easting:	3167439
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0			CON	CONCRETE.
1	390			
2		3.6/5	FILL	FILL, white gravel and silt to 1.6, black gravel; silt and glass, tarry, strong hydrocarbon odor to 3', wet; whitish gray silt and caly to 4.8, slightly moist, firm; wood debris and strong odor to 5.3, wet, soft.
3				
4	407			
5				
6	423		SC	CLAYEY SAND, SC, with SILT, dark gray, some mottling, slightly moist, firm.
7		5.2/5		
8				
9	210			
10				
11	336		CL	SILTY, SANDY CLAY, CL, light gray, increasing sand with depth, mottled orange, red mottling at base.
12		4.5/5		
13				
14	763			
15				
16	601			
17	3905	2.5/5	SP	SAND, SP, green gray, strong hydrocarbon staining/mottling of brown and tan stains, wet. (No recovery from 17.5 to 20'.)
18				
19				
20				

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Notes:
Samples collected at 1.4-2.5', 12.5-15', and 15-16.4'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-15-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/14/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727886
Field Supervisor:	Carolyn Sexton	Easting:	3167290
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–2	-	3/5	CON	CONCRETE.
2–5	2009		FILL	FILL, black, gravel, silt, glass, sheen at base, wet, unconsolidated.
4–5			SM	SILT, whitish gray, wet, slightly firm.
5–6			SM	SANDY, CLAYEY SILT, SM, black brown, hydrocarbon staining, very moist, soft to slightly firm.
6–10	MAX	5.1/5	CL	SILTY, SANDY CLAY, CL, dark gray to light gray, medium to fine grained sand, carbonate clasts, red and orange mottling, slightly moist, firm.
8–9	1345			
10–13	92.8	3.4/5		
13–14	333			
15–16	88	3.2/5	SC	CLAYEY SAND, SC, with SILT, green gray, fine grianed, some tan mottling, moist, slightly firm.
16–18	58		SP	SAND, SP, gray, fine to medium grained, hydrocarbon staining and strong odor, wet, soft. (No recovery from 18.2 to 20'.)

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Notes:
Samples collected at 2-5', 5-7.5', and 15-16.2'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-16-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/13/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727721
Field Supervisor:	Carolyn Sexton	Easting:	3166906
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	-		CON	CONCRETE.
2		2.1/5		
3	5.8		FILL	FILL, gravel, sand, silt, glass, brick, unconsolidated.
4				
5			SM	SANDY SILT, SM, with CLAY, dark gray brown, fine grained, very moist, soft.
6	2.6		CL	SANDY/SILTY CLAY, CL, dark brown gray to light gray, fine grained, carbonate clasts, mottling and sand increasing with depth and lighter gray, slightly moist, firm, low plasticity.
7		5.1/5		
8				
9	4.8			
10				
11	38.2			
12		4.8/5		
13				
14	21			
15				
16				SANDY CLAY, CL, green gray, some orange staining, increasing sand with depth
17	84	3/5		
18	19.4		SP	SAND, green gray, wet, unconslidated. (No recovery from 18 to 20'.)
19				
20				

PBW

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Notes:
Samples collected at 1.9-5', 10-12.5', and 15-17.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-17-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/15/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728210
Field Supervisor:	Carolyn Sexton	Easting:	3167657
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	-		PAV	ASPHALT.
2				
3		2.7/5		
4	MAX		FILL	FILL, black, gravel, sand, silt, glass, hydrocarbon odor and staining throughout, moist, unconsolidated.
5				WOOD, hydrocarbon odor and staining, wet, soft.
6	MAX		SM	CLAYEY SILT, dark gray brown, moist to wet, soft.
7		3.7/5		
8	MAX			SILTY CLAY, CL, with SAND, green gray, orange mottling, hydrocarbon odor and staining throughout, slightly moist, firm.
9				
10				
11	MAX		CL	
12				
13		5.1/5		
14	MAX			
15			SC	CLAYEY SAND, SC, green gray, light orange mottling, hydrocarbon odor and staining, slightly moist, firm.
	38.6			
16				SAND, SP, green gray, fine to medium grained, very strong hydrocarbon odor and abundant staining, wet, soft. (No recovery from 19 to 20'.)
17				
18	489	4.5/5	SP	
19				
20				

PBW

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Notes:
Samples collected at 2.3-5' and 13-15'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-18-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/14/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728275
Field Supervisor:	Carolyn Sexton	Easting:	3168143
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–1	-	3.3/5	CON	CONCRETE.
1–3	158		FILL	FILL, gravel, sand, silt, glass, unconsolidated.
3–5			SM	SANDY/SILT, SM, with CLAY, black brown, very fine grained, moist, soft, some odor.
5–7	0	4.7/5	CL	SILTY CLAY, CL, with SAND, green gray, very fine grained, abundant carbonate clasts, to 8.4', mottled gray and orange, slightly moist, firm.
7–9	11			
9–11	0			
11–13		4.6/5		
13–14	8.7			SANDY CLAY, CL, gray tan, fine to medium grained, moist, soft, medium plasticity.
14–17	0	3.6/5	SP	SAND, SP, green gray, fine grained, moderately sorted, wet, soft. (No recovery from 18.6 to 20'.)
17–20				

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Notes:
Samples collected at 1.7-5' and 12.5-14.3'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-19-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/14/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728442
Field Supervisor:	Carolyn Sexton	Easting:	3168004
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–2	-	3.1/5	CON	CONCRETE.
2–4	138		FILL	FILL, black, gravel, sand, silt, glass, moist to wet, unconsolidated, hydrocarbon odor and appearance below 3.4'.
4–5			SM	CLAYEY SILT, SM, with SAND, dakr gray, moist, hard.
5–7.5	0	5/5	CL	SILTY, SANDY CLAY, CL, gray, orange and dark gray mottling, increasing sand with depth, moist, slightly firm.
7.5–10	43			
10–12.5	9.3	4.8/5		
12.5–15	37			
15–18.6	30.2	3.6/5	SP	SAND, green gray, fine to medium grained, wet, soft. (No recovery from 18.6 to 20'.)
18.6–20				

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Notes:
Samples collected at 1.9-5' and 7.5-10'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-20-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/14/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	727301
Field Supervisor:	Carolyn Sexton	Easting:	3167511
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	MAX			
2		3.8/5	FILL	FILL, dark gray, gravel, silt, glass, wet, unconsolidated.
3				
4	208			
5				
6	108		SM	SANDY, CLAYEY SILT, SM, dark brown gray, moist, soft.
7		5.1/5		
8				
9	156			
10			CL	SILTY CLAY, CL, with SAND, gray to tan, carbonate clasts at 10.2 - 10.5, orange and red mottling, moist, firm.
11	3.4			
12		4.2/5		
13				
14	24.1			
15				
16	-		SC	SAND, with CLAY, gray, fine to medium grained, wet, soft.
17		4/5		
18	-			
19			CL	SANDY CLAY, white. (No recovery from 19 to 20'.)
20				

PBW

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Notes:
Samples collected at 0-2.5' and 5-7.5'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: CPT-21-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/15/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728379
Field Supervisor:	Carolyn Sexton	Easting:	3167773
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0–2	170	4.2/5	FILL	FILL, gravel, sand, clay, hydrocarbon odor and staining, unconsolidated.
2–5	1666			
4–10	333, 473	5.1/5	CL	CLAYEY SILT, SM, with SAND, dark brown gray, moist, soft, hydrocarbon odor and staining. SANDY/SILTY CLAY, CL, green gray, mottled gray and orange increasing with depth, slightly moist, firm, carbonate nodules locally, 7.6 - 9.6, hydrocarbon staining and odor in fractures at top.
10–15	231, 169	4.5/5		
15–20	-	3.4/5	SP	SAND, SP, green gray, wet, soft, hydrocarbon odor and staining. (No recovery from 18.4 to 20'.)

PBW
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Notes:
Samples collected at 2-5' and 7.5-10'.

Location is adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Union Pacific Railroad

Log of Boring: SB-22-13

UPRR Houston Wood Preserving Works
Houston, TX

PBW Project No. 1358

Completion Date:	2/15/2013	Drilling Method:	Geoprobe
Drilling Company:	Fugro	Borehole Diameter (in.):	3
Driller:	Doug Isenhart	Total Depth (ft):	20
Driller's License:		Northing:	728501
Field Supervisor:	Carolyn Sexton	Easting:	3167891
Sampling Method:	2"x 5' Barrel	Ground Elev. (ft AMSL):	

Depth (ft)	PID (ppm-v)	Recovery (ft/ft)	USCS	Lithologic Description
0				
1	1003			
2		3.9/5	FILL	FILL, black brown, gravel, sand, silt, hydrocarbon odor and staining
3				
4	2103			
5				
6	988			SILTY CLAY, CL, dark gray, carbonate clasts at base, balck and orange mottling, hydrocarbon odor and stianing throughout, moist, slightly firm.
7		4.7/5		
8				
9	3838			SANDY/SILTY CLAY, CL, light green gray, increasing sand with depth, orange and green mottling, hydrocarbon odor and staining, moist, firm.
10			CL	
11	1786			
12		2.6/5		
13				
14	-			
15	387			SANDY CLAY, moist, firm.
16				SAND, green white, fine to medium grained, wet, soft. (No recovery from 18.2 to 20'.)
17	168			
18		3.2/5	SP	
19				
20				

PBW

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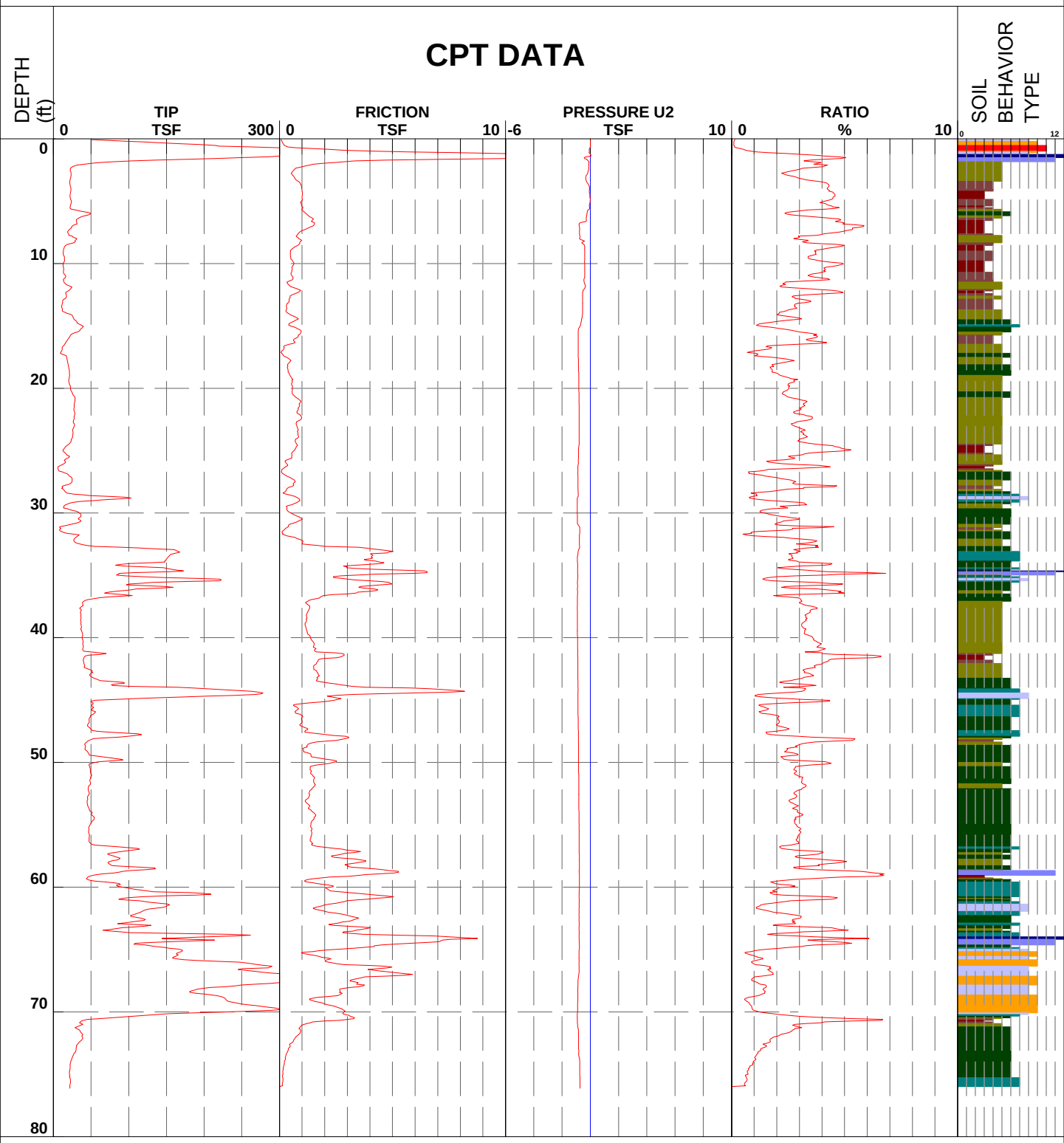
Notes:
Samples collected at 2-5' and 7.5-10'.

Location is NOT adjacent to CPT location.

Borehole plugged with bentonite chips upon completion.

Job Number	04.1913-0008	CPT Number	IM-CPT-01	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	11-Feb-2013 11:34:59	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

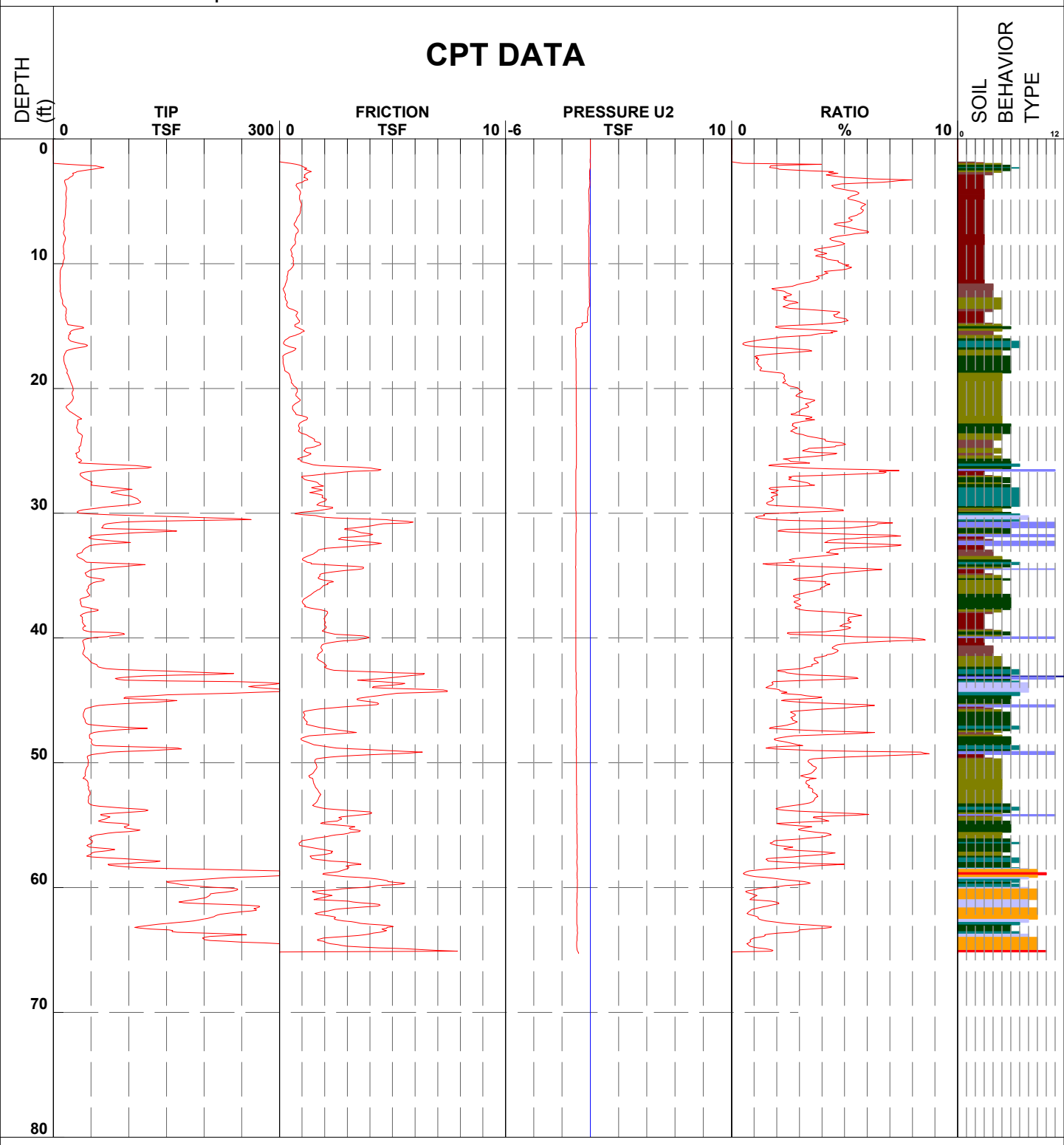


1 - sensitive fine grained	4 - silty clay to clay	7 - silty sand to sandy silt	10 - gravelly sand to sand
2 - organic material	5 - clayey silt to silty clay	8 - sand to silty sand	11 - very stiff fine grained (*)
3 - clay	6 - sandy silt to clayey silt	9 - sand	12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-02	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	11-Feb-2013 12:58:23	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 2'

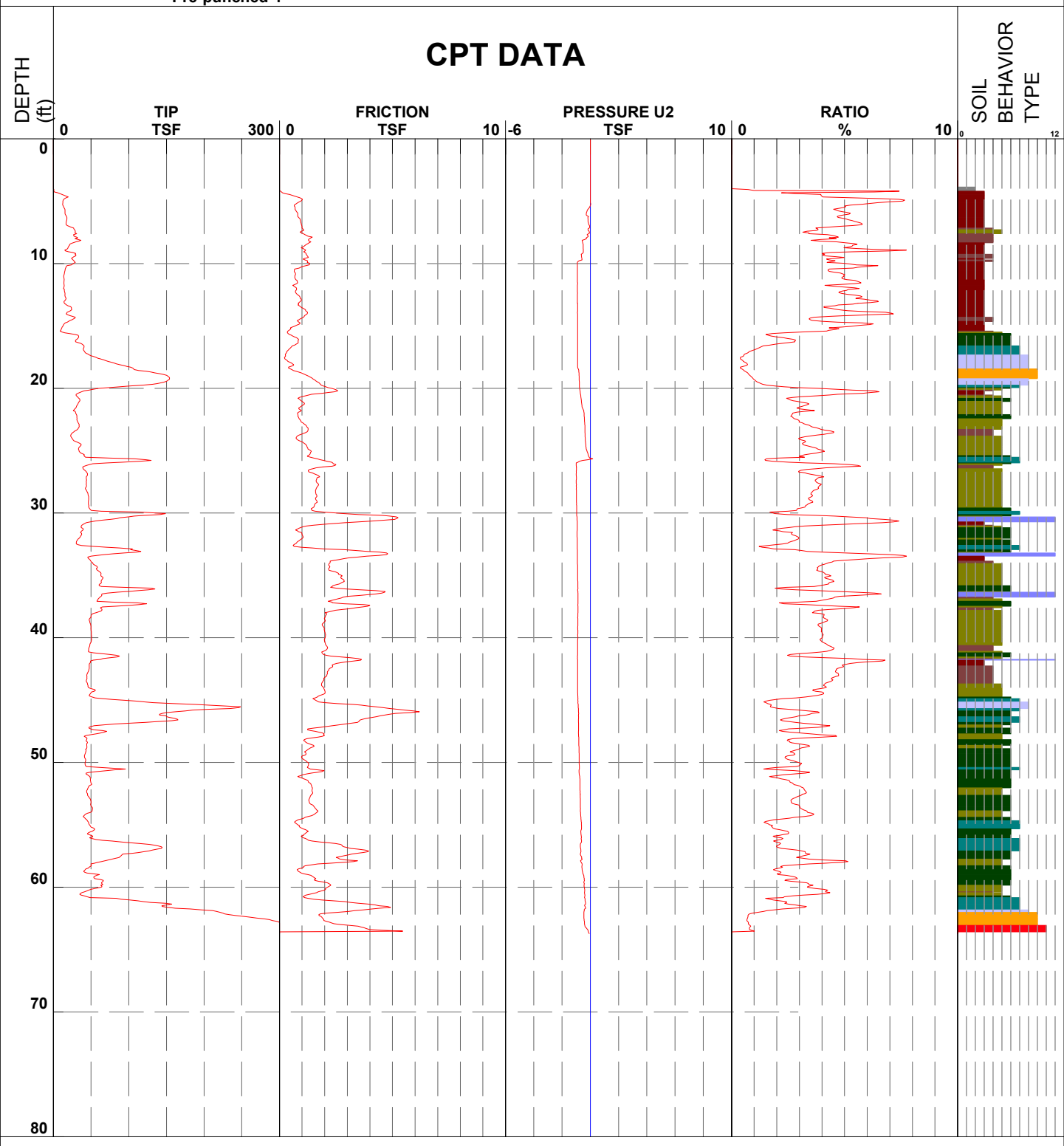


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-03	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	11-Feb-2013 15:03:13	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 4'

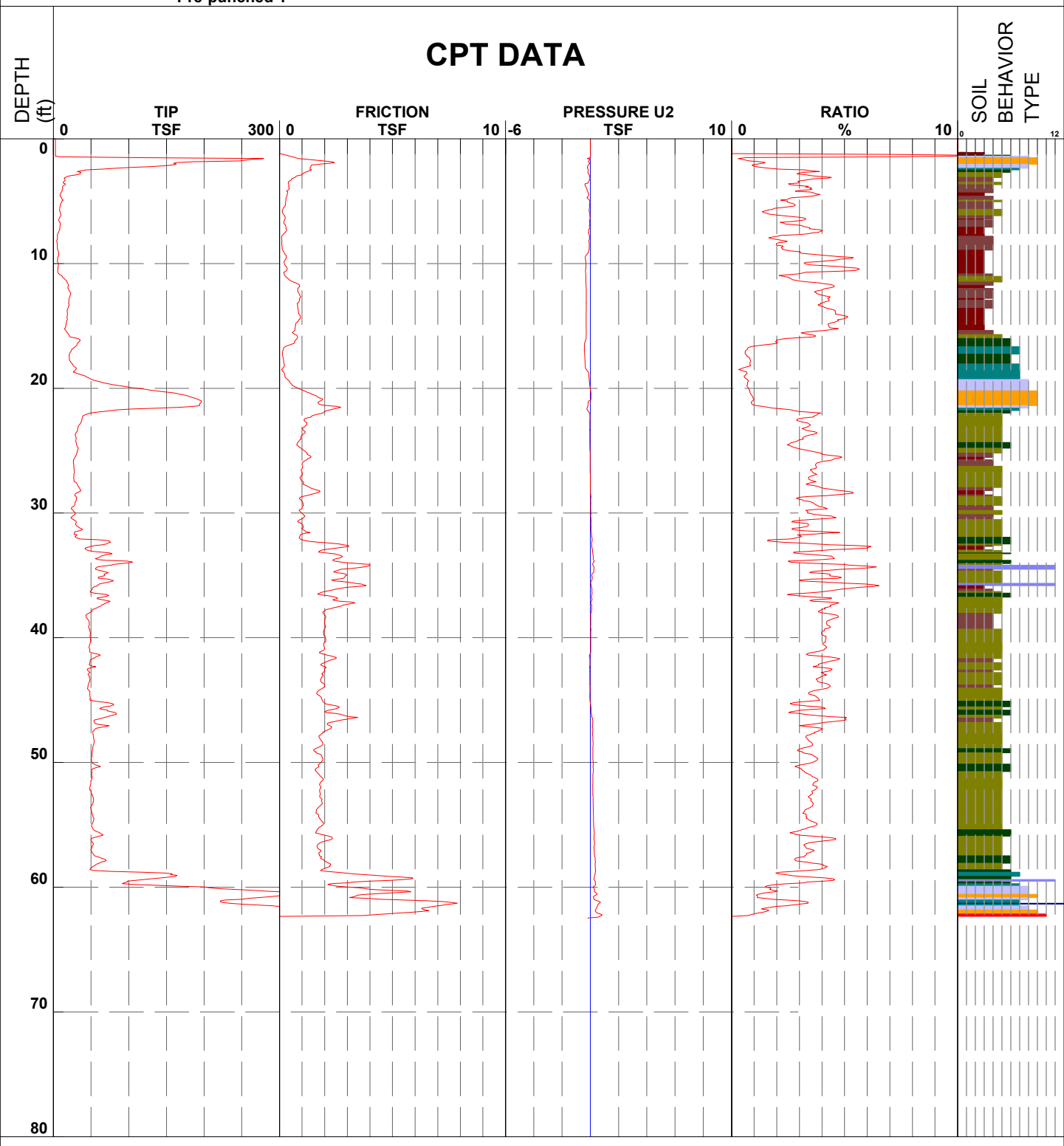


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-04	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	11-Feb-2013 16:30:19	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1'

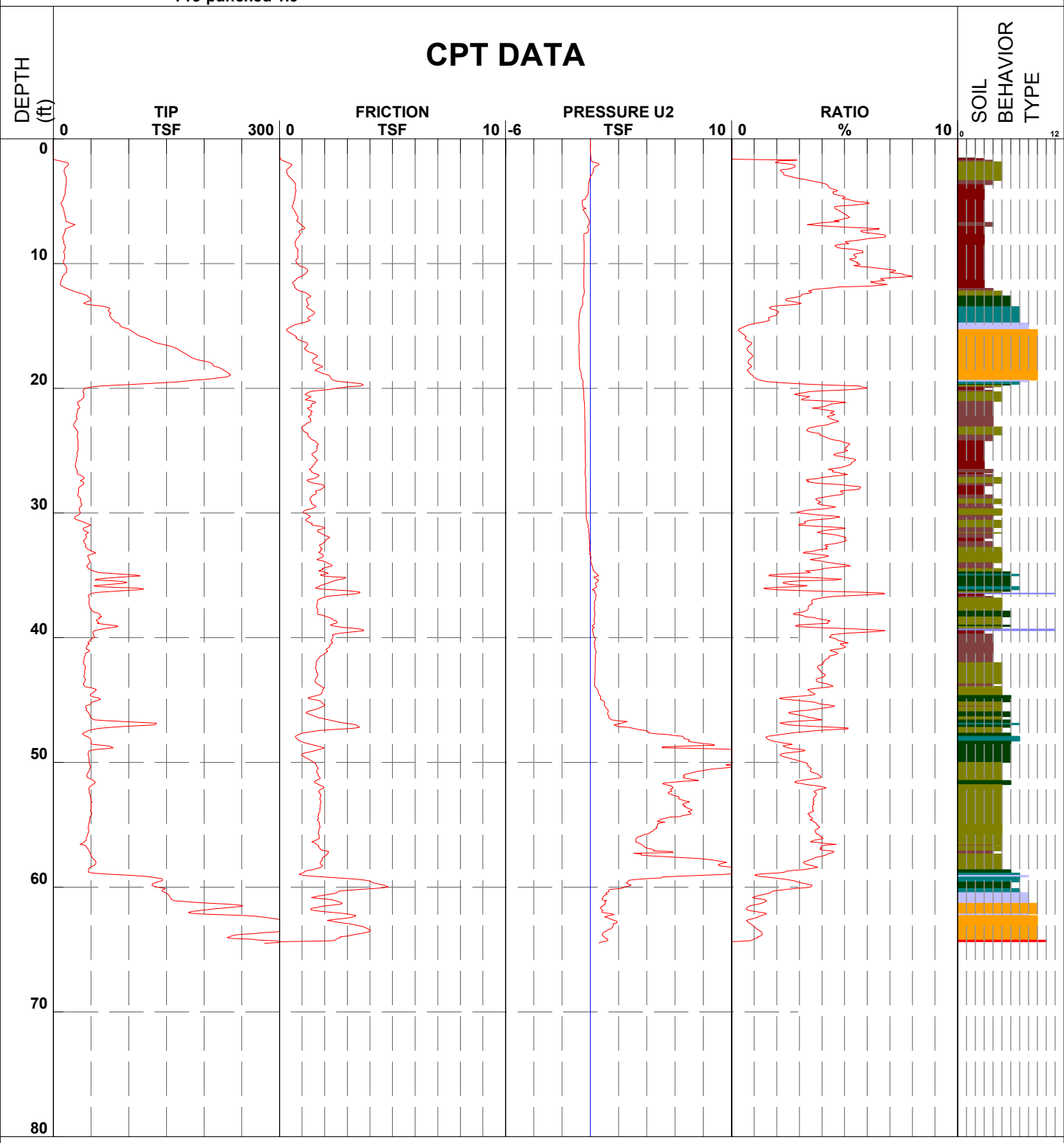


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-05	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	14-Feb-2013 13:47:25	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.5'

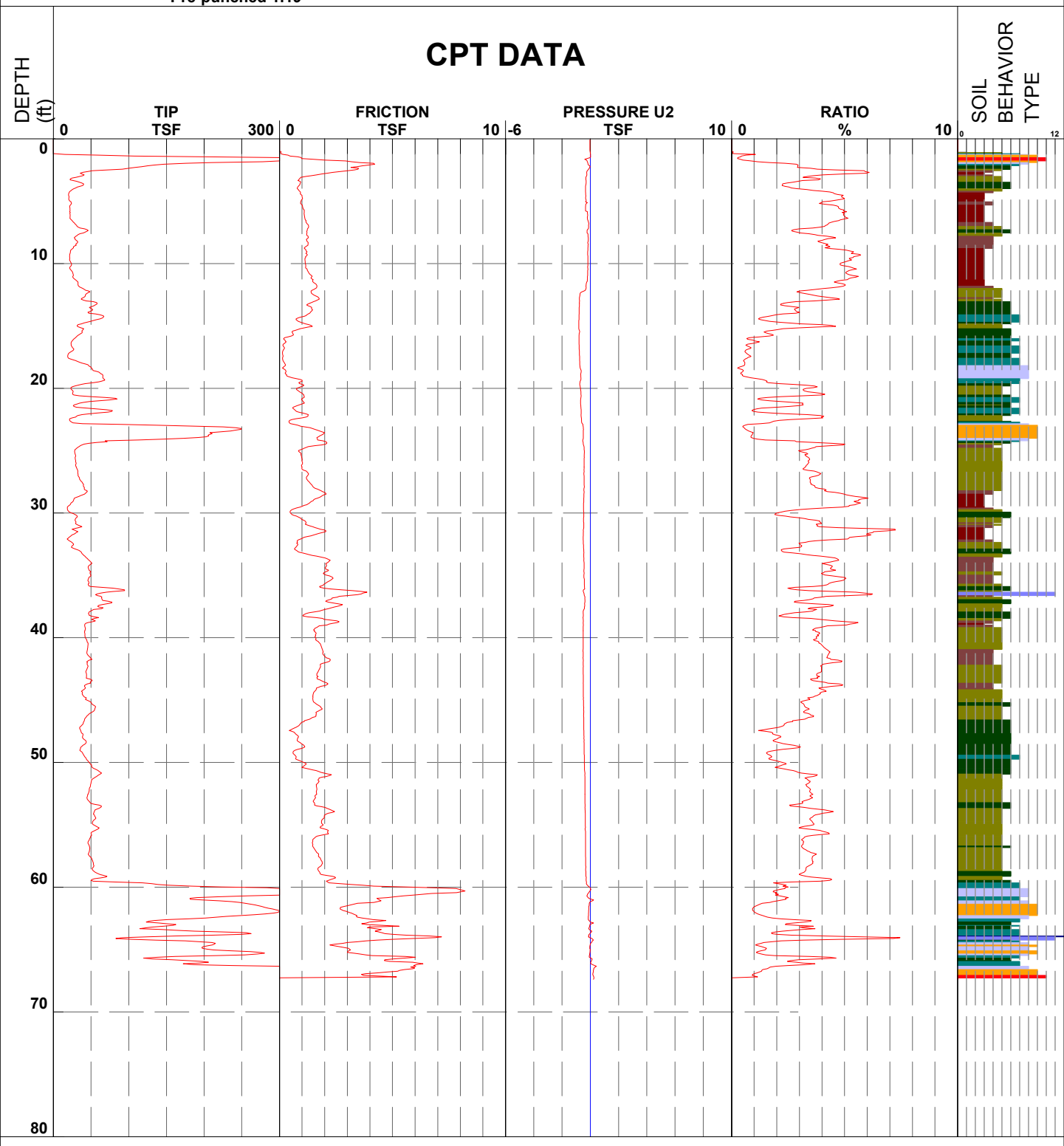


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-06	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	14-Feb-2013 12:00:22	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.19'

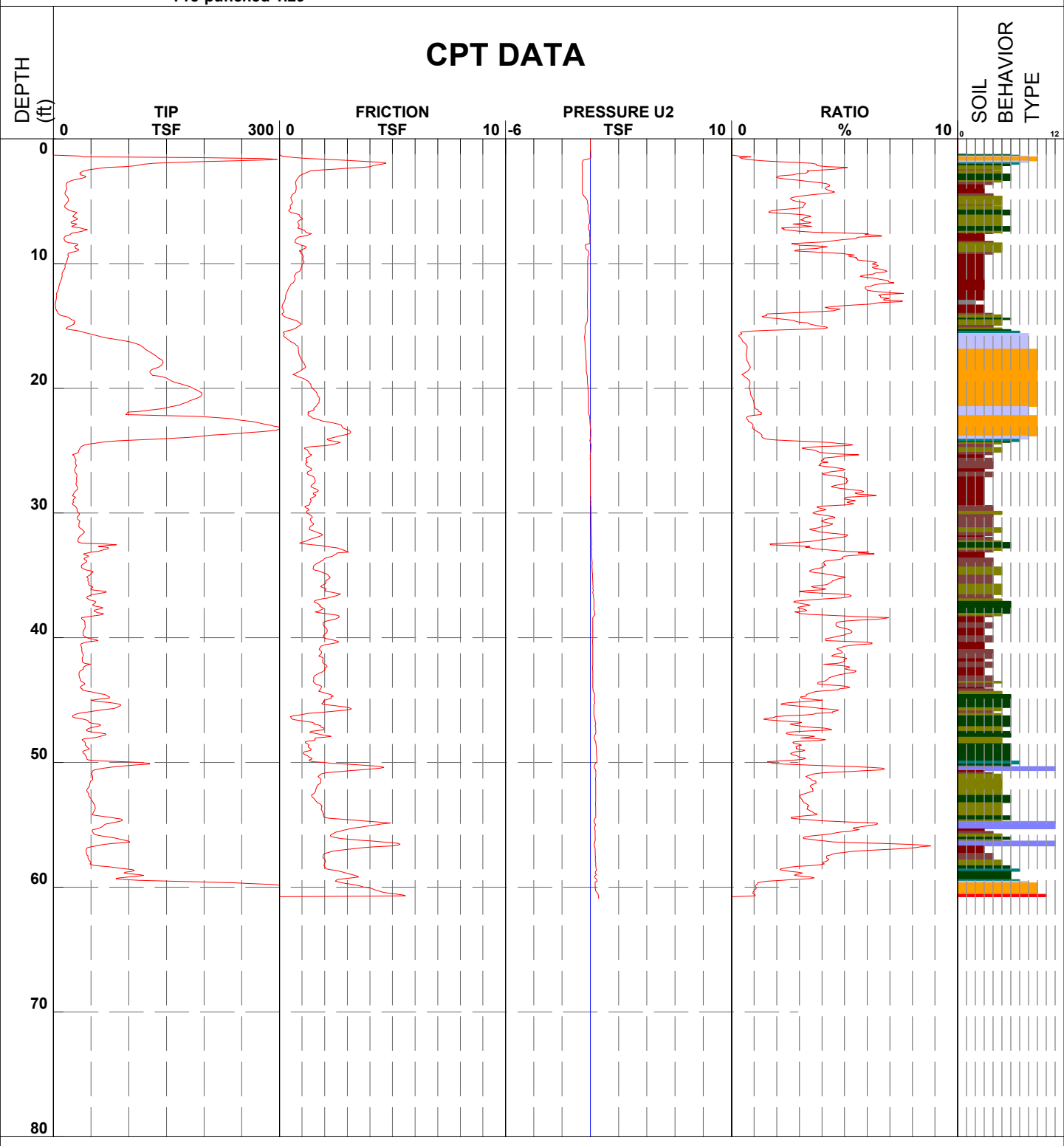


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-07	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 09:00:27	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.29'

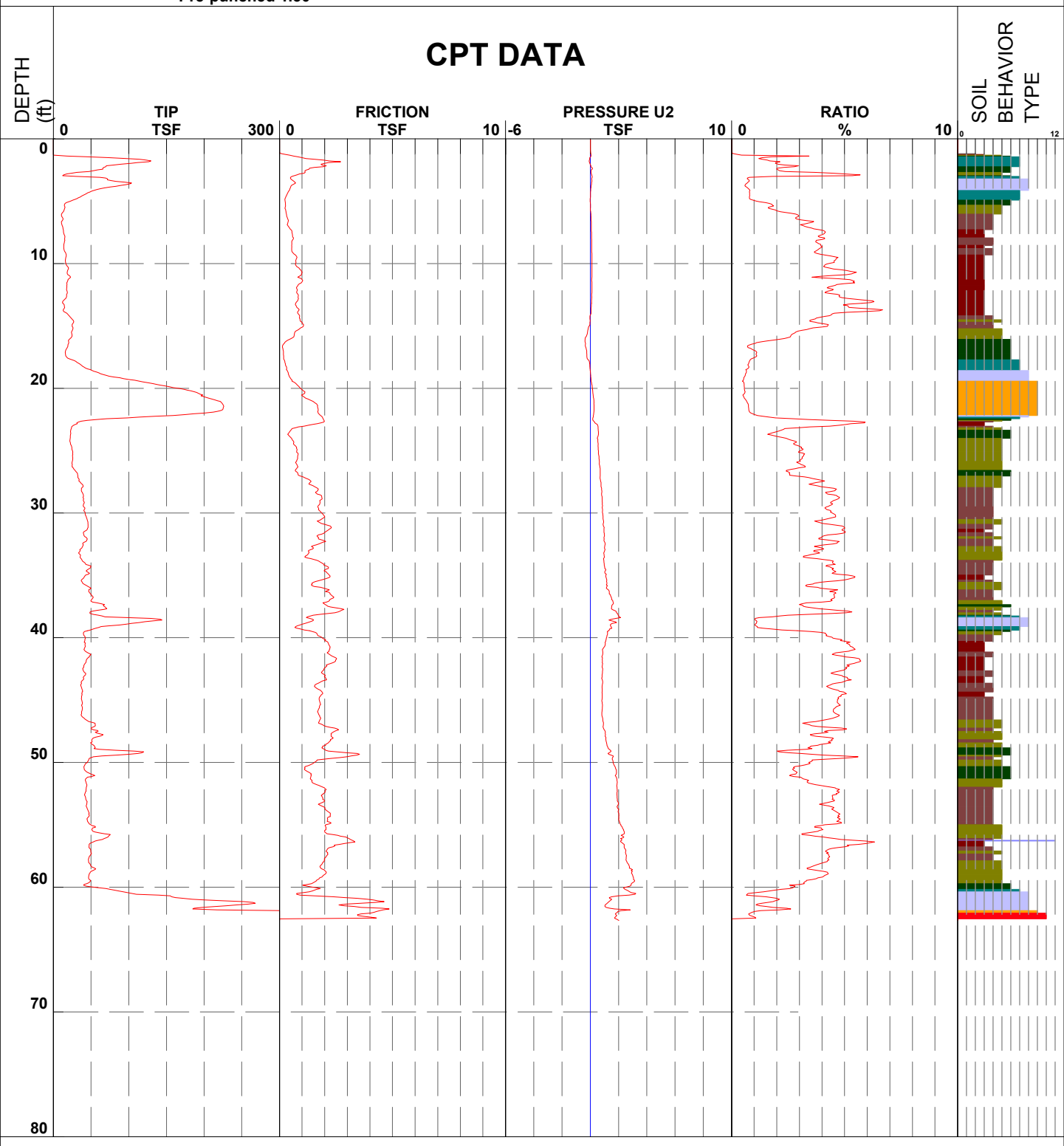


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-08	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 11:58:50	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.30'

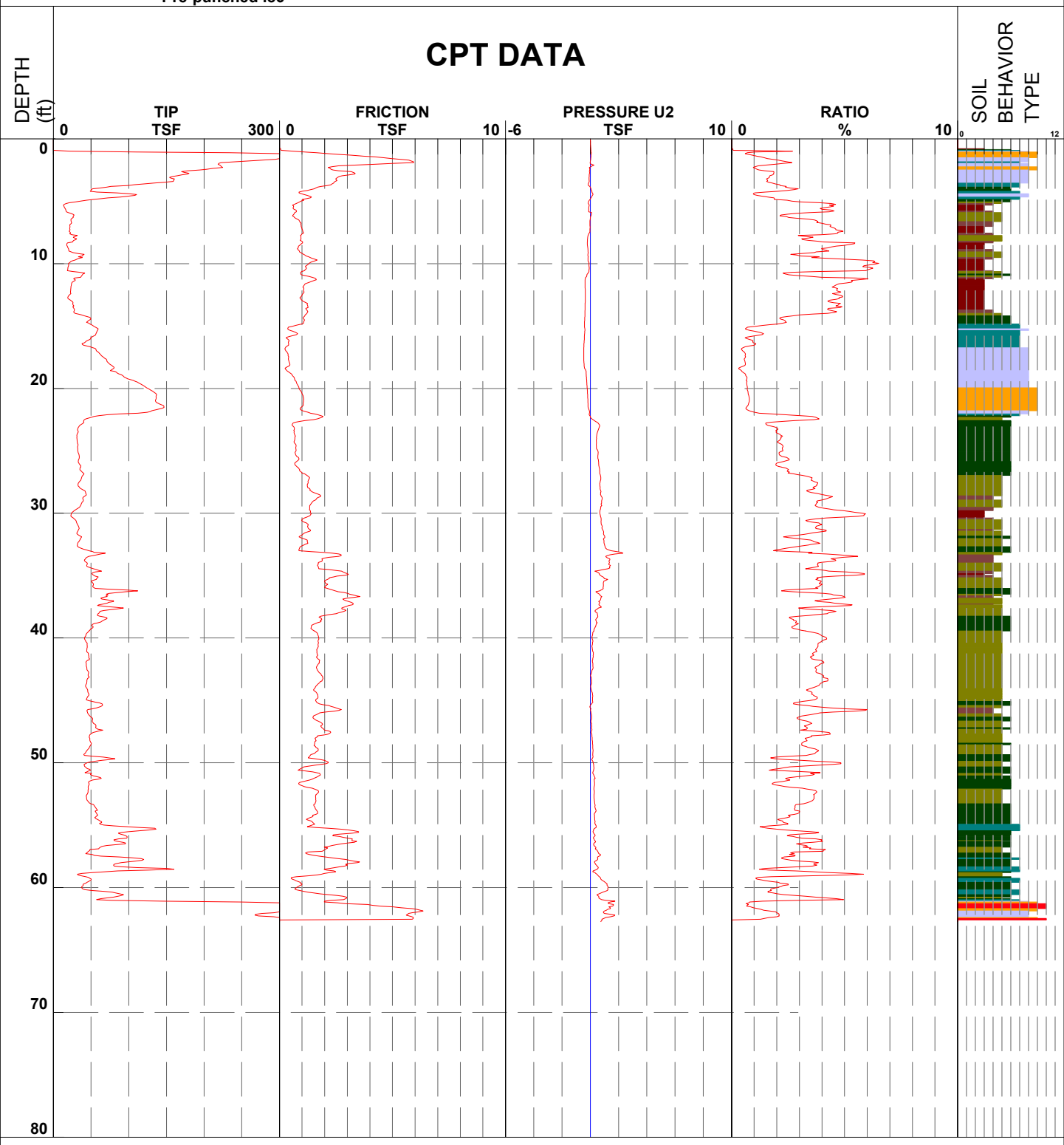


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-09	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 10:32:30	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched .86

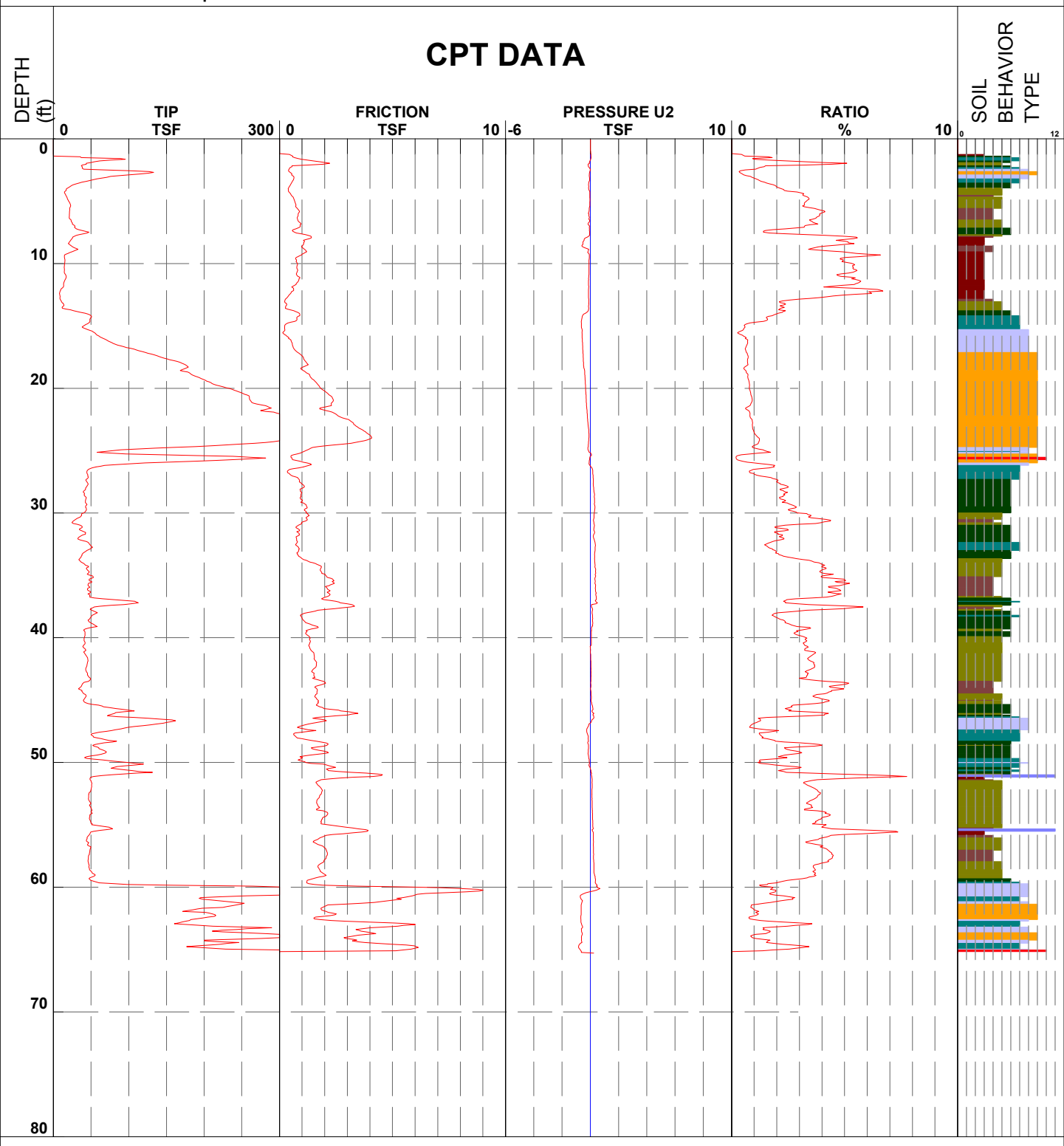


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-10	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	13-Feb-2013 09:31:49	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.37'



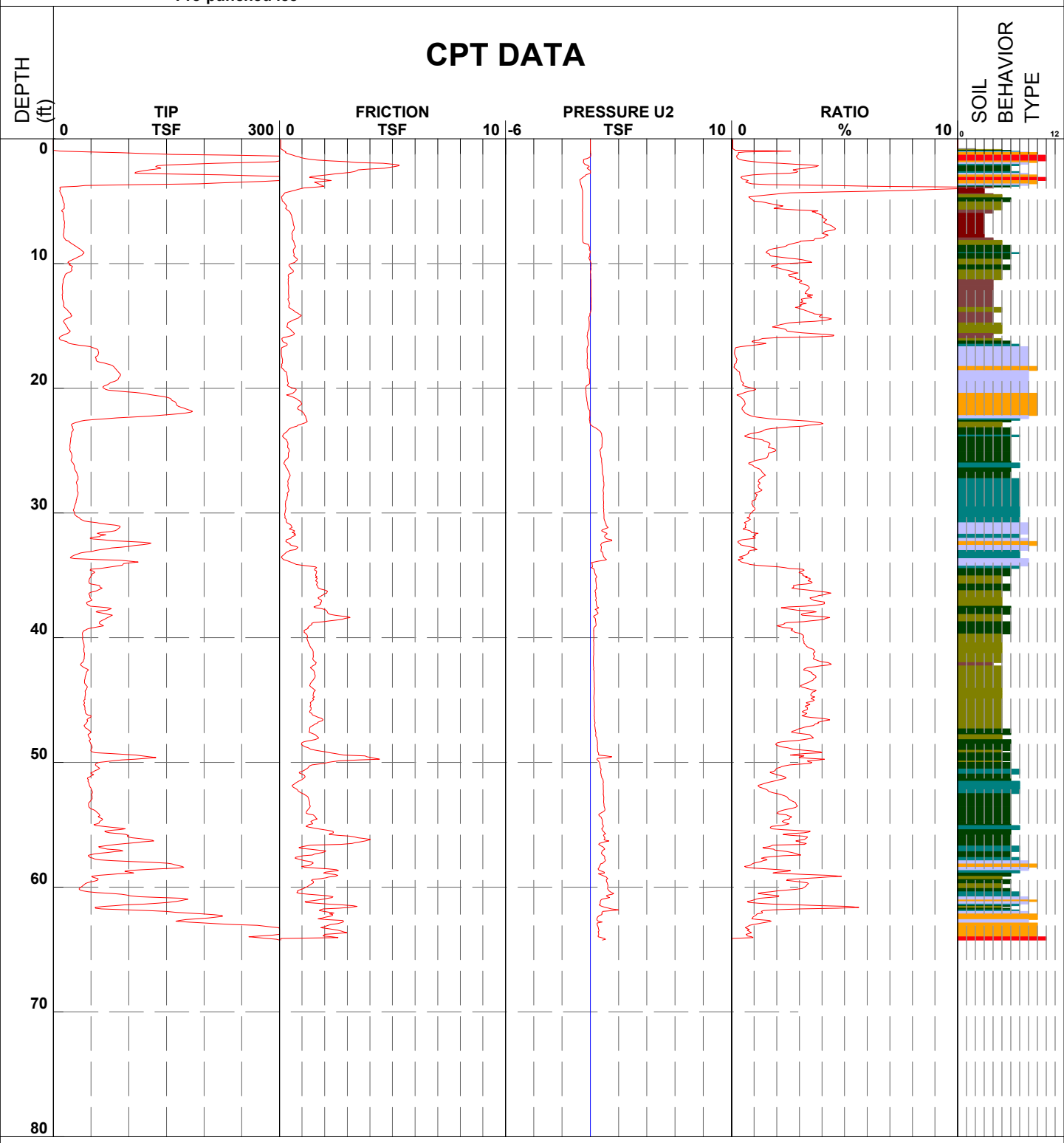
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-11	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 13:38:38	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched .88

CPT DATA

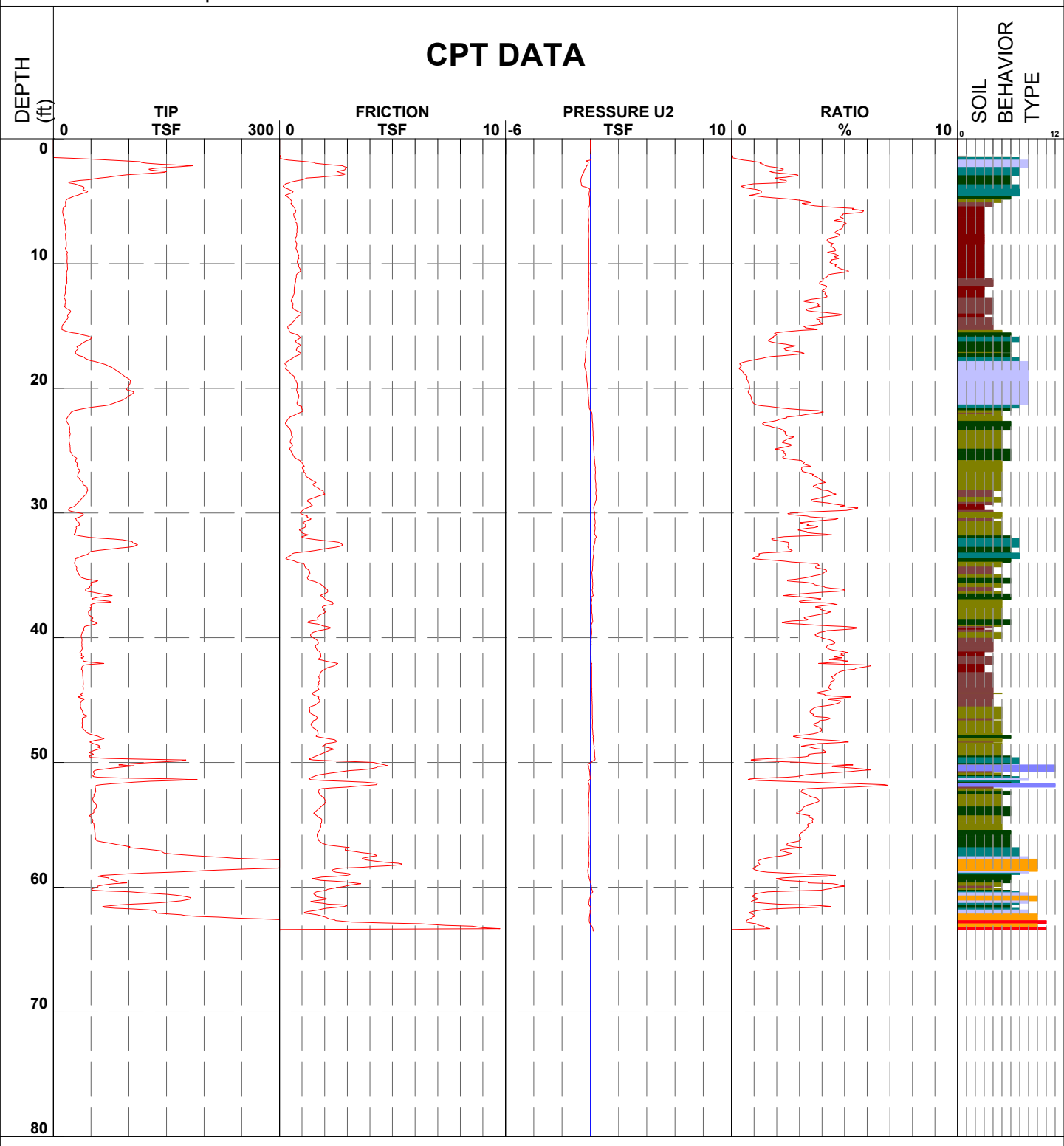


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-12	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 15:06:08	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.45'

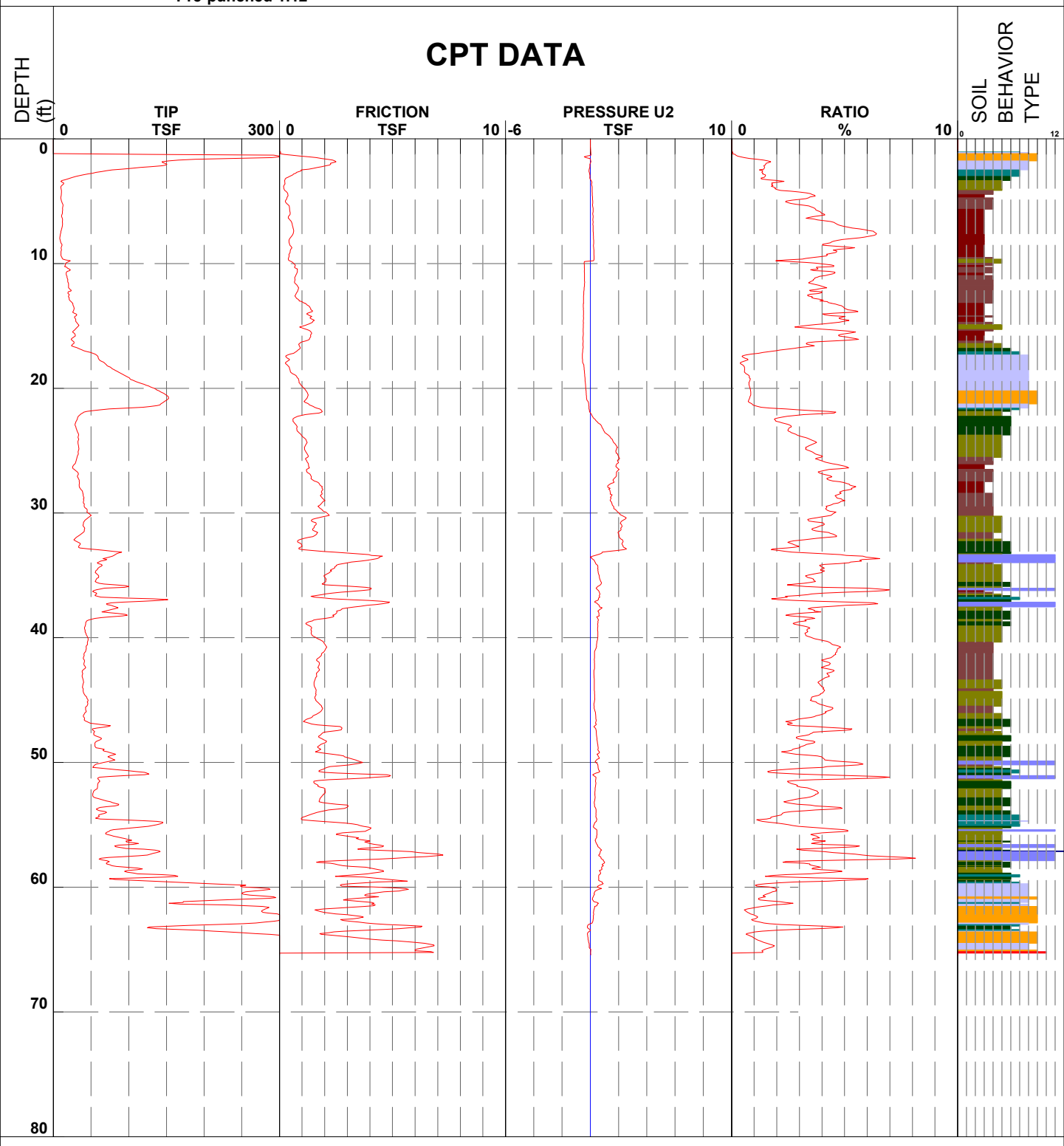


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-13	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	12-Feb-2013 16:24:43	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.12'

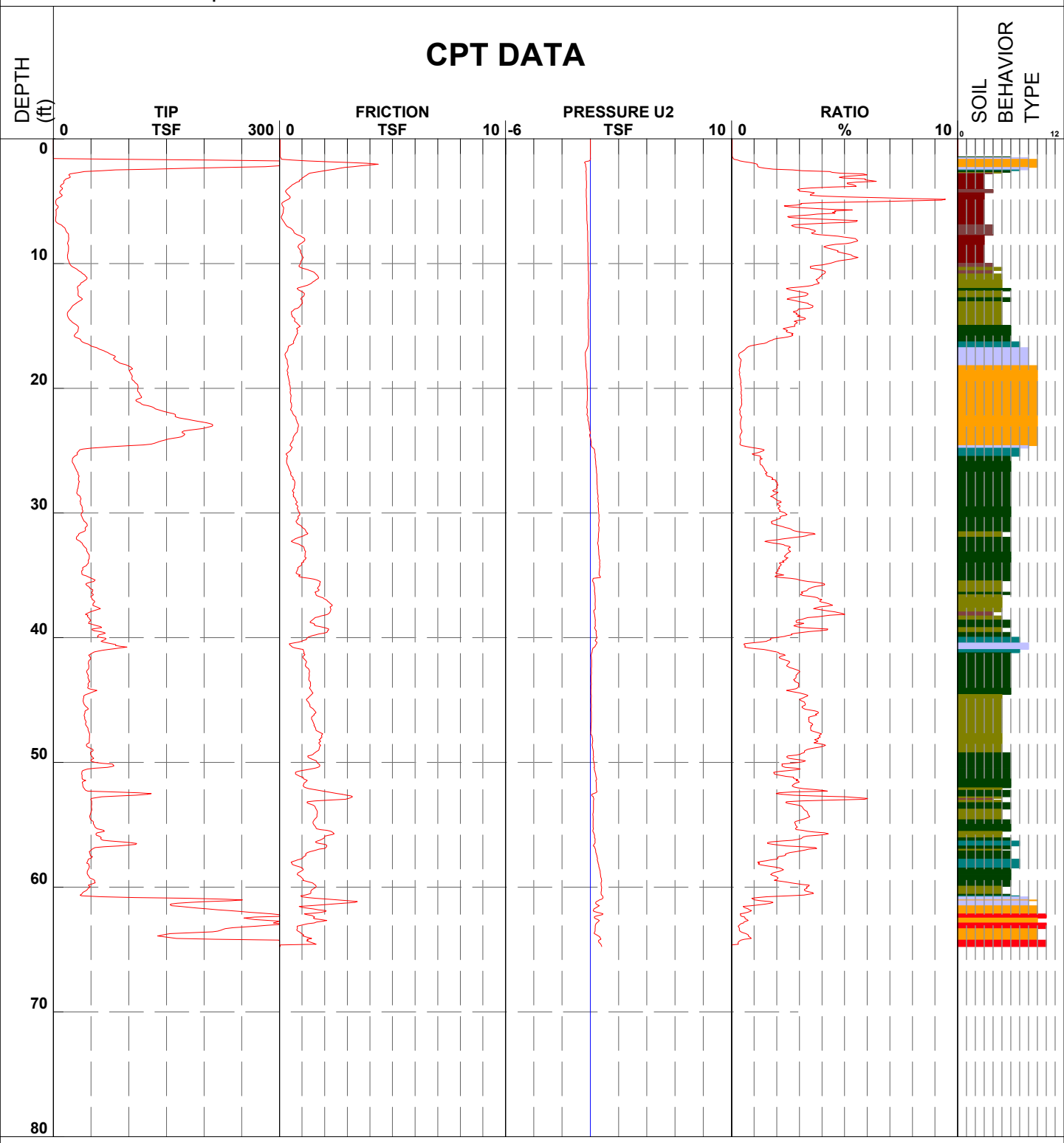


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-14	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	13-Feb-2013 10:50:24	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.54'

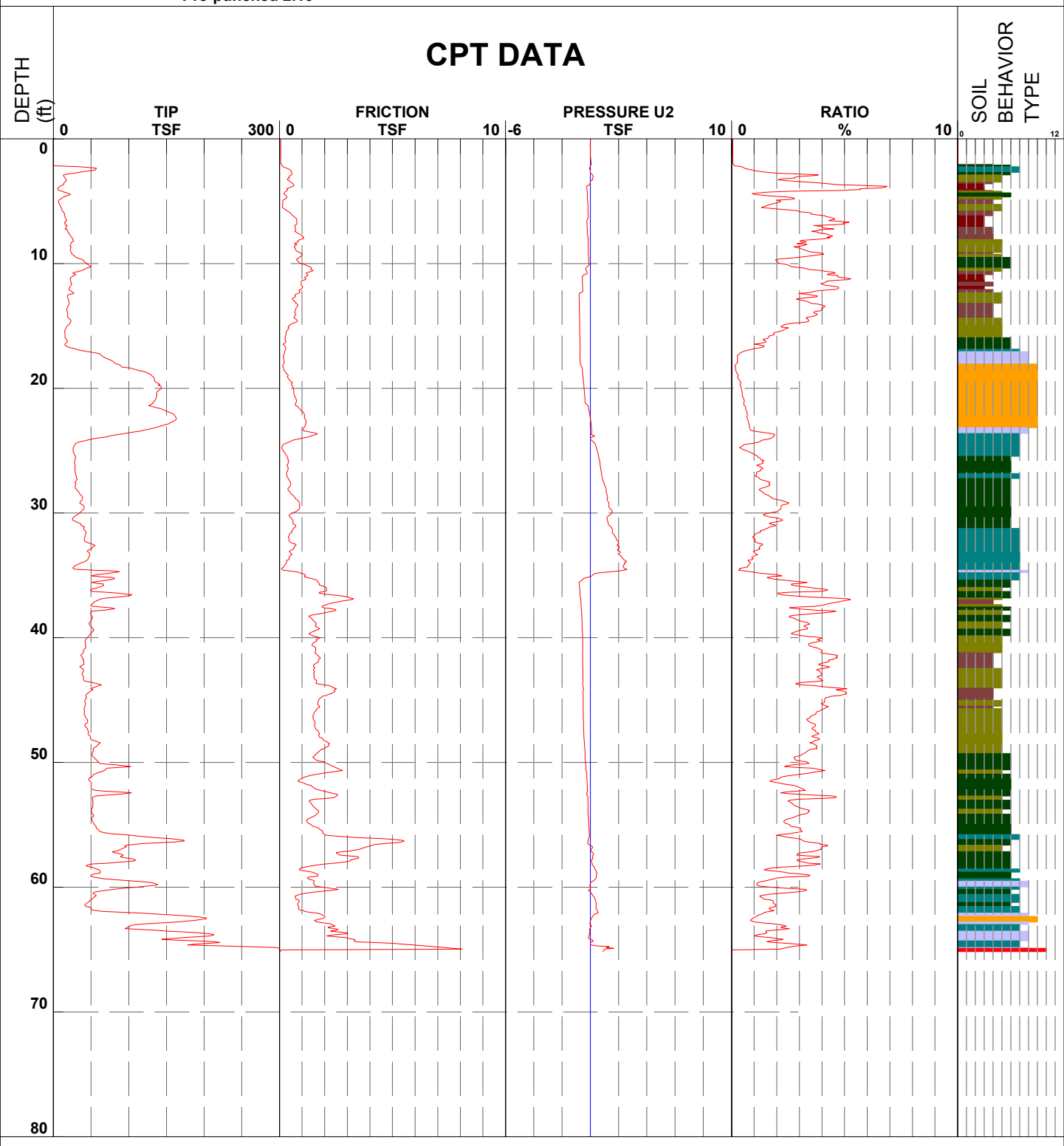


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-15	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	13-Feb-2013 12:10:26	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 2.10'

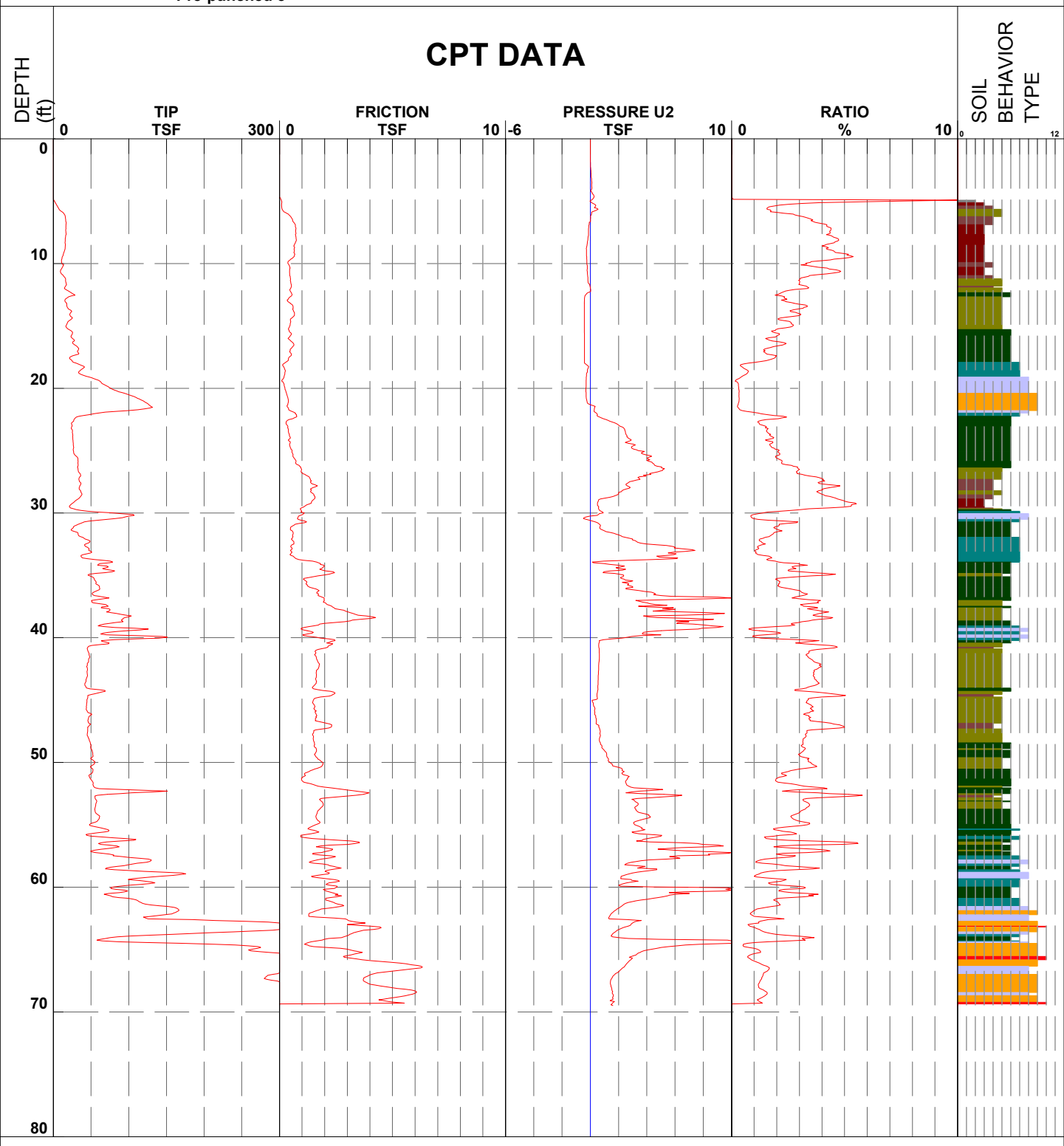


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-16	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	14-Feb-2013 09:13:27	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 5'

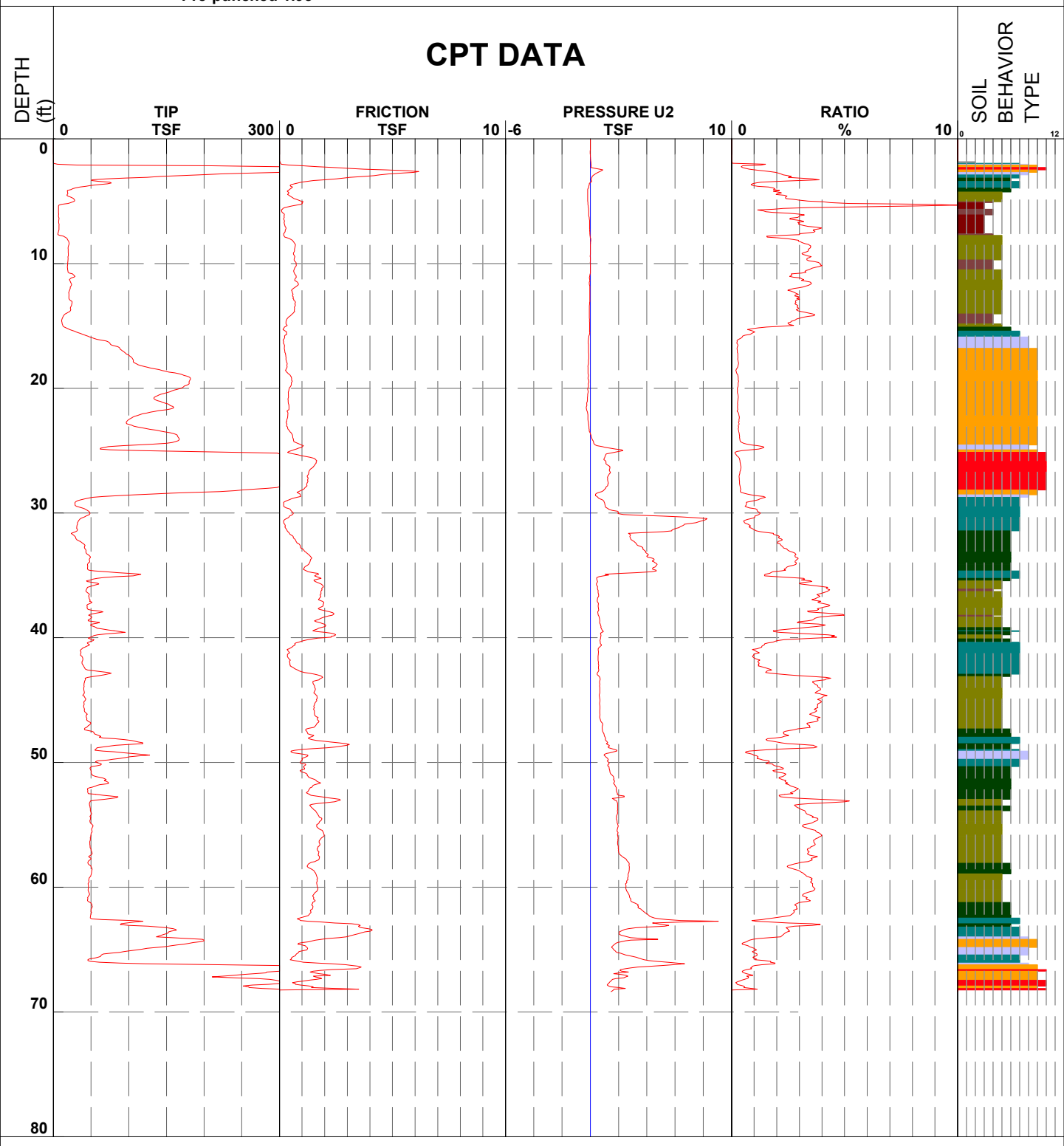


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-17	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	13-Feb-2013 14:26:08	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.95'

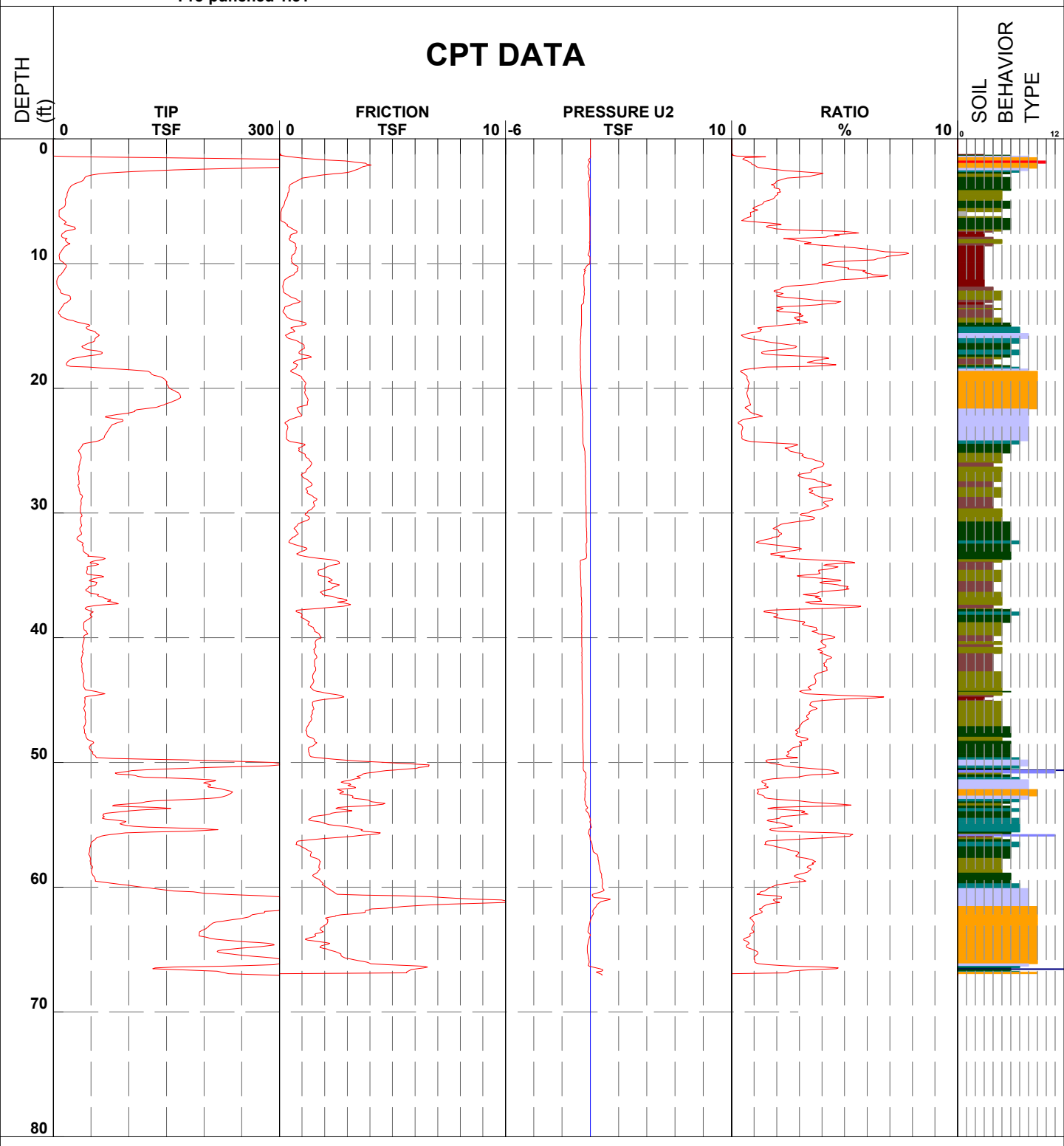


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-18	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	13-Feb-2013 15:42:42	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.31'

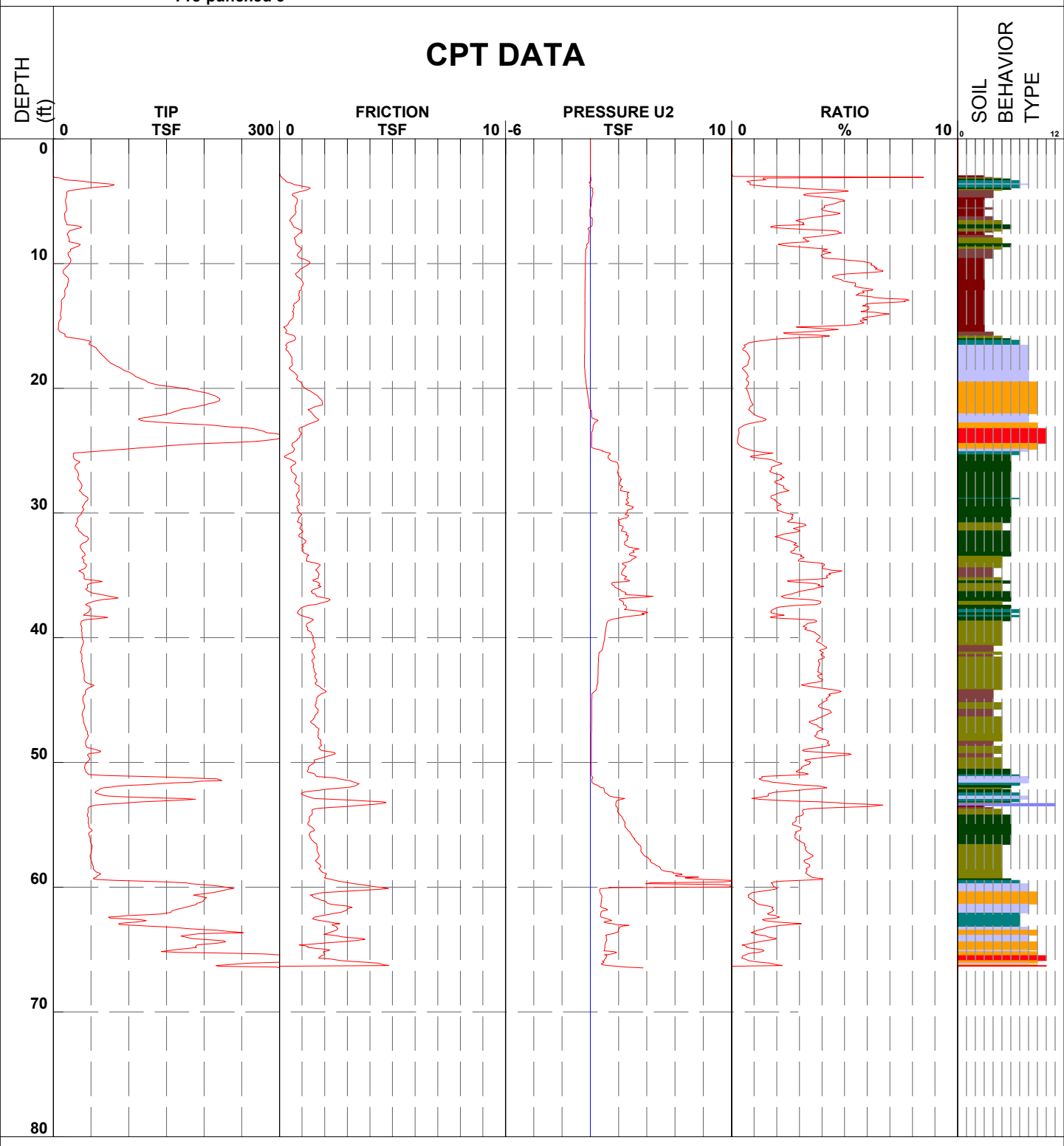


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-19	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	14-Feb-2013 10:42:33	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 3'

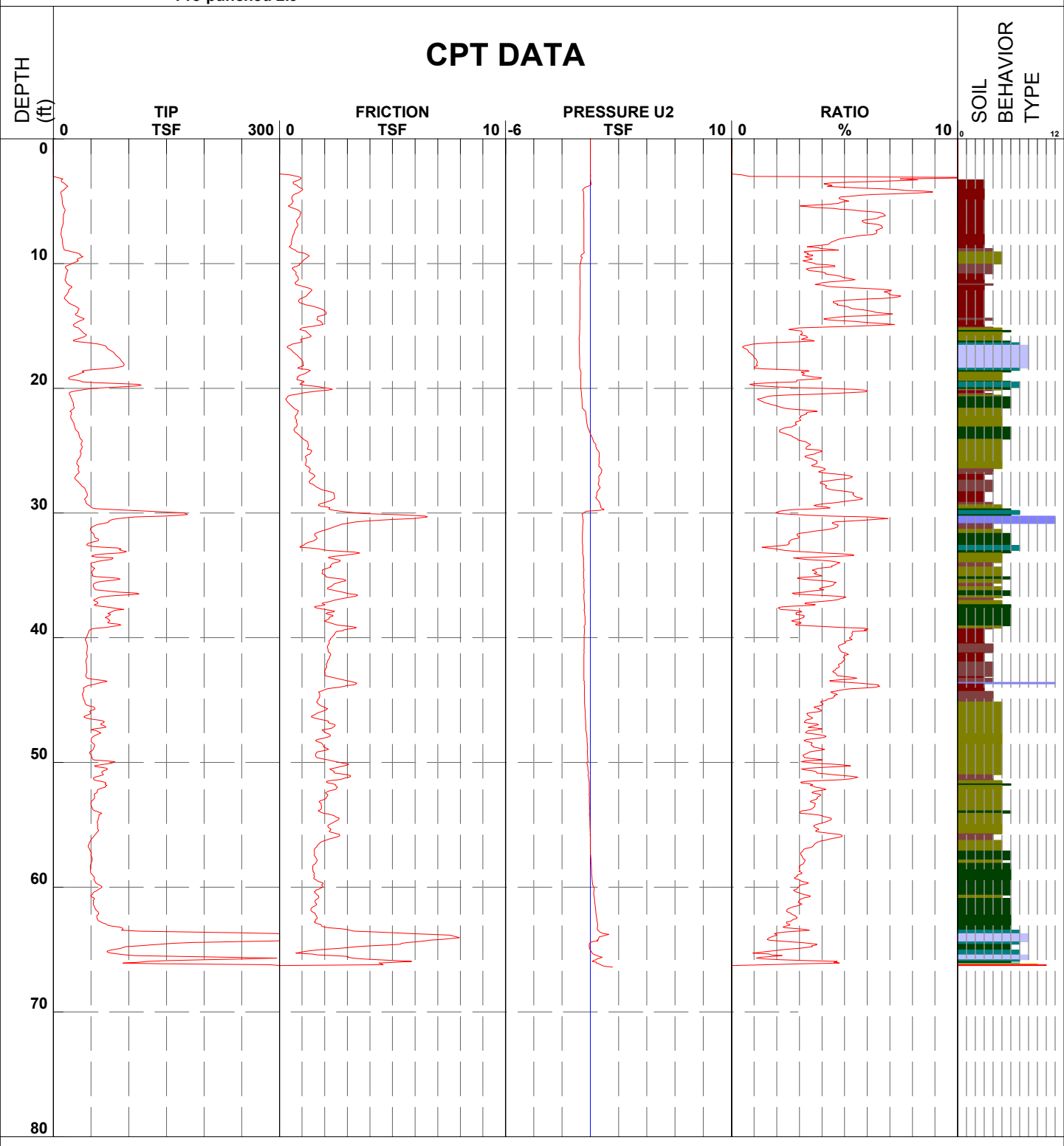


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-20	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	14-Feb-2013 15:06:34	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 2.9'

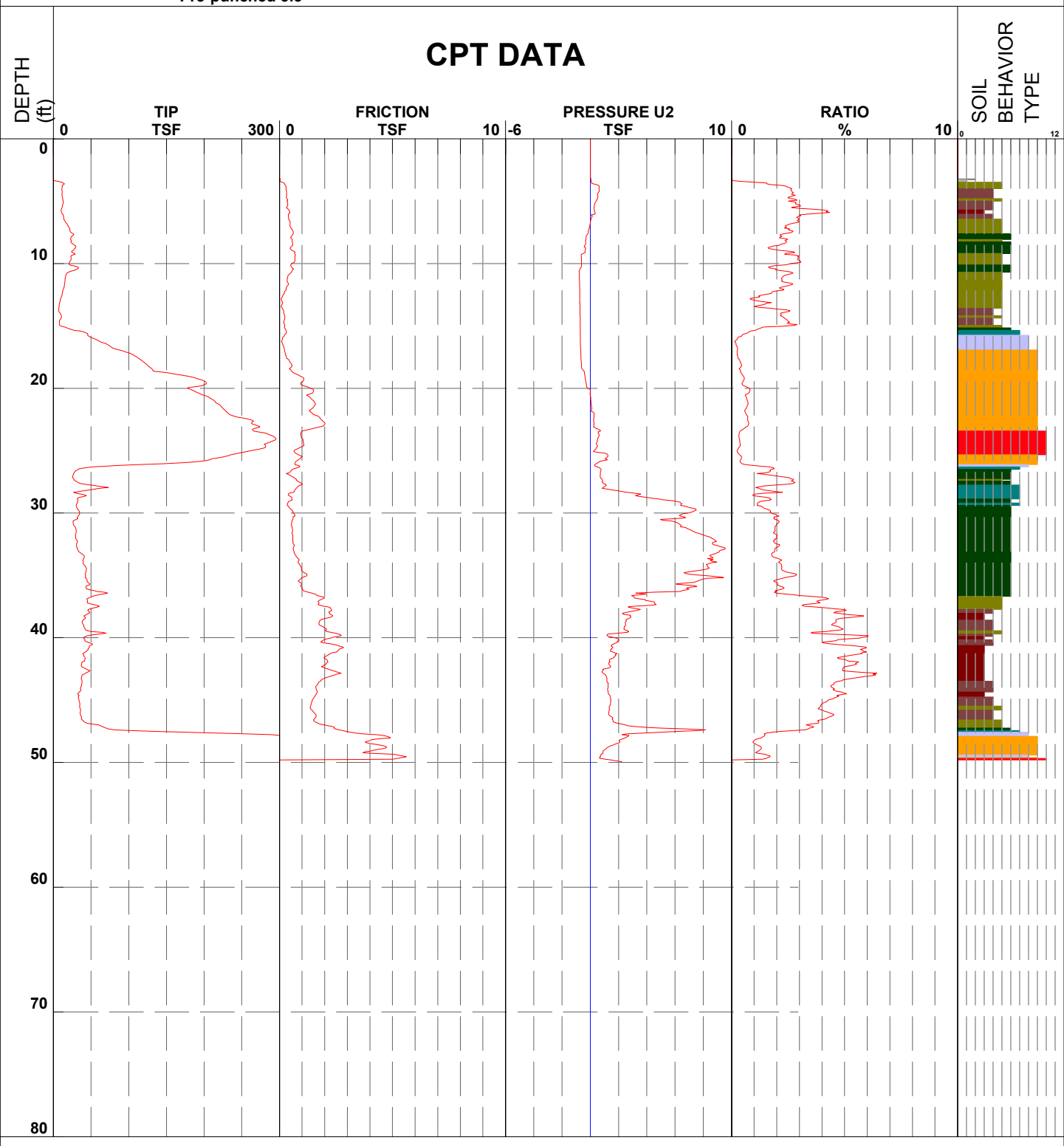


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-21	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	15-Feb-2013 09:49:31	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 3.3'

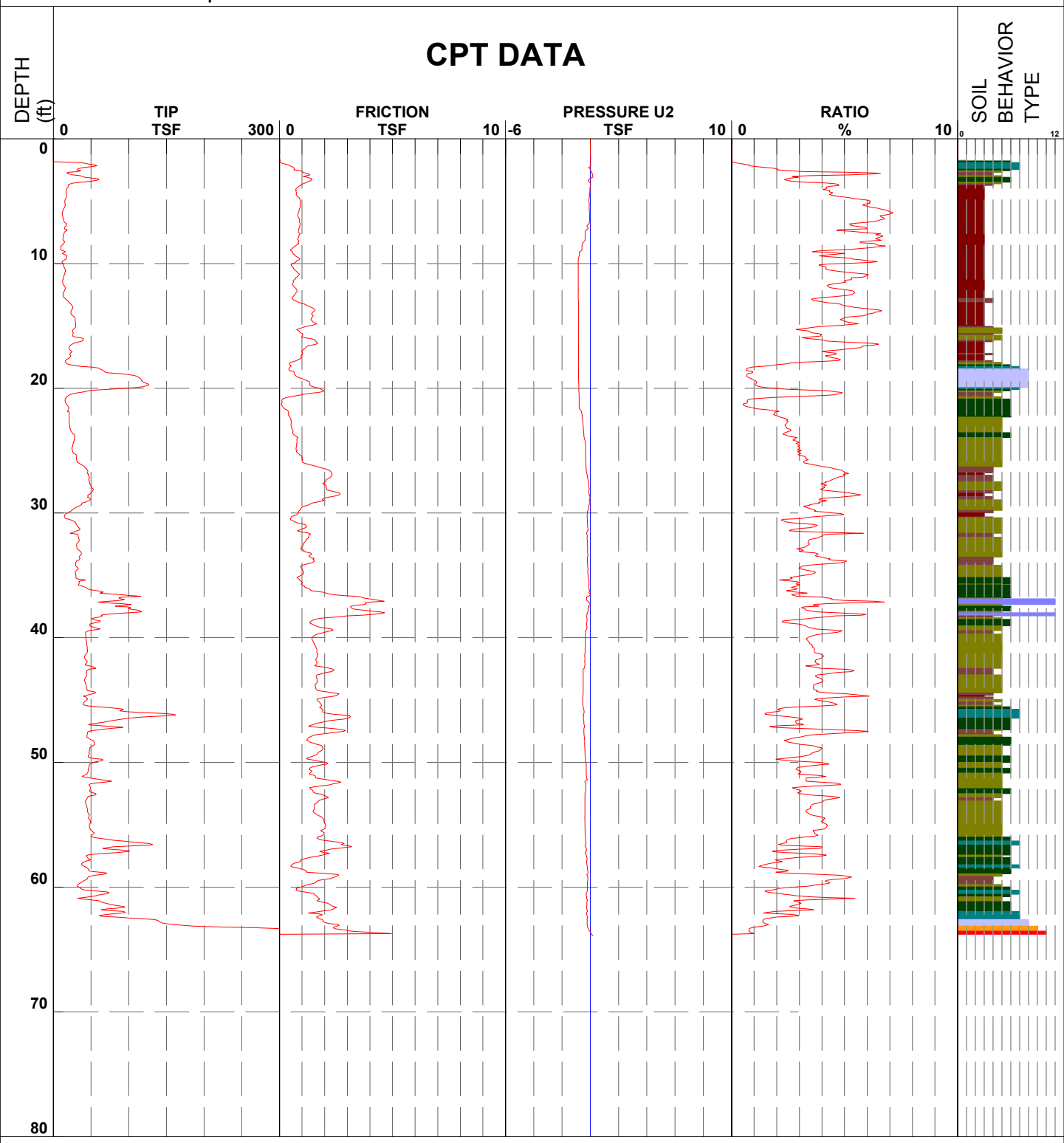


1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

Robertson et al. 1986 * Overconsolidated or Cemented

Job Number	04.1913-0008	CPT Number	IM-CPT-23	Location	Houston, Texas
Operator	Robert Biehle	Date and Tim	15-Feb-2013 14:12:12	Cone Number	A15F2.5CKE2H2053
Client	Pastor, Behling & Wheeler, LLC				

Pre-punched 1.80'



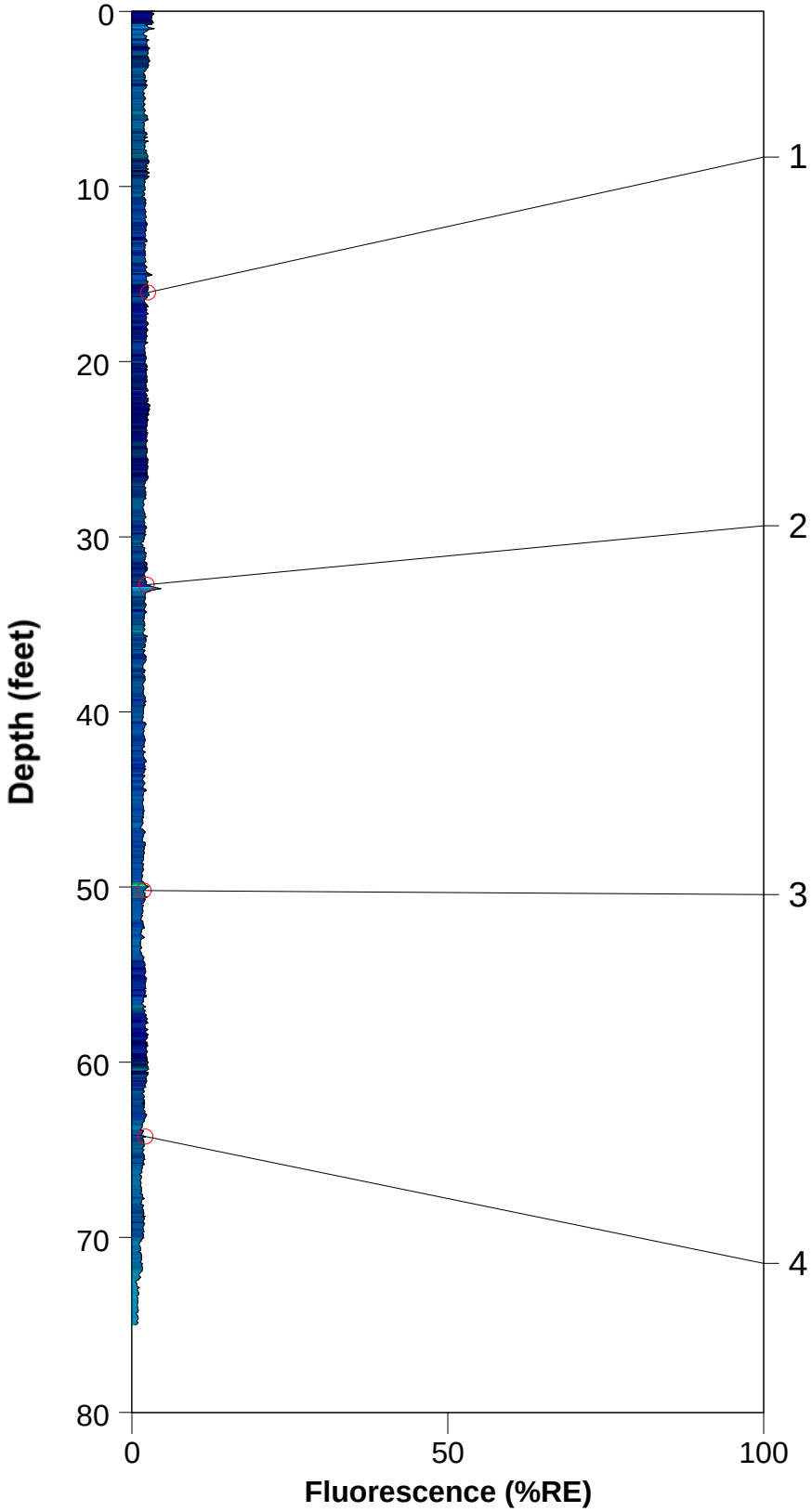
1 - sensitive fine grained
2 - organic material
3 - clay
4 - silty clay to clay
5 - clayey silt to silty clay
6 - sandy silt to clayey silt
7 - silty sand to sandy silt
8 - sand to silty sand
9 - sand
10 - gravelly sand to sand
11 - very stiff fine grained (*)
12 - sand to clayey sand (*)

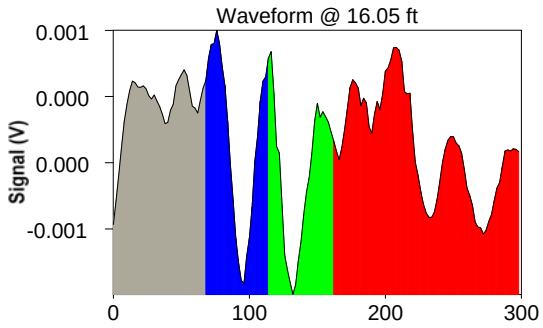
Robertson et al. 1986 * Overconsolidated or Cemented

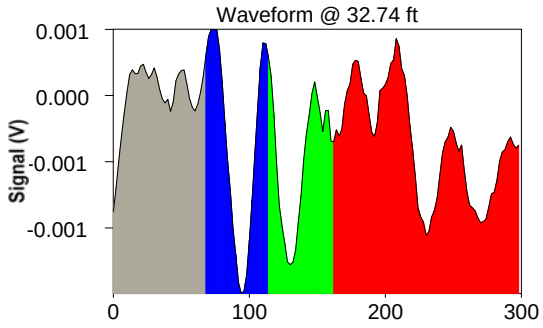
ROST Fluorescence Response Data

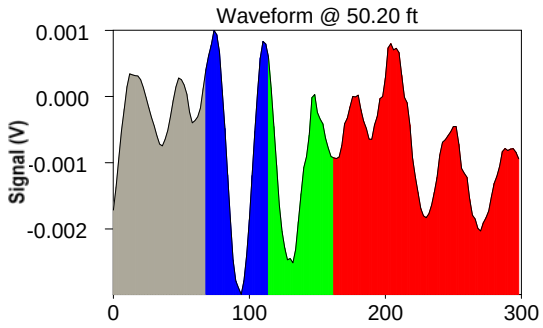
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/11/2013 @ 11:08:27 AM	Max fluorescence: 4.58% @ 32.96 ft
ROST Unit: Houston	Final depth BGS: 75.00 ft

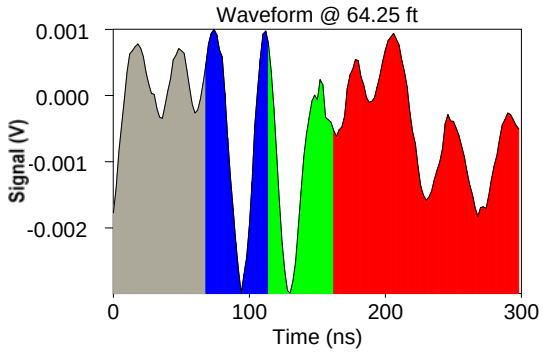
IM-CPT-01







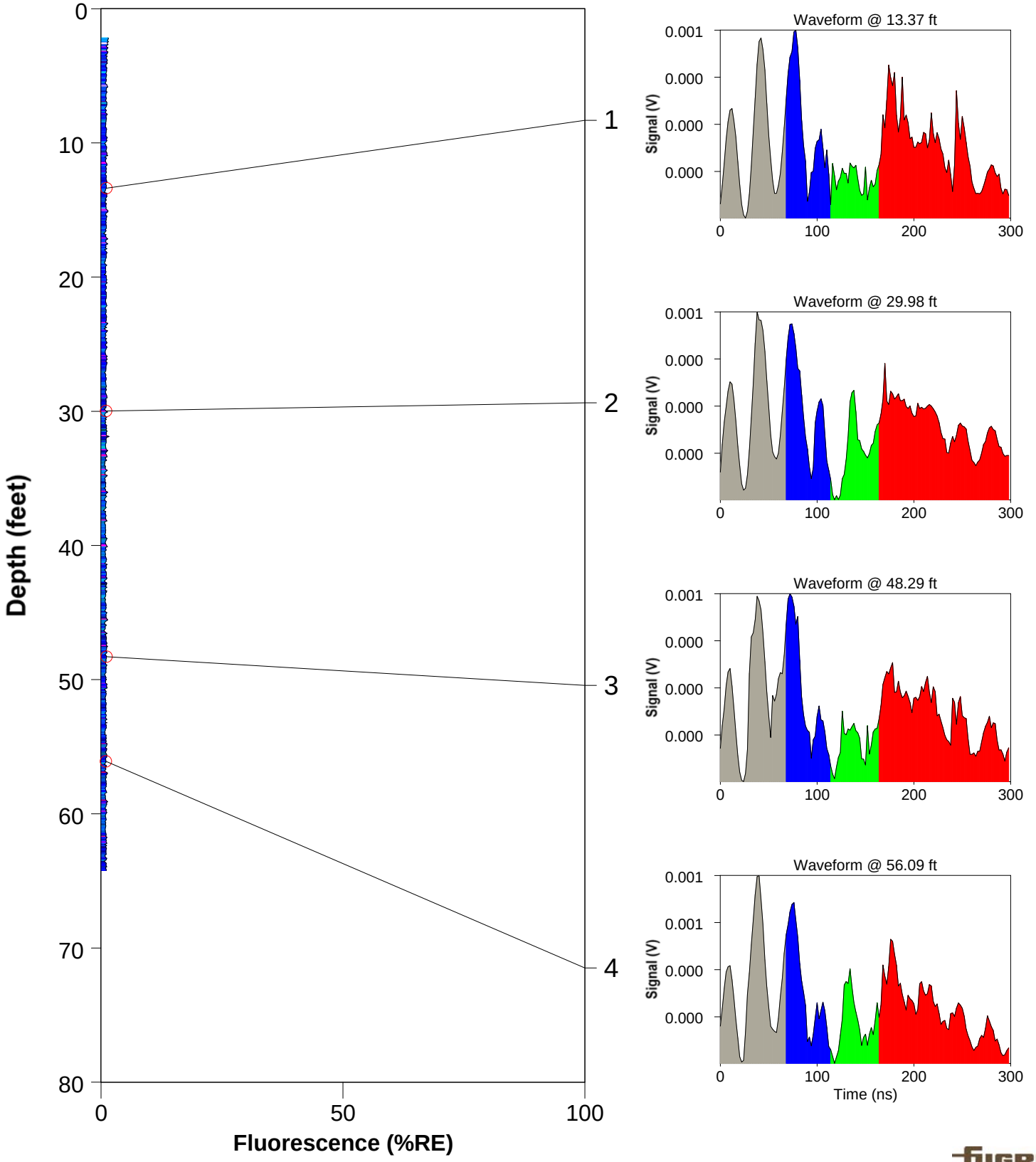




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/11/2013 @ 1:02:20 PM	Max fluorescence: 1.64% @ 31.88 ft
ROST Unit: Houston	Final depth BGS: 64.23 ft

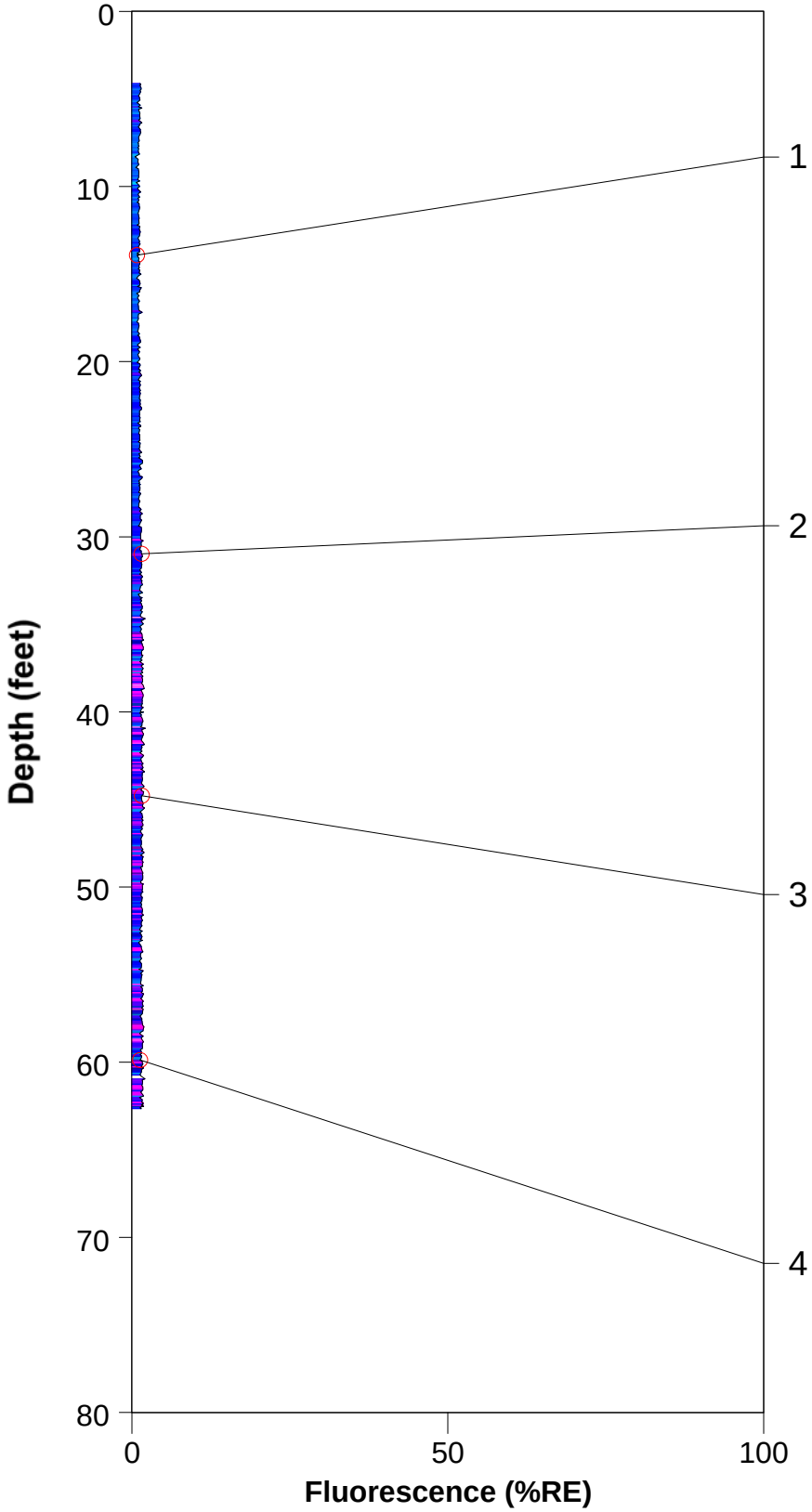
IM-CPT-02

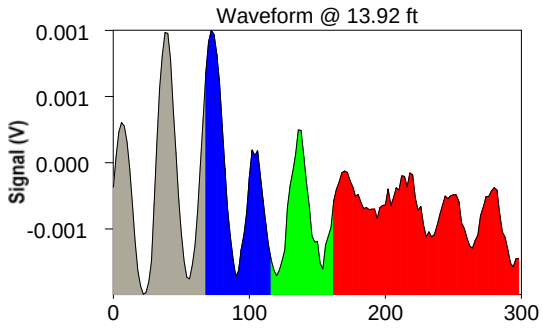


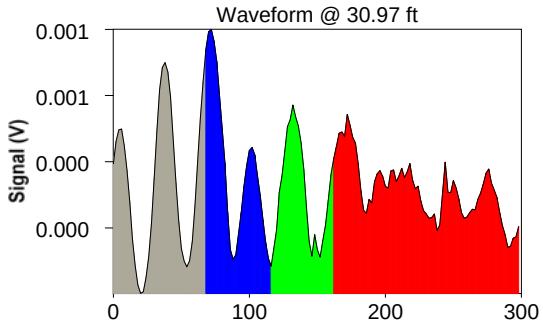
ROST Fluorescence Response Data

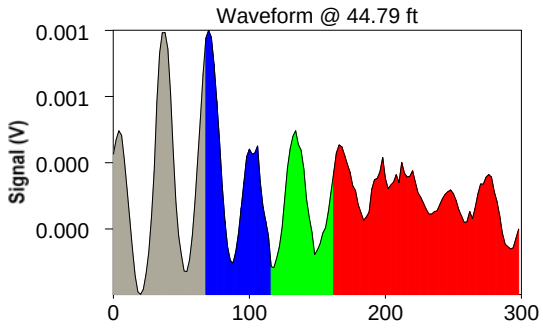
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/11/2013 @ 3:03:43 PM	Max fluorescence: 2.11% @ 40.94 ft
ROST Unit: Houston	Final depth BGS: 62.66 ft

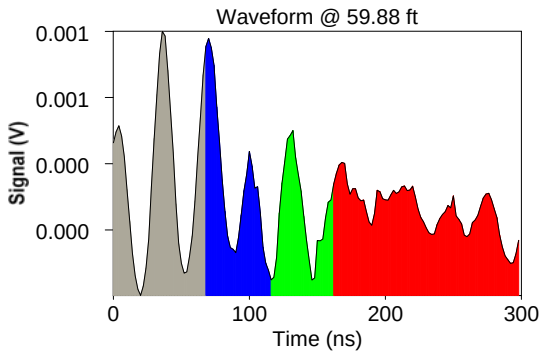
IM-CPT-03







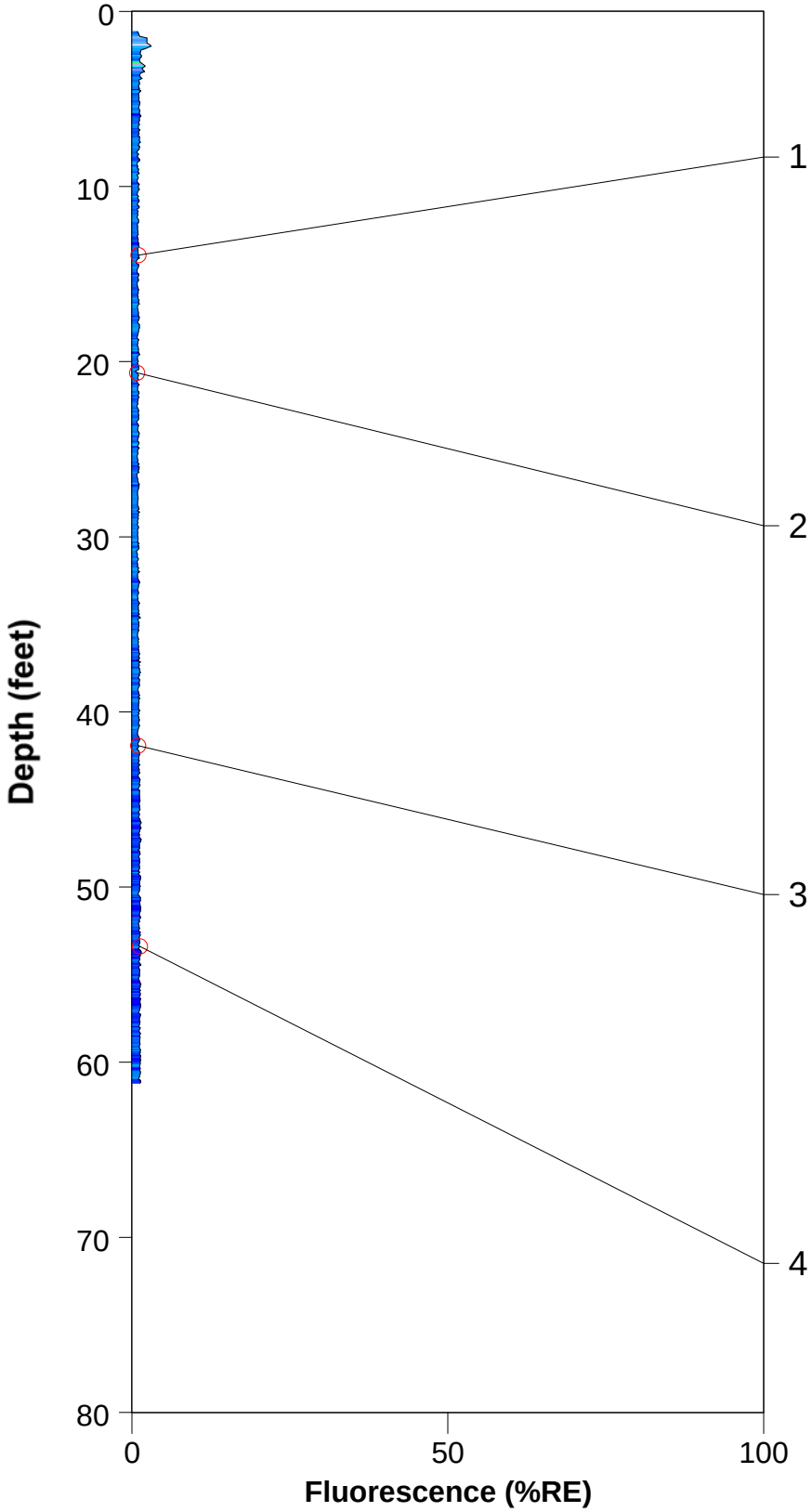


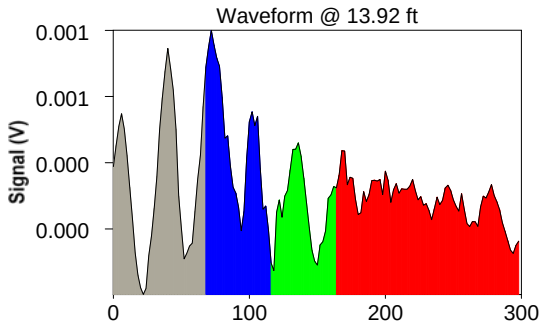


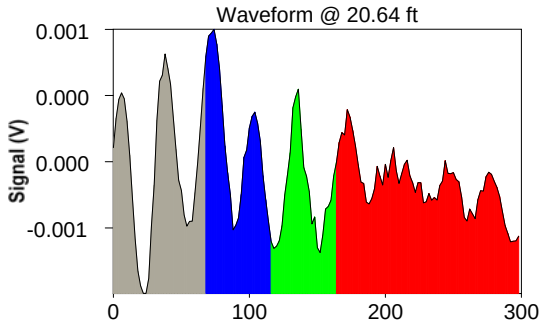
ROST Fluorescence Response Data

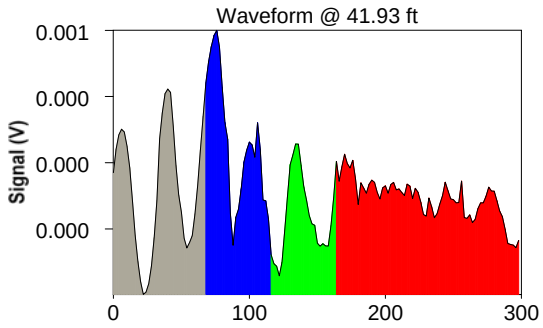
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/11/2013 @ 4:31:42 PM	Max fluorescence: 3.05% @ 1.98 ft
ROST Unit: Houston	Final depth BGS: 61.20 ft

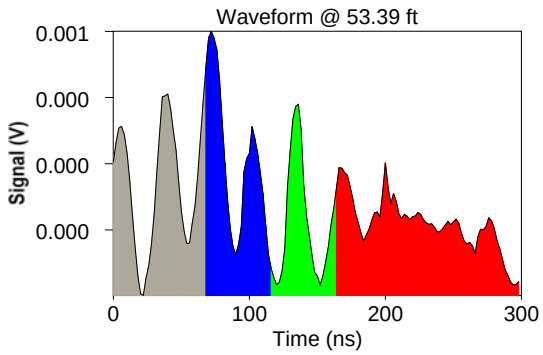
IM-CPT-04







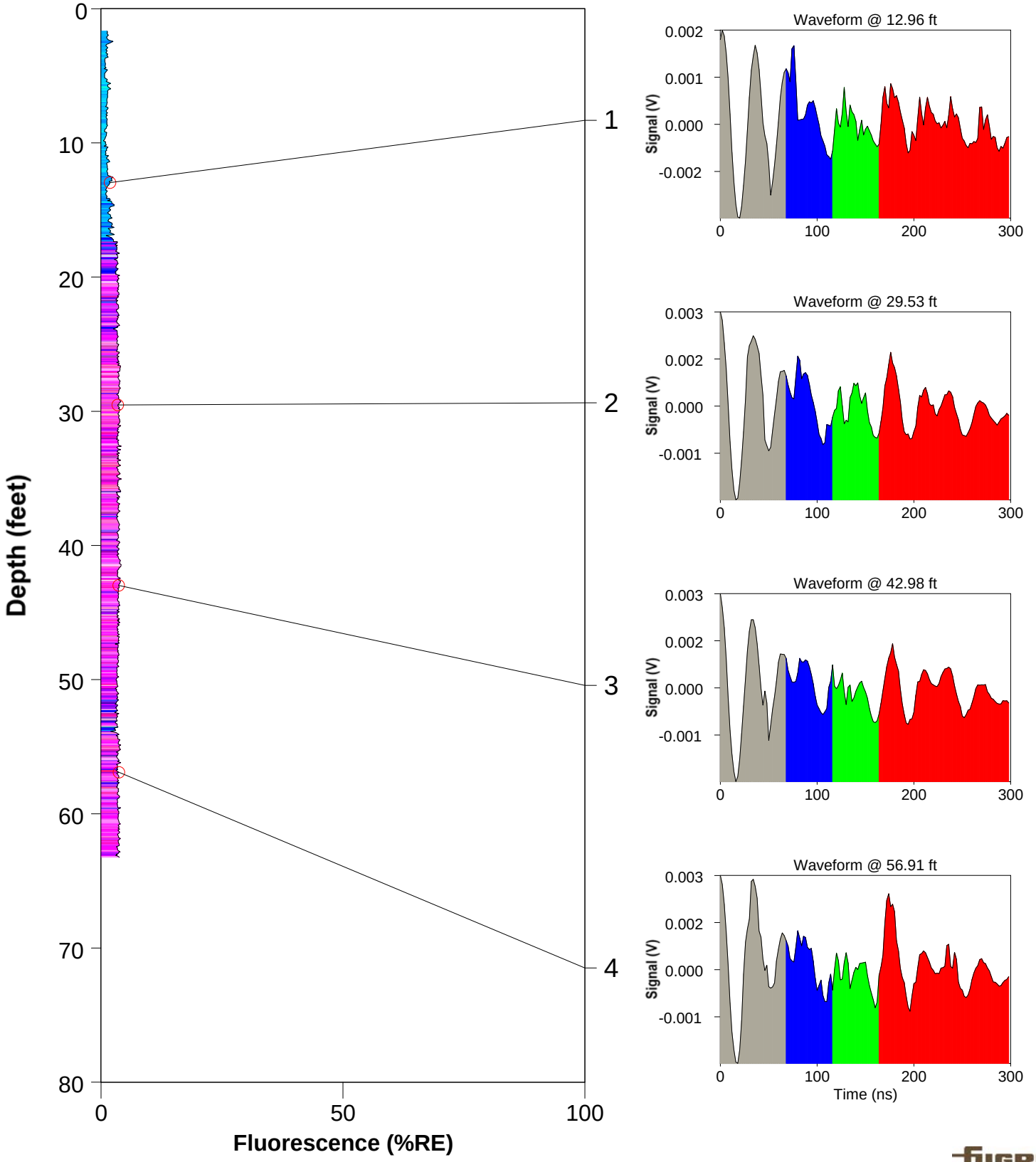




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/14/2013 @ 1:47:53 PM	Max fluorescence: 4.20% @ 35.05 ft
ROST Unit: Houston	Final depth BGS: 63.24 ft

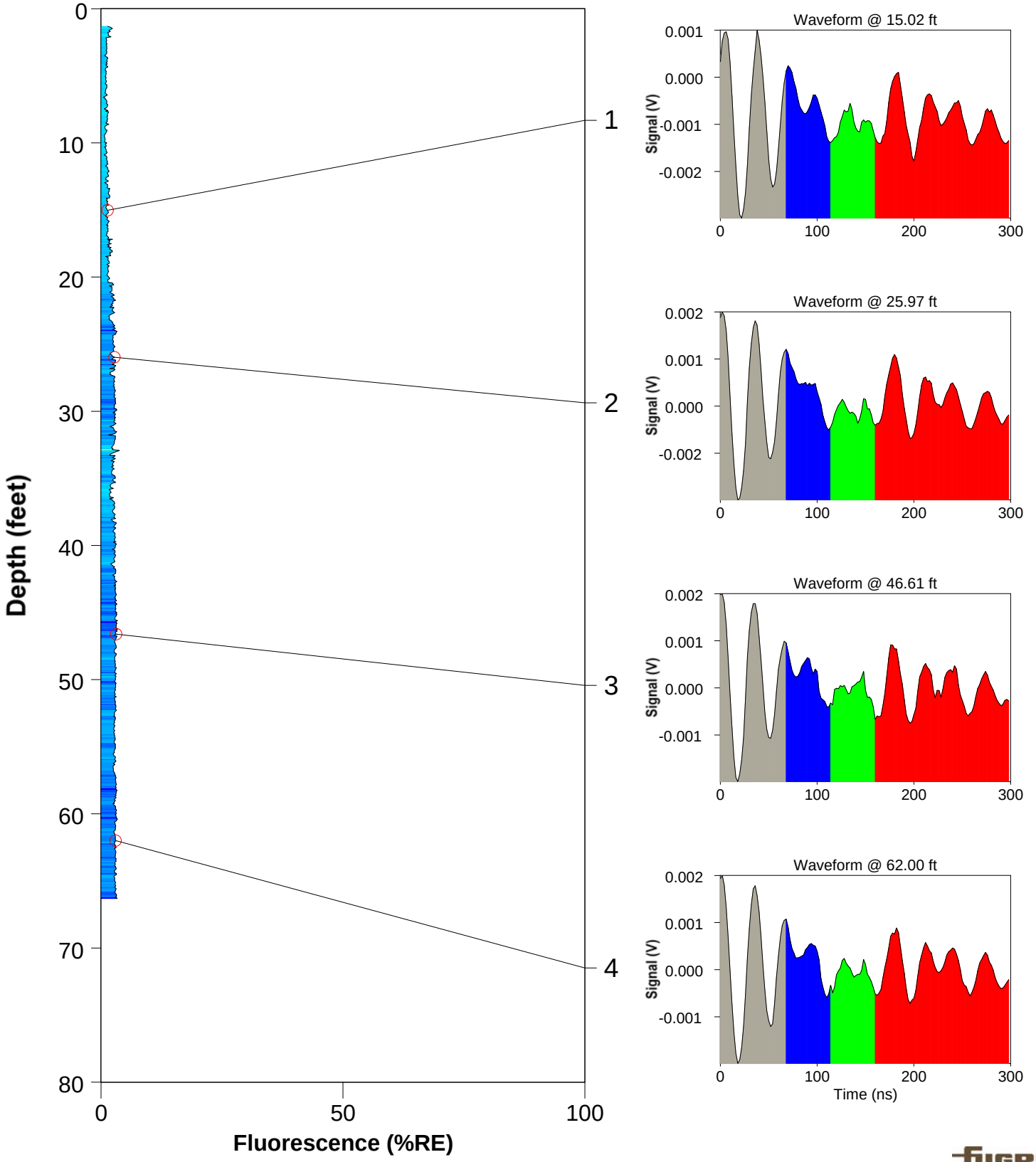
IM-CPT-05



ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/14/2013 @ 12:00:57 PM	Max fluorescence: 3.77% @ 32.93 ft
ROST Unit: Houston	Final depth BGS: 66.31 ft

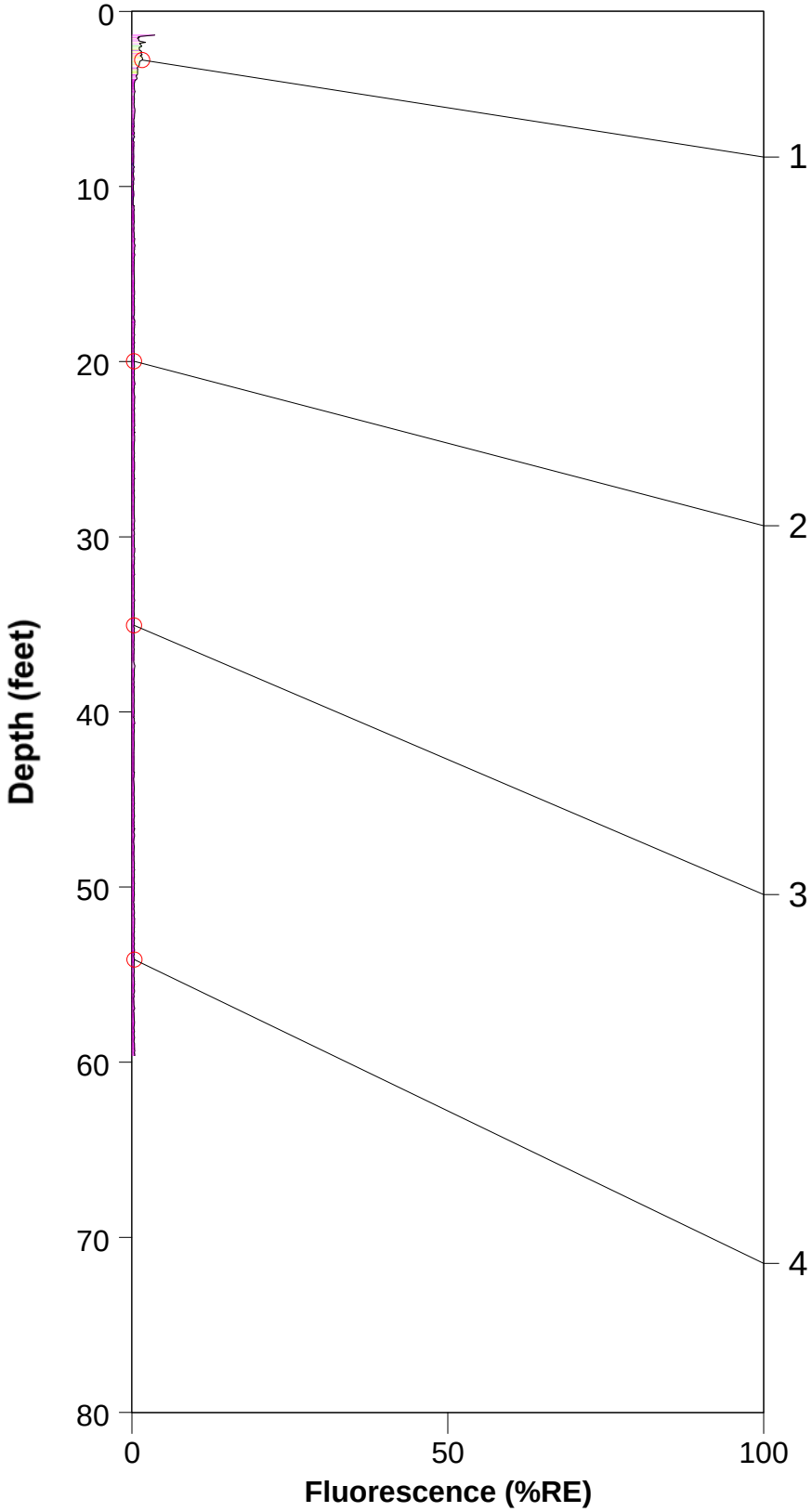
IM-CPT-06

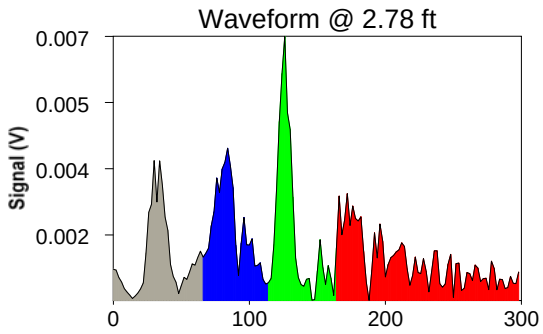


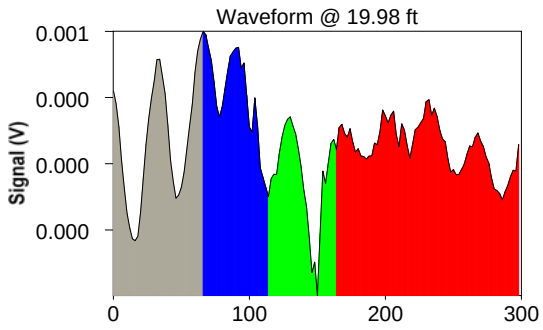
ROST Fluorescence Response Data

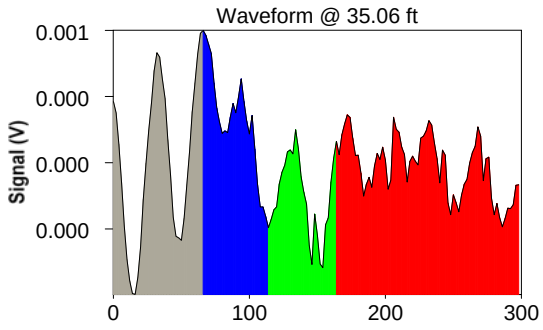
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 9:01:56 AM	Max fluorescence: 3.63% @ 1.35 ft
ROST Unit: Houston	Final depth BGS: 59.62 ft

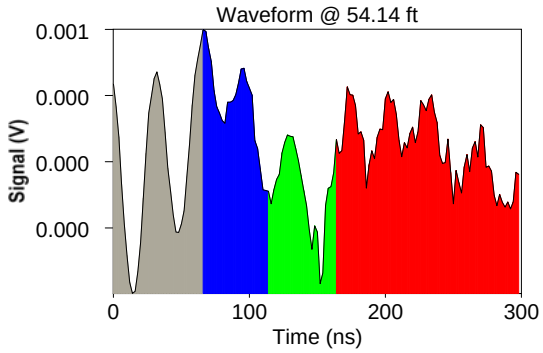
IM-CPT-07







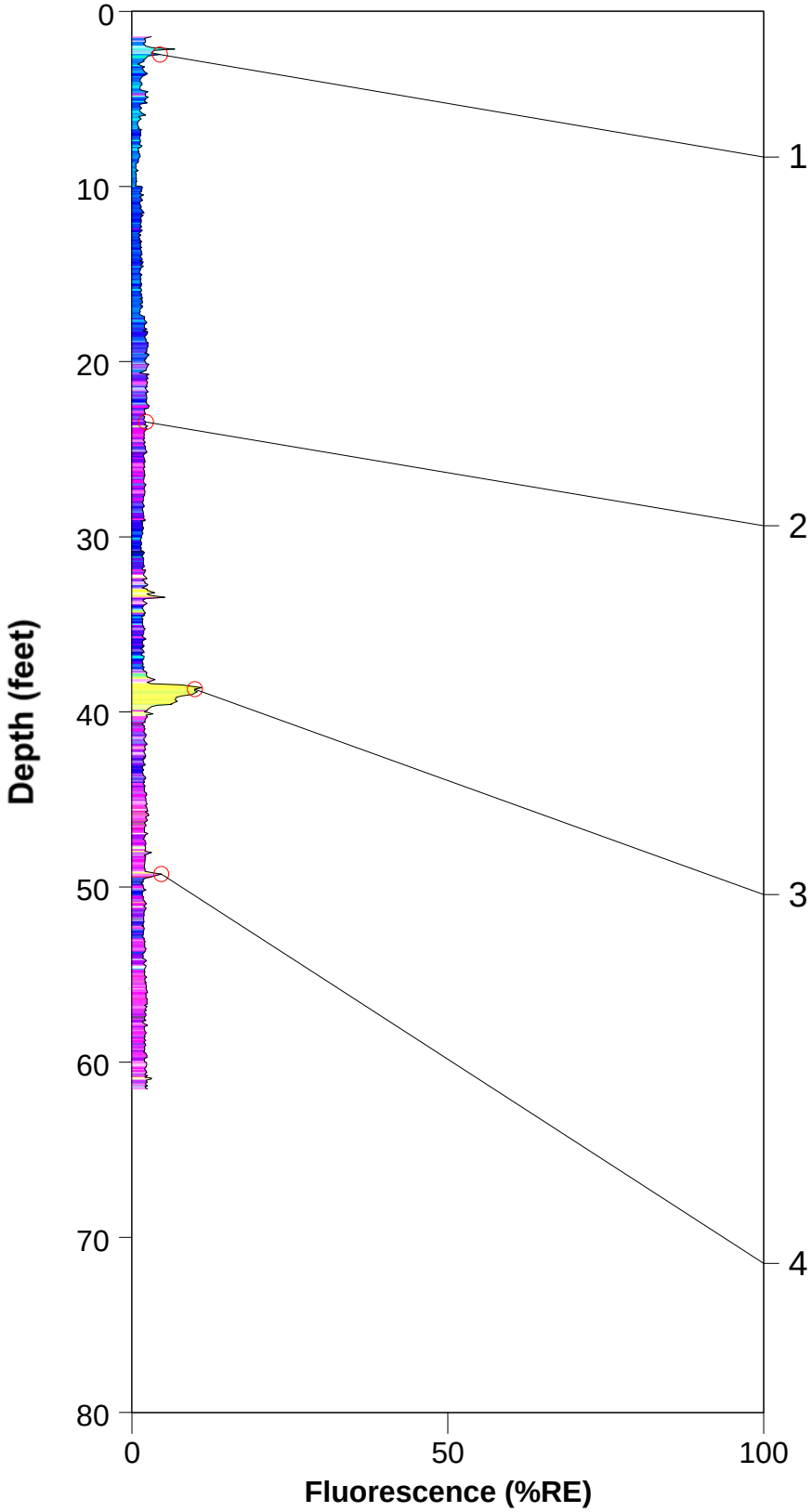


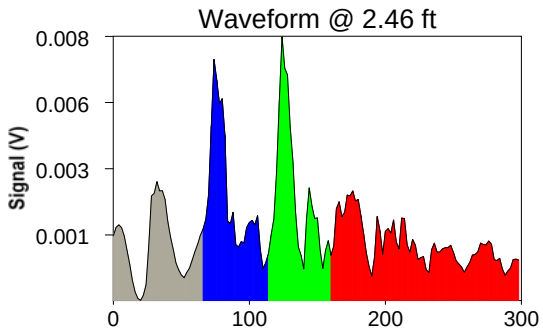


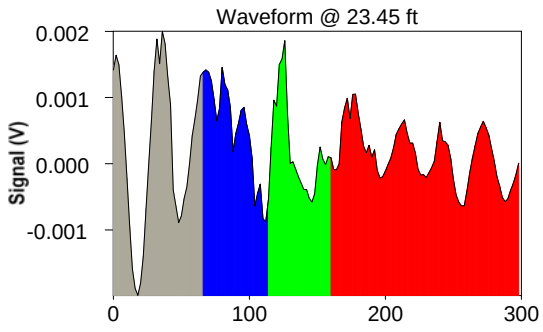
ROST Fluorescence Response Data

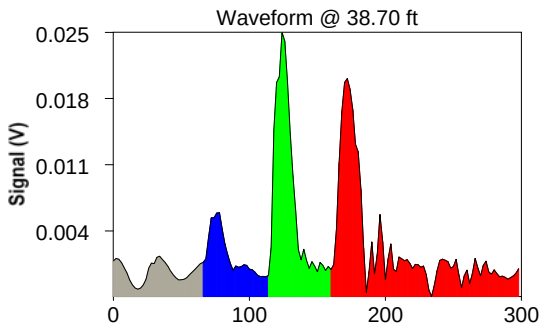
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 12:00:14 PM	Max fluorescence: 11.09% @ 38.62 ft
ROST Unit: Houston	Final depth BGS: 61.53 ft

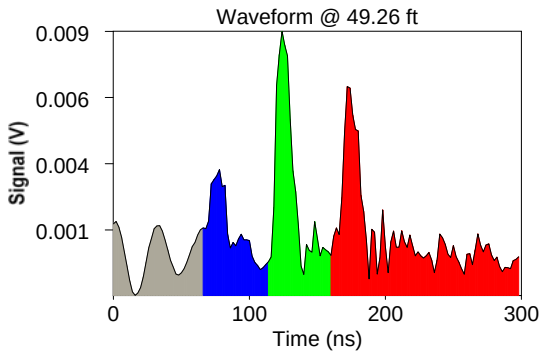
IM-CPT-08







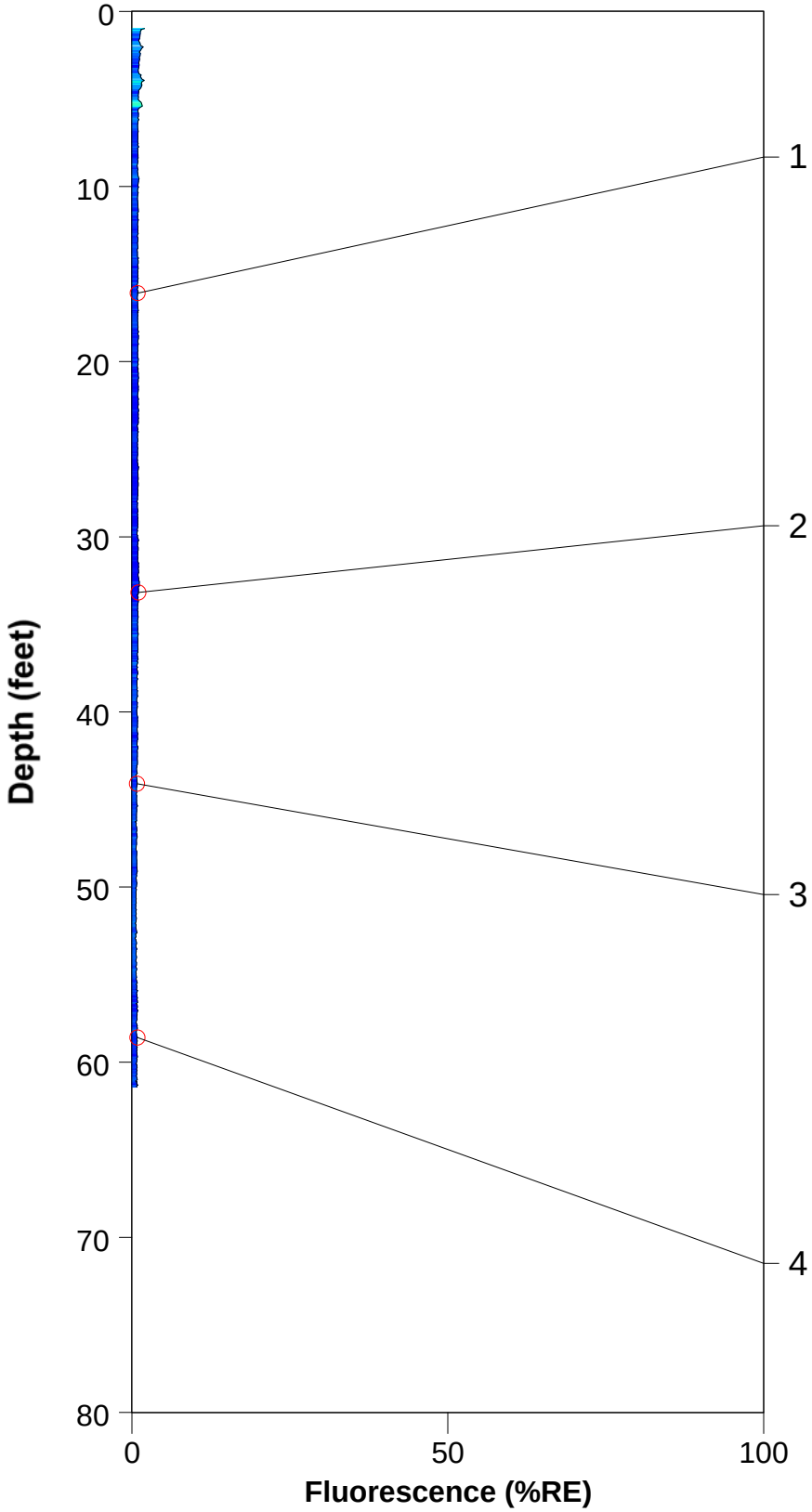


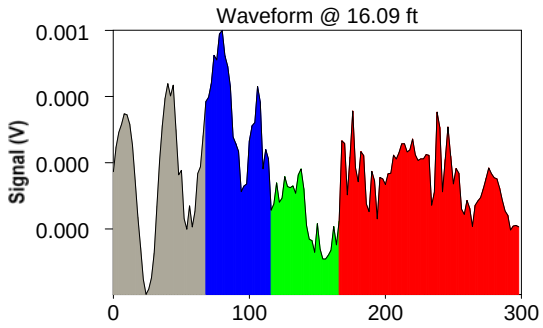


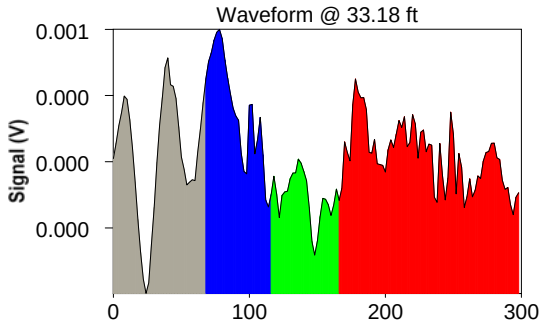
ROST Fluorescence Response Data

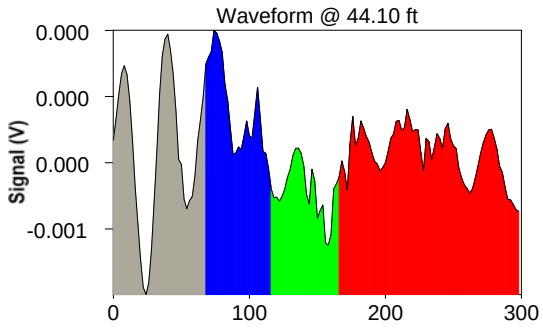
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 10:36:16 AM	Max fluorescence: 1.99% @ 0.98 ft
ROST Unit: Houston	Final depth BGS: 61.43 ft

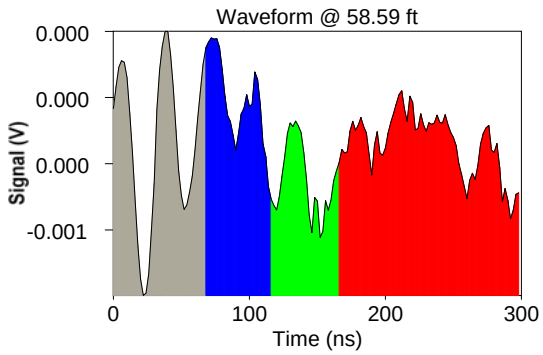
IM-CPT-09







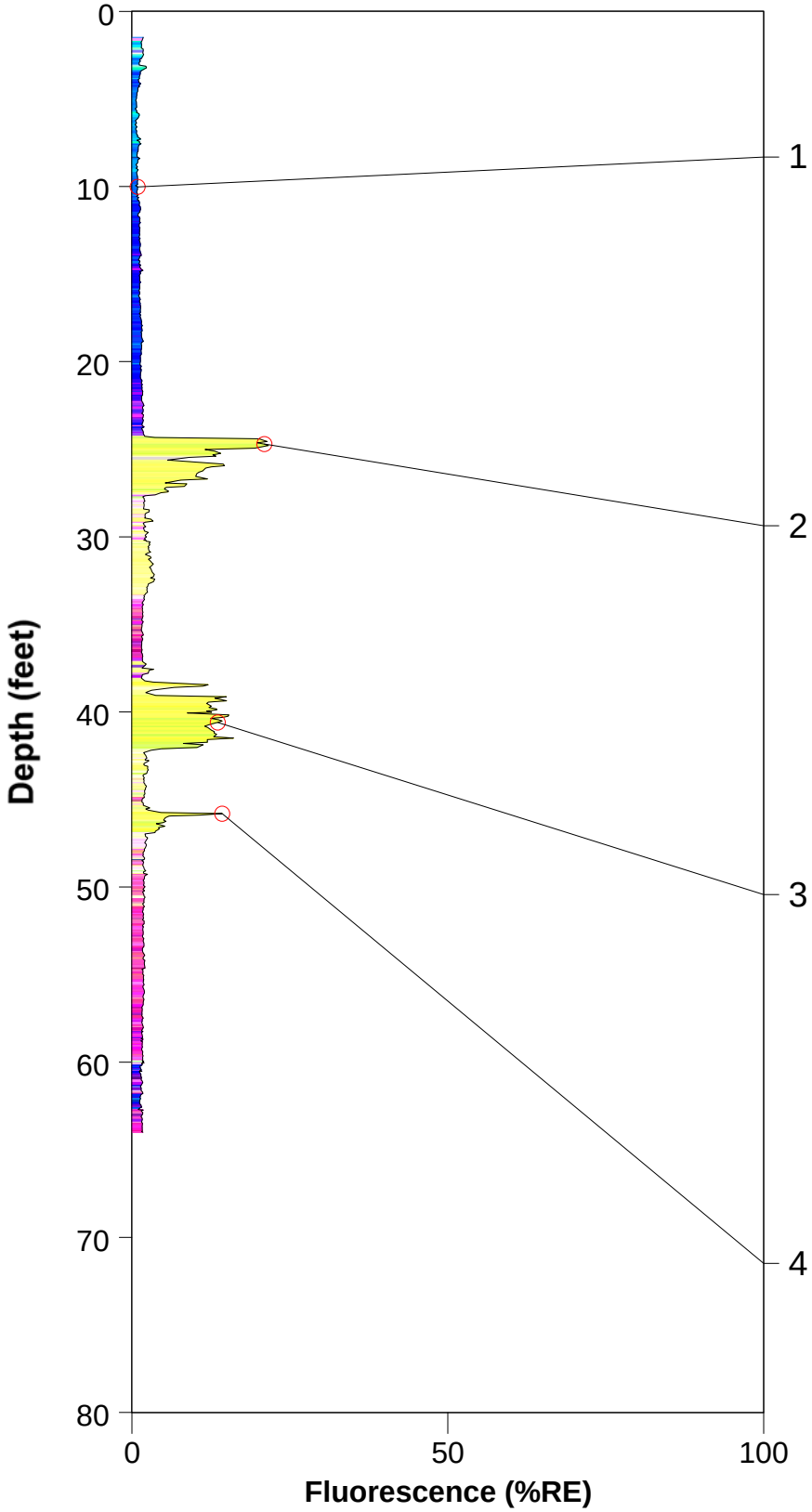


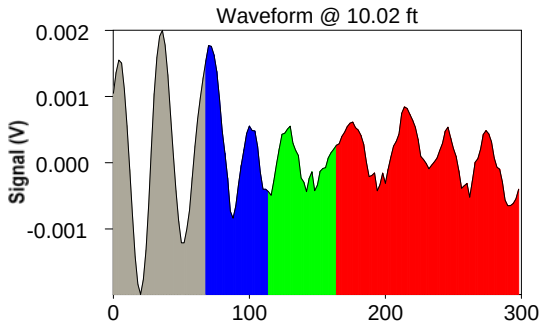


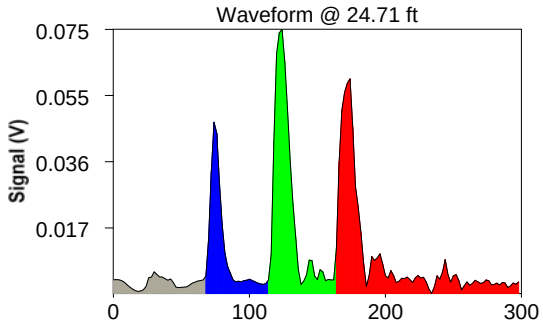
ROST Fluorescence Response Data

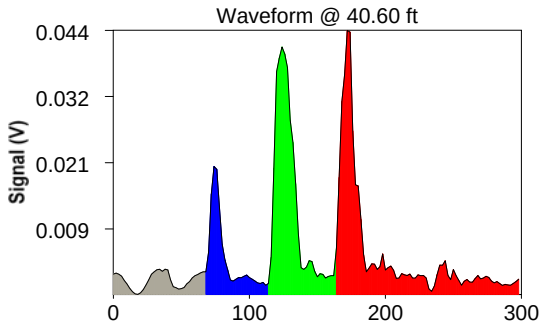
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/13/2013 @ 9:33:33 AM	Max fluorescence: 21.59% @ 24.79 ft
ROST Unit: Houston	Final depth BGS: 64.01 ft

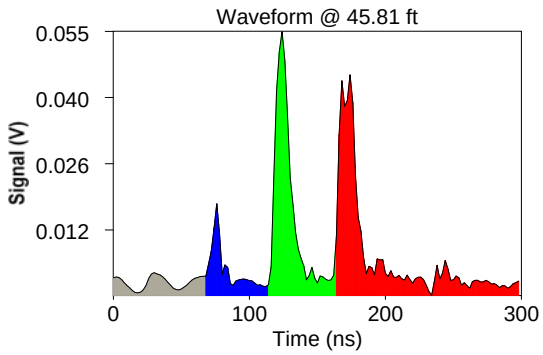
IM-CPT-10







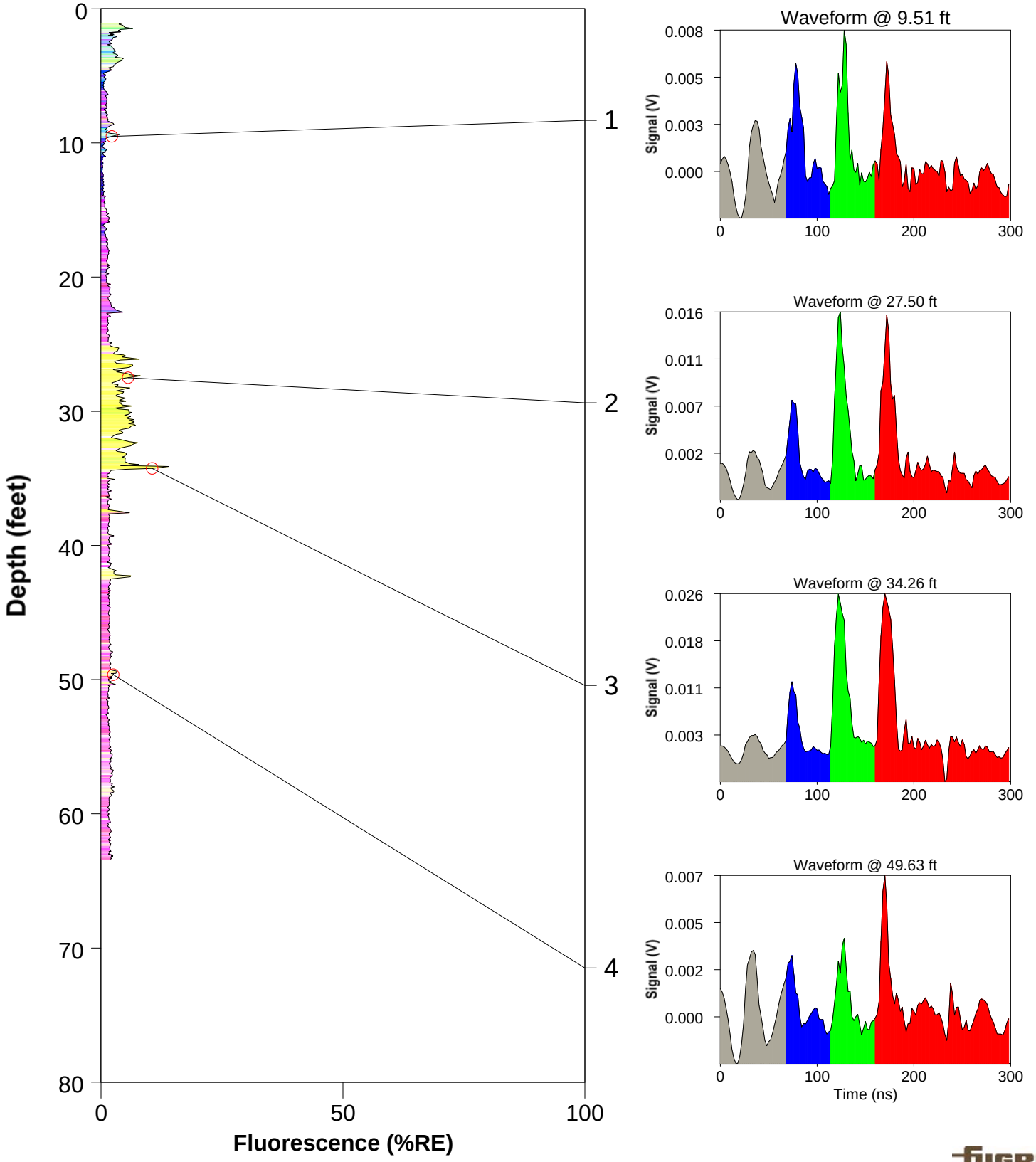




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 1:40:18 PM	Max fluorescence: 14.02% @ 34.11 ft
ROST Unit: Houston	Final depth BGS: 63.38 ft

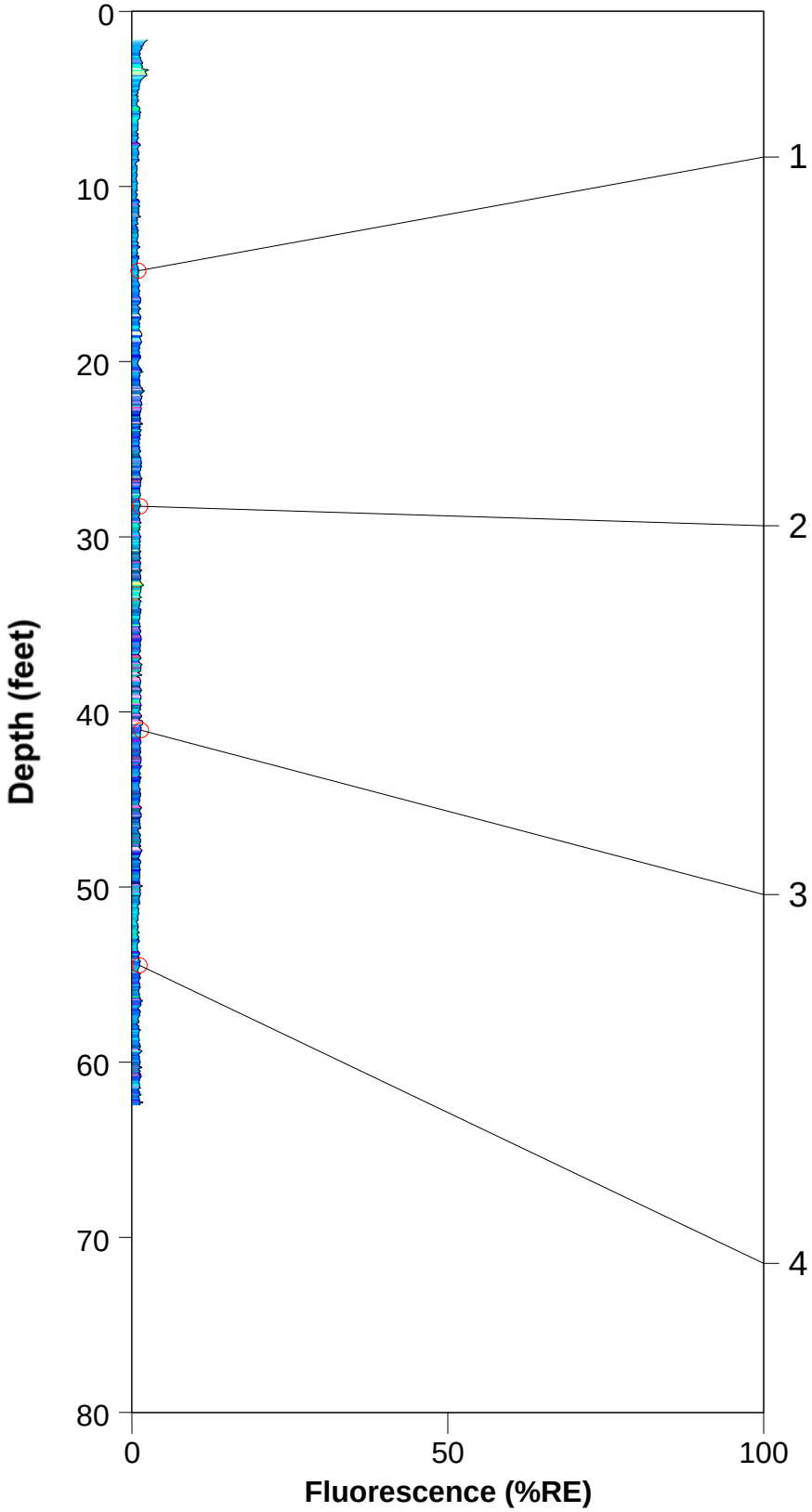
IM-CPT-11

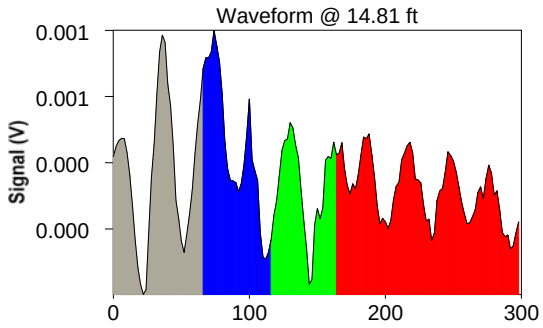


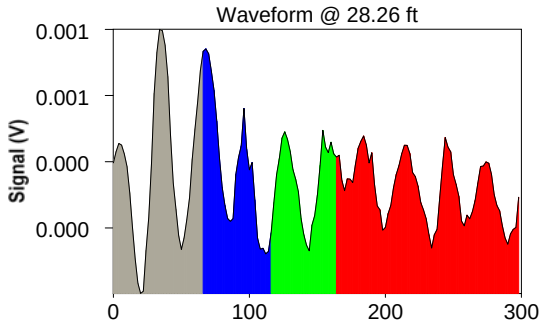
ROST Fluorescence Response Data

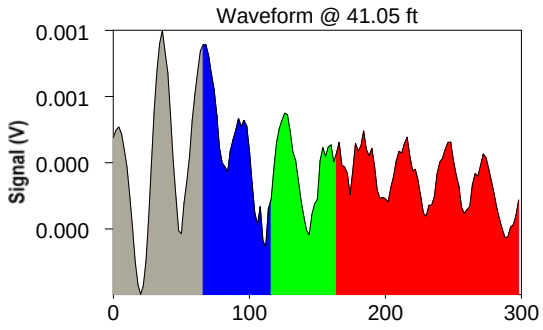
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 3:08:31 PM	Max fluorescence: 2.66% @ 3.35 ft
ROST Unit: Houston	Final depth BGS: 62.42 ft

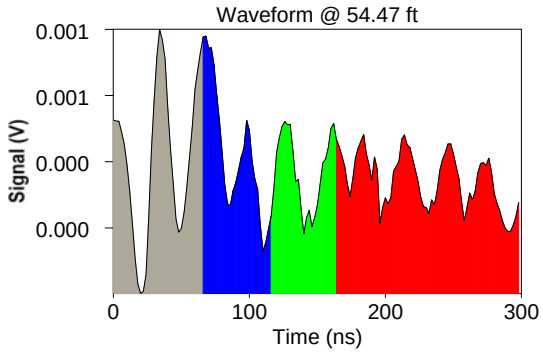
IM-CPT-12







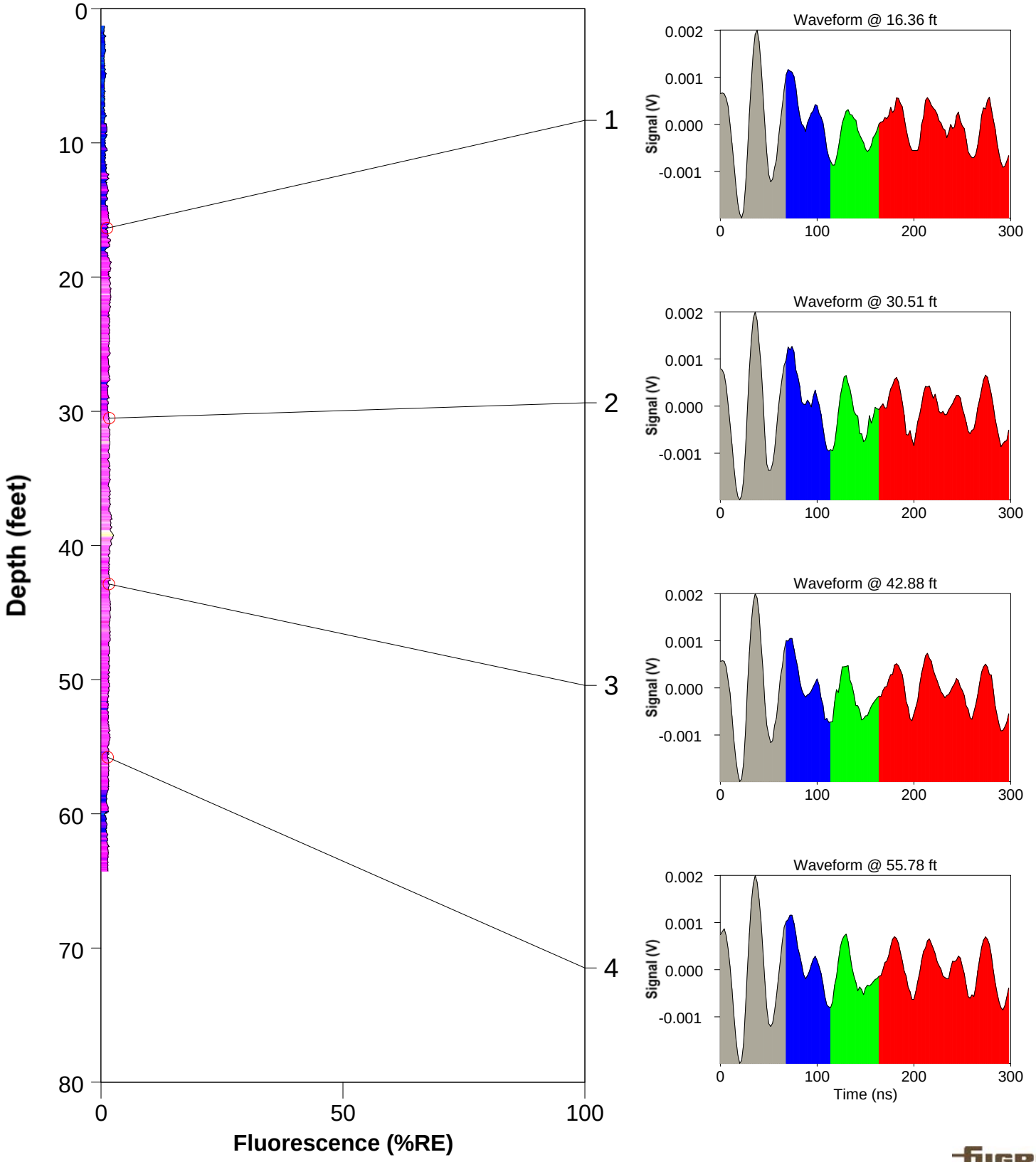




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/12/2013 @ 4:26:06 PM	Max fluorescence: 2.61% @ 39.28 ft
ROST Unit: Houston	Final depth BGS: 64.26 ft

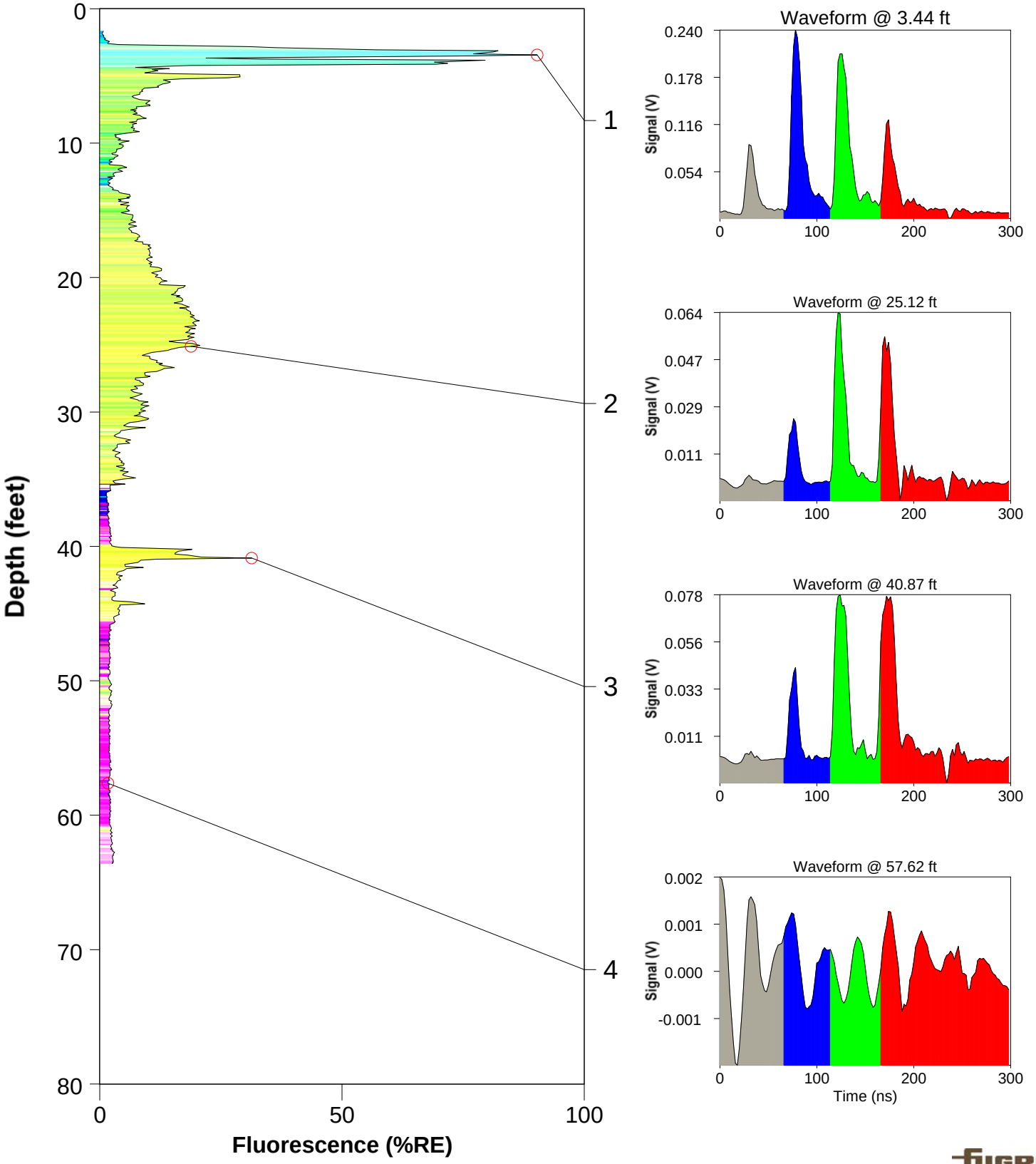
IM-CPT-13



ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/13/2013 @ 10:53:41 AM	Max fluorescence: 90.28% @ 3.44 ft
ROST Unit: Houston	Final depth BGS: 63.60 ft

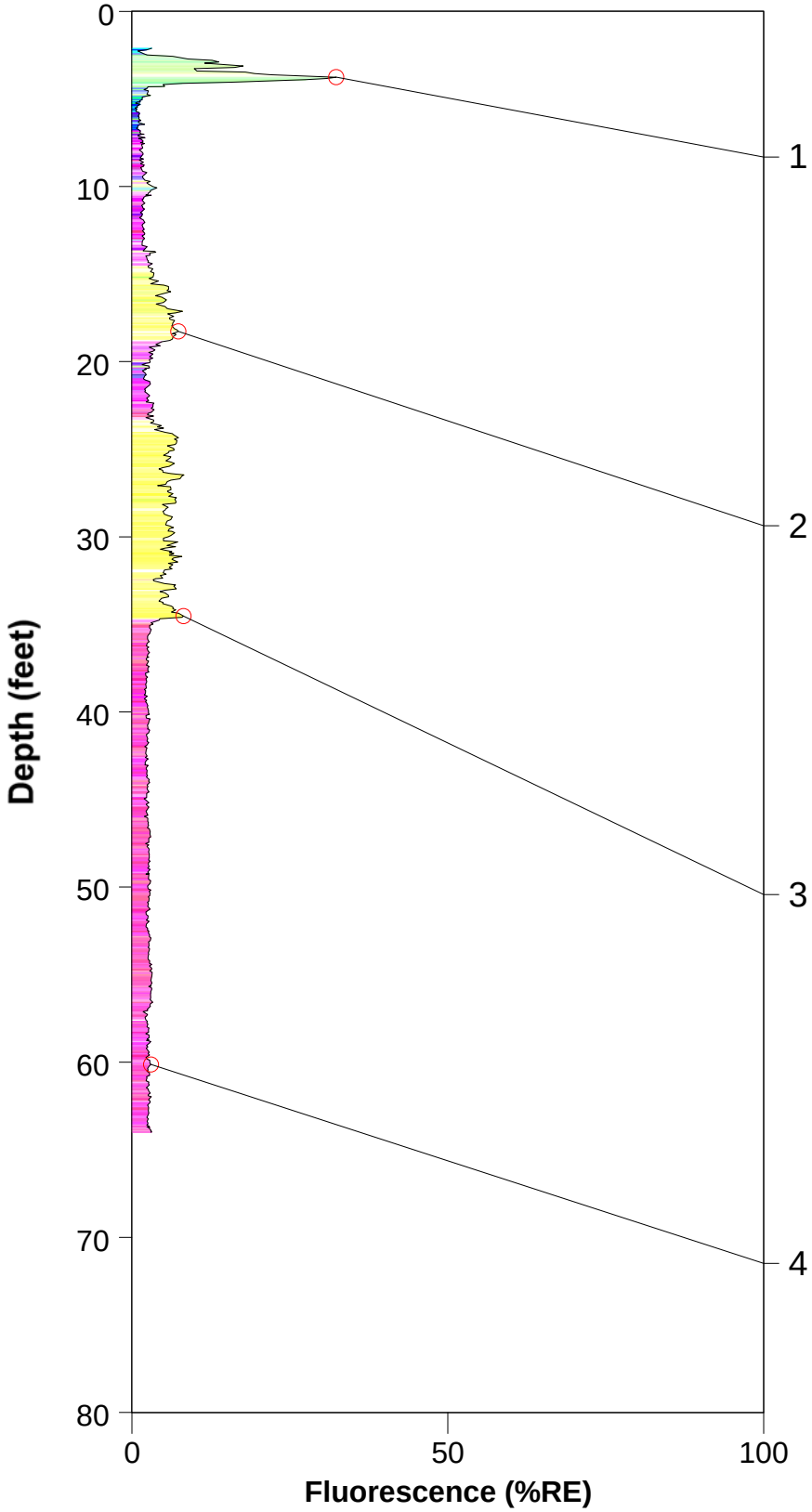
IM-CPT-14

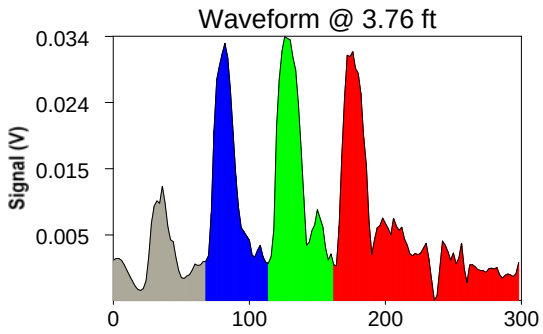


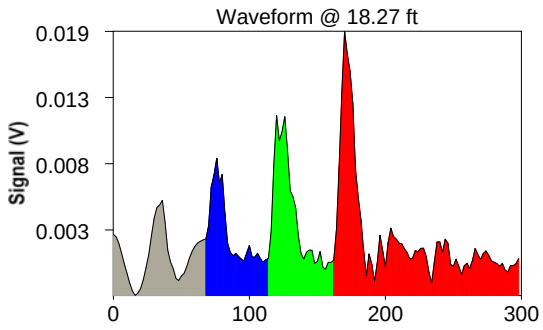
ROST Fluorescence Response Data

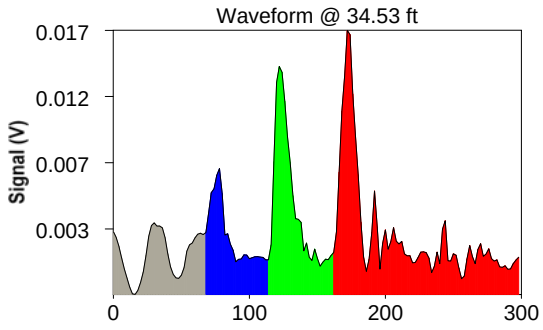
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/13/2013 @ 12:05:57 PM	Max fluorescence: 32.33% @ 3.76 ft
ROST Unit: Houston	Final depth BGS: 64.00 ft

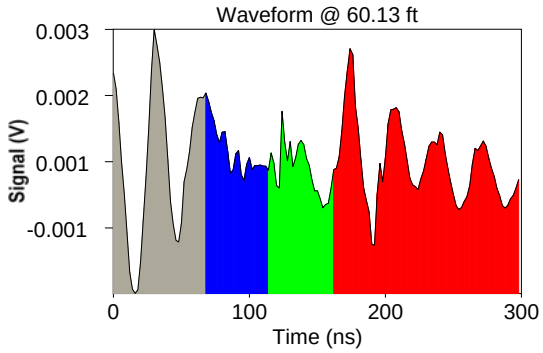
IM-CPT-15







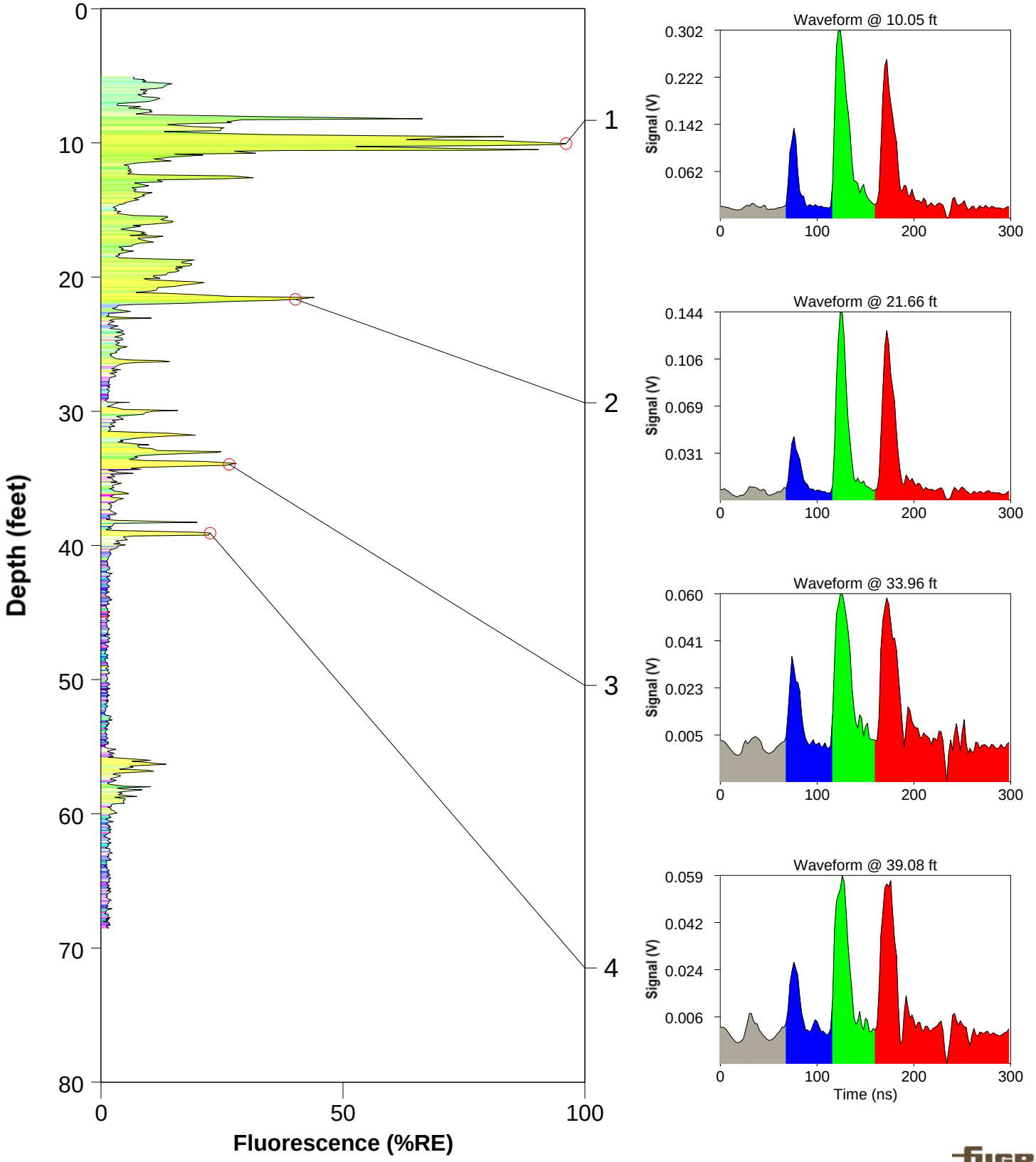




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/14/2013 @ 9:13:02 AM	Max fluorescence: 96.11% @ 10.05 ft
ROST Unit: Houston	Final depth BGS: 68.51 ft

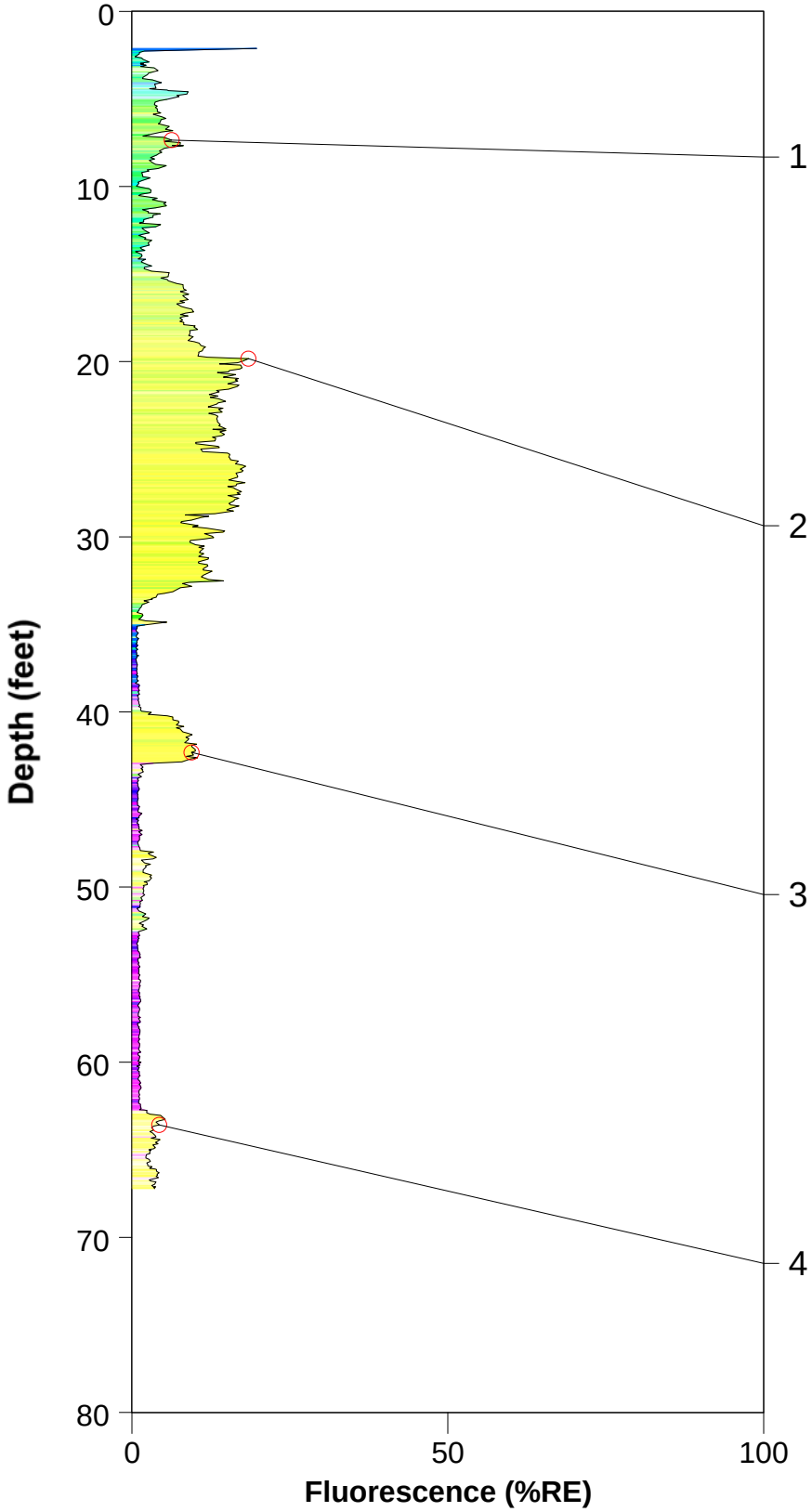
IM-CPT-16

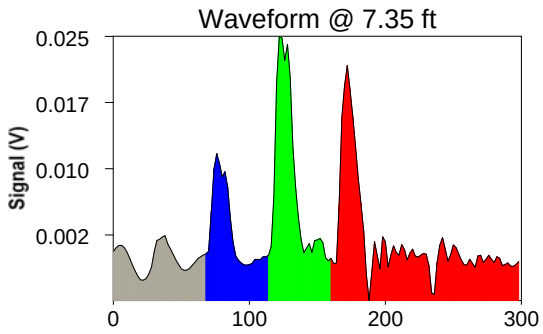


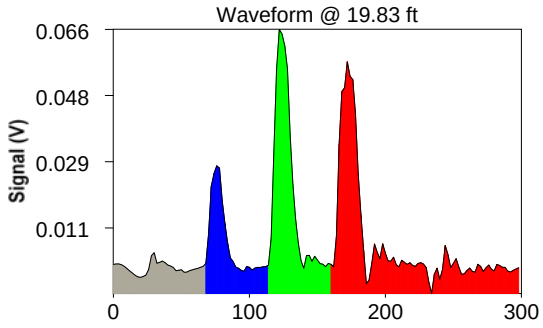
ROST Fluorescence Response Data

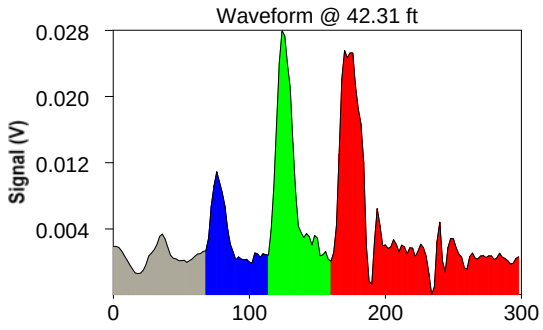
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/13/2013 @ 2:25:46 PM	Max fluorescence: 19.73% @ 2.12 ft
ROST Unit: Houston	Final depth BGS: 67.22 ft

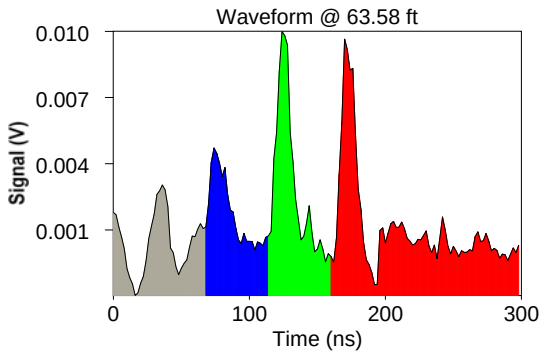
IM-CPT-17







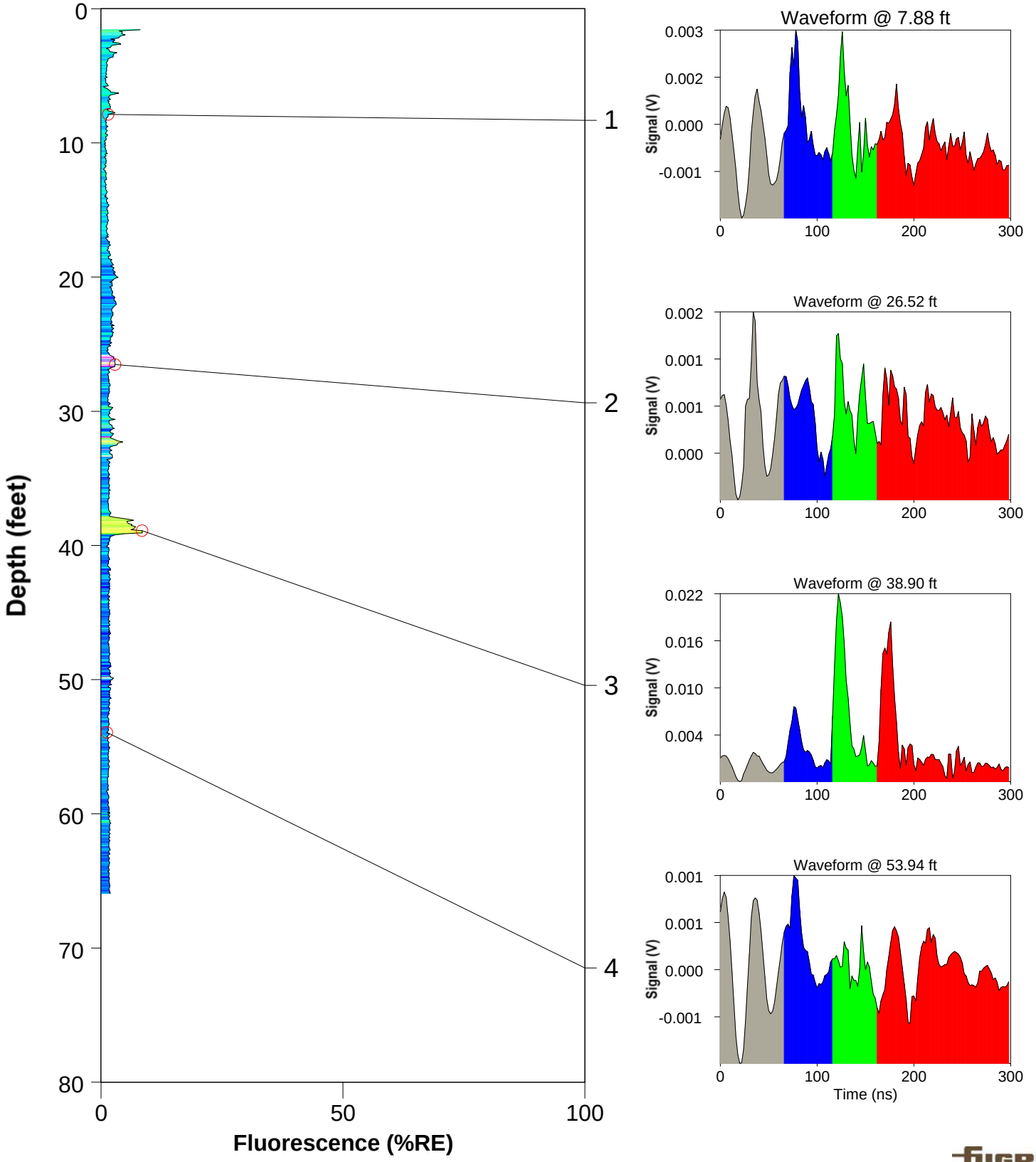




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/13/2013 @ 3:42:09 PM	Max fluorescence: 8.53% @ 39.06 ft
ROST Unit: Houston	Final depth BGS: 65.94 ft

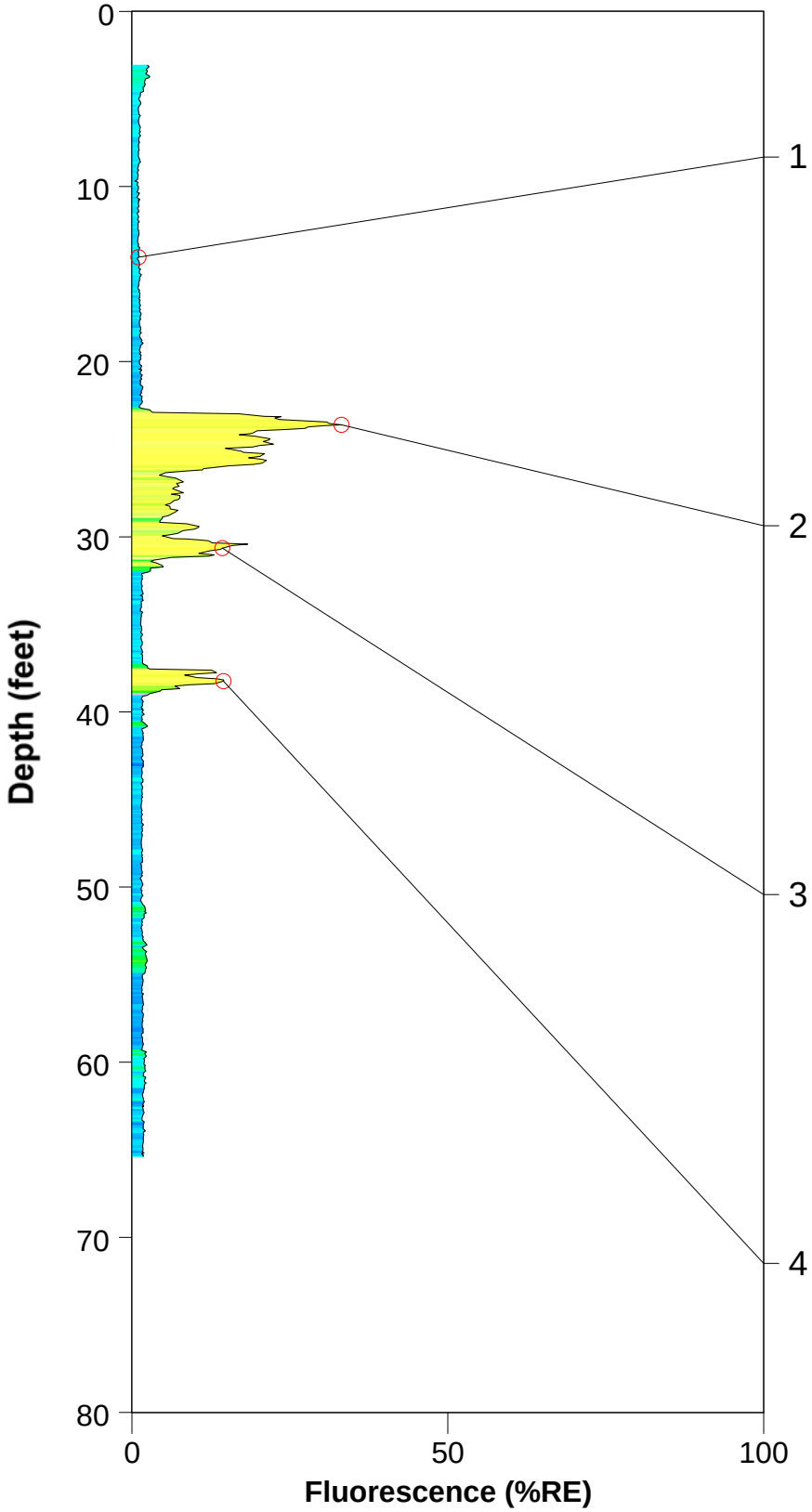
IM-CPT-18

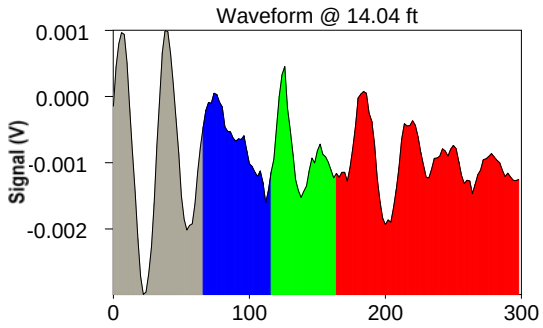


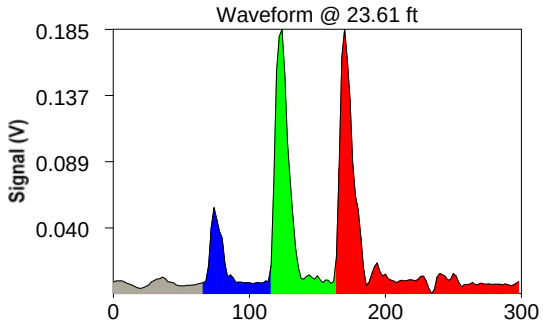
ROST Fluorescence Response Data

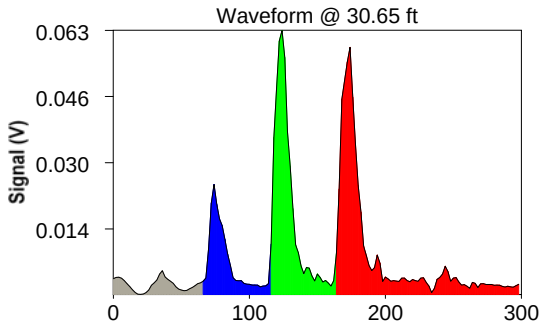
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/14/2013 @ 10:44:53 AM	Max fluorescence: 33.17% @ 23.61 ft
ROST Unit: Houston	Final depth BGS: 65.38 ft

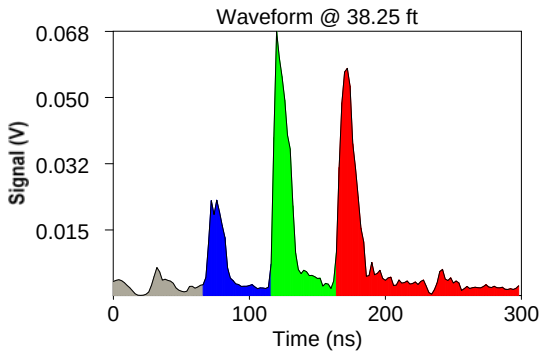
IM-CPT-19







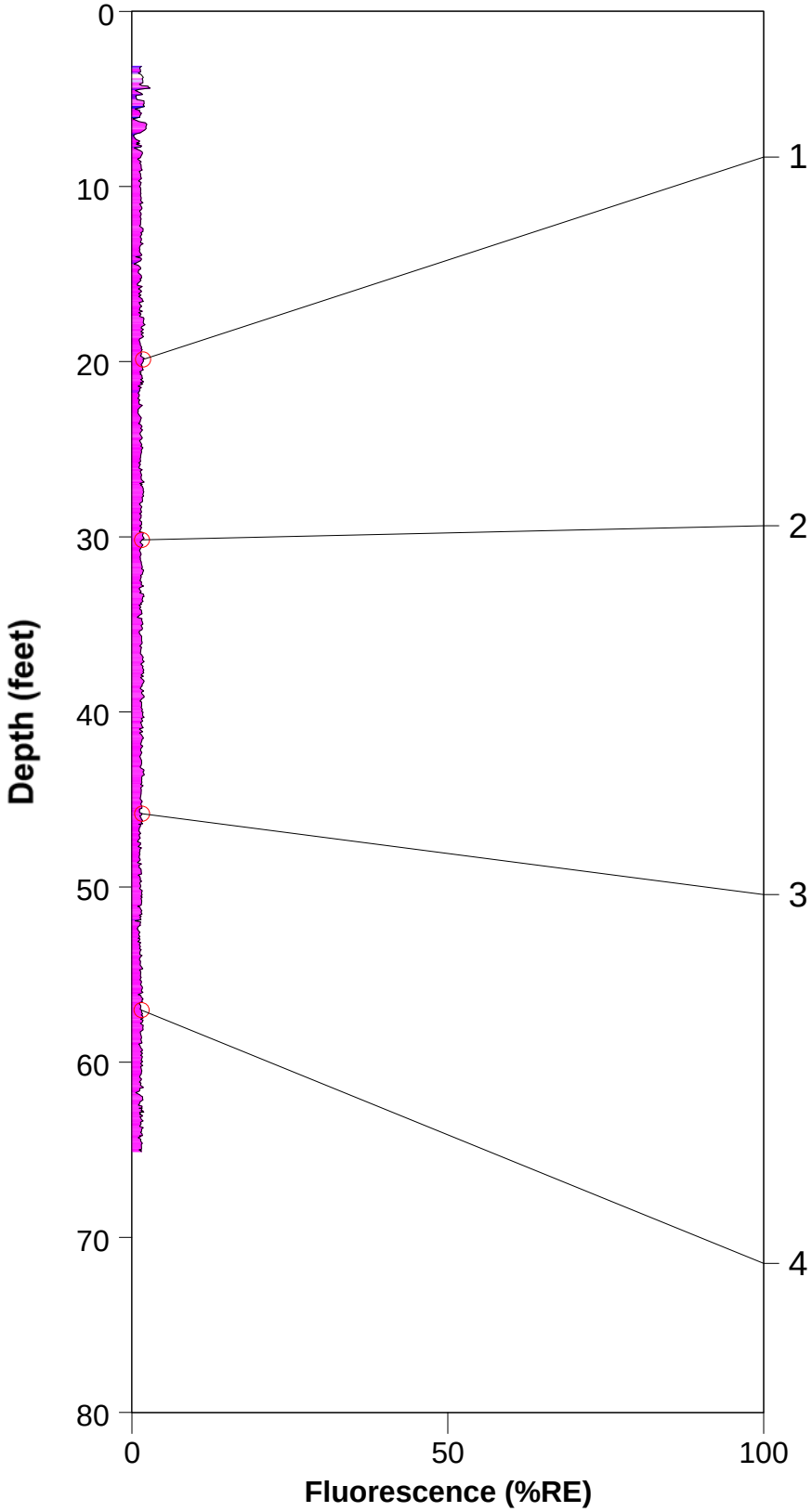


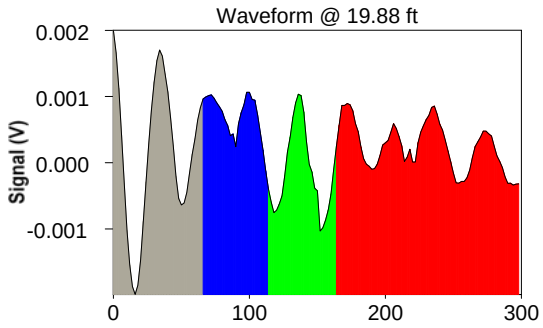


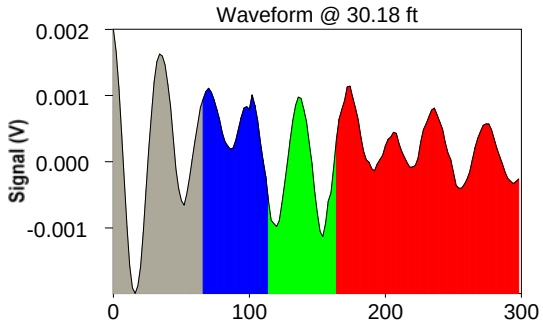
ROST Fluorescence Response Data

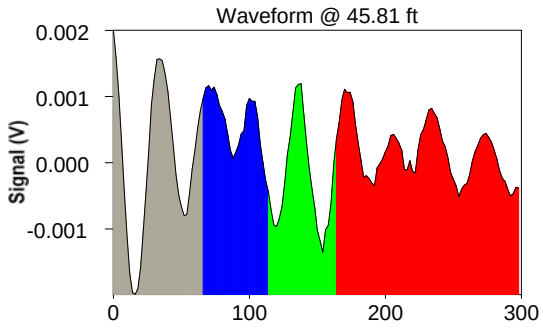
Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/14/2013 @ 3:07:16 PM	Max fluorescence: 2.87% @ 4.38 ft
ROST Unit: Houston	Final depth BGS: 65.11 ft

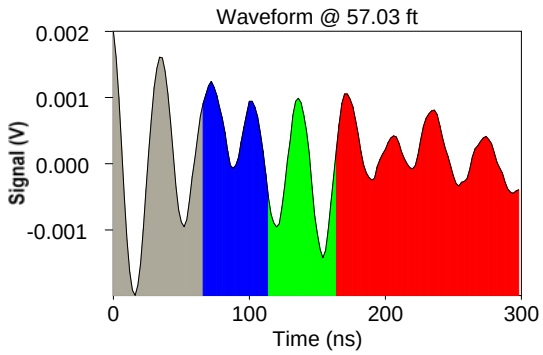
IM-CPT-20







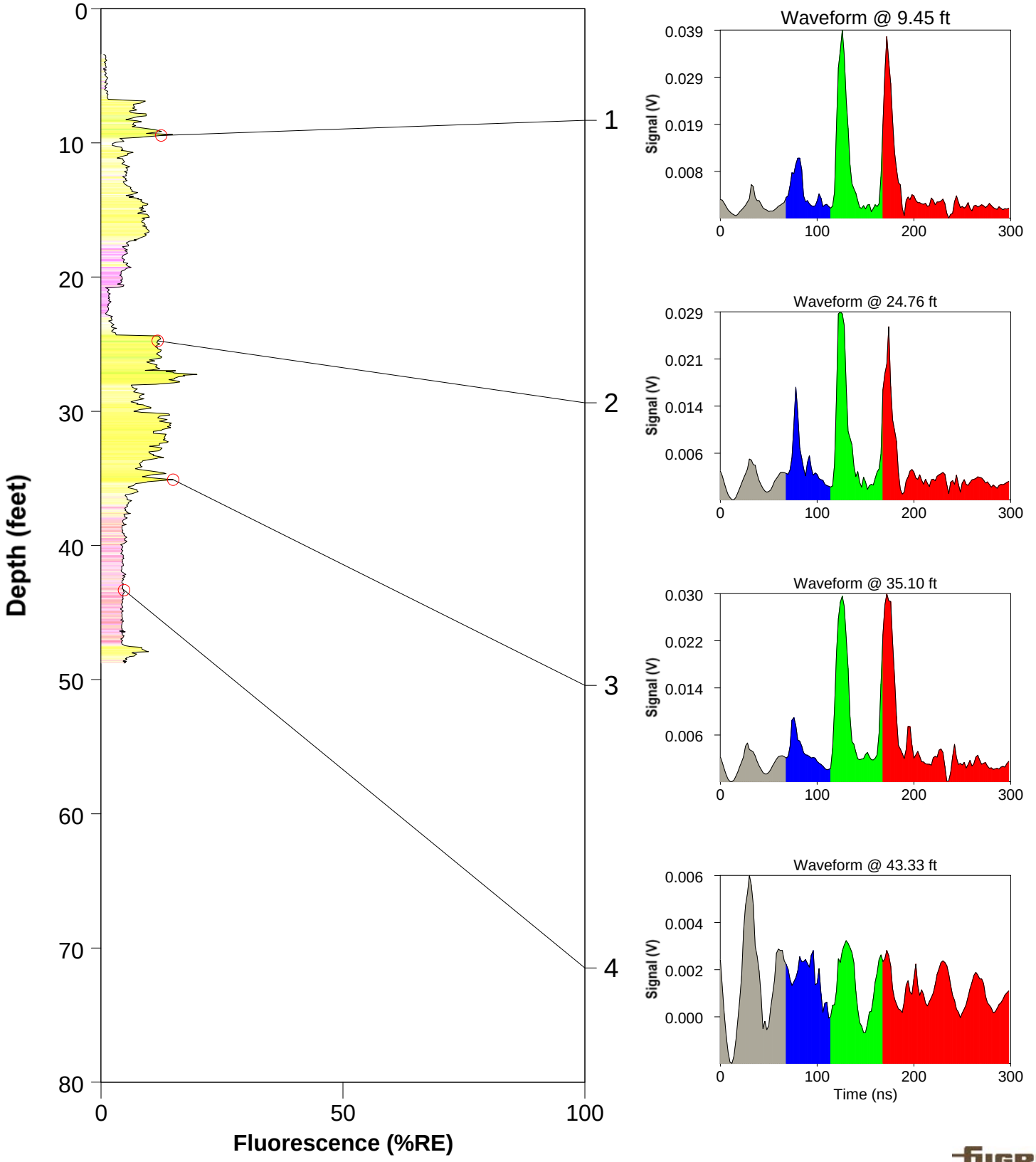




ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/15/2013 @ 9:48:47 AM	Max fluorescence: 19.83% @ 27.26 ft
ROST Unit: Houston	Final depth BGS: 48.77 ft

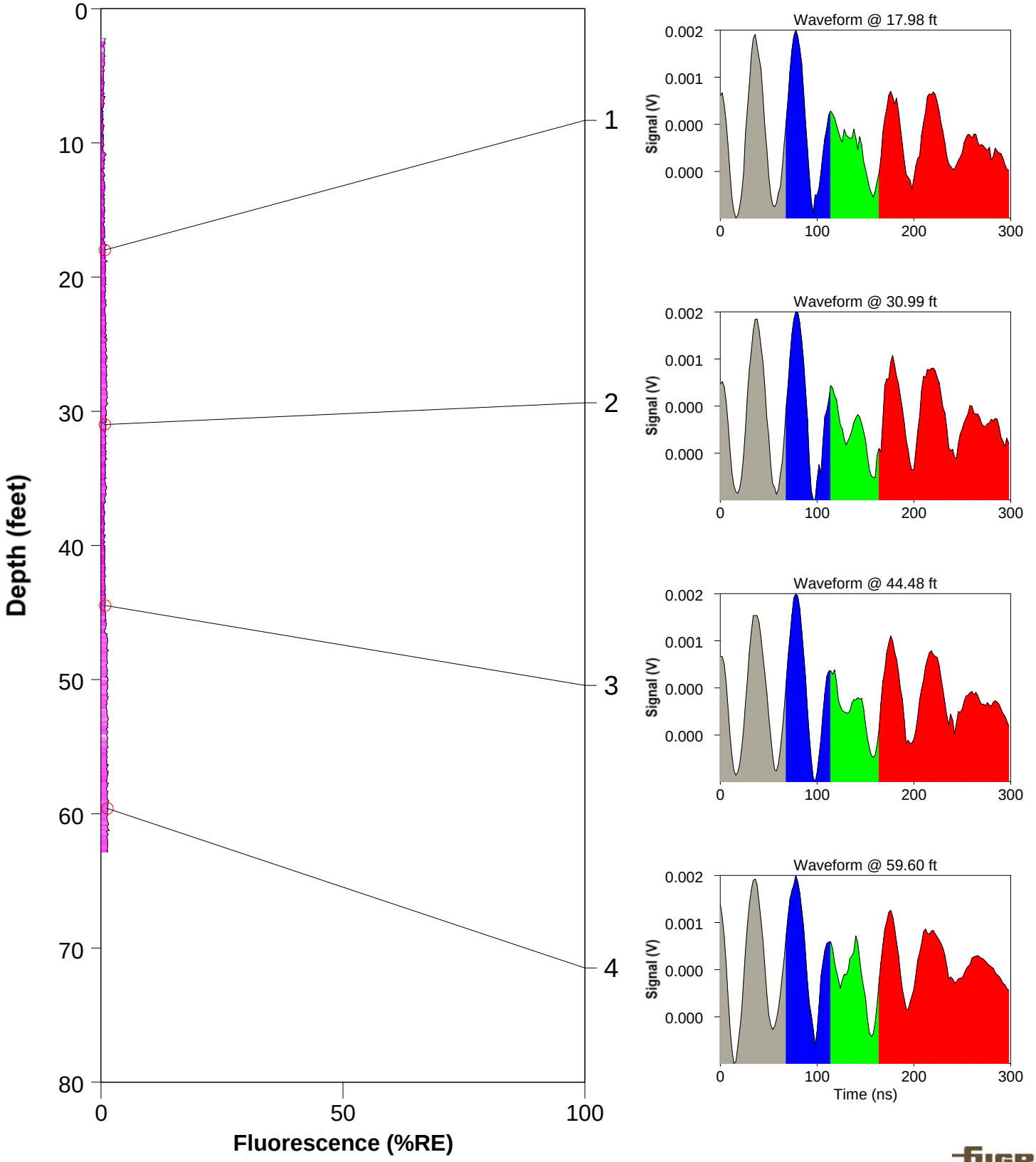
IM-CPT-21



ROST Fluorescence Response Data

Site: Houston, TX	Operator: Robert Biehle
Client: Pastor, Behling & Wheeler, LLC	Fugro Job #: 04.1913-0008
Date/Time: 2/15/2013 @ 2:12:49 PM	Max fluorescence: 1.69% @ 61.24 ft
ROST Unit: Houston	Final depth BGS: 62.85 ft

IM-CPT-23



APPENDIX 3

STUDIES/TESTS DOCUMENTATION

3A – Groundwater Classification Tables, Figures, And Attachments
3B – DNAPL Recovery Pilot Test Work Plan and 18-Month Report
3C – Request for No Further Action – RCRA Unit No. 1/SWMU 1
3D – Request for Preliminary Review Of Area Of Contamination (AOC)

APPENDIX 3A

GROUNDWATER CLASSIFICATION TABLES, FIGURES, AND ATTACHMENTS

TABLE 3.1
CONSTANT YIELD TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-15B Constant Yield Test 1 03/6/12		
Time (min)	Water Level (ft)	Drawdown (ft)
0	8.65	0.00
5	10.14	1.49
10	10.69	2.04
15	10.88	2.23
20	10.96	2.31
25	11.14	2.49
30	11.13	2.48
35	11.14	2.49
40	11.13	2.48
45	11.21	2.56
50	11.05	2.40
55	10.93	2.28
60	10.90	2.25
65	11.13	2.48
70	11.13	2.48
75	11.13	2.48
80	11.05	2.40
85	11.03	2.38
90	11.17	2.52
95	11.29	2.64
100	10.87	2.22
105	10.82	2.17
110	11.20	2.55
115	11.27	2.62
120	11.25	2.60
125	11.29	2.64
130	11.34	2.69
135	11.30	2.65
140	11.53	2.88
145	11.38	2.73
150	11.13	2.48
156	11.13	2.48
160	11.15	2.50
179	11.01	2.36

TABLE 3.1
CONSTANT YIELD TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-33BR Constant Yield Test 1 03/5/12		
Time (min)	Water Level (ft)	Drawdown (ft)
0	3.29	0.00
5	5.50	2.21
9	8.00	4.71
11	9.35	6.06
13	10.05	6.76
15	11.30	8.01
19	12.65	9.36
23	14.68	11.39
27	15.70	12.41
33	18.56	15.27
37	19.99	16.70
46	23.82	20.53
49	24.70	21.41
53	27.35	24.06
57	28.85	25.56
61	29.90	26.61
65	30.35	27.06
69	31.30	28.01
75	33.40	30.11
80	34.75	31.46
86	34.90	31.61
87	34.82	31.53
90	35.08	31.79
95	34.99	31.70
102	34.91	31.62
107	34.86	31.57
115	34.79	31.50
134	34.71	31.42
1019	33.20	29.91
1319	32.66	29.37
1624	32.21	28.92
2415	30.89	27.60
2806	30.29	27.00
3876	28.65	25.36

TABLE 3.1
CONSTANT YIELD TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-68B Constant Yield Test 1 03/5/12		
Time (min)	Water Level (ft)	Drawdown (ft)
0	3.36	0.00
3	3.79	0.43
6	4.29	0.93
8	4.70	1.34
11	5.55	2.19
13	6.18	2.82
14	6.54	3.18
15	7.21	3.85
17	7.64	4.28
19	8.32	4.96
20	8.64	5.28
21	9.09	5.73
23	9.66	6.30
25	10.22	6.86
27	10.75	7.39
29	11.34	7.98
31	11.79	8.43
33	12.27	8.91
35	12.70	9.34
37	13.13	9.77
39	13.52	10.16
41	13.99	10.63
43	14.45	11.09
45	14.90	11.54
47	15.30	11.94
49	15.62	12.26
51	15.89	12.53
53	16.13	12.77
55	16.30	12.94
57	16.39	13.03
61	16.50	13.14
65	16.63	13.27
69	16.78	13.42
73	16.90	13.54
77	17.00	13.64
81	17.09	13.73
85	17.18	13.82
89	17.30	13.94
93	17.56	14.20
97	17.66	14.30
101	17.63	14.27
105	17.60	14.24
109	17.59	14.23
113	17.59	14.23
117	17.59	14.23
121	17.59	14.23
125	17.59	14.23
129	17.59	14.23
133	17.78	14.42
137	17.73	14.37
141	17.68	14.32
145	17.62	14.26

TABLE 3.1
CONSTANT YIELD TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-71B Constant Yield Test 1 03/6/12		
Time (min)	Water Level (ft)	Drawdown (ft)
0	8.78	0
2	9.4	0.62
6	10.78	2
11	13.31	4.53
15	15.3	6.52
20	17.59	8.81
25	20.11	11.33
30	22.95	14.17
35	25.65	16.87
40	28.1	19.32
45	30.8	22.02
50	33.2	24.42
55	33.35	24.57
60	33.6	24.82
65	33.96	25.18
70	34.45	25.67
75	35.4	26.62
82	35.95	27.17
85	35.9	27.12
90	35.69	26.91
95	35.62	26.84
103	35.56	26.78
423	35.18	26.4
1244	34.98	26.2
1643	34.92	26.14
2703	34.76	25.98

TABLE 3.1
CONSTANT YIELD TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-74B Constant Yield Test 1 03/7/12		
Time (min)	Water Level (ft)	Drawdown (ft)
0	7.75	0.00
5	9.37	1.62
10	10.85	3.10
15	11.93	4.18
20	13.16	5.41
25	13.75	6.00
30	14.43	6.68
35	14.88	7.13
40	15.37	7.62
45	15.70	7.95
50	15.80	8.05
55	15.90	8.15
60	15.92	8.17
65	15.92	8.17
70	15.98	8.23
75	15.95	8.20
80	16.09	8.34
85	16.70	8.95
90	17.10	9.35
95	17.45	9.70
100	17.48	9.73
105	17.36	9.61
110	17.24	9.49
115	17.36	9.61
120	17.46	9.71
125	17.24	9.49
130	17.36	9.61
135	17.32	9.57
145	17.55	9.80
150	17.52	9.77
155	17.35	9.60
160	17.39	9.64
165	17.36	9.61
170	17.37	9.62
175	17.41	9.66
180	17.41	9.66
185	17.41	9.66
190	17.56	9.81
195	17.47	9.72
200	17.52	9.77
205	17.47	9.72
210	17.41	9.66
215	17.40	9.65
220	17.41	9.66
225	17.46	9.71
230	17.45	9.70
235	17.53	9.78
240	17.59	9.84
245	17.56	9.81
250	17.68	9.93
255	17.83	10.08
260	17.95	10.20
265	17.75	10.00
270	17.80	10.05

TABLE 3.2
SLUG TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-32B Slug In 1 03/6/12		
Time (min)	Water Level (ft)	Displacement (ft)
0	3.93	0.00
0.17	1.25	2.68
0.33	1.30	2.63
0.5	1.31	2.62
1	1.31	2.62
2	1.32	2.61
3	1.33	2.61
5	1.33	2.60
10	1.35	2.58
20	1.39	2.54
30	1.42	2.52
215	1.85	2.08
366	2.30	1.63
1308	3.25	0.68
1687	3.45	0.48

MW-32B Slug Out 1 03/7/12		
Time (min)	Water Level (ft)	Displacement (ft)
0	3.45	0.00
0.5	6.11	2.66
1	6.11	2.66
1.5	6.11	2.66
2	6.10	2.65
3	6.10	2.65
43	6.01	2.56
113	5.89	2.44
206	5.73	2.28
1074	4.99	1.54
1373	4.89	1.44

TABLE 3.2
SLUG TESTING WATER LEVEL CHANGES

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

MW-70B Slug In 03/6/12		
Time (min)	Water Level (ft)	Displacement (ft)
0	5.49	0.00
0.17	2.80	2.69
0.5	2.86	2.63
0.67	2.87	2.62
0.83	2.88	2.61
1	2.88	2.61
2	2.89	2.60
3	2.89	2.60
5	2.89	2.60
10	2.90	2.59
20	2.94	2.55
303	4.15	1.34
1125	4.30	1.19
1515	4.32	1.17

MW-70B Slug Out 03/7/12		
Time (min)	Water Level (ft)	Displacement (ft)
0	4.32	0.00
0.5	7.04	2.72
1	7.03	2.71
1.5	7.03	2.71
2	7.03	2.71
34	7.01	2.69
102	7.01	2.69
195	6.98	2.66
1066	6.88	2.56
1207	6.87	2.55
1368	6.92	2.60

TABLE 3.3
SUMMARY OF AQUIFER TEST RESULTS AND SUSTAINABLE WELL YIELD CALCULATIONS - 2009-2012

Groundwater Resource Classification: UPRR Houston Wood Preserving Works
Houston, Texas

Well Number	Type of Test	Analysis Method	Hydraulic Conductivity, K (cm/sec)	Average[1] K for Well (cm/sec)	Average[2] K for Unit (cm/sec)	Saturated Thickness, b (ft)	Confining Head, h_c (ft)	Calculated Average Yield[3], Q (GPD)
B-TZ GWBU Unit Well								
MW-35B	Bail Down	Bouwer - Rice	1.6E-04	1.6E-04	1.6E-04	35	21.21	1694
			1.6E-04					
			1.3E-04					
	Slug	Bouwer - Rice	1.5E-04					
			1.9E-04					
B-CZ GWBU Wells								
MW-32B	Slug	Bouwer - Rice	6.6E-07	5.8E-07		40	15.77	8
MW-32B	Slug	Bouwer - Rice	5.1E-07					
MW-33B	Bail Down	Bouwer - Rice	1.1E-06	1.1E-06		35	17.31	14
MW-36B	Bail Down	Bouwer - Rice	9.4E-08	9.4E-08		31.5	23.12	2
MW-49B	Bail Down	Bouwer - Rice	2.9E-07	2.9E-07		35	11.6	3
MW-55B	Slug	Bouwer - Rice	1.8E-08	1.8E-08		40	10.42	0.2
MW-57B	Slug	Bouwer - Rice	2.1E-08	2.1E-08	1.1E-07	40	5.97	0.1
MW-59B	Bail Down	Bouwer - Rice	7.6E-07	7.6E-07		34.5	12.69	7
MW-63B	Bail Down	Bouwer - Rice	9.2E-08	9.2E-08		37	0	4
MW-67B	Bail Down	Bouwer - Rice	2.1E-07	2.1E-07		35	28.97	5
MW-70B	Slug	Bouwer - Rice	6.5E-08	4.9E-08		13.2	16.31	0.3
MW-70B	Slug	Bouwer - Rice	3.4E-08					
MW-72B	Slug	Bouwer - Rice	8.0E-09	8.0E-09		40	0	1
D-TZ Unit Wells								
MW-36D	Slug	Bouwer - Rice	3.8E-05	4.0E-05	4.0E-05	35	14.53	302
			4.0E-05					324
			4.0E-05					320
			4.1E-05					331
			3.9E-05					311
			4.1E-05					327

1. Calculated as an arithmetic average.
2. Calculated as a geometric average.
3. Based on idealized well function for a fully penetrating 4-inch diameter well.

TABLE 3.4
SUMMARY OF WELL YIELD TEST RESULTS
Groundwater Resource Classification: UPRR Houson Wood Preserving Works
Houston, Texas

Well Number	Test Type[1]	Sustains 150 GPM?	Yield (GPD)
B-TZ Unit Wells			
MW-15B	Constant Discharge	Yes	>150
MW-35B	Cyclic Bailing	Yes	480
MW-68B	Constant Discharge	Yes[2]	>150
MW-74B	Constant Discharge	Yes[2]	>150
B-CZ Unit Wells			
MW-33B	Cyclic Bailing	No	<4
MW-33BR	Constant Discharge	No	<10
MW-36B	Cyclic Bailing	No	<7.75
MW-49B	Cyclic Bailing	No	<4
MW-59B	Cyclic Bailing	No	<5.75
MW-63B	Cyclic Bailing	No	<3
MW-67B	Cyclic Bailing	No	<7.25
MW-71B	Constant Discharge	No	<10

1. Constant distcharge tests conducted at a pumping rate of 0.1 gpm.
2. Longer test period could indicate yield is not sustainable.

ATTACHMENT 3A

AQUIFER TEST FIELD NOTES

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 3-6-12	Well No.: 32B
Slug IN or OUT: In	Measuring Point (MP): TOC / Steel
Well Diameter (in.): 2" act 2¼"	MP Height (ft. above ground level): -0.40
Well Depth (ft. BGL): 36'	Slug Type (stainless, PVC, Teflon): PVC
Screen Interval (ft. BGL): 26' - 36'	Slug Length ~~(ft.)~~: 60"
Starting WL (ft. BMP): 3.93	Slug Diameter ~~(ft.)~~: 1.75"
Decon. Procedures: Alconox + DI, Rinse	Slug Volume ~~(cu. ft.)~~: 144.32 cu ins
	Expected Well Response (+/- ft.): ~~+5'~~ +36.26"
Start Time: ~~3-6-12~~ 913	End Time: 3-7-12 1327
	Performed by: SDBerndt

Slug was 1¼" PVC pipe Sch 40

Minutes Since Start/Time	Water Level (ft. BMP)
10 secs	1.25
20	1.30
30	1.31
60	1.31
2:00 mins.	1.32
3:00	1.325
5:00	1.33
10:00	1.35
20:00	1.39
30:00	1.415
~~1240:00~~	1.85
1519	~~2.30~~
3-7-12 701	3.25

Minutes Since Start/Time	Water Level (ft. BMP)
3-7-12 1320	3.45

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 3-7-12	Well No.: 32B
Slug IN or OUT: OUT	Measuring Point (MP): TOC/SS
Well Diameter (in.): 2¼	MP Height (ft. above ground level): -0.40
Well Depth (ft. BGL): 36'	Slug Type (stainless, PVC, Teflon): PVC
Screen Interval (ft. BGL): 26 - 36	Slug Length (ft.): 60"
Starting WL (ft. BMP): 3.45 not quite 90% recover	Slug Diameter (ft.): 1.75"
Decon. Procedures: disposable from day before	Slug Volume (cu. ft.): 144.32
	Expected Well Response (+/- ft.):
Start Time: 1327 (3-7-12)	End Time:
	Performed by: SD Berndt

Minutes Since Start/Time	Water Level (ft. BMP)
132730	6.11
1328	6.11
132830	6.105
1329	6.10
1330	6.10
1410	6.01
1520	5.89
1653	5.73
3-8-12 721	4.99
" 1220	4.89

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-33B
Slug IN or OUT:	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 32.02 after bailing [illegible] 9.09	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
3 gallons removed, stopped bailing, well is dry	Expected Well Response (+/- ft.):
Start Time: [illegible] 1000	End Time: Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
0	32.[illegible]15
1 MIN	[illegible]32.09
2 MIN	32.04
3	31.99
4	31.95
5	31.90
6	31.86
9 MIN	31.69
18 MIN	31.34
25	31.04
30	30.83
35	30.66
40	30.42

Minutes Since Start	Water Level (ft. BMP)
45	30.19
50	29.99
60	29.53
[illegible]70	29.18
80	28.79
140	26.92
	25.84
	24.17
	22.56
	20.21
2-27-09	10.02

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

1120
1220
1303
1403
1444
1618
1101
1030

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-35B
Slug IN or OUT: bail down	Measuring Point (MP): TOC / STAINLESS
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 5.79	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
5 gallons removed, stopped bailing	Expected Well Response (+/- ft.):
Start Time:	End Time:
	Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
START	16.15
15 SEC	15.05
30 SEC	14.16
45 SEC	13.80
1 MIN	13.24
15	12.81
30	12.37
45	11.90
2 MIN	11.51
15	11.12
30	10.77
45	10.47
3 MIN	10.13

Minutes Since Start	Water Level (ft. BMP)
3 MIN 30 SEC	9.59
4 MIN	9.09
30	8.64
5 MIN	8.17
6 MIN	7.61
7 MIN	7.06
8 MIN	6.67
9 MIN	6.37
10 MIN	6.14
11 MIN	5.98
12 MIN	5.82
13 MIN	5.71
14 MIN	5.66

Minutes Since Start	Water Level (ft. BMP)
15 MIN	5.63

Minutes Since Start	Water Level (ft. BMP)

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-35B
Slug IN or OUT:	Measuring Point (MP): TOC / STAINLESS
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 5.64	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
5 gallons removed	Expected Well Response (+/- ft.):
Start Time:	End Time: / Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
START	16.47
15	15.31
30	14.39
45	13.89
1 MIN	13.40
15	12.99
30	12.53
45	12.12
2 MIN	11.75
15	11.33
30	10.96
45	10.60
3 MIN	10.22

Minutes Since Start	Water Level (ft. BMP)
3 MIN 30 SEC	9.64
4 MIN	9.08
30	8.67
5	8.21
6	7.62
7	7.11
8	6.68
9	6.32
10	6.06
11	5.85
12	5.76
13	5.69
14	5.64

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-35B
Slug IN or OUT:	Measuring Point (MP): TOC / STAINLESS
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 5.67	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
5 gallons removed	Expected Well Response (+/- ft.):
Start Time: 1520	End Time:
	Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
START	17.06
15	15.83
30	14.96
45	14.51
1 MIN	14.02
15	13.56
30	13.12
45	12.73
2 MIN	12.47
15	12.06
30	11.74
45	11.38
3 MIN	10.91

Minutes Since Start	Water Level (ft. BMP)
30	10.32
4 MIN	9.77
30	9.53
5	9.09
6	8.46
7	7.96
8	7.53
9	7.21
10	7.01
11	6.82
12	6.70
13	6.51
14	6.29

Minutes Since Start	Water Level (ft. BMP)
15	6.03
16	5.91
17	5.78
18	5.65

Minutes Since Start	Water Level (ft. BMP)

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BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 36B
Pump or Bailer: Bailer	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2"	MP Height (ft. above ground level): -0.60
Well Depth (ft. BGL): MP 42.82	Casing Volume (gal): 6.61
Screen Interval (ft. BGL): 38-43	Bailer/Pump Type (stainless, PVC, Teflon): PVC
Starting WL (ft. BMP): 4.38	Volume Removed (V1) (gal): 7.75
Decon. Procedures: dedicated equipment	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time: 11:22	End Time: Performed by: S. Burndt

Minutes Since Start	Water Level (ft. BMP)
11:33:15	42.30
11:33:30	42.14
11:33:45	42.08
11:33 00	42.01
11:34 15	41.93
11:34 30	41 89
11:34 45	41.84
11:35 00	41.81
11:36:30	41.69
11:38:00	41.63
11:39:30	41.60
11:41:00	41.57
11:42:30	41.54

Minutes Since Start	Water Level (ft. BMP)
11:44:00	41.51
11:47:	41.47
11:50	41.44
11:53	41.41
11:56	41.39
12:01	41.36
12:09	41.30
12:30	41.23
12:48	41.19
13:12	41.14
13:42	41.11
14:33	41.06
15:04	41.04

Minutes Since Start	Water Level (ft. BMP)
15:36	41.02
16:19	41.00
17:04	40.99

Minutes Since Start	Water Level (ft. BMP)

Notes:

90% Recovery of watercol. 8.224 DTW

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-49B
Slug IN or OUT:	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL): 34.75	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 13.90	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
4 gallons removed, well is dry	Expected Well Response (+/- ft.):
Start Time: 1325	End Time:
	Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
0	33.15
1 MIN	32.98
2 MIN	32.86
3 MIN	32.79
4 MIN	32.74
5 MIN	32.71
6 MIN	32.68
8 MIN	32.63
10 MIN	32.56
15 MIN	32.52
20 MIN	32.48
30 MIN	32.43
1455	32.11

Minutes Since Start	Water Level (ft. BMP)
1635	31.68
2-27-09 1055	30.28

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-25-12	Well No.: MW-55B
Slug IN or OUT: IN	Measuring Point (MP): TOC / STEEL
Well Diameter (in.): 2 1/2 SS	MP Height (ft. above ground level):
Well Depth (ft. BGL): 38'	Slug Type (stainless, PVC, Teflon):
Screen Interval (ft. BGL):	Slug Length (ft.): 60 1/4"
Starting WL (ft. BMP): 13.38	Slug Diameter ~~(ft)~~: 1 1/4"
Decon. Procedures:	Slug Volume (cu. ft.):
7-25-12	Expected Well Response (+/- ft.):
Start Time: 1644	End Time:
	Performed by: S D Berndt

Minutes Since Start/Time	Water Level (ft. BMP)
sec 15	11.38
30	11.42
45	11.44
1:00	11.445
2:00	11.45
3:00	11.45
4:00	11.45
5:00	11.455
1741	11.45
7-26 735	11.47
1245	11.485
1730	11.485
7-27 638	11.51

7-25-12

Minutes Since Start/Time	Water Level (ft. BMP)
7-27 1300	11.52
no black product on slug or rope. Rope did smell so ~~it~~ discarded it into drum	

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

1/4 braided nylon rope loose braid

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-25-12	Well No.: MW-57B
Slug IN or OUT: IN	Measuring Point (MP): TOC/STEEL
Well Diameter (in.): 2" SS	MP Height (ft. above ground level): 2'-1"
Well Depth (ft. BGL): 40'	Slug Type (stainless, PVC, Teflon): Gray Plastic
Screen Interval (ft. BGL):	Slug Length (ft.): 60"
Starting WL (ft. BMP): 20.23	Slug Diameter (in): 1.5"
Decon. Procedures: DI Rinse	Slug Volume (cu. ft.):
7-25-12	Expected Well Response (+/- ft.):
Start Time: 1554	End Time: 7-27-12 1248
	Performed by: S.D. Berndt

Minutes Since Start/Time	Water Level (ft. BMP)
Sec 30	17.91
sec 45	17.92
1:00	17.92
1:30	17.92
2:00	17.92
3:00	17.925
4:00	17.925
5:00	17.925
28:00	17.925
1654	17.92
1747	17.91
7-26 729	17.875
1240	17.86

7-25-12

Minutes Since Start/Time	Water Level (ft. BMP)
7-26 1725	17.84
7-27 633	17.81
1248	17.79

Minutes Since Start/Time	Water Level (ft. BMP)
Product on rope app 2' from top of Slug	
Slug covered in product lost 2'½ ft.	

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SS tubing for well is actually 2⅛" in dia

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BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 59B
Pump or Bailer: Bailer	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2"	MP Height (ft. above ground level): —0.25
Well Depth (ft. ~~BGL~~): mp 32.91	Casing Volume (gal): 4.23
Screen Interval (ft. BGL): 28-33	Bailer/Pump Type (stainless, PVC, Teflon): PVC
Starting WL (ft. BMP): 8.31	Volume Removed (V1) (gal): 6.75
Decon. Procedures: dedicated equipment D.I. Rinse	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time: Bailing 8:25	End Time:
	Performed by: S. D. Berndt

Minutes Since Start	Water Level (ft. BMP)
8:37:00	32.46
8:37:15	32.39
8:37:30	32.33
8:37:45	32.28
8:38:00	32.23
8:38:15	32.18
8:38:30	32.14
8:40:00	32.01
8:41:30	31.92
8:43:00	31.84
8:44:30	31.76
8:46	31.70
8:47:30	31.64

Minutes Since Start	Water Level (ft. BMP)
8:49	31.58
8:52	31.47
8:55	31.39
9:00	31.26
9:05	31.18
9:10	31.09
9:15	31.00
9:20	30.92
9:30	30.79
9:40	30.66
13:24	28.37
17:04	25.11

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

V1 - 90% recovery DTW should be 10.77

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 2-25-09	Well No.: MW-43B
Slug IN or OUT: bail down (dry)	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2	MP Height (ft. above ground level):
Well Depth (ft. BGL): 36.25	Slug Type (stainless, PVC, Teflon): bailer
Screen Interval (ft. BGL):	Slug Length (ft.):
Starting WL (ft. BMP): 34.97 after bailing 25.58	Slug Diameter (ft.):
Decon. Procedures:	Slug Volume (cu. ft.):
3 gallons removed, well is dry	Expected Well Response (+/- ft.):
Start Time: 0853	End Time: Performed by: JTB

Minutes Since Start	Water Level (ft. BMP)
0.	34.97
1 MIN	34.84
2	34.74
3	34.68
4	34.64
5	34.61
7 MIN 30 SEC	34.54
0903 10 MIN	34.48
15 MIN	34.42
20 MIN	34.39
0933 40 MIN	34.30
1037 104 MIN	34.20
1114 141	34.16

Minutes Since Start	Water Level (ft. BMP)
1222 209	34.14
1403	34.13
1437	34.12
1612	34.06
2-27-09 1104	33.76
3/10/09 0835	31.96

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

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BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 67B
Pump or Bailer: Bailer	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2"	MP Height (ft. above ground level): -0.50
Well Depth (ft. BGL): MP ~~2.08~~ 39.46	Casing Volume (gal): 6.34
Screen Interval (ft. BGL): 35-40	Bailer/Pump Type (stainless, PVC, Teflon): PVC
Starting WL (ft. BMP): 2.62	Volume Removed (V1) (gal): 7.25
Decon. Procedures: dedicated equipment DI Rinse	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time: 10:01	End Time:
	Performed by: SD Berndt

Minutes Since Start	Water Level (ft. BMP)
10:10:30	38.45
10:10 45	38.89
10:11:00	38.79
10:11:15	38.74
10:11:30	38.66
10:11 45	38.61
10:12	38.58
10:13:30	38.30
10:1500	38.15
10:16:30	37.03
10:19	36.96
10:19:30	36.90
10:21	36.85

Minutes Since Start	Water Level (ft. BMP)
10:24	36.77
10:27	36.70
10:30	36.64
10:35	36.57
10:40	36.50
10:45	36.43
10:50	36.37
10:55	36.31
11:00	36.27
11:05	36.23
11:10	36.19
13:29	35:43
17:10	33.96

Minutes Since Start	Water Level (ft. BMP)

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

90% recovery of water colum DTW 6.30

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 3-6-12	Well No.: 70B
Slug IN or OUT: In	Measuring Point (MP): TOC/Steel
Well Diameter (in.): 2, 25sch.	MP Height (ft. above ground level): -0,25
Well Depth (ft. BGL): 36'	Slug Type (stainless, PVC, Teflon): PVC
Screen Interval (ft. BGL): 26'-36'	Slug Length (ft.): 60"
Starting WL (ft. BMP): 5.49	Slug Diameter (ft.): 1.75"
Decon. Procedures:	Slug Volume ~~(cu. ft.)~~: 144.32 cu. in.
3-6-12	Expected Well Response (+/- ft.): +36.26"
Start Time: 12:22	End Time: 3-7-12 1337
	Performed by: SDBerndt

Minutes Since Start/Time	Water Level (ft. BMP)
10sec	2.80
30	86
40	87
50	86
60	86
2.00mins	2.89
3.00	2.89
5:00	2.89
10:00	2.90
20:00	2.94
time 1725	4.15
3-7-12 707	4.30
-11- 1337	4.32

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 3-7-12	Well No.: 70B
Slug IN or OUT: OUT	Measuring Point (MP):
Well Diameter (in.): 2.25	MP Height (ft. above ground level):
Well Depth (ft. BGL): 36'	Slug Type (stainless, PVC, Teflon): PVC
Screen Interval (ft. BGL): 26'-36'	Slug Length ~~(ft.)~~: 60"
Starting WL (ft. BMP): didn't recover 90% from day before (4.32)	Slug Diameter ~~(ft.)~~: 1.75"
Decon. Procedures: disposable	Slug Volume ~~(cu. ft.)~~: 144.32 cu in
	Expected Well Response (+/- ft.):
Start Time: 1341 (3-7-12)	End Time:
	Performed by: SD Berndt

Minutes Since Start/Time	Water Level (ft. BMP)
134130	7.04
1342	7.03
134230	7.025
1343	7.025
1415	7.01
1523	7.01
1656	6.98
3-8-12 727	6.88
-.- 948	6.87
-.- 1229	6.92 ?

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Minutes Since Start/Time	Water Level (ft. BMP)

Notes: checker test one 3-times

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

SLUG TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-25-12	Well No.: MW-72B
Slug IN or OUT: IN	Measuring Point (MP):
Well Diameter (in.): 2 1/8 SS	MP Height (ft. above ground level): 3'-3 1/2"
Well Depth (ft. BGL): 38	Slug Type (stainless, PVC, Teflon): Gray Plastic
Screen Interval (ft. BGL):	Slug Length (ft.): 60 - 5/8"
Starting WL (ft. BMP): 29.24	Slug Diameter (ft): 1 1/2"
Decon. Procedures: D I Rinse	Slug Volume (cu. ft.):
7-25-12	Expected Well Response (+/- ft.):
Start Time: 1614	End Time: Performed by:

7-25-12

Minutes Since Start/Time	Water Level (ft. BMP)
15	27.09
30	27.10
45	27.10
1:00	27.10
2:00	27.10
3:00	27.105
4:00	27.105
5:00	27.11
1652	27.11
1741	27.11
7-26 732	27.08
1243	27.065
1726	27.045

Minutes Since Start/Time	Water Level (ft. BMP)
7-27 636	27.03
1256	27.00

Minutes Since Start/Time	Water Level (ft. BMP)
No product on rope or slug	

Minutes Since Start/Time	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

UP - Houston

Slug **~~BAILDOWN~~ TEST FORM**

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 360
Pump or Bailer: Slug ✓ In Out	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2"	MP Height (ft. above ground level): -0.35
Well Depth (ft. BGL): NA	Casing Volume (gal): 4.22
Screen Interval (ft. BGL): 100-110	Bailer/Pump Type (stainless, PVC, Teflon): PVC Slug 1 5/8" x 5.0'
Starting WL (ft. BMP): 85.47	Volume Removed (V1) (gal): 2.86 ft displaced
Decon. Procedures: DI Rinse	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time: 12:31	End Time:
	Performed by:

Slug in 12:31

Minutes Since Start	Water Level (ft. BMP)
12:31	
12:32	
12:33	
12:34	
12:35	
12:36	
12:37	
12:38	
12:39	
12:40	
12:41	
12:42	
12:43	
12:44	
12:45	
12:46	
12:47	
12:48	
12:49	
12:50	
12:55	
13:00	
13:05	

Slug Out 13:07

Minutes Since Start	Water Level (ft. BMP)
13:08:00	88.02
13:08:15	87.96
13:08:30	87.90
13:08:45	87.85
13:09:00	87.81
13:09:15	87.76
13:09:30	87.71
13:09:45	87.66
13:10	87.62
13:10:30	87.54
13:11:00	87.46
13:12	87.31
13:13	87.18

Minutes Since Start	Water Level (ft. BMP)
13:15	86.94
13:20	86.52
13:25	85.89
Check other wells	
13:40	85.78
13:45	85.71
13:55	85.61
14:00	85.59
14:12	85.55
Talking to John	

Cross section of Slug

Has a 1" knob center on one side the whole length

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

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Slug BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 36D
~~Pump or Bailer~~: Slug Inv 2	Measuring Point (MP):
Well Diameter (in.): 2	MP Height (ft. above ground level):
Well Depth (ft. BGL): 110 Not measured	Casing Volume (gal): See page 1
Screen Interval (ft. BGL): 100 - 110	Bailer/Pump Type (stainless, PVC, Teflon): PVC Slug
Starting WL (ft. BMP): 85.55 (14:12)	Volume Removed (V1) (gal):
Decon. Procedures: D I Rinse	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time:	End Time:
	Performed by: S D Berndt

Slug In 14:18

Minutes Since Start	Water Level (ft. BMP)
14:18 00	82.37
14:18 40	82.46
1418 00	82.55
14 19:20	82.62
14:19 40	82.70
1420:00	82.77
1420:20	82.82
14:20:40	82.90
14 2100	82.96
14:21:20	83.02
14:21:40	83.07
14:22:00	83.12
14:22:20	83.18

Minutes Since Start	Water Level (ft. BMP)
14:22:40	83.23
14:23:00	83.28
14:23:30	83.36
14:24:00	83.43
14:24:30	83.50
14:25:00	83.56
1426:00	83:69
14:27:00	83.80
1428:00	—
14:25	83:99
14:30	84.09
14:32:30	84.28
14:35:00	84.46

Minutes Since Start	Water Level (ft. BMP)
14:37:30	84:59
14:40:00	84.70
14:42:30	84.80
14:45:00	84.90
14:50	85.05
14:55	85.13
15:00	85.20
15:05	85.26

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

UP-Houston

BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 36D
~~Pump~~ or Bailer: Slug Out V2	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Casing Volume (gal):
Screen Interval (ft. BGL):	Bailer/Pump Type (stainless, PVC, Teflon):
Starting WL (ft. BMP): See page #1	Volume Removed (V1) (gal):
Decon. Procedures:	Volume Removed (V2) (gal): See page #1
	Volume Removed (V3) (gal):
Start Time:	End Time:
	Performed by: SD Berndt

Slug Out 15:06

Minutes Since Start	Water Level (ft. BMP)
15:07:00	98.25
15:07:20	88.19
15:07:40	88.12
15:08:00	88.05
15:08:20	87.98
15:08:40	87.91
15:09:00	87.86
15:09:20	87.80
15:09:40	87.74
15:10:00	87.69
15:10:20	87.62
15:10:40	87.58
15:11:00	87.53

Minutes Since Start	Water Level (ft. BMP)
15:11:30	87.46
15:12:00	87.39
15:12:30	87.32
15:13:00	87.36
15:14:00	87.14
15:15.00	87.03
15:17.30	86.80
15:20:00	86.60
15:22:30	86.43
15:25:00	86.31
15:27:30	86.18
15:30:00	86.09
~~15:35:00~~ 15:32:30	86.02

Minutes Since Start	Water Level (ft. BMP)
15:35:00	85.95
15:40	85.84
15:45	85.76
15:50	85.71

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 36D
Pump or Bailer: Slug V3	Measuring Point (MP):
Well Diameter (in.):	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Casing Volume (gal):
Screen Interval (ft. BGL):	Bailer/Pump Type (stainless, PVC, Teflon):
Starting WL (ft. BMP): See page # 1	Volume Removed (V1) (gal):
Decon. Procedures:	Volume Removed (V2) (gal): See Page # 1
	Volume Removed (V3) (gal):
Start Time: Slug In 1553	End Time: Performed by:

Minutes Since Start	Water Level (ft. BMP)
15:53:20	82.54
15:53:40	82.63
15:54:00	82.72
15:54:20	82.79
15:54:40	82.85
15:55:00	82.92
15:55:20	82.98
15:55:40	83.05
15:56:00	83.11
15:56:20	83.18
15:56:40	83.22
15:57:00	83.28
15:57:20	83.33

Minutes Since Start	Water Level (ft. BMP)
15:57:40	83.38
15:58:00	83.43
15:58:30	83.50
15:59:00	83.57
15:59:30	83.63
16:00:00	83.70
16:01	83.82
16:02	83.92
16:03	84.02
16:04	84.11
16:05	84.20
16:07:30	84.38
16:10	84.55

Minutes Since Start	Water Level (ft. BMP)
16:12:30	84.67
16:15:00	84.78
16:17:30	84.87
16:20:00	84.95
16:22:30	85.02
16:25:00	85.08
16:27:30	85.12
16:30:00	85.16
16:32:30	85.20
16:35	85.23
16:40	85.28
16:45	85.31

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

BAILDOWN TEST FORM

Pastor, Behling & Wheeler, LLC
2201 Double Creek Dr., Suite 4004
Round Rock, Texas 78664
Phone: (512) 671-3434 Fax: (512) 671-3446

Date Tested: 7-22-10	Well No.: 36D
Pump or Bailer: Slug In	Measuring Point (MP): TOC/PVC
Well Diameter (in.): 2.0	MP Height (ft. above ground level):
Well Depth (ft. BGL):	Casing Volume (gal):
Screen Interval (ft. BGL): See page #1	Bailer/Pump Type (stainless, PVC, Teflon):
Starting WL (ft. BMP):	Volume Removed (V1) (gal): See page #1
Decon. Procedures:	Volume Removed (V2) (gal):
	Volume Removed (V3) (gal):
Start Time:	End Time:
16:46: Slug In	Performed by:

Minutes Since Start	Water Level (ft. BMP)
16:47:20	88.25
16:47 40	88.18
16:48:00	88.10
16:48:20	88 03
16:48:40	87.97
16:49:00	87.90
16:49:20	87.84
16:49:40	87.78
16:50:00	87.71
16:50:20	87.66
16:50:40	87.61
16:51:00	87.56
16:51:20	87.51

Minutes Since Start	Water Level (ft. BMP)
16:51:40	87.46
16:52:00	87.41
16:52:30	87.34
16:53:00	87.29
16:53:30	87.22
16:54:00	87.16
16:55:00	87.02
16:56:00	86.93
16:57	86 84
16:58	86.75
16:59	86.67
17:00	86 60
17:02:30	86.43

Minutes Since Start	Water Level (ft. BMP)
17:05:00	86.29
17:07:30	86.18
17:10:00	86.08
17:12:30	85.99
17:15:00	85.93
17:20:00	85.81
17:25:00	85.75
17:30	85.69
12:35	85.63

Minutes Since Start	Water Level (ft. BMP)

Notes:

Volume (cu ft/linear ft): 2" well = 0.023; 4" well = 0.088

1 gal = 0.133680556 cu ft

Well Yield Test Record

WELL ID: 15B

Pastor Behling & Wheeler, LLC

Purpose of Test: sustainable well yield test

Stratigraphy:

Project and Location: UPRR-HWPW - Houston

Well Radius: 1.125

Well Depth: 38'

Screened Interval: 28-38'

Personnel: SD Berndt

Type of Test: Direct Well Yield

Distance to Pumping Well: N/A

Flow Measuring Devices: Graduated Container

Water Level Measuring Devices: E-line

Measuring Point and Value: 3.90 TOC Steel 8.65

Date/Time Test Started: 3-6-12 1400

Date/Time Pump Turned off: 3-6-12 1659

Target Flow Rate: 0.1 gpm

Comments: TD 40.76 BTOC
Pump intake at 40 BTOC
DTW
gals removed

Date/Clock Time	Test Time (min.)	~~Water Elevation~~ (feet)	Drawdown (feet)	Flow Rate (gpm)	Comments
3-6-12 1405		10.14	0.5		very turbid
1410		10.69	1.0		reddish brn
1415		10.88	1.5		clear
1420		10.96	2.0		
1425		11.14	2.5		
1430		11.13	3.0		
1435		11.14	3.5		
1440		11.13	4.0		
1445		11.21	4.5 –		
1450		11.05	5.0		
1455		10.93	5.5		
1500		10.90	6.0		
1505		11.13	6.5		
1510		11.13	7.0		
1515		11.13	7.5		
1520		11.05	8.0		
1525		11.03	8.5		
1530		11.17	9.0 –		
1535		11.29	9.5		
1540		10.87	10.0		
1545		10.82	10.5		
1550		11.20	11.0		
1555		11.27	11.5		
1600		11.25	12.00		
1605		11.29	12.5		
1610		11.34	13.1		
1615		11.30	13.6 –		
1620		11.53	14.2		
1625		11.38	14.87		turned down
1630		11.13	15.1		
1636		11.13	15.8	between ~~2 and 2.5~~	
1640		11.15	on phone	~~2½ and 3.0~~	
1659		11.01	18 total	gallons	

Well Yield Test Record		WELL ID: 33BR	
Pastor Behling & Wheeler, LLC			Water Level Measuring Devices: E-line
Purpose of Test: sustainable well yield test			Measuring Point and Value: TOC PumpOut 3.29 Pump In 1.92
Stratigraphy:			
Project and Location: UPRR-HWPW - Houston			Date/Time Test Started: 3-5-12 14.49
Well Radius: 1"	Type of Test: Direct Well Yield		
Well Depth: 38'	Distance to Pumping Well: N/A		Date/Time Pump Turned off: 3-5-12 16.15
Screened Interval: 28'-38'	Flow Measuring Devices:		
Personnel: SD Berndt	Graduated Container		Target Flow Rate: 0.1 gpm
Comments: BTOC			

Date/Clock Time	Test Time (min.)	Water Elevation (feet)	Drawdown (feet)	Flow Rate (gpm)	Comments
1454	5.5 →				
1458	8.0 →				
1500	9.35 →			Avg	
1502	10.05 →				
1504		11.30		11.52 oz	
1508		12.65		per	
1512		14.68		minute	
1516		15.70			
1522		18.56			
1526		19.99			
1535		23.82			
1538		24.70			
1539			4.5 gals recovered		
1542		27.35			
1546		28.85		Avg	
1550		29.90		13.76 gpm	
1554		30.35			
1558		31.30			
1559			Additional 2.15 gals		
1604		33.40		13.95	
1609		34.75		oz per min	
86 mins → 1615		34.90	Out of Water	Add. 1.6 gals	
1616		34.82	- Pulled pump		
1618		Pump out			
1619		35.68			DTW
1624		34.99	3-7-12	1335	30.29
1631		34.91	3-8-12	725	28.65
1636		34.86			
1644		34.79			
1503		34.71			
3-6-12 748		33.20			
-"- 1248		32.66			
-"- 1753		32.21			
3-7-12 704		30.89			

Well Yield Test Record		WELL ID: MW-68B	
Pastor Behling & Wheeler, LLC			Water Level Measuring Devices: E-line
Purpose of Test: sustainable well yield test			Measuring Point and Value: TOC 3.36
Stratigraphy:			
Project and Location: UPRR-HWPW -1358			Date/Time Test Started: 3-5-12 1107
Well Radius: 1"	Type of Test: Direct Well Yield		
Well Depth: 38'	Distance to Pumping Well: N/A		Date/Time Pump Turned off: 3-5-12 1335
Screened Interval: 28'-38'	Flow Measuring Devices:		
Personnel: SD Berndt	Graduated Container		Target Flow Rate: 0.1 GPM

Comments: Page 1 of 2

DTW oz/m

Date/Clock Time	Test Time (min.)	Water ~~Elevation~~ (feet)	Drawdown (feet)	Flow Rate (gpm)	Comments
1107	Pump Started				
1110		3.79			
1111		—		4oz/m	up
1112		—		6oz/m	up
1113		4.29			
1115		4.70		8oz/m	up
1118		5.55		10	up
1120		6.18		12oz/m	
1121		6.54		12.5	
1122		7.21		12.0	
1124		7.64		11.0	
1126		8.32		12.0	
1127		8.64		12.0	
1128		9.09		14.0	
1130		9.66		12.0	
1132		10.22		12.0	
1134		10.75		12D/m	
1136		11.34		14.0	
1138		11.79		13.0	
1140		12.27		13.0	
1142		12.70		13.0	
1144		13.13		13.0	
1146		13.52		13.0	
1148		13.99		13.5	
1150		14.45		14.0	turn down
1152		14.90		15.0	
1154.10		15.30		15.0	
1156		15.62		14.0	
1158		15.89		14.0	
1200		16.13		14.0	
1202		16.30		13.0	
1204		16.39		12.5	
1208		16.50		11.0	
1212		16.63		12.0	

Well Yield Test Record		WELL ID: MW-68B	
Pastor Behling & Wheeler, LLC			Water Level Measuring Devices
Purpose of Test: sustainable well yield test			Measuring Point and Value:
Stratigraphy:			
Project and Location:			Date/Time Test Started: 3-5-12 1107
Well Radius:	Type of Test: Direct Well Yield		
Well Depth:	Distance to Pumping Well: N/A		Date/Time Pump Turned off:
Screened Interval:	Flow Measuring Devices: Graduated Container		Target Flow Rate:
Personnel:			

Comments: Page 2 of 2 *@1306 a few nodules of denap came up DTW about a thimbal full ejw

Date/Clock Time	Test Time (min.)	~~Water Elevation~~ (feet)	Drawdown (feet)	Flow Rate (gpm)	Comments
1216		16.78		12.5	
1220		16.90		12.5	
1224		17.00		12.0	
1228		17.09		12.0	
1232		17.18		12.0	
1236		17.30		12.0	
1240:20		17.56		12.0	
1244		17.66		12.0	
1248		17.63		12.0	
1252		17.60		12.0	
1256		17.59		11.5	Turned up
1300		17.59		12.0	—11—
1304		17.59		12.5	
1308		17.59		12.5	*denap showed up
1312		17.59		12.5	
1316		17.59		12.5	
1320		17.78		12.5	*denap again
1324		17.73		11.5	turned up
1328		17.68		12.0	turned up
1332	Pump off	17.62		12.0	
1333		17.31			
1334		16.93			
1335		16.56			

Total 12.75 gals recovered

Well Yield Test Record

WELL ID: 71B

Pastor Behling & Wheeler, LLC

Purpose of Test: sustainable well yield test

Stratigraphy:

Project and Location: UPRR - HWPW - Houston

Well Radius: 1.125

Well Depth: 37

Screened Interval: 32 - 37'

Personnel: SD Berndt

Type of Test: Direct Well Yield

Distance to Pumping Well: N/A

Flow Measuring Devices:

Graduated Container 5gal bucket & 1/2gal marked

Water Level Measuring Devices: E-Line

Measuring Point and Value: TOC/STEEL 8.78

Date/Time Test Started: 8.75 Pump on 3-6-12 1026

Date/Time Pump Turned off:

Target Flow Rate: 0.1 gpm

Comments: Using Typhoon pump and controller set at intake depth DTW Gals removed 36½' BTOC

Date/Clock Time	Test Time (min.)	~~Water Elevation~~ (feet)	~~Drawdown (feet)~~	Flow Rate (gpm)	Comments
1028		9.40			
1032		10.98			
1037		13.31	1.1		
1041		15.30	1.5		
1046		17.59	2.0		
1051		20.11	2.5		
1056		22.95	3.0		
1101		25.65	3.5		
1106		28.10	4.0		
1111		30.80	4.5		very turbid
1116		33.20	5.0		-"-
1121		33.35	5.5		-"-
1126		33.60	6.0		-"-
1131		33.96	6.5		-"-
1136		34.45	7.0		-"-
1141		35.40	7.5		-"-
1146	Below Top of Pump	35.95	8.0		very very turbid
1147	Out of water / Pump off	8.1			-"-
1148		35.60	Pump pulled of the measurement		
1151		35.90			
1156		35.69			
1201		35.62			
1209		35.56			
1729		35.18			
3-7-12 710		34.98			
-"- 1349		34.92			
3-8-12 729		34.76			
		[illegible]			

Well Yield Test Record

WELL ID: 74B Page 1 of 2

Pastor Behling & Wheeler, LLC

Purpose of Test: sustainable well yield test

Stratigraphy:

Project and Location: UPRR - HWPW - Houston

Well Radius: 1.125

Well Depth: 36.5

Screened Interval: 26.5 - 36.5

Personnel: SD Berndt

Type of Test: Direct Well Yield

Distance to Pumping Well: N/A

Flow Measuring Devices:

Graduated Container

Water Level Measuring Devices: E-line

Measuring Point and Value: 7.75 TOC/STEEL Pump1 6.94

Date/Time Test Started: 3-7-12 755

Date/Time Pump Turned off:

Target Flow Rate: 0.1 gpm

Comments: Pump intake at 9"-12" off bottom

DTW Gals. Recovered

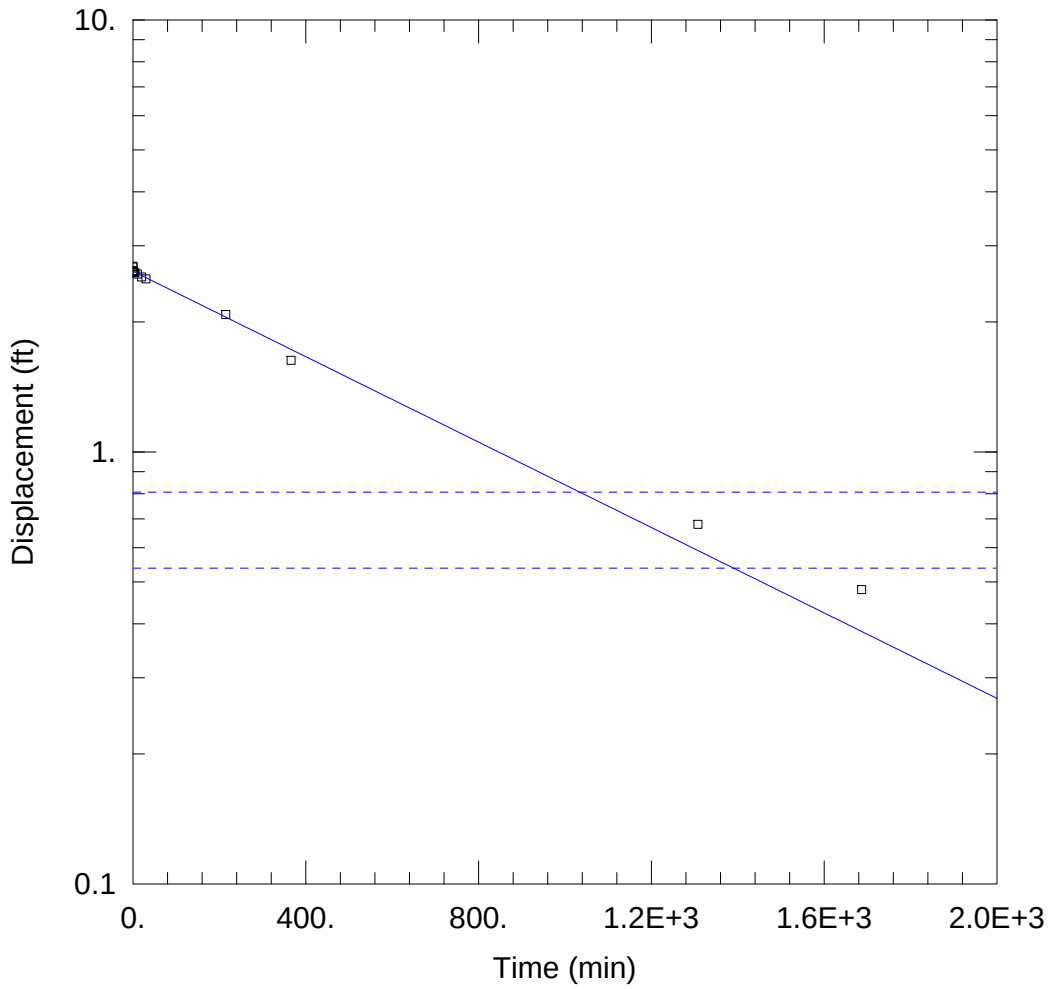
Date/Clock Time	Test Time (min.)	~~Water Elevation~~ (feet)	~~Drawdown~~ (feet)	Flow Rate (gpm)	Comments
3-7-12 800		9.37	0.5		
805		10.85	1.0		
810		11.93	1.5		
815		13.18	2.0		
820		13.75	2.5		
825		14.43	3.0		
830		14.88	3.5		
835		15.37	4.0		
840		15.70	4.5		
845		15.80	.5 5.0		
850		15.90	1.0 5.5		
855		15.92	1.5 6.0		
900		15.92	2.0 6.5		
905		15.98	2.5 7.0		
910		15.95	3.0 7.5		
915		16.09	3.5 8.0		
920		16.70	4.0 8.5		
925		17.10	4.5 9.0		
930		17.45	0.5 9.5		
935		17.48	1.0 10.0		
940		17.36	1.5 10.5		
945		17.24	2.0 11.0		
950		17.36	2.5 11.5		
955		17.46	3.0 12.0		
1000		17.24	3.5 12.5		
1005		17.36	4.0 13.0		
1010		17.32	4.5 13.5		maybe
Pump disconnected and hooked up to battery only off 30 seconds			0.5		
1020		17.55	1.0 14.5		
1025		17.52	1.5 15.0		
1030		17.35	2.0 15.5		
1035		17.39	2.5 16.0		
1040		17.36	3.0 16.5		
1045		17.37	3.5 17.0		

Well Yield Test Record			WELL ID: 74B Page 2
Pastor Behling & Wheeler, LLC			Water Level Measuring Devices: E-line
Purpose of Test: sustainable well yield test			Measuring Point and Value: TOC/Steel
Stratigraphy:			
Project and Location: UPRR - HwPW - Houston			Date/Time Test Started: 3-7-12 755
Well Radius:	Type of Test: Direct Well Yield		Date/Time Pump Turned off:
Well Depth:	Distance to Pumping Well: N/A		
Screened Interval: See Page One	Flow Measuring Devices:		
Personnel:	Graduated Container		Target Flow Rate:
Comments: DTW Gals. Removed			

Date/Clock Time	Test Time (min.)	Water Elevation (feet)	~~Drawdown~~ (feet)	Flow Rate (gpm)	Comments
1050		17.41	4.0 17.5		
1055		17.41	4.5 18.0		
1100		17.41	0.5 18.5		
1105		17.56	1.0 19.0		
1110		17.47	1.5 19.5		
1115		17.52	2.0 20.0		
1120		17.47	2.5 20.5		
1125		17.41	3.0 21.0		
1130		17.40	3.5 21.5		
1135		17.41	4.0 22.0		
1140		17.46	4.5 22.5		
1145		17.45	0.5 23.0		
1150		17.53	1.0 23.5		
1155		17.59	1.5 24.0		
1200		17.56	2.0 24.5		
1205		17.68	2.5 25.0		
1210		17.83	3.0 25.5		
1215		17.95	3.5 26.0		
1220		17.75	4.0 26.5		
1225		17.80	4.5 27.0		Pump Off
~~12~~ 2530		16.65			
12 26		16.48			
12 2630		16.30			
12 27		16.10			
12 2730		15.89			
12 28		15.71			
~~28~~30		15.55			
12 29		15.40			
12 2930		15.25			
1230		15.10			
12 3030		14.98			
1231		14.84			
3130		14.69			
32		14.57			

ATTACHMENT 3B

AQUIFER TEST SOLUTIONS



SLUG IN TEST - MW-32B

Data Set: J:\...\MW32B_Slugin_Mar12_full_thickness.aqt
Date: 08/28/14 Time: 16:13:47

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-32B
Test Date: 03/06/12

AQUIFER DATA

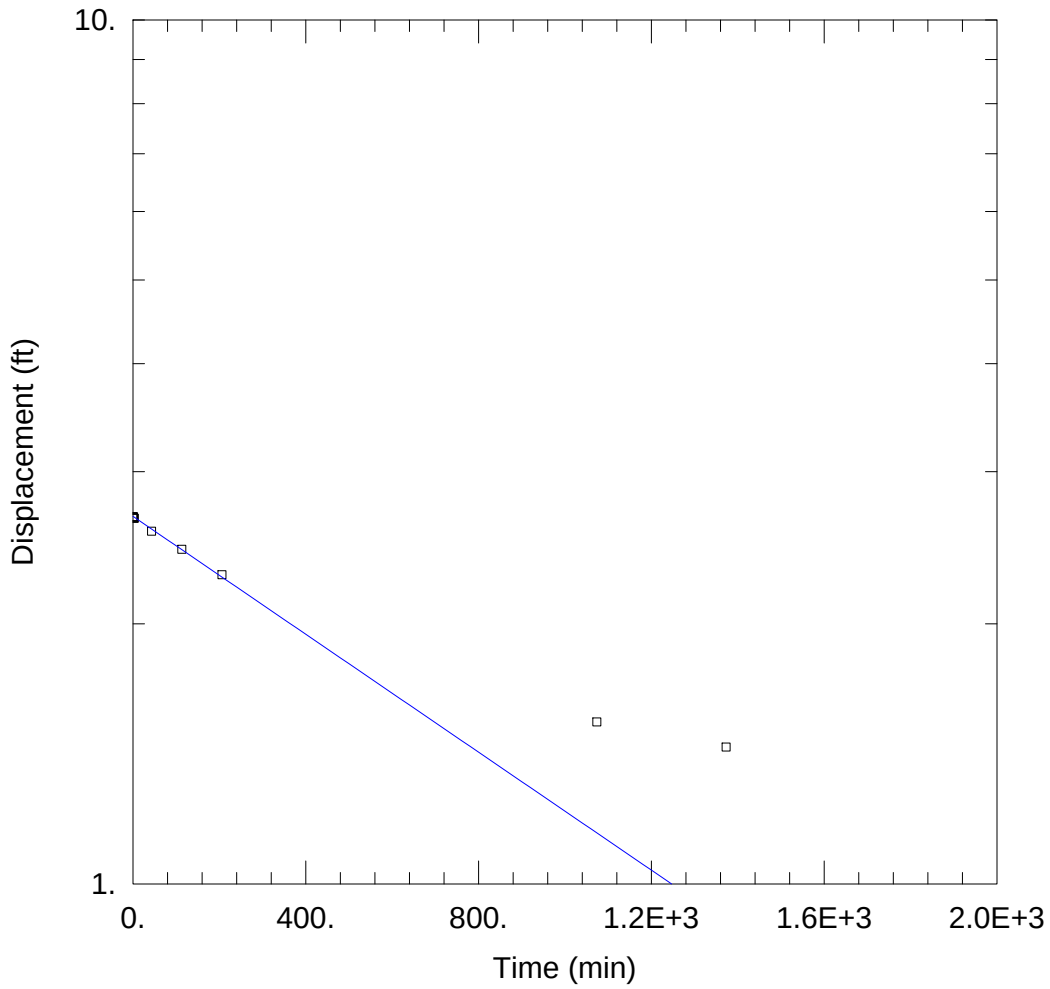
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-32B)

Initial Displacement: 2.69 ft
Total Well Penetration Depth: 16.3 ft
Casing Radius: 0.083 ft
Static Water Column Height: 32.07 ft
Screen Length: 10. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 7.321E-7 cm/sec
y0 = 2.619 ft



SLUG OUT TEST - MW-32B

Data Set: J:\...\MW32B_Slugout_Mar12_full_thickness.aqt
Date: 08/28/14 Time: 16:12:31

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-35B
Test Date: 01/22/10

AQUIFER DATA

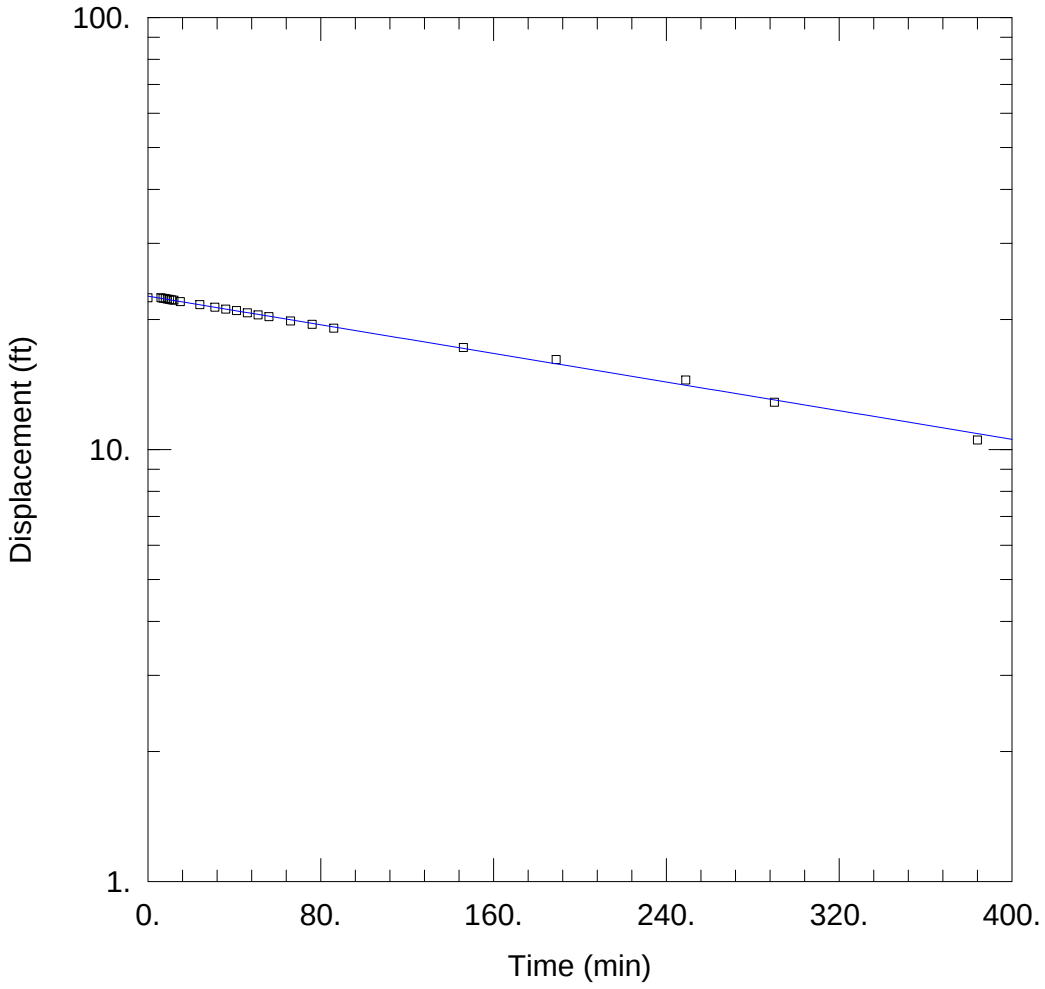
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-32B)

Initial Displacement: 2.66 ft
Total Well Penetration Depth: 16.3 ft
Casing Radius: 0.083 ft
Static Water Column Height: 32.07 ft
Screen Length: 10. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 5.054E-7 cm/sec
y0 = 2.663 ft



BAILDOWN TEST - MW-33B

Data Set: J:\...\MW33B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 13:46:34

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-33B
Test Date: 02/25/09

AQUIFER DATA

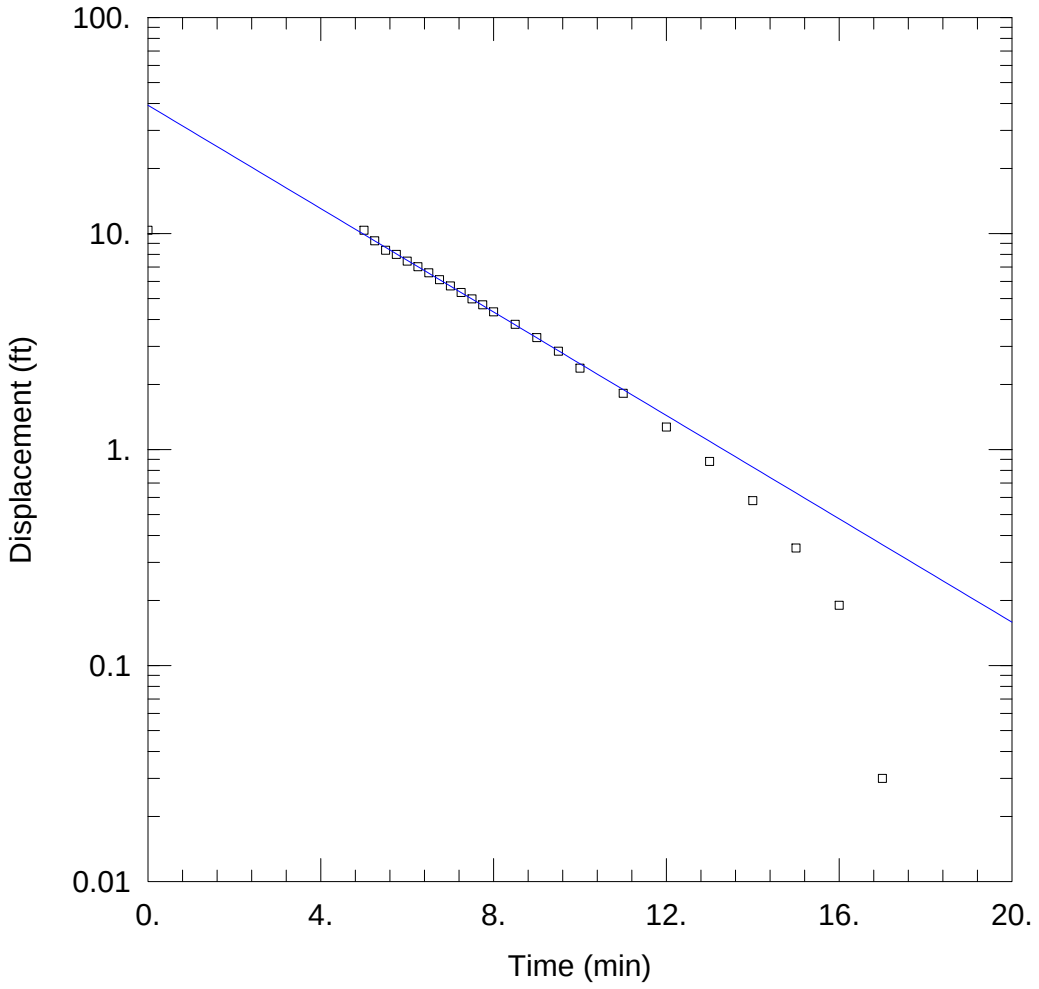
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-33B)

Initial Displacement: 22.46 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.0833 ft
Static Water Column Height: 32.31 ft
Screen Length: 10. ft
Well Radius: 0.3125 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 1.117E-6 cm/sec
y0 = 22.64 ft



BAILDOWN TEST - MW-35B BAIL DOWN TEST 1

Data Set: J:\...\MW35B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 11:57:41

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-35B
Test Date: 02/25/09

AQUIFER DATA

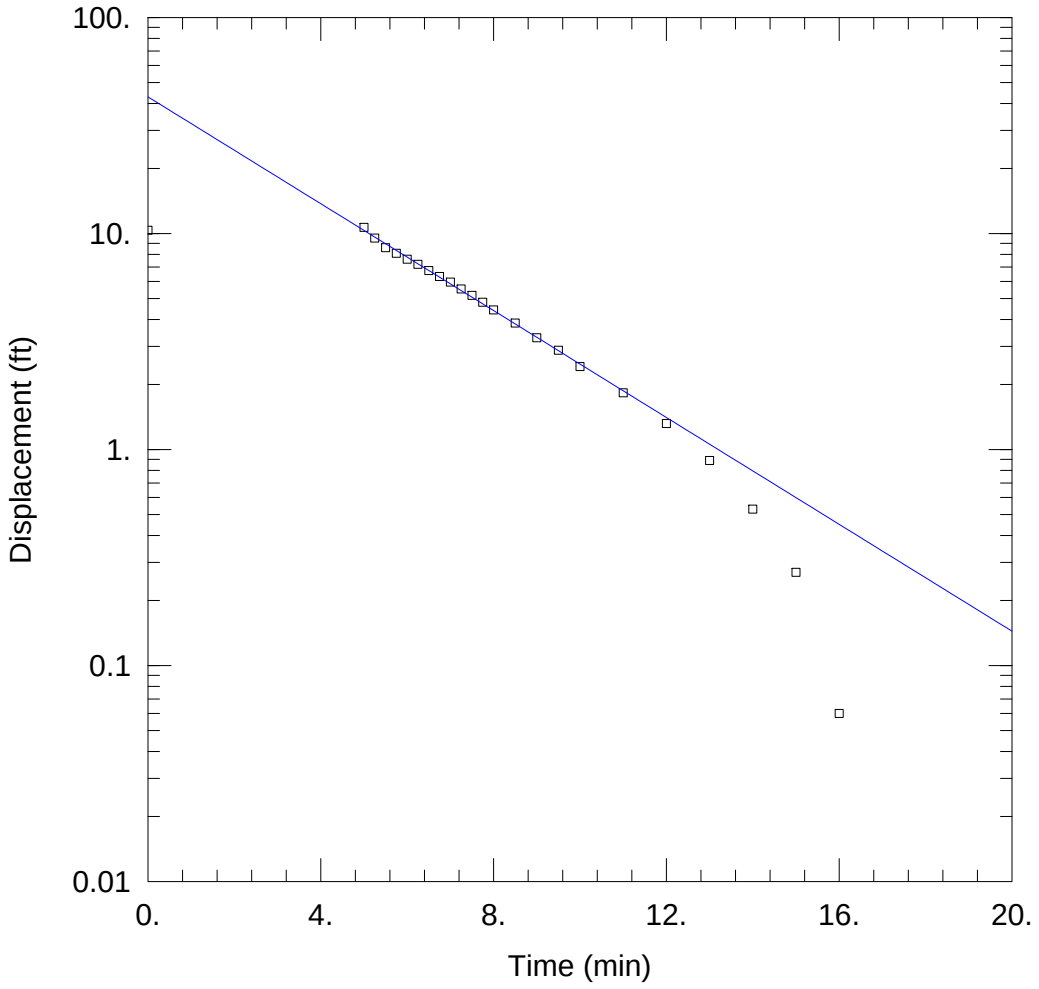
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-35B)

Initial Displacement: 10.36 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.0833 ft
Static Water Column Height: 36.21 ft
Screen Length: 10. ft
Well Radius: 0.354 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0001565 cm/sec
y0 = 39.26 ft



BAILDOWN TEST - MW-35B BAIL DOWN TEST 2

Data Set: J:\...\MW35B_baildown2_full_thickness.aqt
Date: 08/29/14 Time: 13:18:18

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-35B
Test Date: 02/25/09

AQUIFER DATA

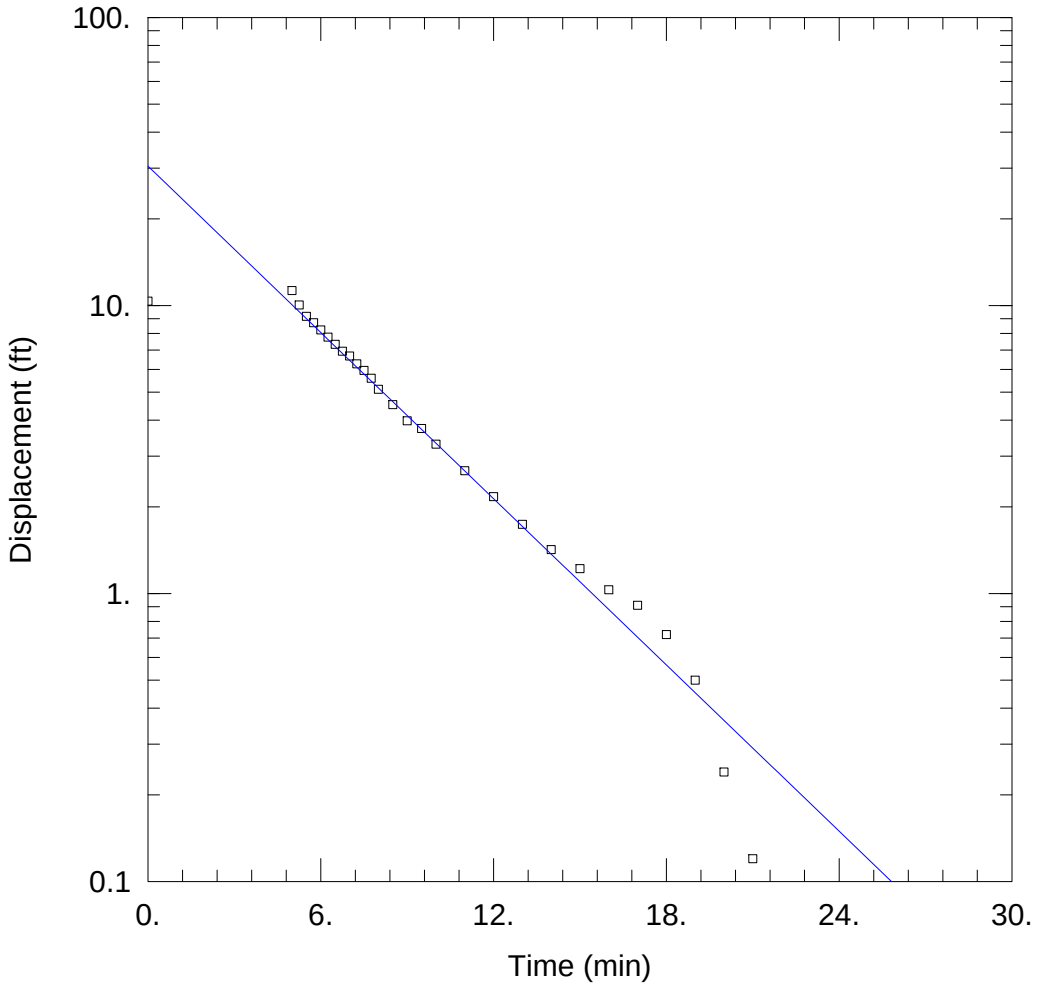
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-35B)

Initial Displacement: 10.36 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.0833 ft
Static Water Column Height: 36.21 ft
Screen Length: 10. ft
Well Radius: 0.354 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0001618 cm/sec
y0 = 42.91 ft



BAILDOWN TEST - MW-35B BAIL DOWN TEST 3

Data Set: J:\...\MW35B_baildown3_full_thickness.aqt
Date: 08/29/14 Time: 13:20:34

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-35B
Test Date: 02/25/09

AQUIFER DATA

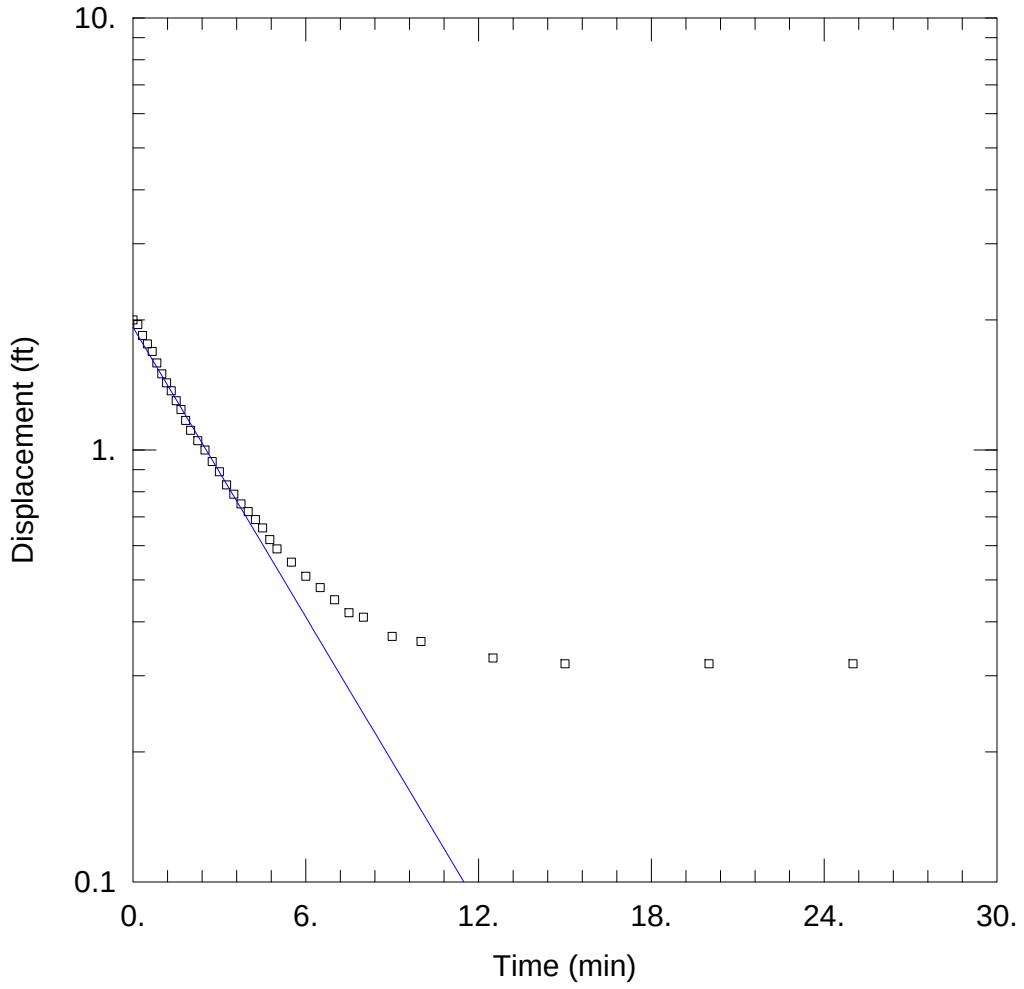
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-35B)

Initial Displacement: 10.36 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.0833 ft
Static Water Column Height: 36.21 ft
Screen Length: 10. ft
Well Radius: 0.354 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0001259 cm/sec
y0 = 30.47 ft



WELL TEST ANALYSIS

Data Set: J:\...\MW35B_Slugin_full_thickness.aqt
Date: 08/29/14 Time: 13:27:28

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-35B
Test Date: 01/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

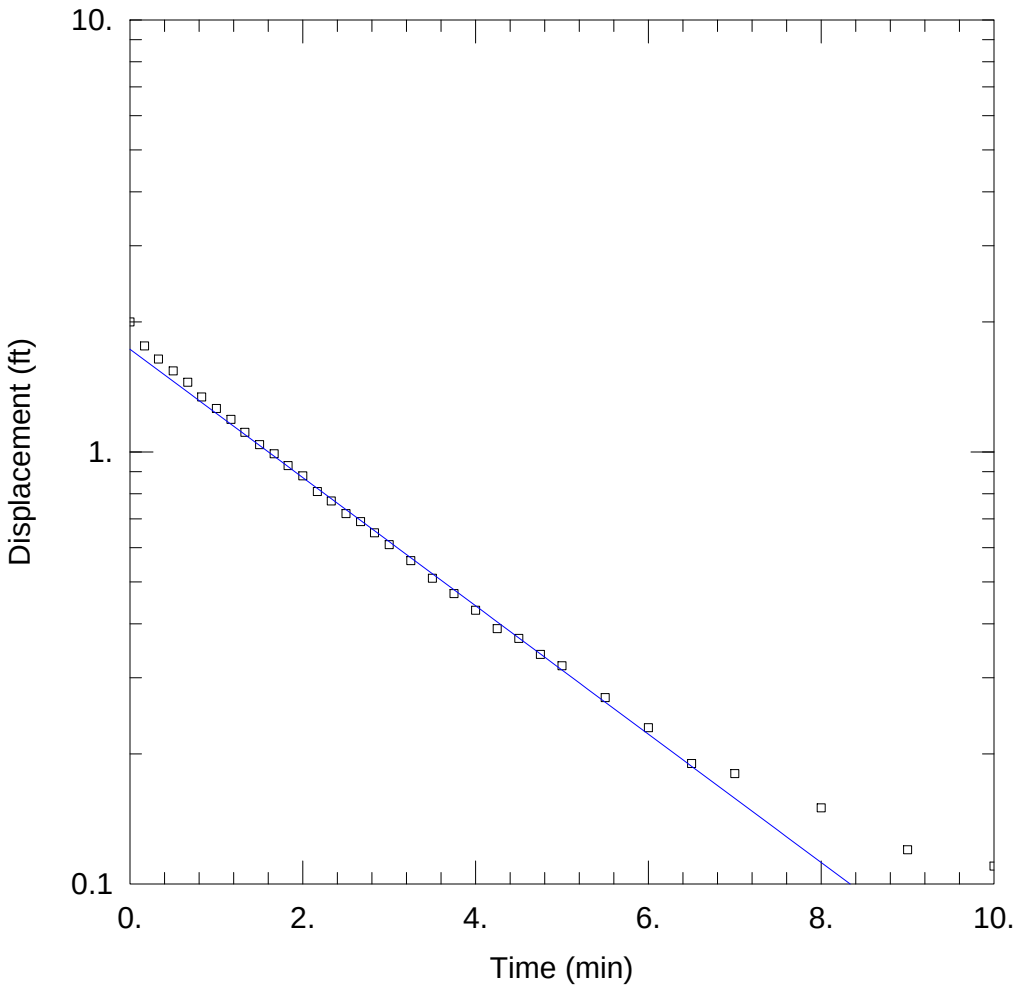
WELL DATA (MW-35B)

Initial Displacement: 2. ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 38.48 ft
Screen Length: 10. ft
Well Radius: 0.354 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.0001452 cm/sec y0 = 1.923 ft



WELL TEST ANALYSIS

Data Set: J:\...\MW35B_Slugout_full_thickness.aqt
Date: 08/29/14 Time: 13:34:10

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-35B
Test Date: 01/22/10

AQUIFER DATA

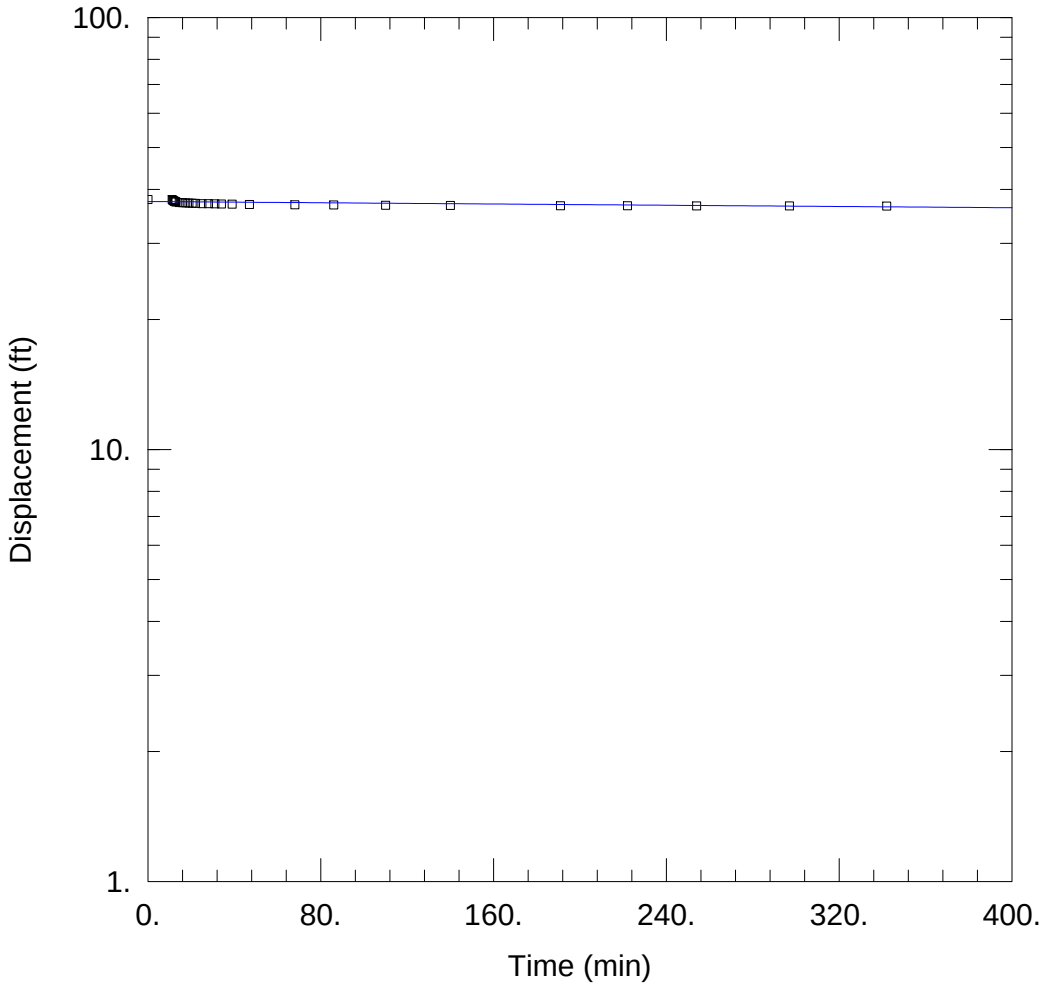
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-35B)

Initial Displacement: 2. ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 38.48 ft
Screen Length: 10. ft
Well Radius: 0.354 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.0001929 cm/sec
y0 = 1.728 ft



MW-36B BAIL DOWN TEST

Data Set: J:\...\MW36B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 10:38:12

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36B
Test Date: 7/22/10

AQUIFER DATA

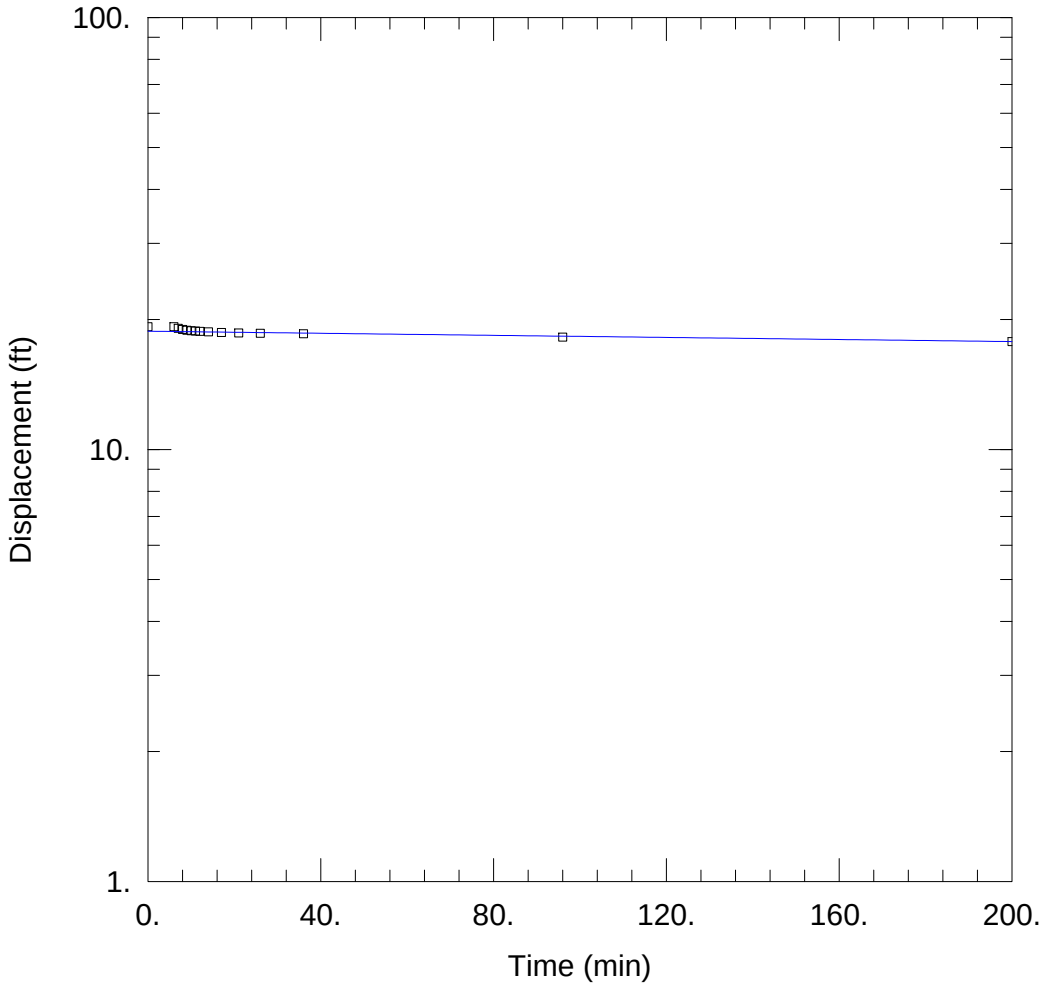
Saturated Thickness: 31.5 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36B)

Initial Displacement: 37.92 ft
Total Well Penetration Depth: 15.5 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 38.62 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 9.426E-8 cm/sec
y0 = 37.5 ft



MW-49B BAIL DOWN TEST

Data Set: J:\...\MW49B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 14:26:41

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-49B

AQUIFER DATA

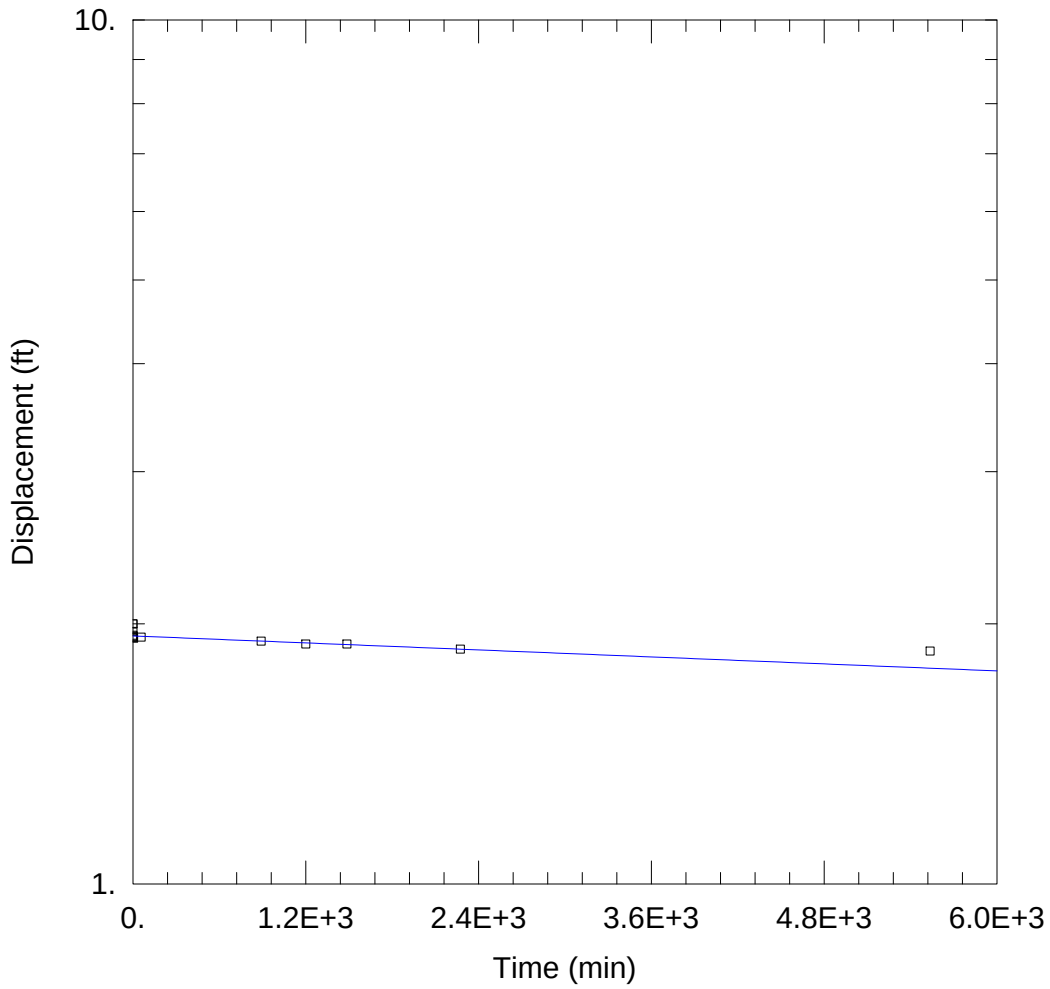
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-49B)

Initial Displacement: 19.25 ft
Total Well Penetration Depth: 9.5 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 21.1 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.901E-7 cm/sec
y0 = 18.79 ft



SLUG IN TEST - MW-55B

Data Set: J:\...\MW55B_slug_in_full_thickness.aqt
Date: 09/17/14 Time: 16:14:40

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-55B
Test Date: 07/25/12

AQUIFER DATA

Saturated Thickness: 40. ft Anisotropy Ratio (Kz/Kr): 0.1

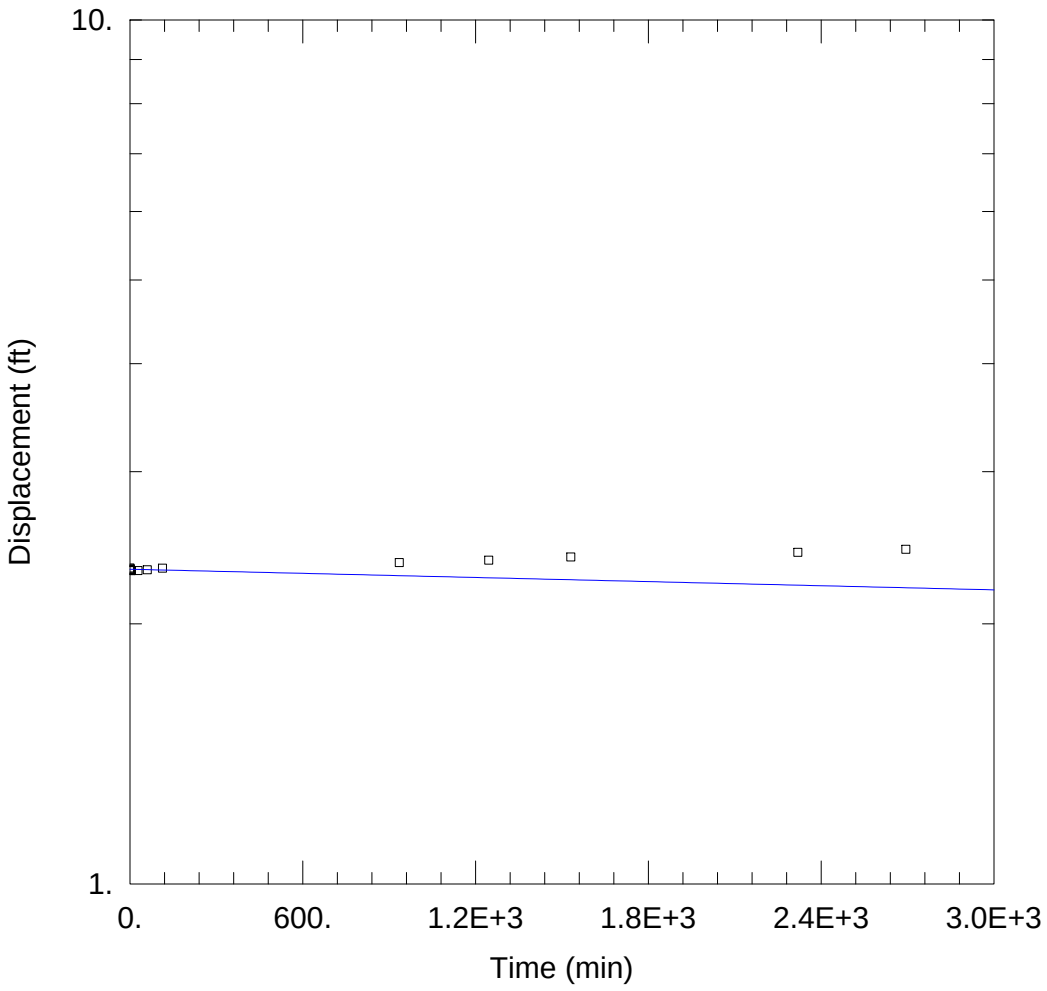
WELL DATA (MW-55B)

Initial Displacement: 2. ft
Total Well Penetration Depth: 13.2 ft
Casing Radius: 0.083 ft
Static Water Column Height: 23.62 ft
Screen Length: 5. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 1.777E-8 cm/sec y0 = 1.937 ft



SLUG IN TEST - MW-57B

Data Set: J:\...\MW57B_slug_in_full_thickness.aqt
Date: 09/17/14 Time: 16:12:59

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-57B
Test Date: 07/25/12

AQUIFER DATA

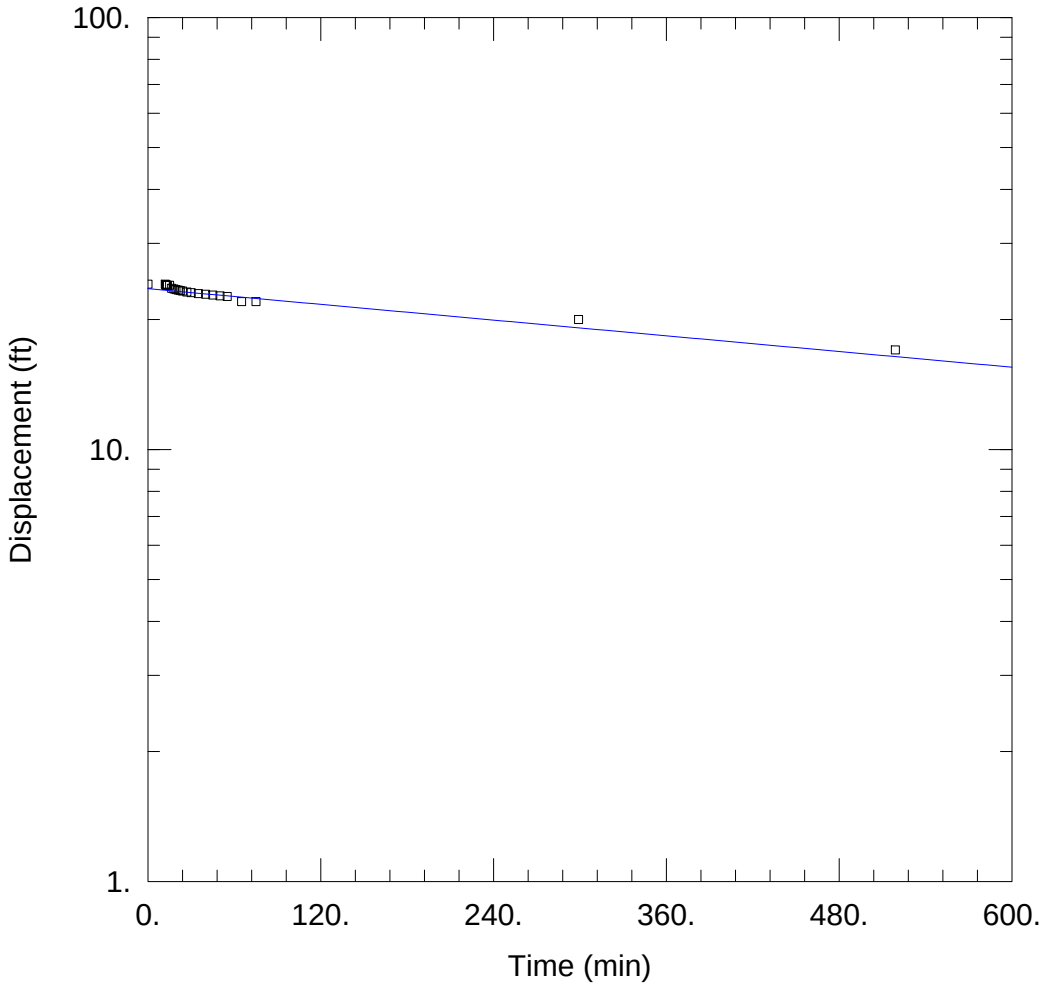
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-57B)

Initial Displacement: 2.32 ft
Total Well Penetration Depth: 12.8 ft
Casing Radius: 0.083 ft
Static Water Column Height: 18.77 ft
Screen Length: 5. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.089E-8 cm/sec
y0 = 2.313 ft



MW-59B BAIL DOWN TEST

Data Set: J:\...\MW59B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 10:56:00

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-59B
Test Date: 7/22/10

AQUIFER DATA

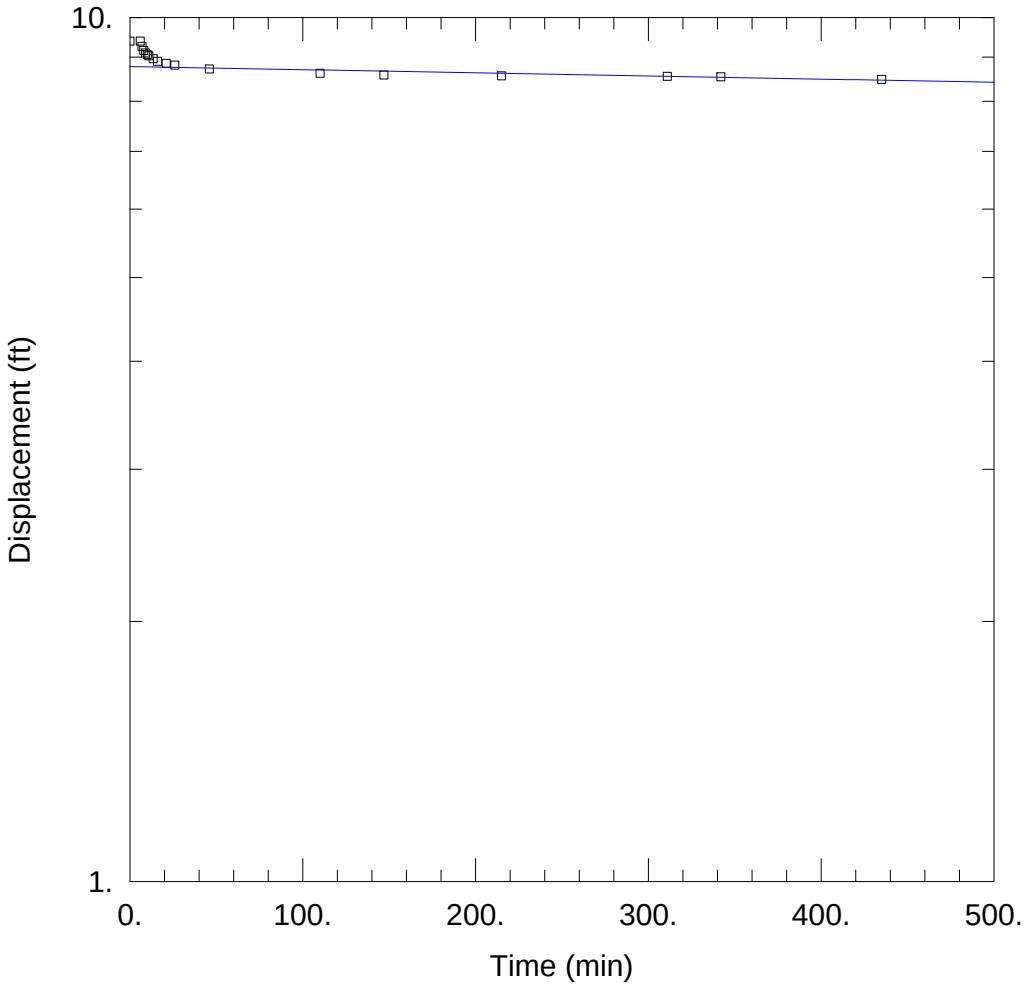
Saturated Thickness: 34.5 ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-59B)

Initial Displacement: 24.15 ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.0833 ft
Static Water Column Height: 24.69 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 7.607E-7 cm/sec
y0 = 23.57 ft



MW-63B BAIL DOWN TEST

Data Set: J:\...\MW-63B_full_thickness.aqt
Date: 08/29/14 Time: 11:35:28

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-63B
Test Date: 2/25/2009

AQUIFER DATA

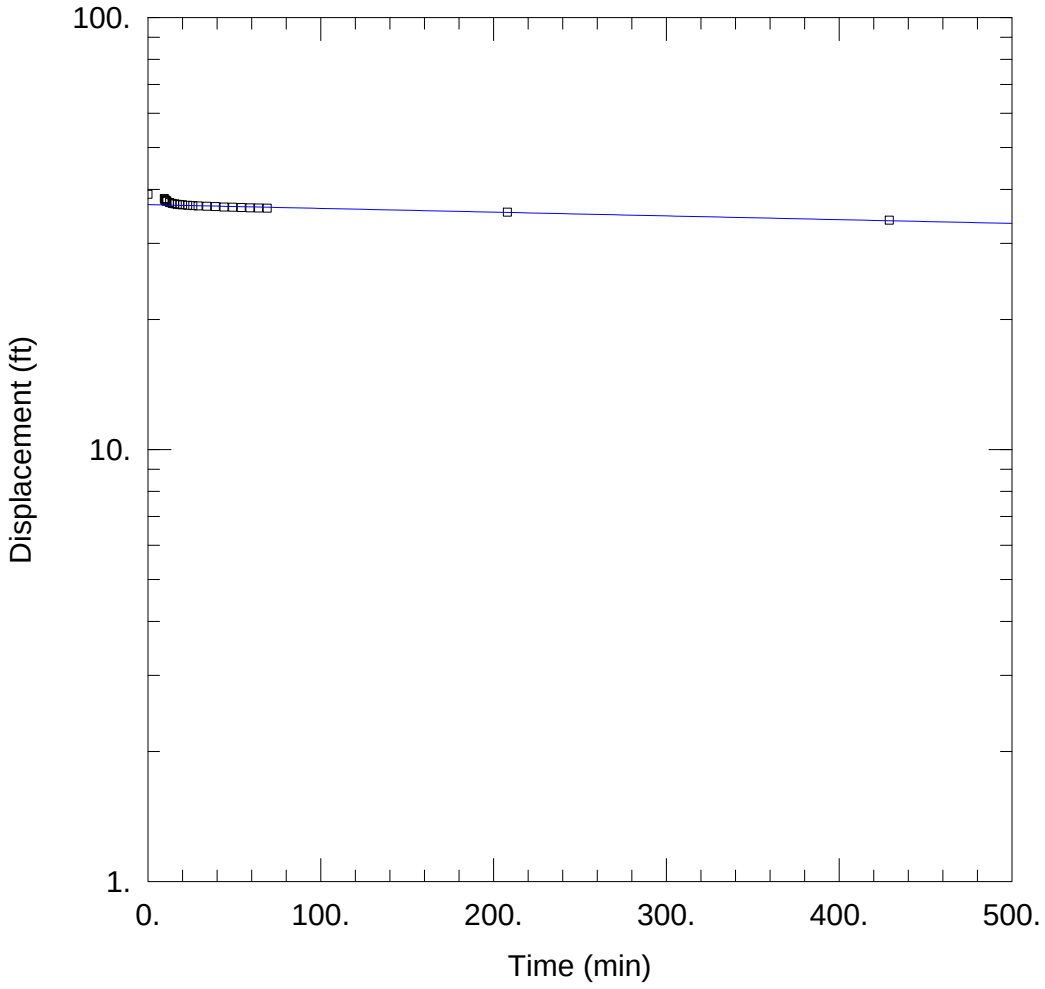
Saturated Thickness: 37. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63B)

Initial Displacement: 9.39 ft
Total Well Penetration Depth: 12.5 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 10.42 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 9.174E-8 cm/sec
y0 = 8.775 ft



MW-67B BAIL DOWN TEST

Data Set: J:\...\MW-67B_baildown_full_thickness.aqt
Date: 08/29/14 Time: 11:15:24

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-67B
Test Date: 7/22/10

AQUIFER DATA

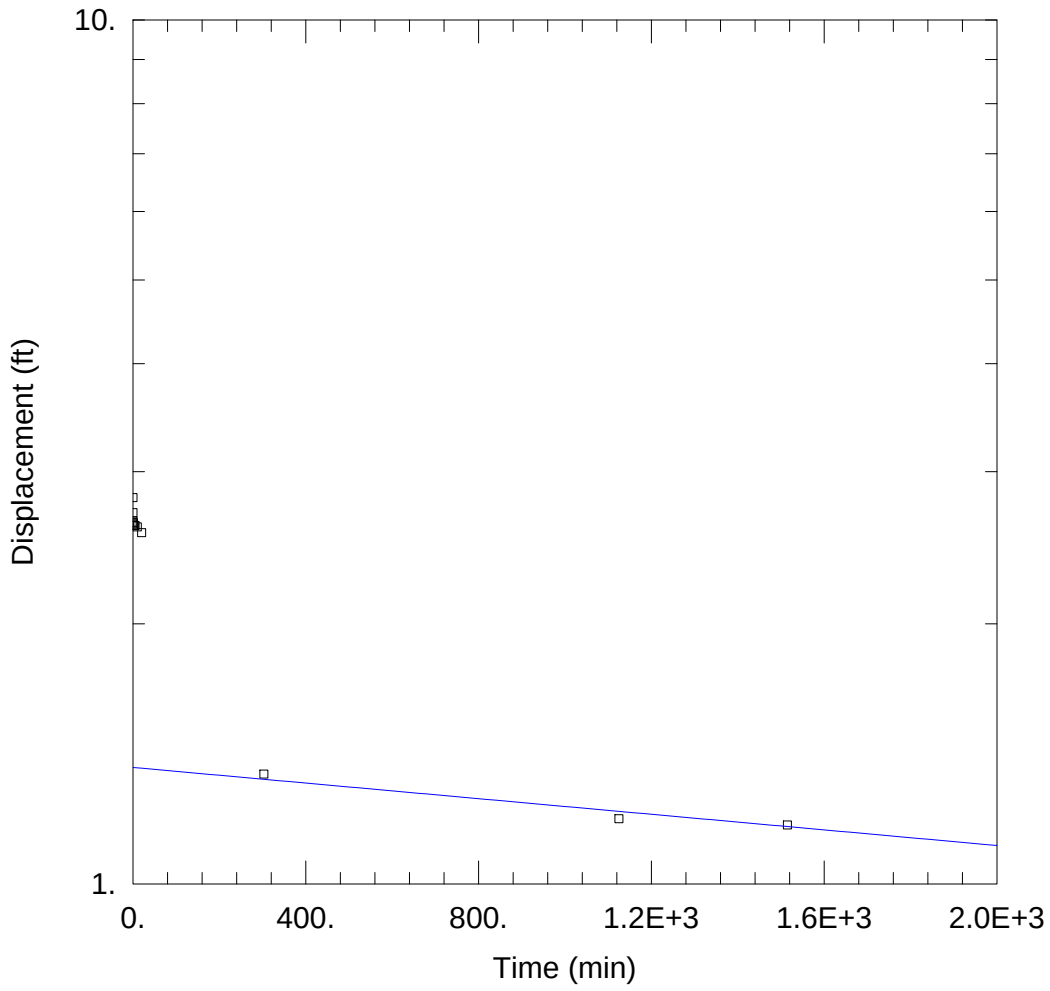
Saturated Thickness: 35. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67B)

Initial Displacement: 39. ft
Total Well Penetration Depth: 8.5 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 37.37 ft
Screen Length: 5. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 2.067E-7 cm/sec
y0 = 36.88 ft



SLUG IN TEST - MW-70B

Data Set: J:\...\MW70B_Slugin_Mar12_full_thickness.aqt
Date: 08/29/14 Time: 14:09:01

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-70B
Test Date: 03/06/12

AQUIFER DATA

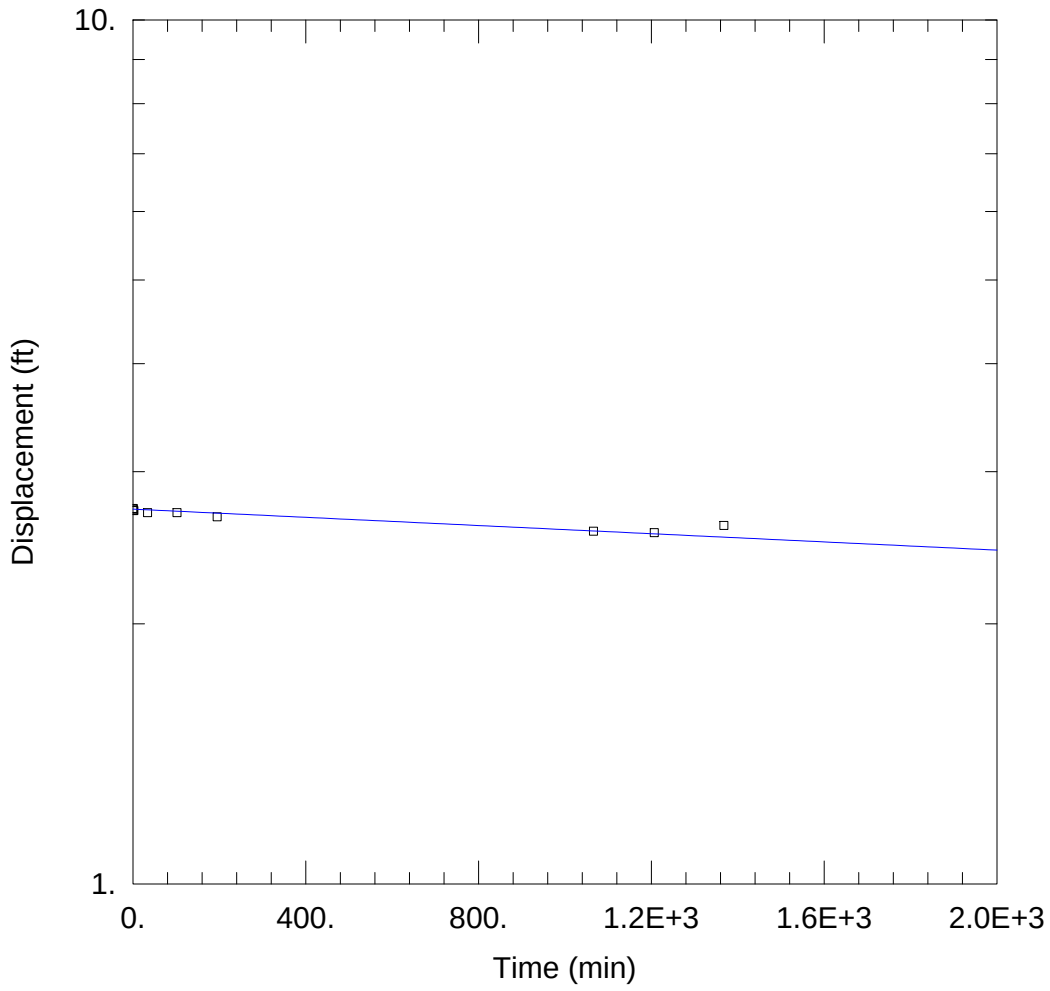
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-70B)

Initial Displacement: 2.8 ft
Total Well Penetration Depth: 13.2 ft
Casing Radius: 0.083 ft
Static Water Column Height: 29.51 ft
Screen Length: 10. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 6.483E-8 cm/sec
y0 = 1.364 ft



SLUG OUT TEST - MW-70B

Data Set: J:\...\MW70B_Slugout_Mar12_full_thickness.aqt
Date: 08/29/14 Time: 13:52:42

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-70B
Test Date: 03/06/12

AQUIFER DATA

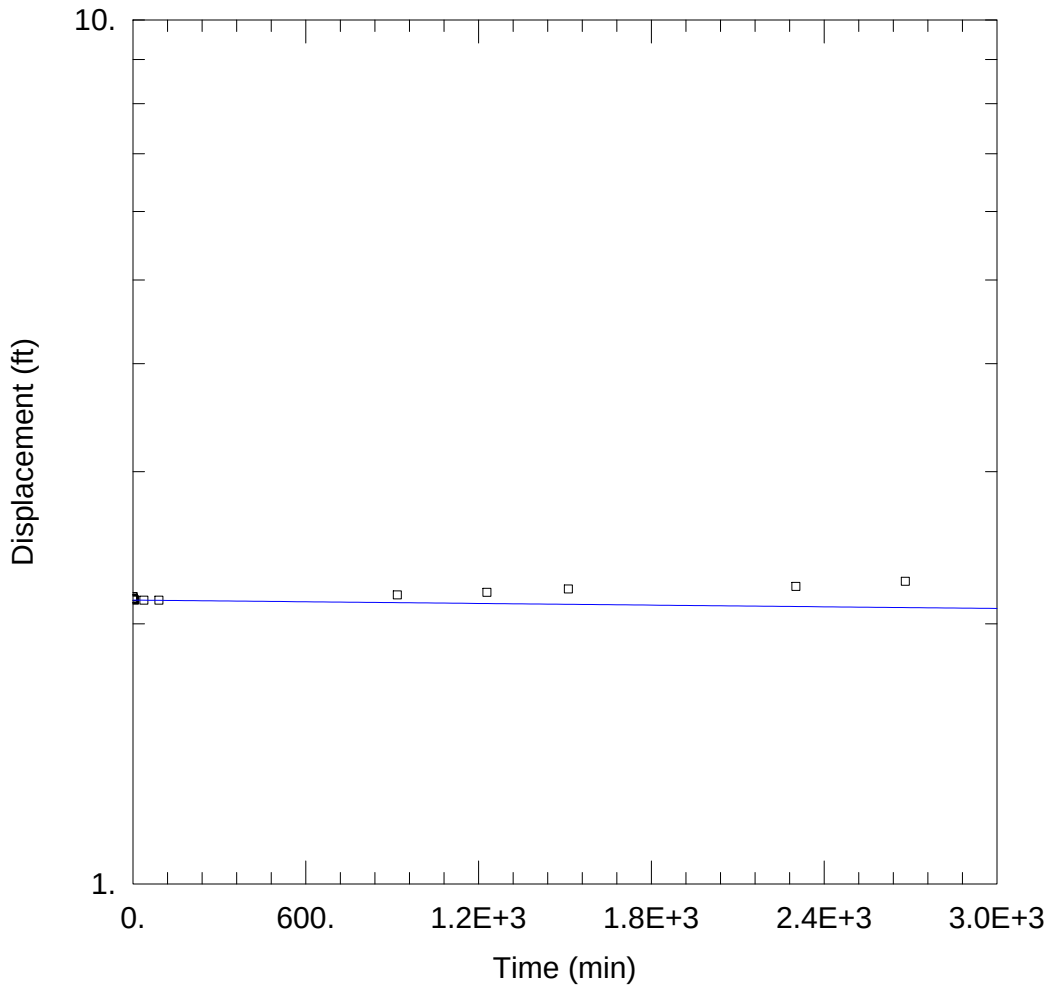
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-70B)

Initial Displacement: 2.72 ft
Total Well Penetration Depth: 13.2 ft
Casing Radius: 0.083 ft
Static Water Column Height: 29.51 ft
Screen Length: 10. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 3.405E-8 cm/sec
y0 = 2.715 ft



SLUG IN TEST - MW-72B

Data Set: J:\...\MW72B_slug_in_full_thickness.aqt
Date: 09/17/14 Time: 16:10:48

PROJECT INFORMATION

Company: Pastor, Behling & Wheeler, LLC
Client: UPRR
Project: 1358
Location: HWPW
Test Well: MW-72B
Test Date: 07/25/12

AQUIFER DATA

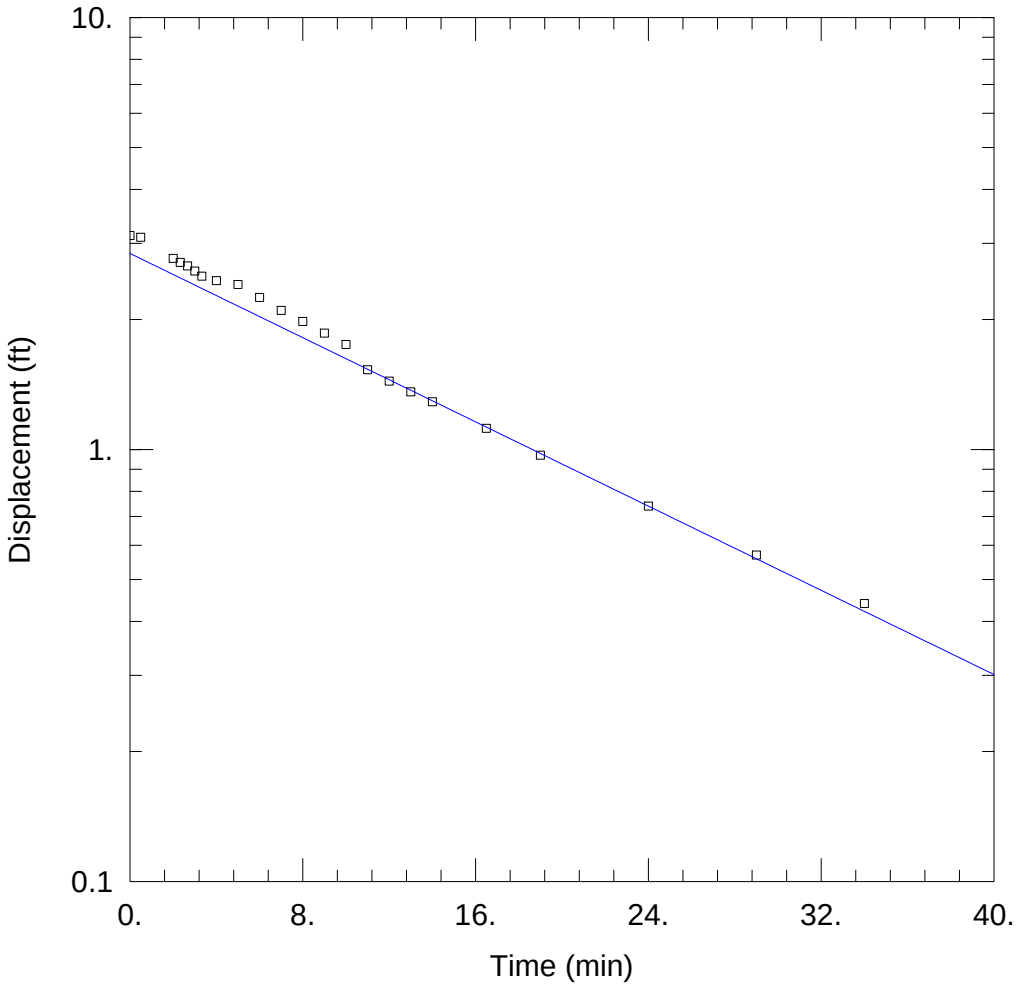
Saturated Thickness: 40. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-72B)

Initial Displacement: 2.15 ft
Total Well Penetration Depth: 8.3 ft
Casing Radius: 0.083 ft
Static Water Column Height: 7.76 ft
Screen Length: 5. ft
Well Radius: 0.208 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 8.002E-9 cm/sec
y0 = 2.131 ft



MW-36D SLUG IN 1

Data Set: J:\...\MW-36D_In_1_full_thickness.aqt
Date: 09/15/14 Time: 10:28:42

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

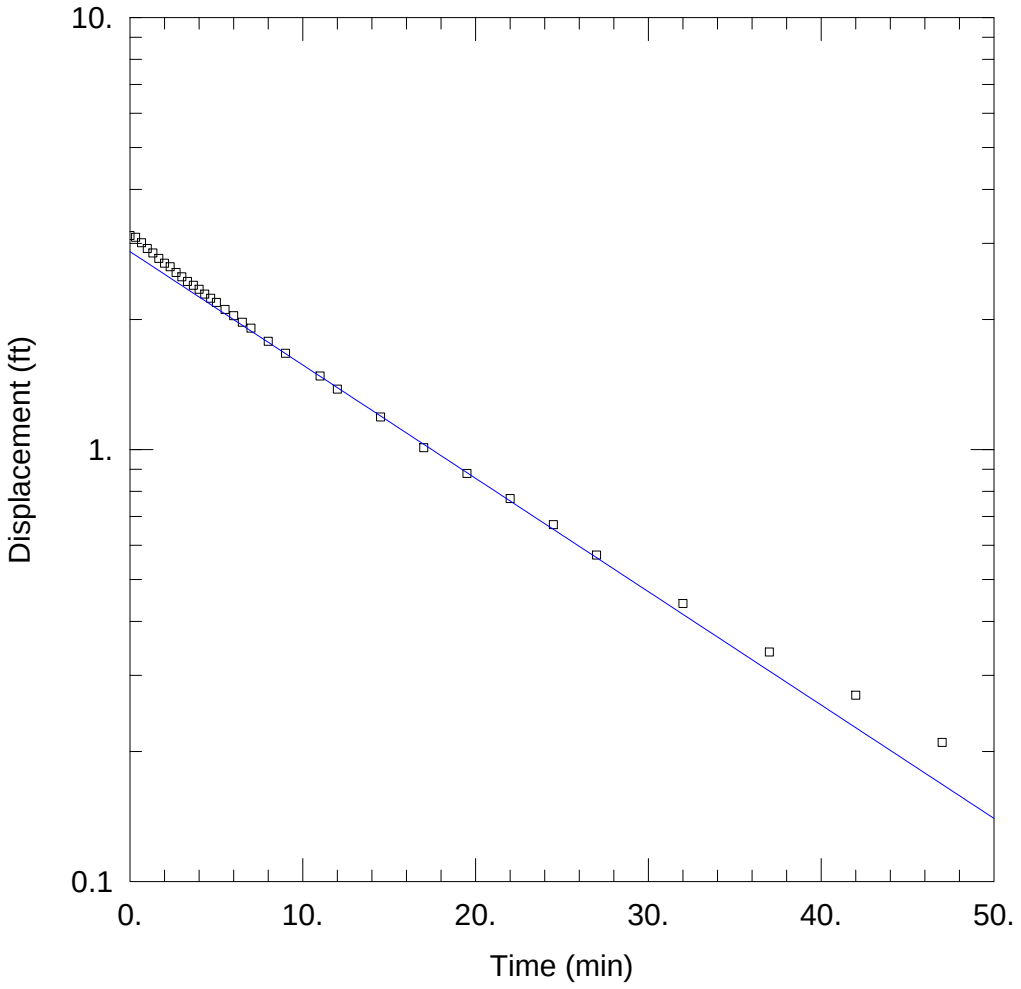
WELL DATA (MW-36D)

Initial Displacement: 3.13 ft
Total Well Penetration Depth: 24.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 24.53 ft
Screen Length: 10. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 3.753E-5 cm/sec y0 = 2.844 ft



MW-36D SLUG IN 2

Data Set: J:\...\MW-36D_In_2_full_thickness.aqt
Date: 09/15/14 Time: 10:30:12

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

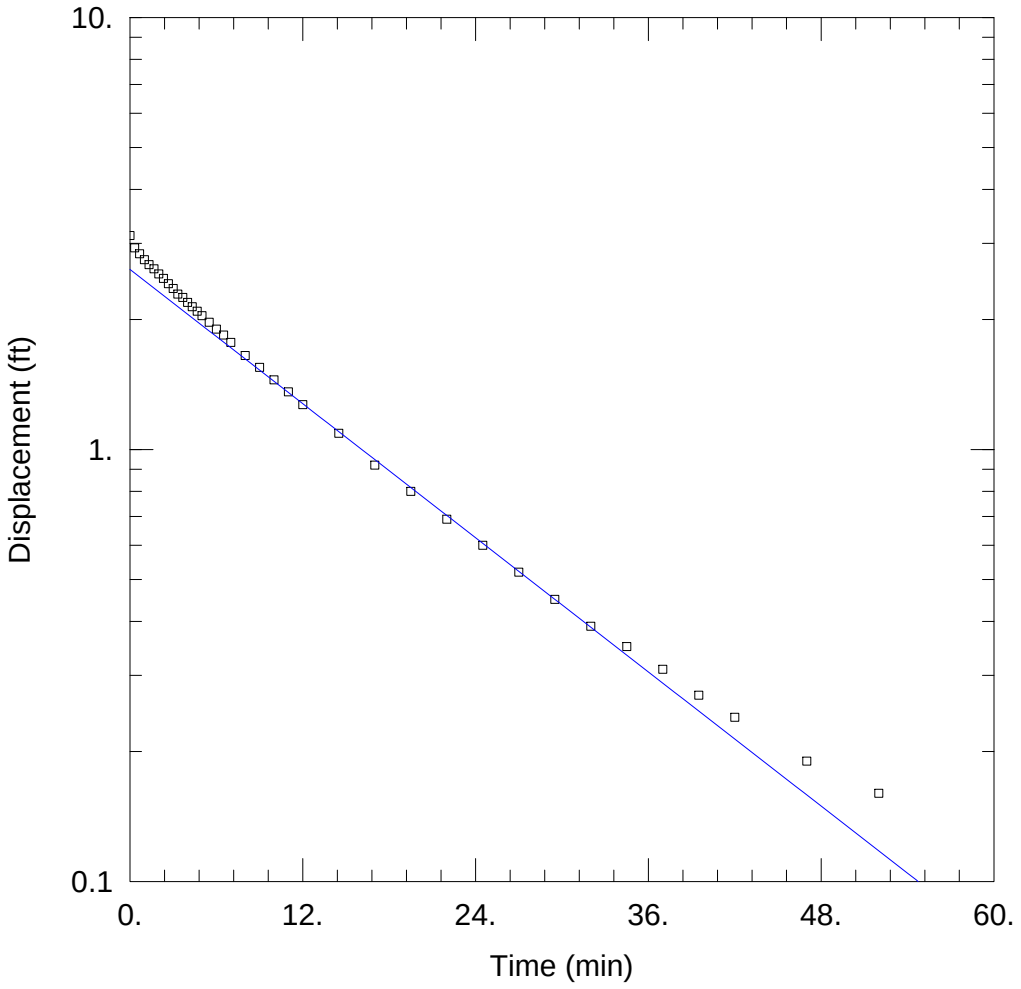
Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36D)

Initial Displacement: 3.13 ft
Total Well Penetration Depth: 24.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 24.53 ft
Screen Length: 10. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 4.043E-5 cm/sec
y0 = 2.871 ft



MW-36D SLUG IN 3

Data Set: J:\...\MW-36D_In_3_full_thickness.aqt
Date: 09/15/14 Time: 10:30:25

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

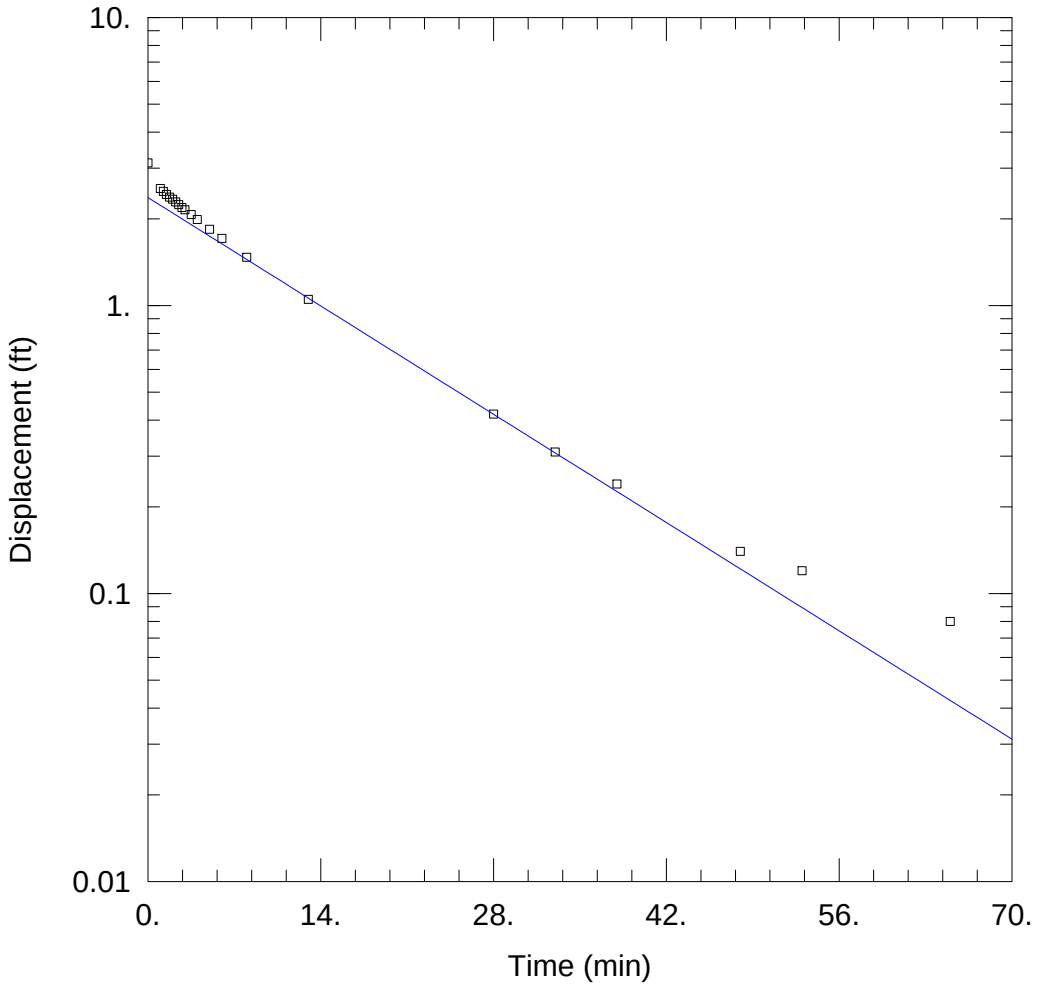
WELL DATA (MW-36D)

Initial Displacement: 3.13 ft Static Water Column Height: 24.53 ft
Total Well Penetration Depth: 24.53 ft Screen Length: 10. ft
Casing Radius: 0.0833 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 3.987E-5 cm/sec y0 = 2.611 ft



MW-36D SLUG OUT 1

Data Set: J:\...\MW-36D_Out_1_full_thickness.aqt
Date: 09/15/14 Time: 10:29:49

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

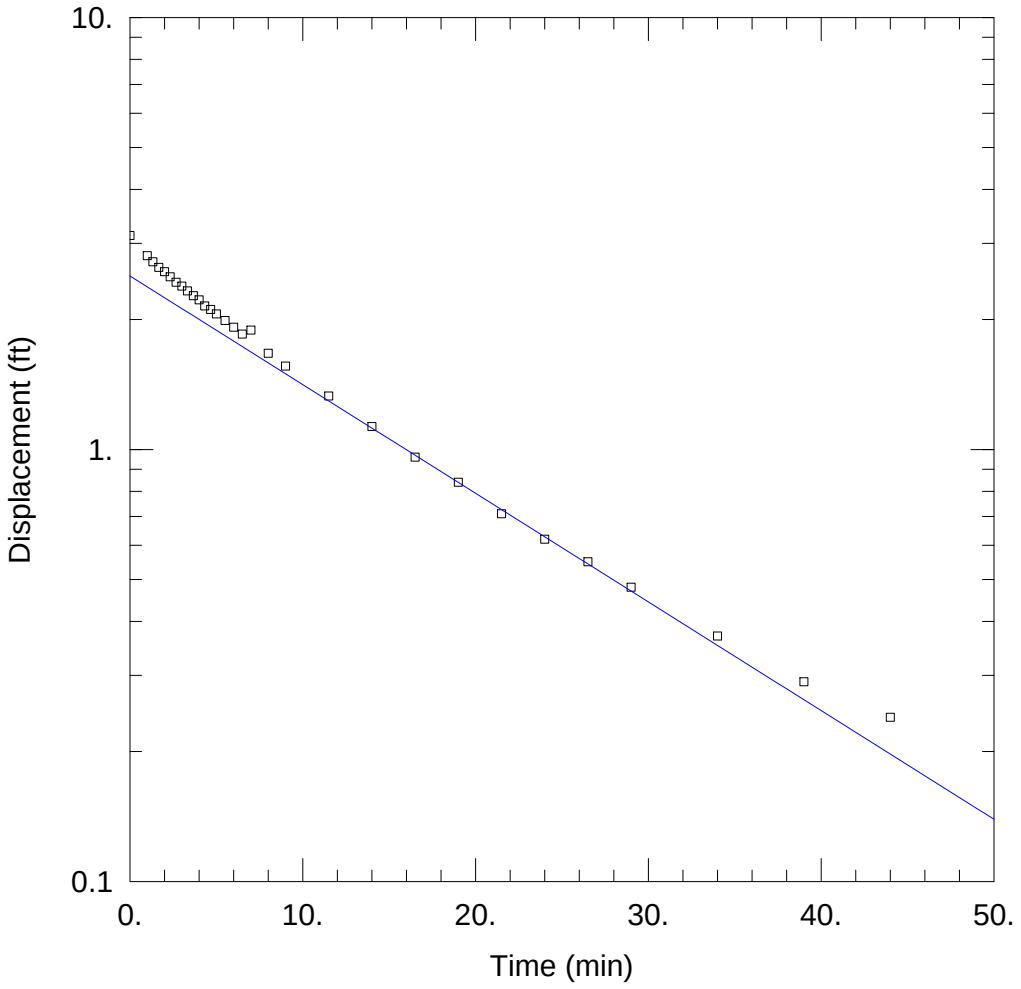
WELL DATA (MW-36D)

Initial Displacement: 3.13 ft
Total Well Penetration Depth: 24.53 ft
Casing Radius: 0.0833 ft
Static Water Column Height: 24.53 ft
Screen Length: 10. ft
Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 4.139E-5 cm/sec y0 = 2.371 ft



MW-36D SLUG OUT 2

Data Set: J:\...\MW-36D_Out_2_full_thickness.aqt
Date: 09/15/14 Time: 10:29:20

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

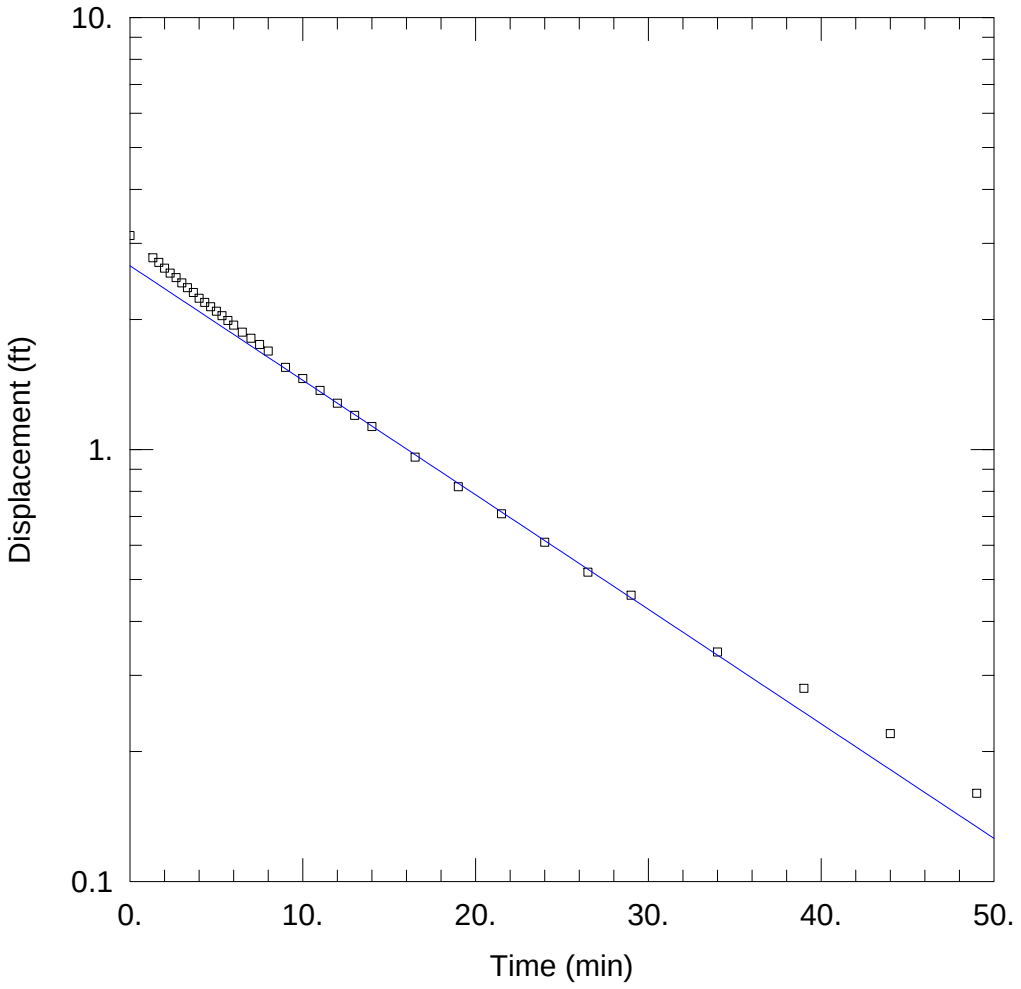
WELL DATA (MW-36D)

Initial Displacement: 3.13 ft Static Water Column Height: 24.53 ft
Total Well Penetration Depth: 24.53 ft Screen Length: 10. ft
Casing Radius: 0.0833 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 3.875E-5 cm/sec y0 = 2.522 ft



MW-36D SLUG OUT 3

Data Set: J:\...\MW-36D_Out_3_full_thickness.aqt
Date: 09/15/14 Time: 10:32:40

PROJECT INFORMATION

Company: PBW, LLC
Client: UPRR
Project: 1358
Location: HWPW, Houston, TX
Test Well: MW-36D
Test Date: 7/22/10

AQUIFER DATA

Saturated Thickness: 35. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36D)

Initial Displacement: 3.13 ft Static Water Column Height: 24.53 ft
Total Well Penetration Depth: 24.53 ft Screen Length: 10. ft
Casing Radius: 0.0833 ft Well Radius: 0.25 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice
K = 4.084E-5 cm/sec y0 = 2.663 ft

Figure 3B-1
Constant Discharge Test - 0.1 GPM - MW-15B
UPRR Houston Wood Preserving Works, Houston, TX
3/6/12

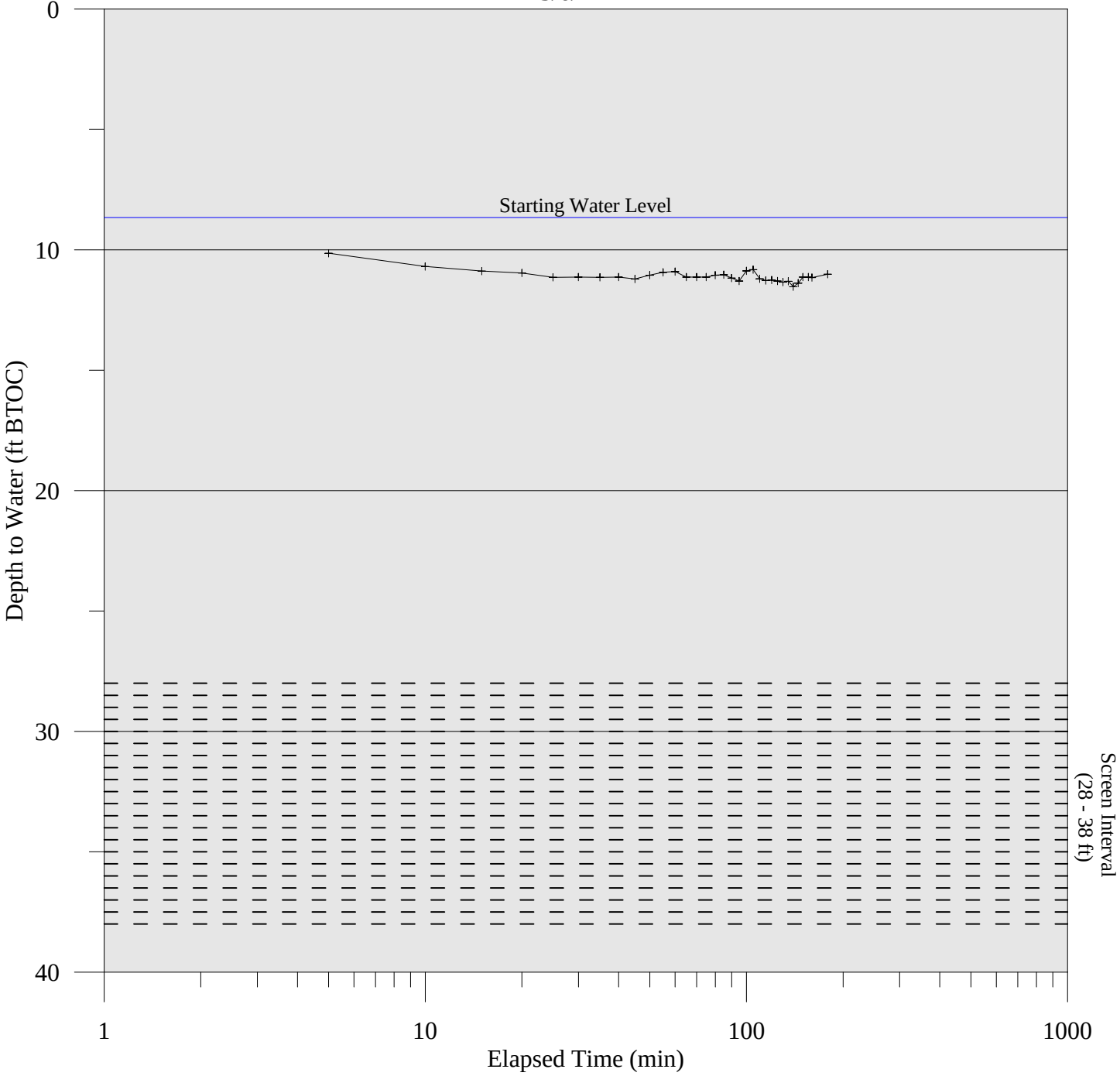


Figure 3B-2
Constant Discharge Test - 0.1 GPM - MW-33BR
UPRR Houston Wood Preserving Works, Houston, TX
3/5/12

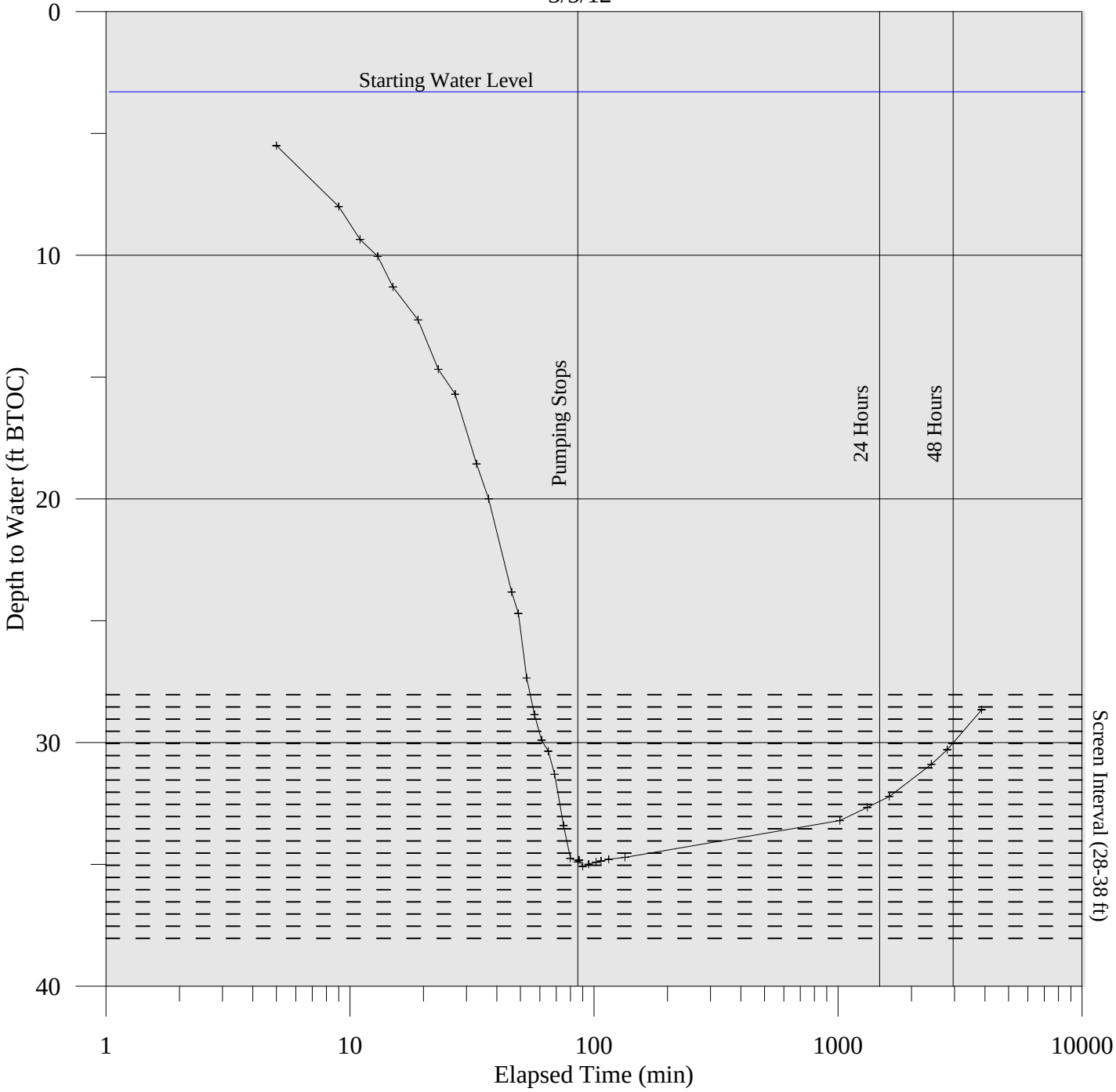


Figure 3B-3
Constant Discharge Test - 0.1 GPM - MW-68B
UPRR Houston Wood Preserving Works, Houston, TX
3/5/12

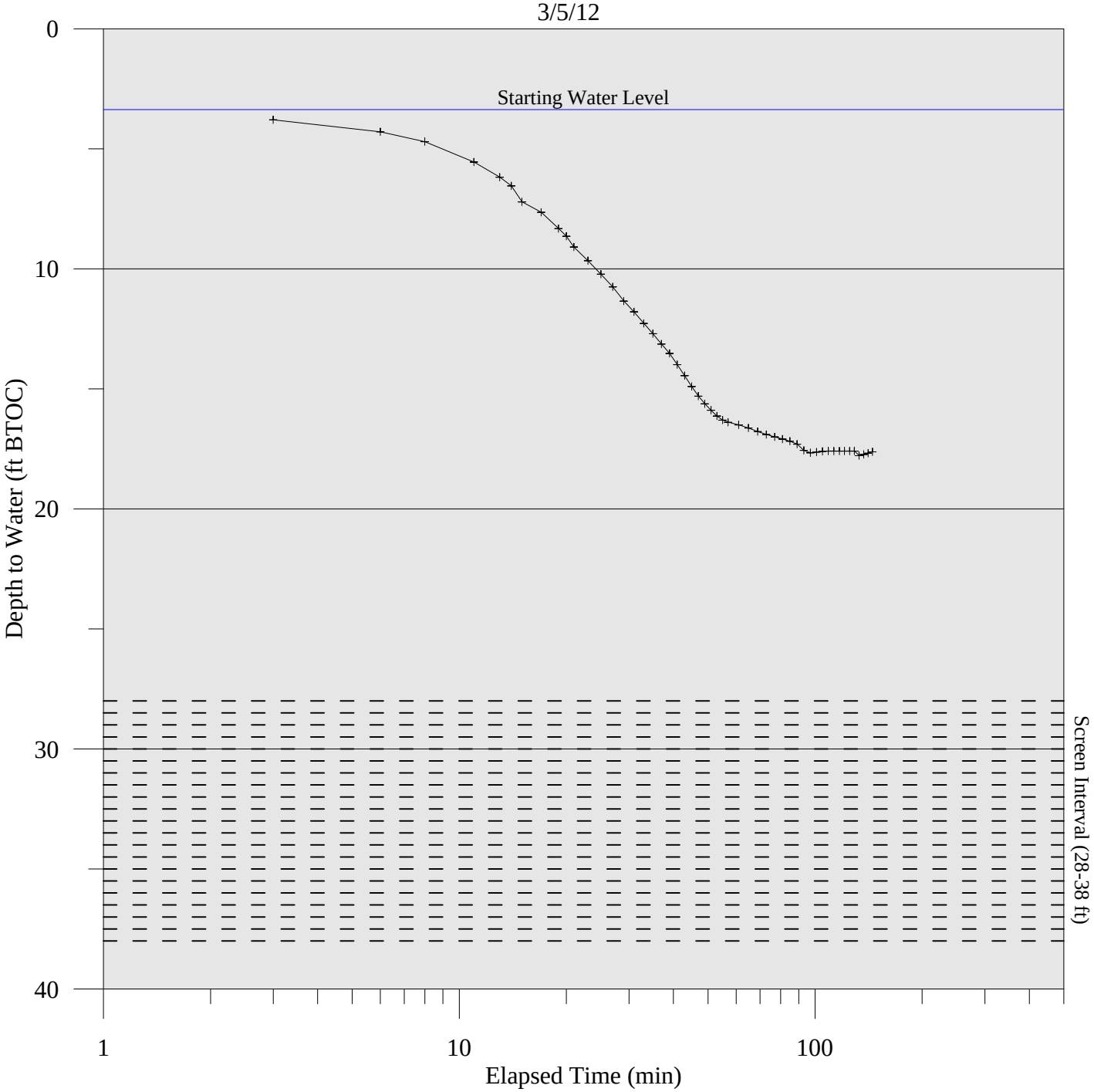


Figure 3B-4
Constant Discharge Test - 0.1 GPM - MW-71B
UPRR Houston Wood Preserving Works, Houston, TX
3/6/12

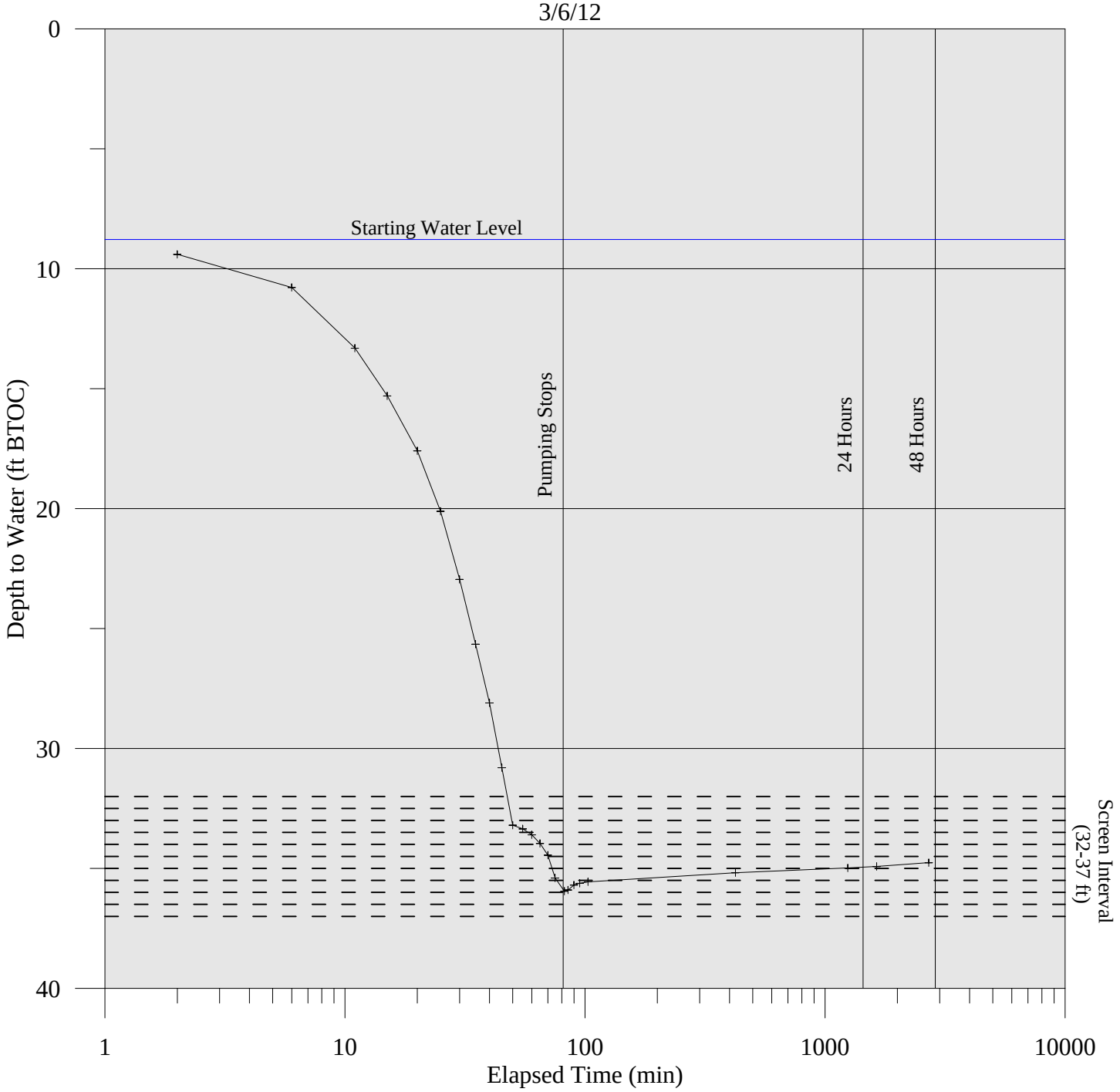
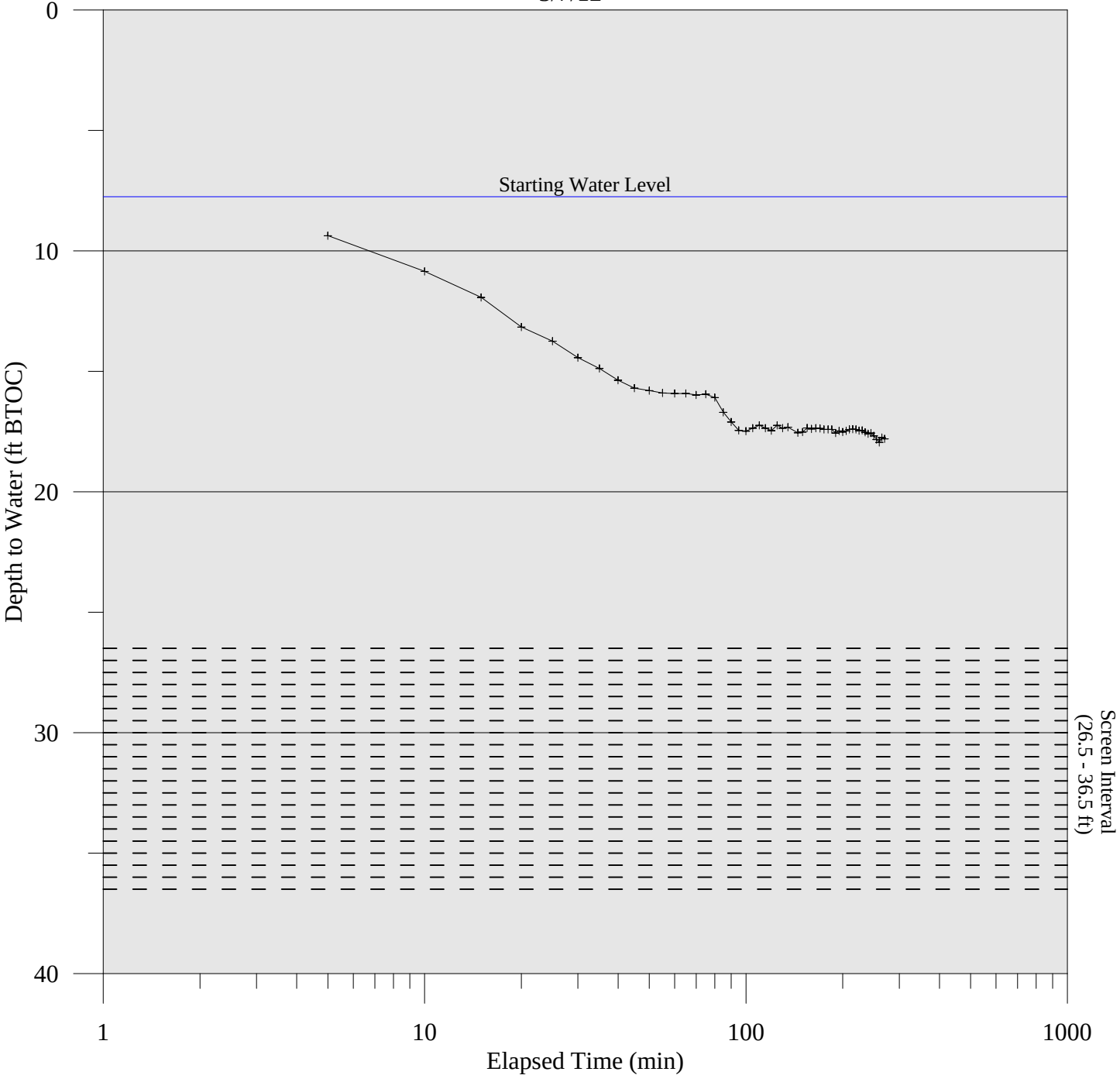


Figure 3B-5
Constant Discharge Test - 0.1 GPM - MW-74B
UPRR Houston Wood Preserving Works, Houston, TX
3/7/12



APPENDIX 3B

DNAPL RECOVERY PILOT TEST WORK PLAN AND 18-MONTH REPORT

PBW

Consulting Engineers
and Scientists

PASTOR, BEHLING & WHEELER, LLC
2201 Double Creek Drive, Suite 4004
Round Rock, TX 78664

Tel (512) 671-3434
Fax (512) 671-3446

February 5, 2013
PBW Project No. 1358

VIA EMAIL

Mr. Mark Arthur
MC-127
Environmental Cleanup Section I, Team 3, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Proposed DNAPL Recovery Pilot Test
Union Pacific Railroad Houston Wood Preserving Works Facility
4910 Liberty Road Facility, Houston, Texas
Post-Closure Care Permit No. HW-50343; Industrial SWR No. 31547

Dear Mr. Arthur:

Pastor, Behling & Wheeler, LLC (PBW), on behalf of Union Pacific Railroad Company, is providing this letter to describe a dense non-aqueous phase liquid (DNAPL) recovery pilot test proposed to be conducted at the Houston Wood Preserving Works Facility (the Site). The pilot test is scheduled to be initiated in February 2013, with a proposed duration of 24 months. This letter outlines the background of the previous DNAPL recovery pilot test, and discusses the procedures and reporting for the proposed DNAPL recovery pilot test.

Background – Preliminary DNAPL Recovery Pilot Test, 2010
PBW conducted a preliminary DNAPL recovery pilot test involving seven monitoring wells (MW-12B, MW-32A, MW-41B, MW-23C, MW-44C, MW-45C and MW-46C) at the Site. The test was conducted between May 2010 and May 2011. From May through October 2010, five monthly recovery events were performed by manually pumping the creosote DNAPL from the selected wells. Approximately 38 cumulative gallons of DNAPL were recovered (Figure 1). Gauging of the DNAPL thickness was performed prior to and after each recovery event.

As shown on Figure 1, DNAPL thicknesses in the wells tested diminished significantly after each recovery event, and did not recover much between each monthly event. The decrease in DNAPL thickness ranged between 14.7 feet (MW-41B) to 1.0 feet (MW-23C). Following the last recovery event in October 2010, DNAPL thicknesses in each of the seven wells increased slightly but remained relatively stable through May 2011 and July 2011, when the wells were gauged during the semi-annual groundwater monitoring event. However, between July 2011 and January/February 2012, DNAPL thicknesses rebounded in three of the seven wells tested to levels similar to pre-pilot test levels measured in May 2010.

The preliminary DNAPL recovery test indicated that the wells that were tested did not produce enough creosote DNAPL to maintain pre-test DNAPL thicknesses when DNAPL was recovered on a monthly basis.

Proposed DNAPL Recovery Pilot, February 2013 through January 2015

As a follow up to the preliminary DNAPL recovery test, PBW proposes to conduct a longer-term DNAPL recovery pilot test to have a longer duration and include more wells relative to the preliminary pilot test. The objective of the recovery test is to evaluate recovery of the creosote DNAPL using the Site wells and assess the recoverability of the DNAPL for development in the Response Action Plan (RAP) for the Site.

PBW proposes to conduct the DNAPL recovery test at 12 monitoring wells located both on and off the Site for a period of 24 months. The following monitoring wells were selected to be included in the proposed DNAPL recovery test based on the amount of DNAPL observed in the wells:

Well Name	Zone	Total Depth (ft. BGS)	Avg. Depth to Water (ft. BTOC)	Min. DPNAL Thickness (ft.)	Max DNAPL Thickness (ft.)
MW-57A	A-TZ	30.0	10.99	4.11	4.25
MW-12B	B-TZ	45.0	7.78	0.41	5.70
MW-41B	B-TZ	40.0	7.36	5.06	24.14
MW-57B	B-CZ	40.0	28.38	0.44	0.50
MW-32B	B-CZ	40.0	3.46	5.77	6.13
MW-33BR	B-CZ	40.0	3.33	0.30	0.30
MW-70B	B-CZ	40.0	6.29	1.44	1.53
MW-75B	B-CZ	40.0	9.20	1.84	1.90
MW-34C	C-TZ	72.0	17.97	7.24	7.60
MW-44C	C-TZ	70.0	17.9	0.75	7.10
MW-45C	C-TZ	70.0	17.9	0.39	1.50
MW-46C	C-TZ	72.0	12.47	0.10	1.25

Notes:
Average depth to water values, minimum and maximum DNAPL thicknesses based on data collected between January, 2011 and December, 2012.

Figure 2 shows the location of the wells that will be included in the proposed pilot study. For the purposes of this proposed pilot study, we have assumed that recovery efforts will be conducted approximately on a monthly basis. However, if DNAPL recovery rates in the wells indicate slow recovery, a reduced recovery frequency (i.e., quarterly) will be evaluated for those wells.

Procedures

The following describes the methods to be carried out for the DNAPL recovery pilot tests. Before any product is removed from the wells, the depth to groundwater surface, the depth to the groundwater/DNAPL interface, and the total depth of the well will be measured relative to the top of the well casing. Using an inertial-style pump, peristaltic pump, or other similar pumping device, DNAPL will be slowly pumped from the bottom of the well until groundwater is encountered in the pump discharge. The volume of recovered DNAPL will be estimated from each well using either a graduated bucket or based on the recovered flow rate. Once groundwater is encountered, pumping will cease and the well will be gauged to measure the total depth of the well and depth to DNAPL following pumping. Recovered DNAPL and all PPE will be temporarily stored, properly labeled and dated in separate drums at the 90-Day Containment Storage Area, to be properly disposed of by a UPRR-approved contractor.

Reporting – DNAPL Recovery Pilot Test Semi-Annual Status Reports
PBW proposes to submit semi-annual status reports to the TCEQ detailing the progress of DNAPL recovery. The report will include a brief discussion on the recovery efforts and waste disposition of the recovered DNAPL. Data collected from the recovery test will be incorporated into the RAP to be submitted to the TCEQ.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Geoffrey Reeder of UPRR at (281) 350-7197.

Sincerely,

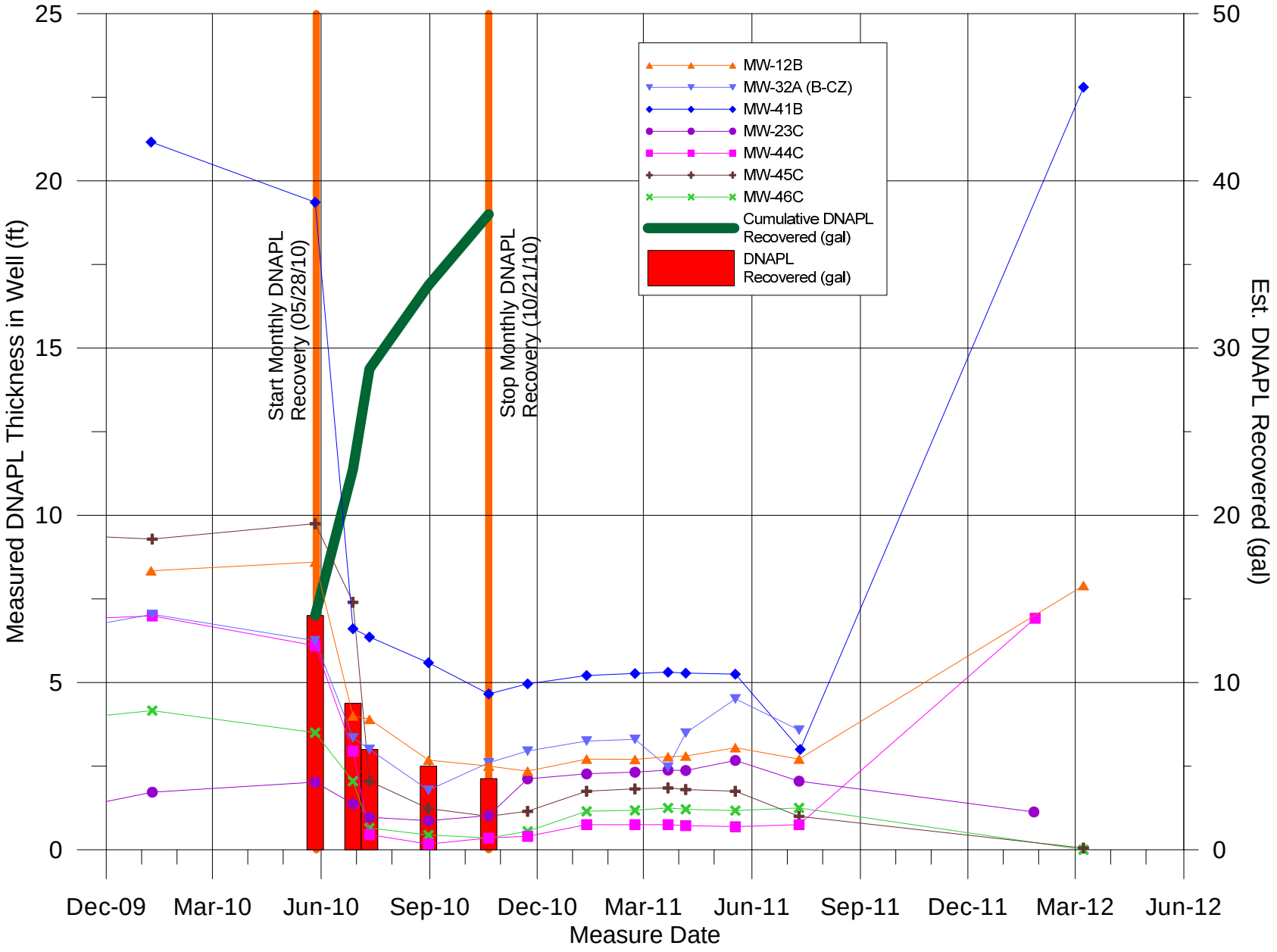
PASTOR, BEHLING & WHEELER, LLC

Eric C. Matzner, P.G.
Senior Hydrogeologist

cc: Waste Program Manager, TCEQ Region 12, Houston
Mr. Geoffrey Reeder, P.G., UPRR – Spring, TX

FIGURES

Figure 1
DNAPL Recovery Pilot Test 2010-2011
UPRR Houston Wood Preserving Works



EXPLANATION

- UPRR Property Boundary
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location
- B-TZ/B-CZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- (0.5) DNAPL Thickness (Ft)

MW-27A
MW-27C
MW-67B
MW-53C
MW-65D
MW-28C
MW-28A
MW-63B
MW-54C
MW-68C
MW-68B
MW-26A
MW-33BR
(0.3)
MW-36B
MW-36D
MW-45C
(0.39)
MW-46C
(0.1)
MW-66D
MW-36A
MW-44A
MW-25C
MW-25A
MW-44C
(7.1)
MW-33A
MW-35B
MW-35A
MW-32AR
MW-32B
(6.31)
MW-70B
(1.53)
MW-71B
MW-34C
(7.24)
MW-57B
(0.5)
MW-57A
(4.25)
MW-18C
MW-58A
MW-18A
MW-60A
MW-47C
MW-13
MW-15C
MW-17
MW-17C
MW-30A
MW-23C
MW-72B
MW-52A
TW-56A
MW-14
MW-15A
MW-15B
MW-20A
MW-31A
MW-19C
MW-55B
MW-55A
MW-73B
MW-74B
MW-49B
MW-48C
MW-49A
MW-61A
MW-39B
MW-38A
MW-12C
MW-40B
MW-12A
MW-38B
MW-12B
(5.7)
MW-42B
MW-16
TW-41B
MW-62B
MW-41B
(24.14)
MW-69A
MW-59A
MW-59B
MW-59D
MW-75B
(1.9)
P-11
MW-02
MW-01A
MW-03
MW-10A
MW-08
P-12
MW-22A
MW-10B
MW-09
MW-22B
MW-11B
MW-11A
P-10
MW-04
MW-07
MW-21C
MW-05
MW-24C
MW-24B
MW-24AR
MW-64A
MW-50A
MW-51A

N

Approx. Scale in Feet
0 200 400

SOURCE:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Figure 2

DNAPL THICKNESS MAP
JAN. - JULY, 2012

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: JAN., 2013	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

PBW

Consulting Engineers
and Scientists

PASTOR, BEHLING & WHEELER, LLC
2201 Double Creek Drive, Suite 4004
Round Rock, TX 78664

Tel (512) 671-3434
Fax (512) 671-3446

September 25, 2014
PBW Project No. 1358

VIA EMAIL

Mr. Michael Kuitu
MC-127
Environmental Cleanup Section I, Team 3, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: DNAPL Recovery Pilot Test – 18-Month Status Update (February 2013 – July 2014)
Union Pacific Railroad Houston Wood Preserving Works Facility
4910 Liberty Road Facility, Houston, Texas
Post-Closure Care Permit No. HW-50343; Industrial SWR No. 31547

Dear Mr. Kuitu:

Pastor, Behling & Wheeler, LLC (PBW), on behalf of Union Pacific Railroad Company, is providing this status update for the dense non-aqueous phase liquid (DNAPL) recovery pilot test being conducted at the Houston Wood Preserving Works Facility (the Site). As detailed in the PBW letter dated February 5, 2013, PBW proposed to conduct a 24-month DNAPL recovery pilot test at the Site consisting of monthly manual DNAPL recovery. This letter discusses the DNAPL recovery pilot test activities and results for the first 18 months of the study (February 2013 through July 2014).

The following monitoring wells were selected to be included in the DNAPL recovery test based on the amount of DNAPL historically observed in the wells:

Well Name	Zone	Min. DNAPL Thickness (ft.)	Max DNAPL Thickness (ft.)
MW-57A	A-TZ	4.11	4.25
MW-12B	B-TZ	0.41	5.70
MW-41B	B-TZ	5.06	24.14
MW-57B	B-CZ	0.44	0.50
MW-32B	B-CZ	5.77	6.13
MW-33BR	B-CZ	0.30	0.30
MW-70B	B-CZ	1.44	1.53
MW-75B	B-CZ	1.84	1.90
MW-34C	C-TZ	7.24	7.60
MW-44C	C-TZ	0.75	7.10
MW-45C	C-TZ	0.39	1.50
MW-46C	C-TZ	0.10	1.25

Notes:
Average depth to water values, minimum and maximum DNAPL thicknesses based on data collected between January 2011 and December 2012.

Figure 1 shows the location of the wells used in the pilot study.

The pilot test procedures consisted of measuring the depth to groundwater surface, the depth to the groundwater/DNAPL interface, and the total depth of the well relative to the top of well casing prior to DNAPL recovery. Using a peristaltic pump, DNAPL was pumped from the bottom of the well until groundwater is returned in the pump discharge. The volume of recovered DNAPL was estimated from each well, and the well was gauged to measure the total depth of the well and depth to residual DNAPL following pumping. Recovered DNAPL was temporarily stored at the Containment Storage Area. Waste manifests for the recovered DNAPL and groundwater are provided in Attachment A.

A summary of the DNAPL recovery measurements from February 2013 through July 2014 is provided on Table 1. A graph of DNAPL thicknesses prior to each month recovery efforts over time is presented on Figure 2. Observations from the recovery testing through July 2014 are provided below:

- Monitoring wells with the thickest DNAPL measurements included MW-12B and MW-41B on the west side of the Site (Figure 1). DNAPL thicknesses increased following the February 2013 recovery event in MW-12B (May 2013) and in MW-41B (June 2013). However, DNAPL thickness in well MW-12B gradual decreased from 8.18 feet in May 2013 to less than a foot thick measured in the well in January 2014. The thickness in MW-12B slightly increased to about 1.54 feet in April 2014, and decreased to less than 1 foot thick in July 2014. DNAPL thickness in MW-41B decreased from the August 2013 event (measured at 10.26 feet) to about 5.5 feet thick in December 2013, but increased in March 2014 and then leveled off ranging from 6.89 feet to 7.6 feet thick from March to July 2014 (Figure 2).
- The other DNAPL wells tested showed significant decreases in DNAPL thicknesses over the first two months of testing, with some sporadic increases from May through August 2013 (Figure 2). During the first 12 months DNAPL thicknesses in the wells generally decreased to less than one-foot thick, except in MW-32B. However, since December 2013, three of the C-TZ wells (MW44C, MW-45C, and MW-46C) have had increasing DNAPL thicknesses with the largest increase at MW-44C increasing about 1.4 feet. Except for MW45C, DNAPL thicknesses are still less than what was measured prior to beginning the pilot test. DNAPL thickness in MW-32B has also shown a slight increase since December 2013.
- DNAPL thickness in well MW-57B decreased from 1.28 feet thick in July 2013 to less than measureable (DNAPL noted on end of probe) thickness in January 2014 through July 2014.
- Of the 12 wells tested as part of the pilot test, well MW-33BR did not have any measureable DNAPL during the 18-month period. Well MW-34C was gauged in October 2013, and no DNAPL was measured in the well. Since a street lane closure permit through the City of Houston is required for this well for the testing and no DNAPL was measured during the October 2013 event, this well was removed from the list of wells tested and was plugged and abandoned. In May 2014, replacement well MW-34CR was installed and is now gauged as part of the pilot test program. No DNAPL has been detected in the well.
- An estimated total of 110 gallons of DNAPL have been recovered during the 18-month period, with monthly DNAPL recovery volumes slightly decreasing over the past six months to around 5 gallons per month (Figure 2). Approximately 50% of the DNAPL recovered is from wells MW-12B and MW-41B.

The preliminary results from the DNAPL recovery pilot test after the first 18 months indicate the following:

- Once per month DNAPL recovery activities are resulting in an overall stable DNAPL thickness trend in the wells tested. Wells showing increasing trends will continue to be evaluated over the next six months of the pilot test program.
- The current monthly recovery frequency appears to be effective with total DNAPL volume recovered becoming stable in the wells over time.

UPRR plans to continue the monthly DNAPL pilot test recovery efforts, and will submit the next status report following the January 2015 recovery event. Concurrently with the pilot test, PBW is assessing the recovery data for evaluating more effective DNAPL recovery efforts.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Geoffrey Reeder of UPRR at (281) 350-7197.

Sincerely,

PASTOR, BEHLING & WHEELER, LLC

Eric C. Matzner, P.G.
Associate Hydrogeologist

cc: Waste Program Manager, TCEQ Region 12, Houston
Mr. Geoffrey Reeder, P.G., UPRR – Spring, TX

TABLES

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-12B				MW-32B				MW-33BR				MW-34C/MW-34CR (July 2014)			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	9.06	39.87	5.93	2.5	6.01	30.06	6.23	2	3.72	ND	0	---	NM	NM	NM	---
4/3/2013	9.41	39.95	5.85	1	4.86	33.61	2.68	1	4.02	PoP	0	---	NM	NM	NM	---
4/22/2013	8.61	31.64	14.16	0.5*	5.62	36.08	0.21	0.25	3.63	ND	0	---	NM	NM	NM	---
5/30/2013	8.47	37.62	8.18	1.5*	5.86	32.21	4.08	2	3.59	ND	0	---	NM	NM	NM	---
6/29/2013	9.62	38.22	7.58	1.5	6.79	33.59	2.7	1.5	6.07	ND	0	---	NM	NM	NM	---
7/22/2013	11.16	39.04	6.76	1	7.14	33.91	2.38	1.5	9.68	ND	0	---	NM	NM	NM	---
8/26/2013	11.31	39.61	6.19	1	7.48	33.83	2.46	1	9.86	ND	0	---	NM	NM	NM	---
9/27/2013	11.17	40.63	5.17	1	7.23	34.39	1.9	1	9.57	ND	0	---	NM	NM	NM	---
10/31/2013	11.09	43.71	2.09	1	7.16	34.96	1.33	0.53	9.32	ND	0	---	21.63	NM	NM	---
11/27/2013	11.17	44.06	1.74	1	7.29	35.03	1.26	0.53	9.16	ND	0	---	NM	NM	NM	---
12/31/2013	11.02	44.62	1.18	1	7.16	35.16	1.13	0.5	8.97	ND	0	---	NM	NM	NM	---
1/30/2014	11.34	45.12	0.68	1	6.72	34.82	1.47	0.53	7.41	ND	0	---	NM	NM	NM	---
3/3/2014	11.17	44.32	1.48	1	6.53	34.52	1.77	0.53	7.16	ND	0	---	NM	NM	NM	---
3/31/2014	11.03	44.53	1.27	1	6.29	34.21	2.08	0.53	7.04	ND	0	---	NM	NM	NM	---
4/30/2014	10.92	44.26	1.54	1	6.42	34.67	1.62	0.53	6.88	ND	0	---	NM	NM	NM	---
5/27/2014	10.81	44.34	1.46	1	6.36	34.72	1.57	0.53	6.72	ND	0	---	NM	NM	NM	---
6/26/2014	10.72	44.61	1.19	1	6.21	34.61	1.68	0.53	6.52	ND	0	---	NM	NM	NM	---
7/31/2014	10.13	44.96	0.84	1	6.06	34.33	1.96	0.25	6.29	ND	0	---	19.06	ND	ND	---
Total DNAPL Pumped (gal)				***20***				***15.24***				***0***				***0***

	MW-41B				MW-44C				MW-45C				MW-46C			
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)
2/14/2013	8.91	41.1	3.71	3	18.96	62.95	7.85	1	21.26	69.9	0.7	0.25	21.07	71.3	1.6	0.25
4/3/2013	9.37	41.6	3.21	1.5	19.34	70.47	0.33	0.25*	21.39	70.39	0.21	0.25*	20.61	72.36	0.54	0.25*
4/22/2013	8.62	41.6	3.21	0.5*	18.62	70.64	0.16	0.25*	21.03	70.47	0.13	0.25*	20.61	72.61	0.29	0.25*
5/30/2013	8.73	34.16	10.65	2	18.43	70.01	0.79	0.25*	21.16	70.25	0.35	0.25*	20.59	71.61	1.29	0.25*
6/29/2013	9.72	37.12	7.69	2	19.34	70.32	0.48	0.25	21.93	70.32	0.28	0.25*	21.09	72.34	0.56	0.25*
7/22/2013	10.31	39.29	5.52	1.5	20.36	70.26	0.54	0.25	22.72	70.39	0.21	0.25*	21.96	72.16	0.74	0.25*
8/26/2013	10.09	34.55	10.26	2.5	20.62	70.39	0.41	0.25	22.86	70.31	0.29	0.25	22.23	72.32	0.58	0.25
9/27/2013	9.63	37.29	7.52	2	20.39	70.61	0.19	0.25	22.66	70.17	0.43	0.25	22.09	72.09	0.81	0.25
10/31/2013	9.52	38.16	6.65	2	20.17	70.75	0.05	0.066	22.59	70.42	0.18	0.13	22.41	72.34	0.56	0.2
11/27/2013	9.57	38.39	6.42	2	20.09	70.78	0.02	---	22.52	70.49	0.11	---	22.31	72.47	0.43	0.07
12/31/2013	9.42	39.36	5.45	2	20.01	70.8	PoP	---	22.39	70.46	0.14	---	22.03	72.53	0.37	0.07
1/30/2014	9.06	39.17	5.64	2	19.67	70.42	0.38	0.25	22.13	70.35	0.25	---	21.81	72.55	0.35	0.07
3/3/2014	8.62	38.06	6.75	2	19.29	70.17	0.63	0.25	21.86	70.09	0.51	---	21.57	72.05	0.85	0.25
3/31/2014	8.52	37.74	7.07	2	19.17	70.02	0.78	0.25	21.71	69.63	0.97	0.25	21.43	72.12	0.78	0.13
4/30/2014	8.36	37.21	7.6	2	19.02	69.81	0.99	0.25	21.59	69.74	0.86	0.25	21.27	71.81	1.09	0.25
5/27/2014	8.26	37.29	7.52	2	18.92	69.71	1.09	---	21.52	69.67	0.93	0.25	21.34	71.71	1.19	0.25
6/26/2014	8.02	37.47	7.34	2	18.81	69.52	1.28	0.25	21.59	69.77	0.83	0.25	21.17	71.6	1.3	0.25
7/31/2014	8.21	37.92	6.89	2	18.66	69.37	1.43	0.25	21.21	69.96	0.64	0.25	20.39	71.43	1.47	0.25
Total DNAPL Pumped (gal)				***35***				***4.316***				***3.38***				***3.79***

TABLE 1

SUMMARY OF DNAPL RECOVERY MEASUREMENTS
UPRR HOUSTON, TX - WOOD PRESERVING WORKS

	MW-57A				MW-57B				MW-70B				MW-75B				Approx
DNAPL Recovery Date	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DTW (ft BTOC)	DTD (ft BTOC)	DNAPL Thickness (ft)	DNAPL Pumped (gal)	DNAPL Recovered (gal)
2/14/2013	10.56	22.12	4.78	0.5	28.56	41.41	1.54	0.25	6.57	34.09	1.61	0.25	10.01	34.1	3.1	0.25	10.25
4/3/2013	10.32	24.79	2.11	0.5	28.09	42.36	0.59	0.25*	6.79	35.26	0.44	0.25	13.71	36.47	0.73	0.25	5.5
4/22/2013	10.71	25.85	1.05	0.5	27.06	42.17	0.78	0.25	6.06	35.12	0.58	0.25	9.72	36.72	0.48	0.25	3.25
5/30/2013	10.63	24.16	2.74	0.5	27.13	41.63	1.32	0.25	6.19	34.67	1.03	0.25	9.61	35.09	2.11	*0.75*	7.25
6/29/2013	12.16	23.82	3.08	2	18.26	42.07	0.88	0.25	8.01	34.92	0.78	0.25*	10.61	35.61	1.59	*0.75*	8.25
7/22/2013	13.21	23.05	3.85	2	16.34	41.67	1.28	0.75	8.22	34.07	1.63	0.25*	9.74	35.71	1.49	*0.75*	7.5
8/26/2013	12.91	25.32	1.58	1	18.01	42.31	0.64	0.25	8.17	35.09	0.61	0.25	10.76	35.93	1.27	0.75	7.5
9/27/2013	12.72	25.71	1.19	0.75	17.74	42.51	0.39	0.25	8.32	35.34	0.36	0.25	10.52	36.39	0.81	0.5	6.5
10/31/2013	12.72	25.92	0.98	1	17.61	42.61	0.29	0.07	8.26	35.39	0.31	0.07	10.31	36.47	0.73	1	6.07
11/27/2013	12.61	25.98	0.92	1	17.54	42.67	0.23	0.07	8.12	35.42	0.28	0.07	10.39	36.51	0.69	1	5.74
12/31/2013	12.46	26.09	0.81	1	17.36	42.74	0.16	0.07	7.89	35.51	0.19	0.07	10.13	36.72	0.48	1	5.71
1/30/2014	11.79	26.15	0.75	0.25	17.04	NM	PoP	---	7.84	35.06	0.64	0.07	12.62	36.49	0.71	0.75	5.52
3/3/2014	11.02	26.25	0.65	0.25	16.51	NM	PoP	---	7.09	35.05	0.65	0.13	12.12	36.35	0.85	0.75	5.16
3/31/2014	10.83	26.41	0.49	0.25	16.41	NM	PoP	---	6.87	35.17	0.53	0.07	12.01	36.27	0.93	0.75	5.23
4/30/2014	10.71	26.31	0.59	0.25	16.29	NM	PoP	---	6.72	35.01	0.69	0.07	11.84	36.02	1.18	0.75	5.35
5/27/2014	10.74	26.16	0.74	0.25	16.13	NM	PoP	---	6.64	34.86	0.84	0.07	11.71	35.79	1.41	0.75	4.85
6/26/2014	10.61	26.29	0.61	0.25	16.02	NM	PoP	---	6.52	34.97	0.73	0.25	11.58	35.91	1.29	0.5	5.28
7/31/2014	10.35	26.18	0.72	0.25	15.84	NM	PoP	---	6.26	34.76	0.94	0.25	11.32	35.82	1.38	0.5	5
Total DNAPL Pumped (gal)				***12.5***				***2.71***				***3.12***				***12***	***109.91***

Notes:
* - indicates DNAPL and groundwater mixture
--- - No DNAPL pumped
DTW - Depth to water (feet Below Top of Casing (BTOC))
DTD - Depth to DNAPL (feet BTOC)
ND - Not detected
NM - Not measured
PoP - Product on probe, not measureable

FIGURES

EXPLANATION

- UPRR Property Boundary
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location
- B-TZ/B-CZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- Plugged and Abandoned Monitoring Well Location (May 2014)
- (0.84) In Well DNAPL Thickness (Ft)

N

Approx. Scale in Feet

0 200 400

Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

HWPW

Englewood Intermodal Yard

MW-27A MW-27C MW-67B MW-53C MW-65D MW-28C MW-28A MW-63B MW-54C MW-66D MW-68C MW-26A MW-33BR (0) MW-36B MW-36D MW-45C (0.64) MW-68B MW-36A MW-44A MW-46C (1.47) MW-25C MW-25A MW-44C (1.43) MW-34CR (0) MW-33A MW-35B MW-35A MW-32AR MW-32B (1.96) MW-70B (0.94) MW-71B MW-34C MW-57A (0.72) MW-57B (0) MW-18C MW-58A MW-18A MW-60A MW-13 MW-15C MW-17 MW-30A MW-23C (2.14) MW-72B MW-47C MW-14 MW-15A MW-15B MW-17C MW-52A TW-56A MW-20A MW-31A MW-19C MW-55B MW-55A MW-73B MW-48C MW-38A MW-39B MW-74B MW-49B MW-12A MW-12C MW-40B MW-61A MW-16 MW-49A MW-38B MW-12B (0.84) MW-42B MW-79A TW-41B MW-62B MW-41B (6.89) MW-59A MW-59B MW-59D MW-69A MW-75B (1.38) P-11 MW-02 MW-01A MW-03 MW-10A MW-08 P-12 MW-78A (1.38) MW-80B MW-22A MW-10B MW-09 MW-22B MW-11B MW-11A P-10 MW-04 MW-07 MW-21C MW-05 MW-77A MW-24C MW-24B MW-24AR MW-64A MW-76C MW-50A MW-81B MW-51A MW-51C

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

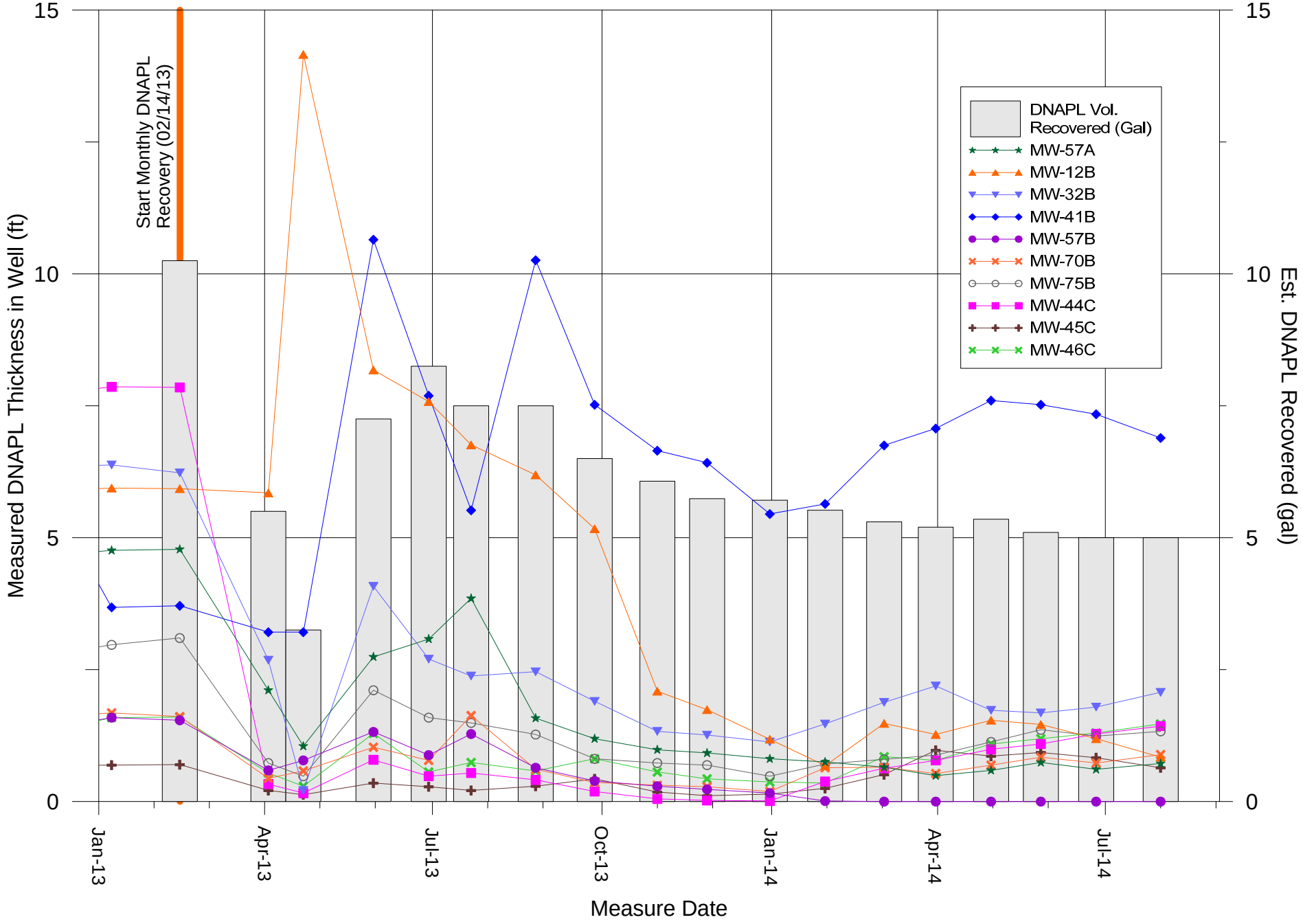
Figure 1

IN-WELL DNAPL THICKNESS JULY 2014

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: SEPT., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

Figure 2
DNAPL Recovery Pilot Test February 2013 - July 2014
UPRR Houston Wood Preserving Works



ATTACHMENT A

WASTE MANIFESTS

#140113649O

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	TXD000820266 St ID	1	866.780.3116	012994934 JJK

GENERATOR

5. Generator's Name and Mailing Address
UNION PACIFIC RAILROAD
24125 ALDINE WESTFIELD ROAD
SPRING, TX 77373
Generator's Phone: 281.350.7197

Generator's Site Address (if different than mailing address)
UNION PACIFIC RAILROAD
4910 LIBERTY ROAD
HOUSTON, TX 77287

6. Transporter 1 Company Name
USA Waste Transportation Services
U.S. EPA ID Number
TXR000032045 St ID 86133

7. Transporter 2 Company Name
Clean Harbors Env. Services Inc
U.S. EPA ID Number
NJD039322270

8. Designated Facility Name and Site Address
Clean Harbors
2027 Battleground Road
Deer Park, TX 77571
Facility's Phone: 281-930-2300
U.S. EPA ID Number
TXD055141378 St ID 50089

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. NA3082, Environmentally Hazardous substances, liquid, n.o.s., 9, III, RQ (Creosote)	1	DM	200	P	0918 219H F034
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information USA Job/PO # 2469-TD-H156
.) CH629200; ERG#: 171;
1 X 55gl

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: GEOFFREY REEDER
Signature: Geoffrey Reeder
Month 7 Day 7 Year 14

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Date leaving U.S.:
Transporter signature (for exports only):

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: L. DE. MONE' HATCH
Signature
Month 7 Day 7 Year 14

Transporter 2 Printed/Typed Name: Ben Shotts
Signature
Month 7 Day 5 Year 14

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
U.S. EPA ID Number
18b. Alternate Facility (or Generator)
Facility's Phone:
Month Day Year
18c. Signature of Alternate Facility (or Generator)

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H040			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Kirstin Hoffman
Signature
Month 07 Day 13 Year 14

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

APPENDIX 3C

REQUEST FOR NO FURTHER ACTION – RCRA UNIT NO. 1/SWMU 1

APPENDIX 3C

REQUEST FOR NO FURTHER ACTION – RCRA UNIT NO. 1/SWMU NO. 1

FORMER HOUSTON WOOD PRESERVING WORKS
4910 LIBERTY ROAD
HOUSTON, TEXAS

November 21, 2014

Prepared for:

Mr. Geoffrey Reeder, P.G.
UNION PACIFIC RAILROAD COMPANY

24125 Aldine Westfield Road
Spring, Texas 77373

Prepared by:

PASTOR, BEHLING & WHEELER, LLC

2201 Double Creek Drive, Suite 4004
Round Rock, Texas 78664
(512) 671-3434

PBW Project No. 1358

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1.0 EXECUTIVE SUMMARY

This report details the supporting documentation for requesting a No Further Action (NFA) for the Closed Surface Impoundment (Solid Waste Management Unit (SWMU) No. 1) at the former Wood Preserving Works facility (the Site) located in Houston, Texas. The SWMU No. 1 was clean closed in 1984 when the waste material was removed from the unit. The groundwater monitoring activities over the past three years have shown compliance with groundwater protective standards, and have achieved the groundwater Remedy Standard A requirements under the Texas Risk Reduction Program.

With more than three years of groundwater monitoring data at the SWMU No.1 less than TRRP Protective Concentration Levels (PCLs), UPRR requests a No Further Action Determination under Remedy Standard A to cease all post-closure care including response action and maintenance activities for SWMU No.1.

2.0 INTRODUCTION

This report details the supporting documentation for requesting a No Further Action (NFA) for the Closed Surface Impoundment (Solid Waste Management Unit (SWMU) No. 1) at the former Houston Wood Preserving Works facility (the Site) located at 4910 Liberty Road in Houston, Texas. SWMU No. 1 is an inactive surface impoundment and is a grass-covered section of land located at the southwest comer of the facility property (Figure 1).

Southern Pacific Transportation Company (SPTCo), which was acquired by Union Pacific Railroad (UPRR) in 1997, originally constructed a surface impoundment (later identified as SWMU No. 1) in 1979 for the disposal of contaminated surface soils remediated from the nearby Inactive Wastewater Lagoon (Area of Concern No. 6 (AOC 6)). Surface soils from the AOC 6 were remediated in response to a fire in 1979 and the discovery of contaminated soils. Installation of SWMU No. 1 was based on an agreement with the Texas Department of Water Resources (TDWR) for disposal of the soils.

SWMU No. 1 is bordered on the southern side by an earthen berm, which is about 2 feet by 3 feet by about 80 to 100 feet long. The berm extends about 100 feet south of the southwest corner of the SWMU No. 1. A chain-link security fence is located along the northern and western margins of SWMU No. 1. The original dimensions of the unit were about 180 feet by 106 feet at the surface, extending to a depth of about 7 feet bgs (SPTCo, 1991). Based on these dimensions, SWMU No. 1 would have a capacity of 133,560 cubic feet (about 4,950 cubic yards). According to SPTCo facility representatives, a clay liner was installed during the original construction of SWMU No. 1. No information was available concerning the thickness and engineering properties of the liner.

In 1984, SPTCo closed SWMU No. 1 by excavating the soils and materials contained within the unit. The visual hazardous material was removed along with apparent contaminated soil. An additional 3-inches of soil was then removed. The area was then divided into 50-foot grids which were randomly selected for sampling. Between 10 and 15 grab samples not more than 6-inches deep were homogenized and analyzed for K001 listed waste parameters and PAHs. When soil confirmation sample concentrations were lower than those of background samples, the excavated area was backfilled with compacted clay and a groundwater monitoring system was installed (Rollins, 1984). Additional soil sampling of the SWMU No. 1 was conducted in 1991 and indicated that the source of contamination had been removed by the 1984 closure activity (SPTCo, 1991). Copies of the 1984 closure documents are provided in Appendix A.

Beginning in 1984, groundwater monitoring activities were conducted around SWMU No. 1. Groundwater data from 1984 indicated that a release had occurred in the area of the SWMU No. 1. The Texas Water Commission (TWC, predecessor to the Texas Commission on Environmental Quality (TCEQ)) requested submittal of a Part B post-closure care application and compliance plan to address the groundwater contamination at SWMU No.1 in July 1990. SPTCo submitted the required Part B Application and the TWC issued a RCRA Permit for the facility in 1994. Currently, semi-annual groundwater monitoring is required for the SWMU No. 1 as a condition of the TCEQ Hazardous Waste Permit No. 50343 and associated Compliance Plan (CP) No. 50343, both renewed and issued on June 10, 2005.

With the unit clean closed in 1984, and more than three years of groundwater monitoring data at the SWMU No.1 less than Texas Reduction Program (TRRP) Protective Concentration Levels (PCLs), UPRR has prepared this Request for No Further Action to cease all post-closure care including response and maintenance activities for SWMU No.1. Details of the groundwater sampling evaluation are discussed in Section 3.0.

3.0 EVALUATION OF GROUNDWATER MONITORING DATA

Semi-annual groundwater samples have been collected from the Background and point of compliance (POC) wells to assess potentially affected groundwater quality in the A-Transmissive Zone (A-TZ) and the B-Transmissive Zone (B-TZ). These water-bearing zones are defined as:

- A-TZ refers to the first sand unit encountered at approximately 13 feet below ground surface (bgs) and averages 7 feet in thickness; and
- B-TZ refers to the second sand unit encountered at approximately 30 feet bgs and averages 9 feet in thickness.

The following monitoring wells were sampled during this event (Figure 2):

- A-TZ POC wells: MW-01A, MW-02, MW-07, MW-10A, and MW-11A;
- A-TZ Background well: MW-08;
- B-TZ POC wells: MW-10B, MW-11B, and P-10; and
- B-TZ background well: P-12.

Groundwater sampling was performed using procedures outlined in a U.S. Environmental Protection Agency (EPA) document titled *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures* (EPA/540/S-95/504). Groundwater samples were analyzed for the Detected Hazardous and Solid Waste Constituents listed in the CP, Table III.

3.1 Analytical Data Evaluation

Groundwater analytical results are compared to the Detected Hazardous and Solid Waste Constituent limits, which are taken from the current TCEQ TRRP Tier 1 PCLs. TRRP PCLs serve as the Groundwater Protection Standard (GWPS), as detailed in Section IV.D and Table III of the CP (Appendix B). Concentrations exceeding the concentration limits are bolded within the two tables.

Section VI.D of the CP describes two methods which may be used to determine the compliance status of a given well:

1) Analytical results may be either directly compared with PCLs, or

2) Analytical results can be statistically compared PCLs using the Confidence Interval Procedure for the mean concentration based on normal, log-normal, or non-parametric distribution, which the 95% confidence coefficient of the t-distribution will be used in construction of the confidence interval.

Direct comparison to PCLs was used to evaluate the analytical data since 2005, including the past three years. Tables 1 (A-TZ) and 2 (B-TZ) show the results of a direct comparison of data for the last eight years to the respective PCLs. As shown on the tables, monitoring wells in the A-TZ and B-TZ have not exceeded the established CP PCLs since July 2005, at which time dibenzofuran exceeded its respective PCL of 0.098 mg/L in MW-01A (0.11 mg/L).

Including the 2014 first semi-annual analytical data, the SMWU No. 1 monitoring wells have been compliant for sixteen consecutive semi-annual monitoring events (8 years) (PBW, 2014). The only exception was for an unverified, initial exceedance for dibenzofuran in POC well MW-10B as part of the second semi-annual 2013 corrective action monitoring event for the unit. Dibenzofuran concentrations were detected at 0.302 mg/L, above the GWPS of 0.098 mg/L at POC well MW-10B. Monitoring well MW-10B was resampled in October 2013 for dibenzofuran, which concentrations were detected at 0.0334 mg/L. Therefore, the initial GWPS exceedance at MW-10B for dibenzofuran was not verified with the resampling event and the POC well was considered to be compliant (PBW, 2013).

To show COCs in groundwater have decreased below PCLs to satisfy Remedy Standard A closure, the following concentration versus time graphs for COCs in the two zones were prepared:

- A-TZ (2-methylnaphthalene (Figure 3), dibenzofuran (Figure 4), and naphthalene (Figure 5)) and
- B-TZ (dibenzofuran (Figure 6) and naphthalene (Figure 7)).

The graphs demonstrate that COC concentrations in the A-TZ and B-TZ POC wells have shown a steady decrease over time.

Based on the analytical results from 2011 through 2014 monitoring events, the compliance wells completed in both transmissive zones have been compliant with GWPSs and COCs in groundwater at SWMU No. 1 have decreased to levels protective of human health and the environment and have satisfied Remedy Standard A closure criteria.

3.2 Recommendation for Changes

With SWMU No. 1 achieving the response action objectives for Remedy Standard A requirements under 30 Texas Administrative Code (TAC) §350.32, UPRR recommends ceasing all post-closure response actions (i.e, groundwater monitoring, inspections, reporting) associated with requirements for SWMU No. 1 detailed in the current RCRA Permit and CP. It is also recommended to plug and abandon the POC and background monitoring wells that will not be incorporated into the corrective action for the overall response action for the facility, as detailed in the Response Action Plan (RAP).

Upon approval, the monitoring wells associated with SWMU No. 1 will be plugged and abandoned by a licensed driller in accordance with the procedures specified in Texas Department of Licensing and Regulations (TDLR) Section 76.1004. During abandonment activities, an attempt will be made to remove the well casing material from the borehole. The borehole will then be backfilled with a cement/bentonite mixture. Surface completions will be removed and a patch will be placed at the former well location to match surrounding grade.

4.0 REFERENCES

Pastor, Behling & Wheeler, LLC (PBW), 2013. *Correction Action Monitoring: 2013 Second Semi-Annual Event – Unverified Groundwater Protection Standard Exceedance – Point of Compliance Well MW-10B*, November 8.

Pastor, Behling & Wheeler, LLC (PBW), 2014. *Correction Action Monitoring Report: 2014 First Semi-Annual Event*, June 30.

Rollins, 1984. *Final Report on Closure Plan of RCRA Facility #31547*, prepared for the Southern Pacific Transportation Company. April

Southern Pacific Transportation Company (SPTCo), 1991. *Part B Application, Closed Surface Impoundment, Englewood Yard – SWR 31547*, May 13

TABLES

TABLE 1
SWMU NO. 1 A-TZ UNIT GROUNDWATER MONITORING DATA
UNION PACIFIC RAILROAD COMPANY
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TX

Well ID	Constituent	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	bis(2-Ethylhexyl) phthalate	Dibenzofuran	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
	PCL (mg/L)	0.098	1.5	1.5	7.3	0.006	0.098	0.98	0.98	0.49	0.73	0.73
MW-01A	3/4/2005	0.0882	0.224	0.00326	0.00754	0.00035 U	**0.101**	0.00935	0.124	0.12	0.0182	0.00362
MW-01A	7/19/2005	**0.1036**	0.245	0.00221	0.0101	0.000356 U	**0.11**	0.0139	0.137	0.0216	0.0233	0.00593
MW-01A	9/8/2005						**0.133**					
MW-01A	1/6/2006	0.00169	0.0937	0.00387	0.0021	0.000356 U	0.0143	0.00557	0.0221	0.000519	0.00065	0.0025
MW-01A	7/28/2006	0.0205	0.163	0.00182	0.00613	0.00009 U	0.0639	0.0079	0.0792	0.00292	0.00698	0.00376
MW-01A	1/23/2007	0.000262	0.0509	0.00137	0.00226	0.00009 U	0.00839	0.00251	0.0155	0.000302	0.000229	0.00105
MW-01A	7/18/2007	0.00133 U	0.11	0.00114 U	0.000952 U	0.00352 U	0.00849 J	0.00696 J	0.0514	0.00124 U	0.00336 J	0.00304 J
MW-01A	1/28/2008	0.00044 U	0.0415	0.00099	0.00129	0.00022 U	0.00129	0.00234	0.0162	0.00044 U	0.00022 U	0.00107
MW-01A	7/16/2008	0.0109	0.126	0.00143	0.00267	0.00137 J	0.00774	0.00923	0.0659	0.0168	0.00177	0.00417
MW-01A	1/22/2009	0.0069	0.054	0.0007 U	0.0012 J	0.0012 U	0.0058	0.0024 J	0.028	0.0008 U	0.001 J	0.001 J
MW-01A	7/22/2009	0.0017 J	0.085	0.0005 U	0.0011 J	0.0033 U	0.0037 J	0.0037 J	0.04	0.0029 J	0.0005 U	0.0019 J
MW-01A	1/22/2010	0.0019 J	0.04	0.0005 U	0.0006 U	0.0033 U	0.0016 J	0.0017 J	0.022	0.0043 J	0.0005 U	0.0005 U
MW-01A	7/14/2010	0.0009 U	0.068	0.0005 U	0.0017 J	0.0033 U	0.0044 J	0.004 J	0.04	0.0006 U	0.0011 J	0.0021 J
MW-01A	1/11/2011	0.0009 U	0.07	0.0011 J	0.0021 J	0.0033 U	0.0007 U	0.0025 J	0.039	0.0006 U	0.0005 U	0.0011 J
MW-01A	7/13/2011	0.0068	0.1	0.0011 J	0.0029 J	0.003 J	0.0054	0.0062	0.056	0.0005 U	0.002 J	0.0028 J
MW-01A	1/31/2012	0.0005 U	0.029	0.0005 U	0.0005 U	0.0005 U	0.0045 J	0.0012 J	0.0013 J	0.0005 U	0.0005 U	0.0005 U
MW-01A	7/11/2012	0.012	0.084	0.0017 J	0.003 J	0.0005 U	0.025	0.0047 J	0.041	0.0005 U	0.0033 J	0.0021 J
MW-01A	1/9/2013	0.00125	0.117	0.00222	0.000285 J	0.00163	0.0141	0.00602	0.0564	0.00219	0.00388	0.00261
MW-01A	7/11/2013	0.00193	0.098	0.00122	0.0022	0.000356 U	0.00264	0.00399	0.0323	0.0169	0.00109	0.00165
MW-01A	1/8/2014	0.00222	0.0895	0.00093	0.003	0.000838 J	0.00951	0.00257	0.0369	0.0000741 U	0.00175	0.0013
MW-01A	7/2/2014	0.00865	0.0848	0.00138	0.00326	0.000349 U	0.0132	0.0043	0.0369	0.074	0.00537	0.00204
MW-02	3/4/2005	0.00008 J	0.0394	0.0004 J	0.00114	0.00035 U	0.0152	0.00421	0.0268	0.00161	0.00024 J	0.00183
MW-02	7/19/2005	0.00007 U	0.0031	0.00006 U	0.00032 J	0.000352 U	0.00245	0.000796	0.00268	0.00006 U	0.00036 J	0.00042 J
MW-02	1/5/2006	0.00046 J	0.0142	0.00128	0.000857	0.00037 U	0.0152	0.00113	0.0148	0.0053	0.00024 J	0.00041 J
MW-02	7/28/2006	0.000622	0.0098	0.0002	0.000783	0.00018 J	0.00767	0.00123	0.00604	0.0106	0.00103	0.00063
MW-02	1/23/2007	0.00008 U	0.00675	0.00015 J	0.000542	0.00009 U	0.00488	0.000625	0.00479	0.000406	0.00005 J	0.0003
MW-02	7/18/2007	0.0024 J	0.0256	0.00114 U	0.00138 J	0.00352 U	0.0174	0.00165 J	0.0157	0.0188	0.00167 J	0.00095 U
MW-02	1/28/2008	0.00038 U	0.017	0.00028 U	0.000922	0.00049 J	0.0106	0.0015	0.0119	0.000827	0.000532	0.00082
MW-02	7/16/2008	0.00039 U	0.0218	0.0003 J	0.00042 J	0.00019 U	0.00673	0.000961	0.0103	0.00118	0.00019 U	0.00045 J
MW-02	1/22/2009	0.0008 U	0.014	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0006 U	0.0039 J	0.0008 U	0.0007 U	0.0009 U
MW-02	7/22/2009	0.0025 J	0.032	0.0005 U	0.0006 U	0.0033 U	0.0042 J	0.0011 J	0.015	0.012	0.0005 U	0.0005 U
MW-02	1/22/2010	0.0009 U	0.0073	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0037 J	0.0006 U	0.0005 U	0.0005 U
MW-02	7/14/2010	0.0009 U	0.018	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.011	0.0006 U	0.0005 U	0.0005 U
MW-02	1/11/2011	0.0009 U	0.0078	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0049 J	0.0006 U	0.0005 U	0.0005 U
MW-02	7/13/2011	0.0021 J	0.026	0.0005 U	0.0005 U	0.0021 J	0.0038 J	0.0012 J	0.015	0.0037 J	0.0005 U	0.0005 U
MW-02	1/30/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-02	7/10/2012	0.0005 U	0.0088	0.0005 U	0.0005 U	0.0005 U	0.0043 J	0.0005 U	0.0043 J	0.0033 J	0.0005 U	0.0005 U
MW-02	1/9/2013	0.00318	0.0384	0.00057	0.00129	0.000874	0.0178	0.00147	0.0201	0.0211	0.00241	0.00087
MW-02	7/11/2013	0.000897	0.0179	0.000335 J	0.0013	0.000356 U	0.00734	0.00069	0.00986	0.00754	0.000776	0.00034 J
MW-02	1/8/2014	0.0000648 U	0.000445 J	0.000101 J	0.00131	0.000343 U	0.000147 J	0.000307 J	0.00026 J	0.0000741 U	0.000122 J	0.00018 J
MW-02	7/2/2014	0.000509	0.00452	0.0000979 J	0.000596	0.000349 U	0.00301	0.000368 J	0.00357	0.00653	0.000594	0.0002 J

TABLE 1
SWMU NO. 1 A-TZ UNIT GROUNDWATER MONITORING DATA
UNION PACIFIC RAILROAD COMPANY
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TX

Well ID	Constituent	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	bis(2-Ethylhexyl) phthalate	Dibenzofuran	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
	PCL (mg/L)	0.098	1.5	1.5	7.3	0.006	0.098	0.98	0.98	0.49	0.73	0.73
MW-07	3/1/2005	0.00007 U	0.0001 J	0.00006 U	0.0004 J	0.000791	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-07	7/19/2005	0.00007 U	0.0015	0.00006 U	0.000653	0.000352 U	0.00015 J	0.00017 J	0.00007 U	0.00006 U	0.00009 U	0.00026 J
MW-07	1/5/2006	0.00007 U	0.00286	0.00008 J	0.000537	0.000422 J	0.00009 J	0.00008 U	0.00038 J	0.00019 J	0.00009 U	0.00009 U
MW-07	7/28/2006	0.00008 U	0.00362	0.00008 U	0.000417	0.00009 U	0.00006 U	0.000275	0.00018 J	0.00007 U	0.00004 U	0.00053
MW-07	1/23/2007	0.00008 U	0.00004 U	0.00008 U	0.000353	0.00009 U	0.00006 U	0.00004 U	0.00004 U	0.000637	0.00004 U	0.00004 U
MW-07	7/17/2007	0.00133 U	0.00114 U	0.00114 U	0.000952 U	0.00352 U	0.0041 U	0.000952 U	0.00095 U	0.00124 U	0.000952 U	0.00095 U
MW-07	1/28/2008	0.00038 U	0.00028 U	0.00028 U	0.000516	0.00019 U	0.00028 U	0.00019 U	0.00019 U	0.00038 U	0.00019 U	0.00019 U
MW-07	7/16/2008	0.00039 U	0.00029 U	0.00044 J	0.000982	0.00019 U	0.00029 U	0.00019 U	0.00019 U	0.000675	0.00036 J	0.00019 U
MW-07	1/22/2009	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0006 U	0.0008 U	0.0008 U	0.0007 U	0.0009 U
MW-07	7/22/2009	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-07	1/22/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-07	7/14/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0049 J	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-07	1/12/2011	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-07	7/12/2011	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-07	1/31/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-07	7/11/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-07	1/10/2013	0.000066 U	0.00181	0.00011 J	0.000833	0.000349 U	0.0000755 U	0.000066 U	0.00014 J	0.0000755 U	0.0000566 U	0.0001 U
MW-07	7/11/2013	0.0000704 U	0.0000804 U	0.0000603 U	0.000749	0.000372 U	0.0000804 U	0.0000704 U	7E-05 U	0.000111 J	0.0000603 U	0.00011 U
MW-07	1/9/2014	0.0000648 U	0.0000741 U	0.0000556 U	4.63E-05 U	0.000343 U	0.0000741 U	0.0000648 U	6.5E-05 U	0.0000741 U	0.0000556 U	0.0001 U
MW-07	7/3/2014	0.000066 U	0.0000755 U	0.0000566 U	0.000696	0.000349 U	0.0000755 U	0.000066 U	6.6E-05 U	0.0000755 U	0.0000566 U	0.0001 U
MW-08	3/1/2005	0.00007 U	0.00012 J	0.00006 U	0.00015 J	0.00035 U	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-08	7/18/2005	0.00007 U	0.00007 U	0.00006 U	0.00026 J	0.000356 J	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00012 J
MW-08	1/6/2006	0.00007 U	0.00007 U	0.00006 U	0.00011 J	0.000363 U	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-08	7/28/2006	0.00008 U	0.00004 U	0.00008 U	0.00018 J	0.00012 J	0.00006 U	0.00004 U	0.00004 U	0.00007 U	0.00004 U	0.00004 U
MW-08	1/22/2007	0.00008 U	0.00004 U	0.00008 U	0.00004 U	0.00009 U	0.00006 U	0.00004 U	0.00004 U	0.00007 U	0.00004 U	0.00004 U
MW-08	7/17/2007	0.00133 U	0.00114 U	0.00114 U	0.00135 J	0.00352 U	0.0041 U	0.000952 U	0.00095 U	0.00124 U	0.000952 U	0.00095 U
MW-08	1/29/2008	0.00044 U	0.00033 U	0.00033 U	0.00031 J	0.00022 U	0.00033 U	0.00022 U	0.00022 U	0.00044 U	0.00022 U	0.00022 U
MW-08	7/16/2008	0.0004 U	0.0003 U	0.00044 J	0.000669	0.0002 U	0.0003 U	0.0002 U	0.0002 U	0.000654	0.00036 J	0.0002 U
MW-08	1/22/2009	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0006 U	0.0008 U	0.0008 U	0.0007 U	0.0009 U
MW-08	7/22/2009	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-08	1/22/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-08	7/14/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-08	1/12/2011	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-08	7/12/2011	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-08	1/31/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-08	7/11/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-08	1/10/2013	0.000066 U	0.0000755 U	0.0000566 U	0.000439 J	0.000349 U	0.0000755 U	0.000066 U	6.6E-05 U	0.0000755 U	0.0000566 U	0.0001 U
MW-08	7/11/2013	0.0000686 U	0.0000784 U	0.0000588 U	0.000101 J	0.000363 U	0.0000784 U	0.0000686 U	6.9E-05 U	0.0000784 U	0.0000588 U	0.00011 U
MW-08	1/9/2014	0.0000648 U	0.0000741 U	0.0000556 U	0.000494	0.000343 U	0.0000741 U	0.0000648 U	6.5E-05 U	0.0000741 U	0.0000637 J	0.0001 U
MW-08	7/3/2014	0.000066 U	0.0000755 U	0.0000566 U	4.72E-05 U	0.000349 U	0.0000755 U	0.000066 U	6.6E-05 U	0.0000755 U	0.0000566 U	0.0001 U

TABLE 1
SWMU NO. 1 A-TZ UNIT GROUNDWATER MONITORING DATA
UNION PACIFIC RAILROAD COMPANY
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TX

Well ID	Constituent	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	bis(2-Ethylhexyl) phthalate	Dibenzofuran	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene
	PCL (mg/L)	0.098	1.5	1.5	7.3	0.006	0.098	0.98	0.98	0.49	0.73	0.73
MW-10A	3/1/2005	0.00007 U	0.00007 U	0.00006 U	0.00013 J	0.00035 U	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-10A	7/19/2005	0.00007 U	0.00011 J	0.00006 U	0.00007 U	0.000352 U	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-10A	1/5/2006	0.00007 U	0.00007 U	0.00006 U	0.00011 J	0.000359 U	0.00008 U	0.00008 U	0.00007 U	0.00006 U	0.00009 U	0.00009 U
MW-10A	7/28/2006	0.00008 U	0.000327	0.00008 U	0.00004 U	0.00009 U	0.00017 J	0.00004 U	0.00004 U	0.00007 U	0.00004 U	0.00004 U
MW-10A	1/23/2007	0.00008 U	0.000714	0.00008 U	0.000273	0.00009 U	0.00009 J	0.00004 U	0.00015 J	0.00007 U	0.00004 U	0.00004 U
MW-10A	7/17/2007	0.00133 U	0.00114 U	0.00114 U	0.000952 U	0.00352 U	0.0041 U	0.000952 U	0.00095 U	0.00124 U	0.000952 U	0.00095 U
MW-10A	1/28/2008	0.0004 U	0.0003 U	0.0003 U	0.0002 U	0.0002 U	0.0003 U	0.0002 U	0.0002 U	0.0004 U	0.0002 U	0.0002 U
MW-10A	7/16/2008	0.00038 U	0.00029 U	0.00029 U	0.00019 U	0.0002 J	0.00029 U	0.00019 U	0.00019 U	0.00038 U	0.00019 U	0.00019 U
MW-10A	1/22/2009	0.0008 U	0.0008 U	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0006 U	0.0008 U	0.0008 U	0.0007 U	0.0009 U
MW-10A	7/22/2009	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-10A	1/21/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-10A	7/13/2010	0.0018 J	0.0018 J	0.001 J	0.0012 J	0.0033 U	0.0014 J	0.001 J	0.0012 J	0.0012 J	0.001 J	0.001 J
MW-10A	1/11/2011	0.0009 U	0.0017 J	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-10A	7/13/2011	0.0005 U	0.0545 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-10A	1/30/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-10A	7/10/2012	0.0005 U	0.0016 J	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-10A	1/9/2013	0.0000667 U	0.0000762 U	0.0000571 U	0.000468 J	0.00171	0.0000762 U	0.0000667 U	6.7E-05 U	0.0000762 U	0.0000571 U	0.00011 U
MW-10A	7/11/2013	0.00178	0.0306	0.000385 J	0.00036 J	0.000356 U	0.00866	0.000186 J	0.00631	0.199	0.00221	0.00011 U
MW-10A	1/8/2014	0.0000648 U	0.0000741 U	0.0000556 U	4.63E-05 U	0.000343 U	0.0000741 U	0.0000648 U	6.5E-05 U	0.0000741 U	0.0000556 U	0.0001 U
MW-10A	7/15/2014	0.00262 J	0.0306	0.000566 U	0.000472 U	0.00349 U	0.00862	0.00066 U	0.0111	0.199	0.00442 J	0.00104 U
MW-11A	3/3/2005	0.00016 J	0.0139	0.00006 U	0.000833	0.000806	0.00451	0.000786	0.00663	0.011	0.00023 J	0.00016 J
MW-11A	7/19/2005	0.00019 J	0.0732	0.00074	0.00201	0.000352 U	0.00957	0.0064	0.0229	0.00482	0.00196	0.00308
MW-11A	1/5/2006	0.00007 U	0.00007 U	0.00006 U	0.00007 U	0.000363 U	0.00008 U	0.000516	0.00008 J	0.00006 U	0.00009 U	0.00011 J
MW-11A	7/28/2006	0.00008 U	0.0306	0.000263	0.000543	0.00014 J	0.000566	0.00362	0.00066	0.00012 J	0.00018 J	0.00186
MW-11A	1/23/2007	0.00008 U	0.00685	0.00008 U	0.000287	0.00009 U	0.0019	0.000292	0.00326	0.00481	0.000829	0.00016 J
MW-11A	7/17/2007	0.00133 U	0.0404	0.00114 U	0.000952 U	0.00352 U	0.0041 U	0.00297 J	0.00095 U	0.00124 U	0.0011 J	0.00148 J
MW-11A	1/28/2008	0.00038 U	0.0346	0.00029 U	0.000798	0.00028 J	0.00276	0.00338	0.0069	0.00038 U	0.00036 J	0.00191
MW-11A	7/16/2008	0.0004 U	0.02	0.0003 U	0.00054	0.0002 U	0.0003 U	0.00387	0.00089	0.0004 U	0.0002 U	0.00184
MW-11A	1/22/2009	0.0008 U	0.0076	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0012 J	0.0008 U	0.0008 U	0.0007 U	0.0009 U
MW-11A	7/22/2009	0.0009 U	0.014	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0011 J	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-11A	1/21/2010	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-11A	7/13/2010	0.0018 J	0.0056 UJ	0.001 J	0.0012 J	0.0033 U	0.0014 J	0.001 J	0.0012 J	0.0012 J	0.001 J	0.001 J
MW-11A	1/11/2011	0.0009 U	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
MW-11A	7/12/2011	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-11A	1/30/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-11A	7/10/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-11A	1/9/2013	0.000066 U	0.00175	0.0000566 U	0.000499	0.000349 U	0.0000755 U	0.000066 U	6.6E-05 U	0.0000755 U	0.0000566 U	0.0001 U
MW-11A	7/11/2013	0.0000673 U	0.000878	0.0000577 U	0.00044 J	0.000356 U	0.0000769 U	0.000221 J	6.7E-05 U	0.0000769 U	0.0000577 U	0.00012 J
MW-11A	1/8/2014	0.0000648 U	0.0000741 U	0.0001 J	0.00125	0.00046 J	0.0000741 U	0.0000795 J	6.5E-05 U	0.0000741 U	0.0000556 U	0.0001 U
MW-11A	7/2/2014	0.000066 U	0.00427	0.000185 J	0.00126	0.00516	0.000618	0.00215	0.00149	0.000343 J	0.000384 J	0.00194

Notes:
PCL = Protective Concentration Level
J = Estimated value between the SDL and the MQL
U = Value not detected greater than the MQL
Bolded concentrations exceed PCL.

1. Resample for dibenzofuran at MW-10B in Ocotber 2013 did not verify initial exceedance in July 2013

TABLE 2
SWMU NO. 1 B-TZ UNIT GROUNDWATER MONITORING DATA
UNION PACIFIC RAILROAD COMPANY
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TX

Well ID	Constituent	Acenaphthene	Acenaphthylene	Anthracene	bis(2-Ethylhexyl) phthalate	Dibenzofuran	Di-n-butyl phthalate	Fluoranthene	Fluorene	Naphthalene	Phenol	Pyrene
	PCL (mg/L)	1.5	1.5	7.3	0.006	0.098	2.4	0.98	0.98	0.49	7.3	0.73
MW-10B	3/1/2005	0.0164	0.00035 J	0.000995	0.00035 U	0.00482	0.00022 J	0.000941	0.00601	0.00171	0.00004 U	0.00041 J
MW-10B	7/19/2005	0.0739	0.000953	0.00413	0.000352 U	0.0286	0.000648	0.00288	0.0377	0.0789	0.00004 U	0.00125
MW-10B	1/5/2006	0.0113	0.000711	0.000556	0.000356 U	0.0002 J	0.000106 U	0.000649	0.00007 U	0.00006 U	0.00004 U	0.00038 J
MW-10B	7/28/2006	0.0802	0.00107	0.00491	0.00022	0.0323	0.000196	0.00273	0.0434	0.0904	0.00007 U	0.00128
MW-10B	1/23/2007	0.0279	0.00103	0.00126	0.00016 J	0.00312	0.0001 U	0.000745	0.00344	0.000242	0.00007 U	0.000283
MW-10B	7/17/2007	0.0961	0.00114 U	0.00437 J	0.0019 U	0.0325	0.00362 U	0.0028 J	0.0399	0.0252	0.00267 U	0.000952 U
MW-10B	1/28/2008	0.0743	0.00122	0.00432	0.00019 U	0.0255	0.00019 U	0.00371	0.0374	0.0185	0.00019 U	0.00146
MW-10B	7/16/2008	0.0975	0.00113	0.00484	0.0002 J	0.0392	0.0002 U	0.00397	0.0457	0.014	0.0002 U	0.00174
MW-10B	1/22/2009	0.096	0.0007 U	0.0043 J	0.0012 U	0.035	0.0007 U	0.0039 J	0.051	0.0028 J	0.0015 U	0.002 J
MW-10B	7/22/2009	0.067	0.0005 U	0.0029 J	0.0033 U	0.023	0.0005 U	0.0022 J	0.033	0.0082	0.0005 U	0.0013 J
MW-10B	1/21/2010	0.052	0.0005 U	0.0025 J	0.0033 U	0.018	0.0005 U	0.0017 J	0.031	0.0037 J	0.0005 U	0.0005 U
MW-10B	7/13/2010	0.138	0.001 J	0.0076 UJ	0.0033 J	0.05	0.001 J	0.0052 UJ	0.082	0.112	0.001 J	0.002 UJ
MW-10B	1/11/2011	0.096	0.0005 U	0.0068	0.0033 U	0.037	0.0005 U	0.0054	0.059	0.075	0.0005 U	0.0023 J
MW-10B	7/13/2011		0.0005 U	0.0033 J	0.0013 J	0.019	0.0005 U	0.0023 J	0.032	0.0018 J	0.0005 U	0.0011 J
MW-10B	1/30/2012	0.1	0.0011 J	0.0057	0.0005 U	0.038	0.0005 U	0.0046 J	0.06	0.084	0.0005 U	0.002 J
MW-10B	7/10/2012	0.054	0.0005 U	0.0032 J	0.0005 U	0.02	0.0005 U	0.0028 J	0.031	0.004 J	0.0005 U	0.0011 J
MW-10B	1/9/2013	0.12	0.00108	0.00546	0.000349 U	0.0401	0.000104 U	0.00427	0.0652	0.00399	3.77E-05 U	0.00146
MW-10B	7/11/2013	0.977	0.00986	0.0391	0.0037 U	**0.302**	0.011 U	0.0274	0.468	0.207	0.0004 U	0.0101
MW-10B[1]	10/18/2013	---	---	---	---	0.0334	---	---	---	---	---	---
MW-10B	1/8/2014	0.021	0.000536	0.00107	0.000408 J	0.00493	0.000275 J	0.000117 J	0.00429	0.0646	0.000037 U	0.000102 U
MW-10B	7/15/2014	0.0777	0.000566 U	0.00352 J	0.00349 U	0.0258	0.00104 U	0.00211 J	0.0424	0.125	0.000377 U	0.00104 U
MW-11B	3/1/2005	0.0131	0.00031 J	0.00025 J	0.00037 U	0.00027 J	0.0003 J	0.000589	0.0001 J	0.00006 U	0.00004 U	0.00025 J
MW-11B	7/19/2005	0.0577	0.000799	0.0024	0.000352 U	0.0289	0.000357 J	0.00159	0.0261	0.186	0.00004 U	0.000745
MW-11B	1/5/2006	0.0537	0.000617	0.00269	0.000352 U	0.0261	0.00013 J	0.00189	0.0259	0.0025	0.00004 U	0.000873
MW-11B	7/31/2006	0.0707	0.00119	0.00345	0.00026	0.0359	0.00042	0.00245	0.0336	0.1	0.00007 U	0.00122
MW-11B	1/23/2007	0.0125	0.000315	0.000523	0.00009 U	0.00295	0.0001 U	0.000549	0.00231	0.00013 J	0.00007 U	0.000319
MW-11B	7/17/2007	0.088	0.00114 U	0.00396 J	0.0019 U	0.0411	0.00362 U	0.0029 J	0.0353	0.0901	0.00267 U	0.00146 J
MW-11B	1/28/2008	0.0649	0.00028 U	0.00236	0.00021 J	0.0273	0.00019 U	0.00175	0.0297	0.0354	0.00019 U	0.000848
MW-11B	7/16/2008	0.12	0.00126	0.00472	0.00021 U	0.0649	0.00021 U	0.00383	0.0578	0.0772	0.00021 U	0.00163
MW-11B	1/22/2009	0.072	0.0007 U	0.0022 J	0.0012 U	0.031	0.0007 U	0.0018 J	0.032	0.0008 U	0.0015 U	0.0009 U
MW-11B	7/22/2009	0.12	0.0015 J	0.0043 J	0.0033 U	0.054	0.0005 U	0.0036 J	0.053	0.048	0.0005 U	0.002 J
MW-11B	1/21/2010	0.048	0.0013 J	0.0011 J	0.0033 U	0.012	0.0005 U	0.0014 J	0.013	0.0006 U	0.0005 U	0.0005 U
MW-11B	7/13/2010	0.22	0.001 J	0.011	0.0033 U	0.096	0.001 J	0.0092 UJ	0.112	0.0136	0.001 J	0.0044 UJ
MW-11B	1/11/2011	0.039	0.0012 J	0.0006 U	0.0033 U	0.006	0.0005 U	0.0015 J	0.0038 J	0.0006 U	0.0005 U	0.0005 U
MW-11B	7/12/2011	0.084	0.0012 J	0.0054	0.0005 U	0.038	0.0005 U	0.0046 J	0.046	0.06	0.0005 U	0.0024 J
MW-11B	1/30/2012	0.025	0.0011 J	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0013 J	0.0005 U	0.0005 U	0.0005 U	0.0005 U
MW-11B	7/10/2012	0.1	0.0013 J	0.0055	0.0005 U	0.04	0.0005 U	0.0053	0.054	0.004 J	0.0005 U	0.0024 J
MW-11B	1/9/2013	0.0631	0.00136	0.000168 J	0.00195	0.00352	0.000104 U	0.00307	0.00205	0.0000755 U	3.77E-05 U	0.00154
MW-11B	7/11/2013	0.108	0.00119	0.00321	0.000356 U	0.0231	0.000106 U	0.00383	0.0388	0.00535	3.85E-05 U	0.00196
MW-11B	1/8/2014	0.0603	0.00102	0.00242	0.000493 J	0.0111	0.000317 J	0.00267	0.0195	0.000382 J	0.000037 U	0.00126
MW-11B	7/2/2014	0.0953	0.00166	0.00375	0.000349 U	0.0199	0.000109 J	0.00417	0.0339	0.0135	3.77E-05 U	0.00213

TABLE 2
SWMU NO. 1 B-TZ UNIT GROUNDWATER MONITORING DATA
UNION PACIFIC RAILROAD COMPANY
HOUSTON WOOD PRESERVING WORKS
HOUSTON, TX

Well ID	Constituent	Acenaphthene	Acenaphthylene	Anthracene	bis(2-Ethylhexyl) phthalate	Dibenzofuran	Di-n-butyl phthalate	Fluoranthene	Fluorene	Naphthalene	Phenol	Pyrene
	PCL (mg/L)	1.5	1.5	7.3	0.006	0.098	2.4	0.98	0.98	0.49	7.3	0.73
P-10	3/3/2005	0.00453	0.00008 J	0.00015 J	0.000836	0.000892	0.00028 J	0.00015 J	0.000723	0.0142	0.00004 U	0.00009 U
P-10	7/19/2005	0.0737	0.000476	0.00346	0.000352 U	0.0314	0.000481	0.0024	0.0364	0.464	0.00004 U	0.00102
P-10	1/5/2006	0.102	0.00006 U	0.0057	0.000359 U	0.0325	0.000107 U	0.00273	0.048	0.433	0.00004 U	0.00108
P-10	7/31/2006	0.0346	0.00016 J	0.000981	0.00016 J	0.00945	0.00032	0.000924	0.0115	0.062	0.00007 U	0.00046
P-10	1/23/2007	0.0165	0.00008 U	0.000437	0.00009 U	0.0044	0.0001 U	0.00004 U	0.00541	0.0204	0.00007 U	0.000215
P-10	7/17/2007	0.0688	0.00114 U	0.00319 J	0.0019 U	0.0272	0.00362 U	0.0021 J	0.0291	0.297	0.00267 U	0.001 J
P-10	1/28/2008	0.00373	0.00028 U	0.000703	0.00023 J	0.000713	0.00019 U	0.000506	0.000668	0.00038 U	0.00019 U	0.00039 J
P-10	7/16/2008	0.0106	0.00053	0.000747	0.00022 J	0.00176	0.00092 J	0.00022 J	0.00245	0.00079	0.00021 U	0.00021 U
P-10	1/22/2009	0.0008 U	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0007 U	0.0006 U	0.0008 U	0.0008 U	0.0015 U	0.0009 U
P-10	7/22/2009	0.0044 J	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-10	1/22/2010	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-10	7/14/2010	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-10	1/12/2011	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-10	7/12/2011	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-10	1/31/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-10	7/11/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-10	1/10/2013	0.0000755 U	0.0000566 U	0.0000472 U	0.000906	0.0000755 U	0.000104 U	0.000066 U	0.000066 U	0.0000755 U	3.77E-05 U	0.000104 U
P-10	7/11/2013	0.0000808 U	0.0000606 U	0.000133 J	0.000492 J	0.0000808 U	0.000111 U	0.0000707 U	0.0000707 U	0.0000808 U	4.04E-05 U	0.000111 U
P-10	1/9/2014	0.000102 J	0.0000556 U	0.000323 J	0.000343 U	0.0000741 U	0.000262 J	0.0000648 U	0.0000648 U	0.0000741 U	0.000037 U	0.000102 U
P-10	7/2/2014	0.01	0.0000588 U	0.000375 J	0.00127	0.00205	0.000108 U	0.00042 J	0.00393	0.0000784 U	3.92E-05 U	0.000318 J
P-12	3/3/2005	0.00007 U	0.00006 U	0.00007 U	0.00035 U	0.00008 U	0.00013 J	0.00008 U	0.00007 U	0.00006 U	0.00004 U	0.00592
P-12	7/18/2005	0.00007 U	0.00006 U	0.00007 U	0.000431 J	0.00008 U	0.000533	0.00008 U	0.00007 U	0.00006 U	0.00004 U	0.00767
P-12	1/6/2006	0.00007 U	0.00006 U	0.00007 U	0.000352 U	0.00008 U	0.000105 U	0.00008 U	0.00007 U	0.00006 U	0.00004 U	0.00615
P-12	7/28/2006	0.00004 U	0.00008 U	0.00004 U	0.00011 J	0.00006 U	0.00017 J	0.00004 U	0.00004 U	0.00007 U	0.00007 U	0.00545
P-12	1/22/2007	0.00004 U	0.00008 U	0.00004 U	0.00009 U	0.00006 U	0.0001 U	0.00004 U	0.00004 U	0.00007 U	0.00007 U	0.00312
P-12	7/17/2007	0.00114 U	0.00114 U	0.000952 U	0.0019 U	0.0041 U	0.00362 U	0.000952 U	0.000952 U	0.00124 U	0.00267 U	0.0075 J
P-12	1/29/2008	0.00029 U	0.00029 U	0.000645	0.00019 U	0.00029 U	0.00019 U	0.00019 U	0.00019 U	0.00038 U	0.00019 U	0.00932
P-12	7/16/2008	0.0003 U	0.0003 U	0.000552	0.00034 J	0.0003 U	0.00085 J	0.0002 U	0.000626	0.0002 U	0.00211
P-12	1/22/2009	0.0008 U	0.0007 U	0.0007 U	0.0012 U	0.0007 U	0.0007 U	0.0006 U	0.0008 U	0.0008 U	0.0015 U	0.0026 J
P-12	7/22/2009	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-12	1/22/2010	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-12	7/14/2010	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-12	1/12/2011	0.0009 U	0.0005 U	0.0006 U	0.0033 U	0.0007 U	0.0005 U	0.0005 U	0.0006 U	0.0006 U	0.0005 U	0.0005 U
P-12	7/12/2011	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-12	1/31/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-12	7/11/2012	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
P-12	1/9/2013	0.0000755 U	0.0000566 U	0.0000472 U	0.00142	0.0000755 U	0.000104 U	0.000066 U	0.000066 U	0.0000755 U	3.77E-05 U	0.000104 U
P-12	7/11/2013	0.00008 U	0.00006 U	0.00005 U	0.00039 J	0.00008 U	0.00011 U	0.00007 U	0.00007 U	0.00008 U	0.00004 U	0.00011 U
P-12	1/9/2014	0.0000741 U	0.0000556 U	0.0002 J	0.000515 J	0.0000741 U	0.000416 J	0.0000648 U	0.0000648 U	0.0000741 U	0.000037 U	0.000102 U
P-12	7/2/2014	0.0000755 U	0.0000566 U	0.000189 J	0.000439 J	0.0000755 U	0.000144 J	0.000066 U	0.000066 U	0.0000755 U	3.77E-05 U	0.00189

Notes:

Last three years of groundwater data are highlighted

PCL = Protective Concentration Level

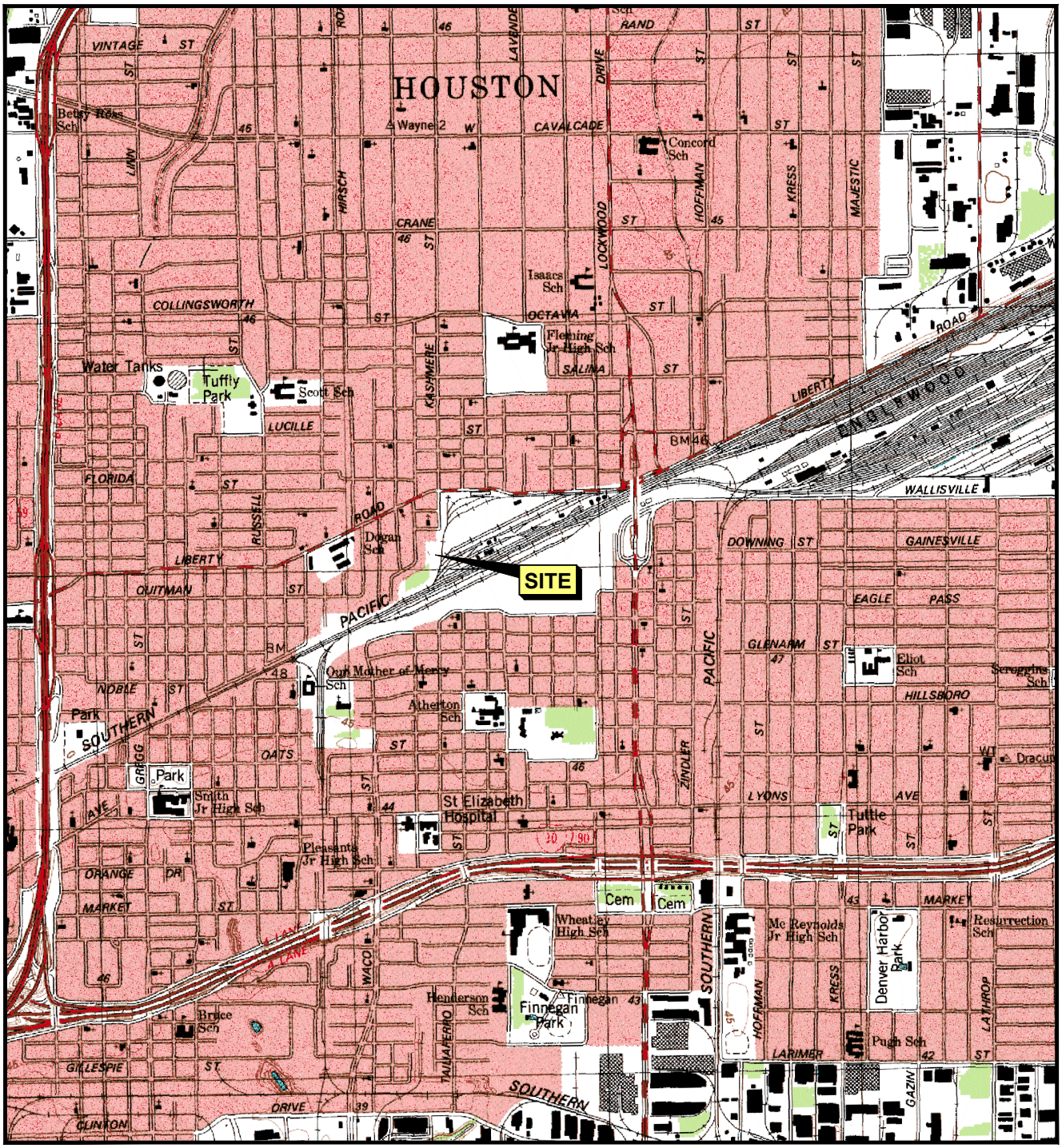
J = Estimated value between the SDL and the MQL

U = Value not detected greater than the MQL

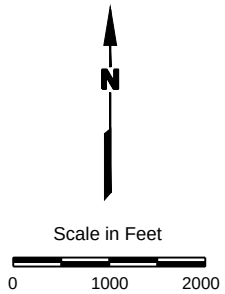
Bolded concentrations exceed PCL.

1. Resample for dibenzofuran at MW-10B in Ocotber 2013 did not verify initial exceedance in July 2013

FIGURES



QUADRANGLE LOCATION



Source:
U.S.G.S. 7.5 minute quadrangle, Settegast, Texas, 1982.

UNION PACIFIC RAILROAD CO.

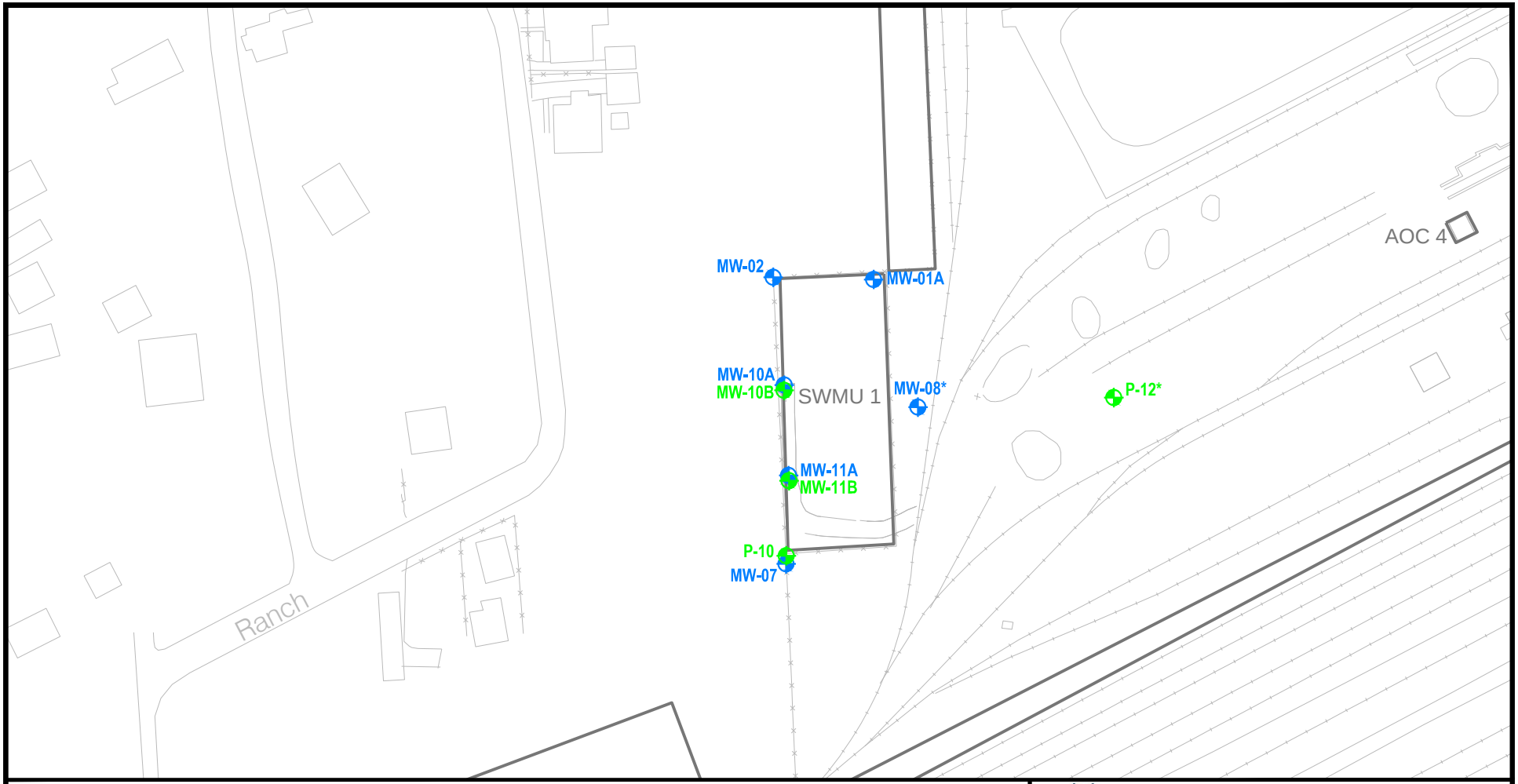
HOUSTON WOOD PRESERVING WORKS

Figure 1

SITE LOCATION MAP

PROJECT: 1358	BY: ADJ	REVISIONS
DATE: JUNE, 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS



EXPLANATION

- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location
- B-TZ Monitoring Well Location

Note:
* Background well.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST

N

Approx. Scale in Feet

0 60 120

Source:
Base map from ERM-Southwest, Inc
0014419a310.dwg, 6/19/2006.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Figure 2

CORRECTIVE ACTION MONITORING WELL NETWORK TCEQ PERMIT UNIT NO. 1

PROJECT: 1358	BY: ADJ	REVISIONS
DATE: JUNE, 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

Figure 3
2-Methylnaphthalene Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

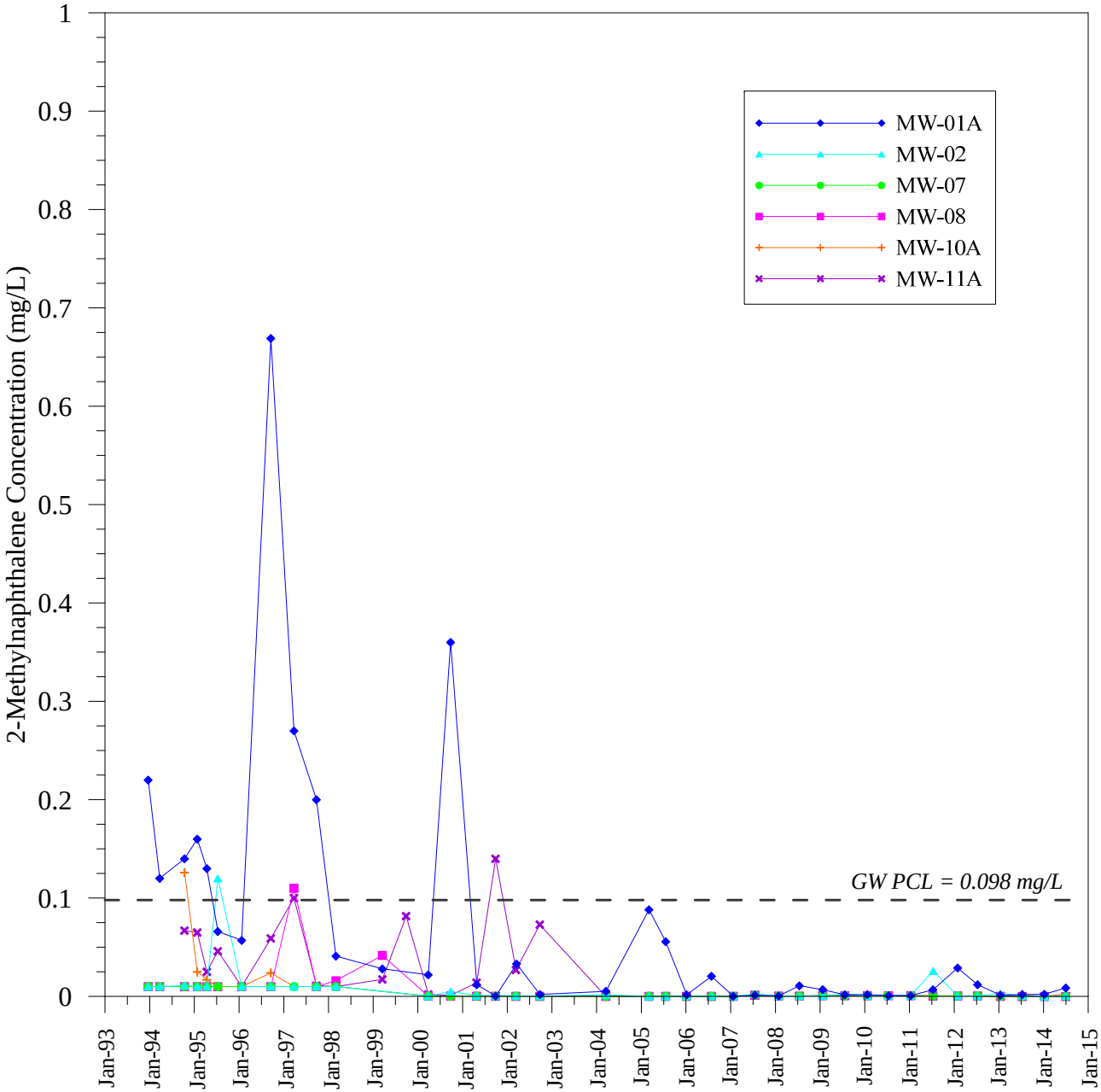


Figure 4
Dibenzofuran Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

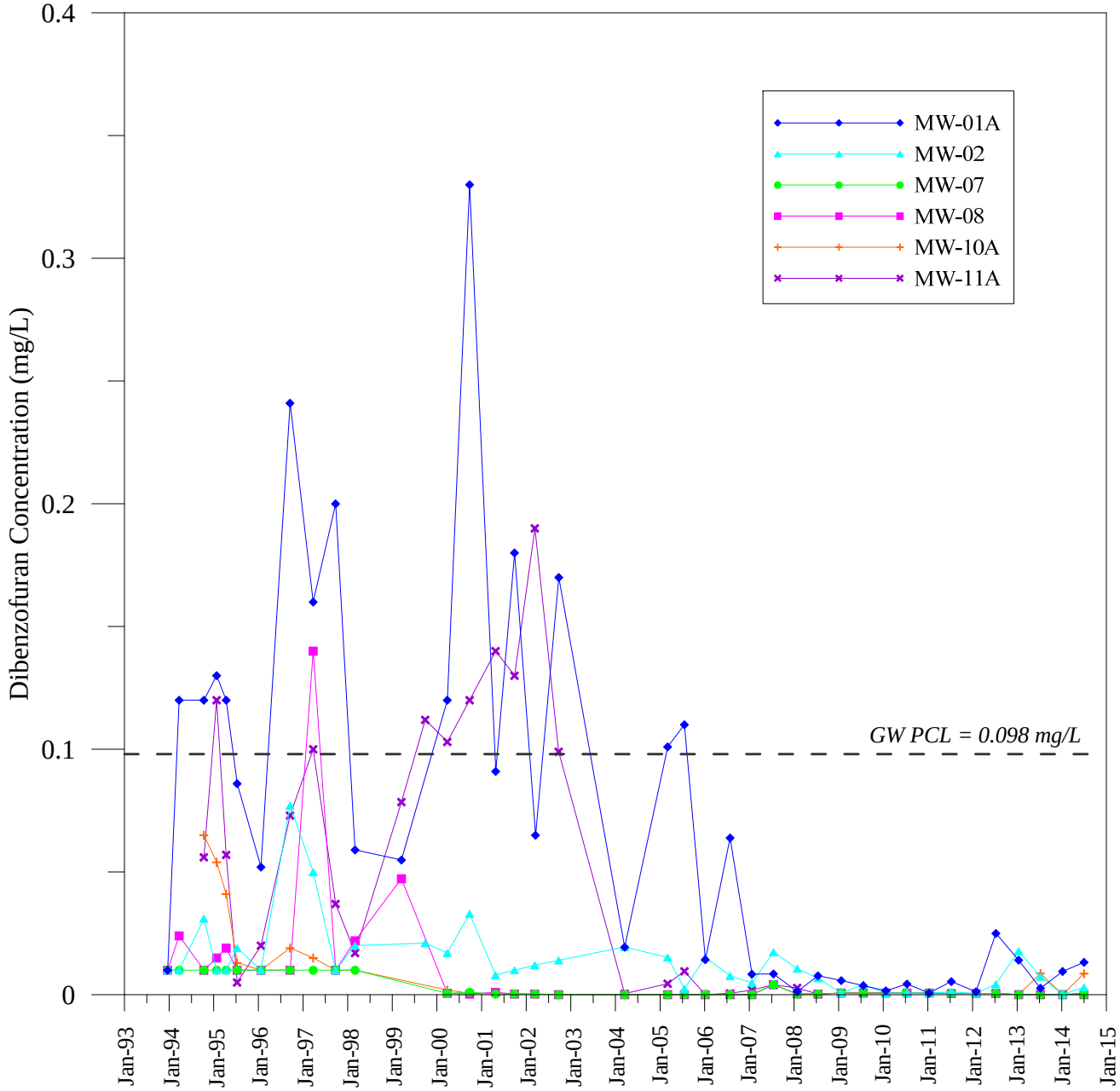


Figure 5
Naphthalene Concentrations vs Time - A-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1

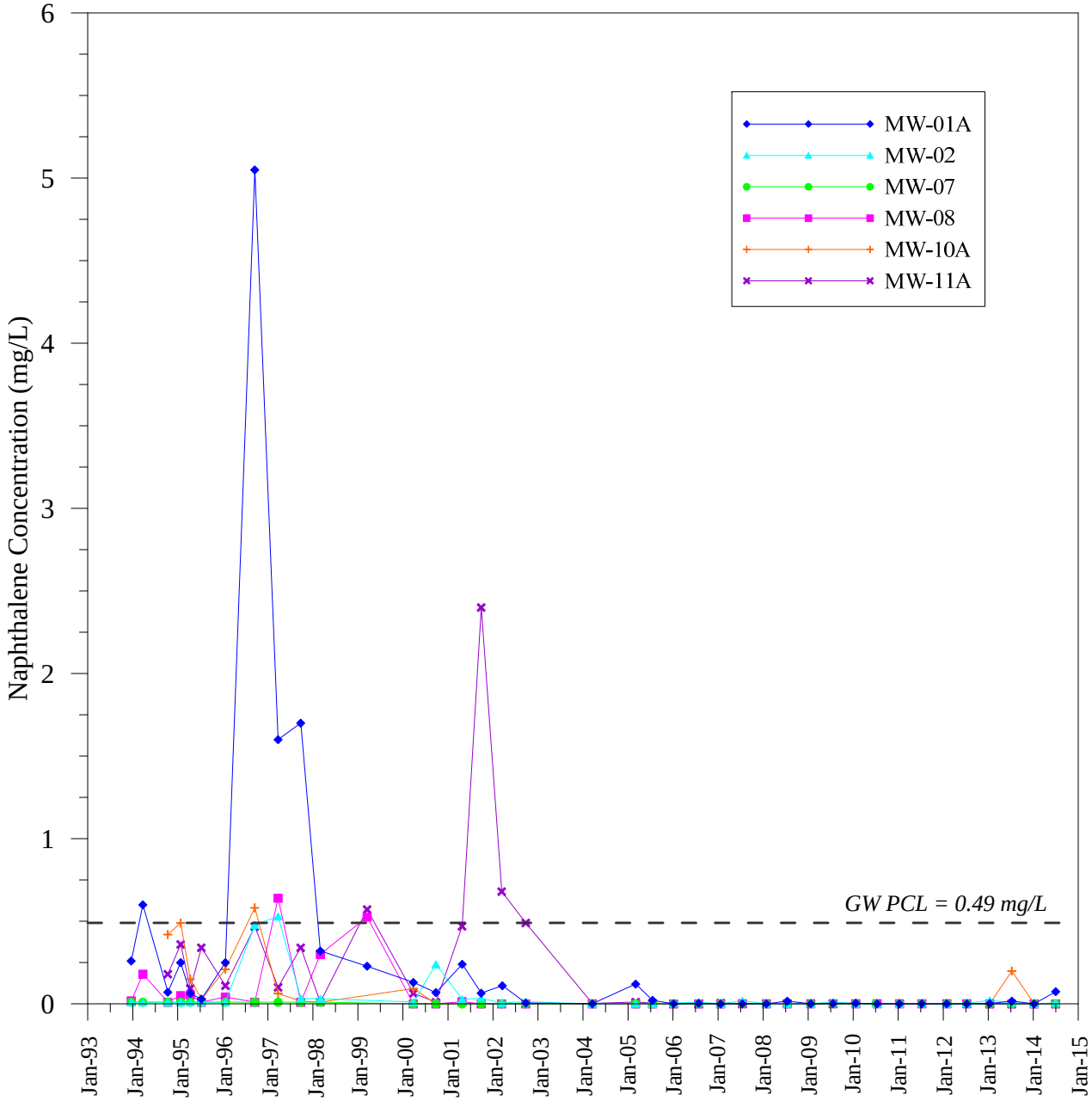
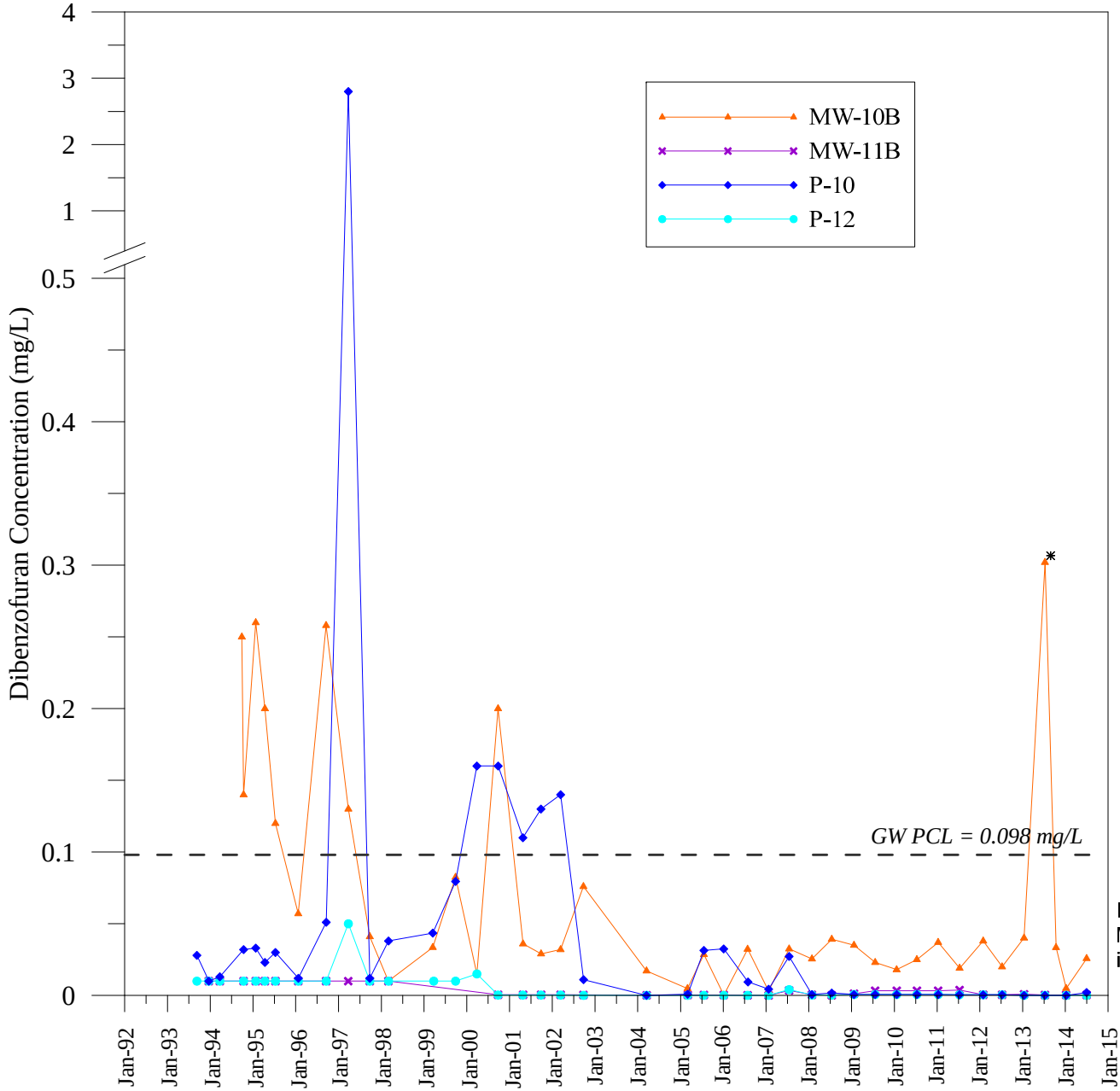
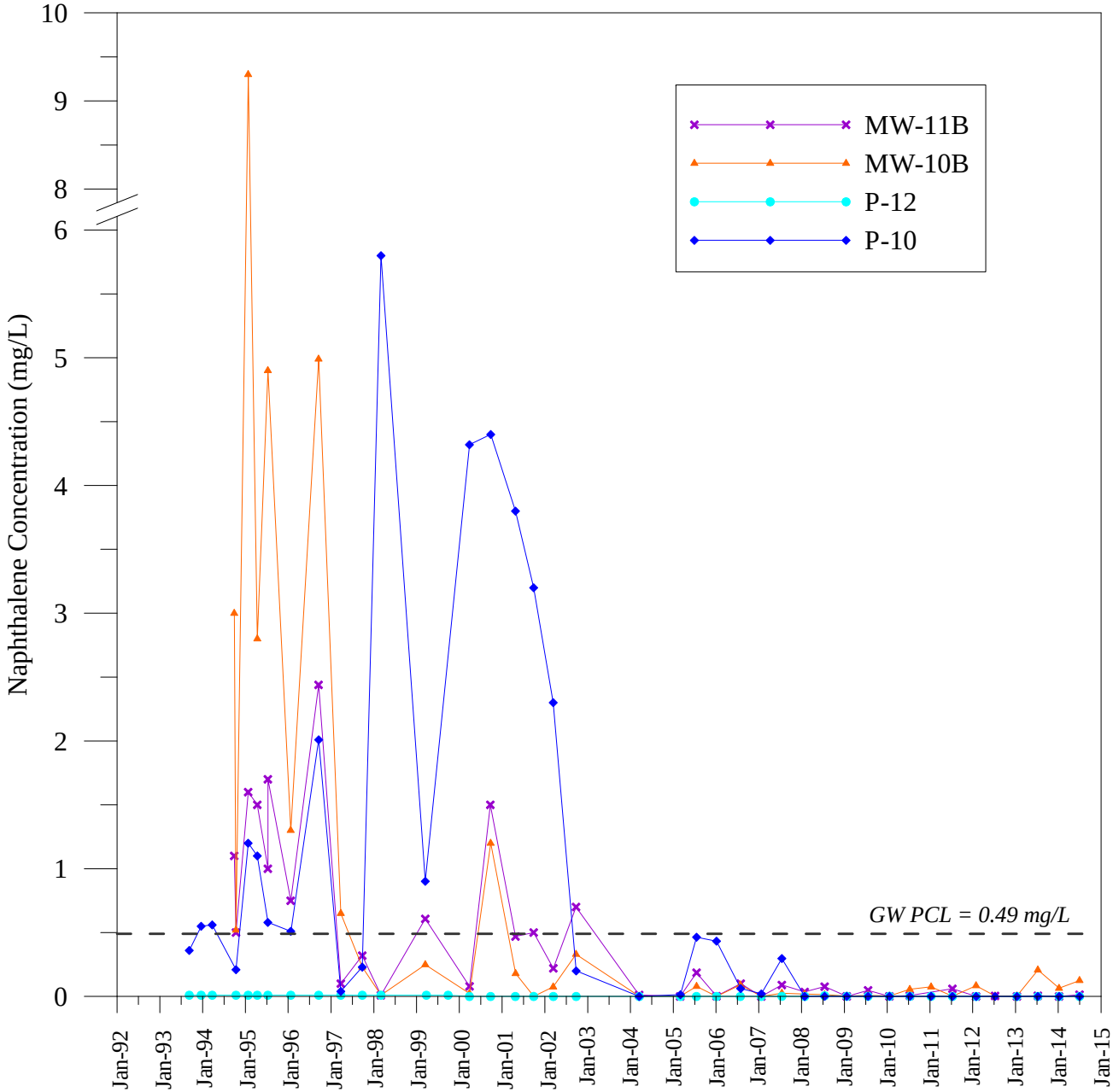


Figure 6
Dibenzofuran Concentrations vs Time - B-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1



Note: * Resample of dibenzofuran in MW-10B in October 2013 did not verify initial PCL exceedance in July 2013.

Figure 7
Naphthalene Concentrations vs Time - B-TZ Unit
UPRR HWPW Facility - RCRA SWMU No. 1



APPENDIX A

SWMU NO. 1 1984 CLOSURE DOCUMENTS

FINAL REPORT ON CLOSURE PLAN

OF RCRA FACILITY #31547

Prepared For: Southern Pacific Transportation Company
By: Rollins Environmental Services (FS) Inc.
April, 1984

TABLE OF CONTENTS

I. INTRODUCTION

In March of 1981 RES (FS) submitted a proposal to Southern Pacific for the excavation, transportation and disposal of creosote waste in a surface impoundment at 4910 Liberty Road. The pricing was revised January, 1982. In November, 1983 a formal contract was signed to cover specifics concerning the excavation, transportation and disposal of the creosote waste.

RES (FS) completed a formal Closure Plan for the surface impoundment (RCRA Facility #31547) that was submitted by Southern Pacific to the Texas Department of Water Resources. The Closure Plan was officially approved by letter dated February 28, 1984.

Southern Pacific had a public notice announcing the closure published in the Houston Chronicle on January 13, 1984. On-site operations to carry-out the closure plan began on March 15, 1984. The on-site work was inspected and certified by an

independent registered engineer. There were four major phases to the closure on-site work:

1. Waste Removal
2. Sampling Program
3. Clay Backfill
4. Groundwater Monitoring Well Installation

Pertinent documents and letters are included as Appendix A. A Project Calendar of on-site work is provided on the following page. Appendix B is a series of photographs pertaining to project phases.

PROJECT CALENDAR OF ON-SITE WORK

DATES	
March 15-16	Dewater Surface of Waste Impoundment
17	Heavy Equipment Move-On
18	Dewater Remaining Water On Top of Waste
19	6 Loads of Waste to Landfill
20	36 Loads of Waste to Landfill
21	41 Loads of Waste to Landfill
22	43 Loads of Waste to Landfill
23	2 Loads of Waste to Landfill
24	Dewatering
25	Dewatering
26	22 Loads of Waste to Landfill
27	53 Loads of Waste to Landfill, East Bank Clay Fill 32
28	17 Loads of Waste to Landfill, East Bank Clay Fill 184
29	Samples procurred
30-31	Sample Analysis
April 1	Sample Analysis
2	Rainout, All area clean except for Section C-1
3	Dewater
4	Dewater, Sample Procurred for Section C-1, Several Yards of Waste to Landfill
5-6	Dewater

7	1826 Truck Yards of Clayfill Emplaced
8	242 Truck Yards of Clayfill Emplaced
9	2622 Truck Yards of Clayfill Emplaced
10	1402 Truck Yards of Clayfill Emplaced
11	1230 Truck Yards of Clayfill Emplaced
12	Final Dressing
17-18	Well Installation

II. WASTE REMOVAL PHASE

Vacuum trucks were used to pump water off the surface of the impoundment. The water was then transported to a local deepwell. Dewatering continued from March 15 through March 18.

On Monday, March 19, the first loads of waste were transported to the Rollins Deer Park Landfill. All trucks were lined with visquine, tarped and placarded. The waste was loaded with a large backhoe. A small bulldozer was used to push material to the backhoe. From March 19 through March 28, a total of 220 loads of waste were transported to landfill.

Fourteen samples of waste were taken to determine an average weight per cubic yard. The weight per cubic yard varied from a low of 1345 pounds to a high of 2746 pounds. The average weight of 2177 pounds per cubic yard was agreed upon as representative of the waste.

The total waste poundage taken to landfill as of March 28, was 10,962,642 pounds moved by 220 loads. This amounted to 5,036 cubic yards.

The basic challenge during the waste removal phase was water control. Overnight approximately four to five inches of water

would build up in the bottom of the impoundment. This waste had to be pumped off by vacuum trucks each morning. During the latter stages of the waste removal the dozer could not operate on the wet bottom soil and a small backhoe had to be placed in the impoundment to move waste to the larger backhoe used for truck loading.

III. SAMPLING PHASE

On March 29, six samples were obtained according to the random sampling program outlined in the formal Closure Plan (see Appendix A). Henry Koster, Field Supervisor RES (FS), Dan Bridge, Project Manager RES (FS), and Karen Freibus of the T.D.W.R. were all present during the sample procurement. Samples were immediately taken to M.B.A. Labs for analysis. The results of the sample analyses are in Appendix A.

Concentrations of the six samples were compared against concentrations of two background samples obtained from clay about six feet deep 10 feet north of the north side of the impoundment area. All of the samples contained lower concentrations than background, except for the sample taken from area C-1 of the sample grid. The sample grid is on the last page of the Closure Plan in Appendix A. Sample analyses are also provided in Appendix A.

On April 4, 63,820 pounds of waste (29.32 cubic yards) were removed from Section C-1 and taken to landfill. A composite sample of the section was procurred and taken to M.B.A. Labs for analysis. On Friday, April 6, the lab analysis confirmed that

the concentrations of contaminants were lower than those of the background samples. The analytical results are attached in Appendix A. At 4 p.m., Friday, April 6, Mr. Tom Kearns, Head of the Solid Waste Department of the T.D.W.R., District 7 Office, confirmed that the waste had been removed and gave approval to begin the clay backfill phase.

Originally, according to the approved Closure Plan, the samples were to be analyzed for conentrations of contaminants associated with the waste K001. These contaminants were principally phenols. However, the actual sample analyses revealed poly-nuclear aromatics (PNA's) to be the primary contaminants in the waste. All samples were analyzed for both phenols and PNA's and both families of contaminants were used as criteria for determining acceptable limits.

IV. CLAY BACKFILL PHASE

Red Beaumont Clay from the local area was unloaded and compacted into the impoundment from April 7 through April 11. A total of 7,538 truck yards were brought to the project site. A compaction factor of 40% was used to estimate a total of 4,523 cubic yards of clay compacted inplace.

The completed clay surface was graded to provide water runoff. A drainage trench, lined with clay, was excavated along the railroad tracks running parallel to the east side of the backfilled area.

V. GROUNDWATER MONITORING WELL INSTALLATION

Four groundwater monitoring wells were installed -- One upstream on the south side of the backfill area and three downstream on the north side of the backfilled area. The exact locations are depicted on the last page of the Closure Plan in Appendix A.

A dry soil core revealed clay down to approximately 13 feet on the north side of the backfilled area, followed by 3 feet of a clayey sand and then clay beyond 16 feet. Drilling on the south side of the backfilled area revealed the same strata; however, the 3 feet thick clayey sand was found at 15 feet. PVC casing was installed with bottom screen extending 10' from the bottom clay strata, up through the clayey sand. All four wells were producing groundwater from the clayey sand strata. All wells were cased with sand surrounding the screen, then bentonite, and then grouted to the ground surface. All wells were developed and metal casing was installed to enable the use of pad locks. A concrete mound was built around each well to prevent surface water from ponding around the well pipe. A complete documentation of well borings and installation is included in Appendix A.

VI. SUMMARY

On-site operations for carrying out the Closure Plan began with the dewatering of surface water on March 15 and ended with monitoring well installation on April 17. The remaining work will be monitoring well sampling and analysis .

A total of 5064.98 cubic yards (11,026,462 pounds) of waste were removed, transported and disposed.

A random sampling program was carried out and sample results were compared to two background samples. The one section where sample results were higher than background was scraped and resampled. The analysis of the composite sample showed that concentrations were lower than background levels.

A total of 7,538 truck yards of clay were backfilled and compacted to total 4,523 cubic yards implace (based on a compaction factor of 40%).

Four groundwater monitoring wells, one upstream and three

downstream, were installed.

An official "Closure of Facilities" letter signed by an independent engineer is included in Appendix A. Appendix B includes a series of photographs pertaining to the project phases.

APPENDIX A

PERTINENT DOCUMENTS IN

CHRONOLOGICAL ORDER

1. Revised pricing and original proposal.

2. Contract between Rollins and Southern Pacific

3. Closure Plan

4. Executive Director (T.D.W.R.) Approval of Closure Plan

5. Public Notice of final facility closure.

6. Bulk Density Values

7. MBA Laboratories Analyses

8. Letter of Certification of Closure by independent Professional Engineer.

1. Proposal and Updates

Rollins Environmental Services (TX) Inc.
P. O. Box 609 Deer Park Texas 77536 (713) 479-6001

Rollins

June 14, 1983

Mr. G. F. (Frank) Bozeman
Senior Manager, E & M
Southern Pacific Railroad
Engineering Department
P. O. Box 1314
Houston, TX 77001

Dear Mr. Bozeman:

Our latest correspondence, dated January 15, 1982, is attached. In that correspondence I quoted a final "turn-key" price of $48.55 per cubic yard for excavation, transportation and disposal of approximately 1800 cubic yards of creosote sludge.

Clay backfill was quoted at $10.00 per yard.

These prices are still in effect. The contents of the attached proposal will remain the same except for the changes in pricing indicated in this letter. I might add that we do plan to use polyethylene liners in the dump trucks to insure against leakage of wetter materials. The truck beds will possess chained tailgates as a security measure against waste spillage on the highway. The contents of the original proposal dated March 23, 1981, will remain the same except for the price change indicated in this letter.

Please contact me if you desire further information.

Sincerely,

Dan Bridge

Dan Bridge, Ph.D.
Field Services Group

DB/vs
Attachment

Rollins Environmental Services (TX) Inc.
P. O. Box 609, Deer Park, Texas 77536 (713) 479 6001

Rollins

January 15, 1982

Mr. G. F. (Frank) Bozeman
Senior Manager, E & M
Southern Pacific Railroad
Engineering Department
P. O. Box 1314
Houston, Texas 77001

Dear Mr. Bozeman:

In March 1981 I sent the attached proposal for clean-out and backfill of the creosote sludge lagoon at the Liberty Plant in Houston.

Several developments have occurred since March 1981, that have allowed us to reduce our pricing in excavation and transportation. Our corporate headquarters has given us considerable leeway in our pricing policy and we find that excavation rental equipment and trucking have become more competitive, reducing our costs in these areas as well.

Our new price per yard is $48.55, which is $7.02 less per yard than the March 1981 price of $55.57 per yard. Price breakdown is below:

Excavation	$14,290
Transportation	$7,700
Disposal	$64,663
TOTAL	$86,653

or $48.55 per cubic yard.

Clay backfill remains at $10.00 per yard and it is our understanding that Empak is currently deep-welling the standing water.

The contents of the attached proposal will remain the same, except for the changes in pricing indicated in this letter.

We look forward to visiting with Bob Kilpatrick and yourself. If you require any further information, please call.

Sincerely,

ROLLINS ENVIRONMENTAL SERVICES (TX) INC.

Dan Bridge

Dan Bridge, Ph. D.
Field Services Group

DB:csw

Rollins Environmental Services (TX) Inc.
P. O. Box 609, Deer Park, Texas 77536 (713) 479 6091

Rollins

PROJECT PROPOSAL

LIBERTY PLANT, HOUSTON

Prepared For

Southern Pacific Transportation Company
1 Market Plaza
San Francisco, CA. 94105

By

ROLLINS ENVIRONMENTAL SERVICES

March 23, 1981

TABLE OF CONTENTS

Attention: Mr. K. S. Kilpatrick - Room 1100
Southern Pacific Transportation Company
1 Market Plaza
San Francisco, CA. 94105

Dear Mr. Kilpatrick:

This proposal contains strategies and pricing schedules for excavation, transport, and disposal of waste sludge from a waste storage pond at the 4910 Liberty Road site. Pricing is also included for backfilling the excavated area with clay material. The proposal rational is founded on data gathered by our sampling team and results of independent laboratory chemical analysis. A diagram of the waste pond and the independent laboratory analysis are attached. For internal record keeping purposes at Rollins, the waste sludge will be designated as #HO-6242.

I. Site and Material Description

The clay-lined sludge pond is four-sided: 106' x 180' x 72' x 177'. The sludge is approximately 3' thick, with a volume of 1562 cubic yards. The levees or berms account for an additional 223 cubic yards. Total waste volume is 1785 cubic yards. The sludge bulk density is 2392 pounds per square yard. The solids content is 71%.

Chemical analyses of samples of water and sludge taken from the pond show relatively high concentrations of phenols (11 p.p.m. and 120 p.p.m., respectively) and other chemicals. Copies of the analyses are attached.

II. Plan of Action

Initially, a wide-track dozer will be used to flatten the berms to facilitate access for a backhoe. The dozer and backhoe will work in conjunction to provide surface drainage trenches for the accumulation and removal of surface water. The water will be pumped into vacuum trucks and deep-welled at EMPAK, Inc. We anticipate 2 to 3 truckloads of waste liquid, or roughly 7,000 to 10,000 gallons.

After the surface water has been removed, the backhoe will load the sludge directly into tandem dump trucks. The sludge will be transported to Rollins Chemically Secure Landfill in Deer Park. The waste will be solidified with flue dust prior to landfilling. Approximately 128 truck loads will be transported.

After the sludge and contaminated berm material have been removed, the pond will be backfilled with clay material.

The entire project will require a minimum of 3 days.

III. Access Problems and Costs

No access problem is anticipated concerning the site ground conditions. However, it is requested that the railroad tracks near the waste pond be clear of rail cars so as not to impede the movement of heavy equipment. If road stabilization did become necessary due to heavy rains, flue dust can be used at a cost of $3.00 per running foot 20 feet wide.

IV. General Considerations

A Rollins' supervisor will be continuously at the job site. Rollins' employees will perform excavation. Rollins may use subcontractors for transport. Rollins assumes responsibility for its subcontractors and for all operations contractually under its control.

Rollins indemnifies and holds Southern Pacific harmless from liability or claims arising out of the operations caused by Rollins or its subcontractors.

Rollins plans to work a 10 hour day, seven day week unless otherwise directed by Southern Pacific. Certain circumstances, beyond Rollins control, such as mechanical failure, transport traffic problems and excessive rainfall may necessitate a longer period for completion

V. Customer Provisions

A. It is requested that Southern Pacific provide a representative available during working hours with authority to make operation decisions.

B. It is requested that Southern Pacific provide access so as not to impede normal plant traffic and maintain freedom from unnecessary protocol.

C. It is requested that Southern Pacific notify Rollins of any hidden pipes, cables, or obstructions.

VI. Paperwork

Rollins will provide copies of Bills of Lading, weigh tickets, and summary sheets. The summary sheet will list information pertinent to each truck load--a sample copy is attached. Rollins will also provide the Texas Department of Water Resources (T.D.W.R.) Manifests.

VII. Pricing Schedule

Prices below are subject to change within 90 days of this proposal. Pricing will be done on a volume basis (i.e., per cubic yard, per gallon). Material transported in bulk will be weighed and net weights will be divided by bulk densities (pounds per cubic yard) to convert to cubic yards.

Waste Pond - - Sludge and Berm Material

	Price/Yd	Estimated Volume(YD^3)	Estimated Total Price
Excavation	$ 14.32	1785	$ 25,563
Transportation	5.02	1785	8,960
Disposal	36.23	1785	64,663
TOTAL	$ 55.57	1785	$ 99,186

Waste Pond - - Liquid Waste

	Price/Gal	Estimated Volume(Gal)	Estimated Total Price
Excavation	-	10,300	-
Transportation	$0.0277	10,300	$ 286
Disposal	0.1428	10,300	1,471
TOTAL	$0.17	10,300	$ 1,757

Waste Pond - - Clay Fill

	Price/Yd	Estimated Volume(YD^3)	Estimated Total Price
Clay Delivered, Placed, and Compacted	$ 10.00	1,562	$ 15,620

We appreciate the opportunity to quote this project. If you need clarification on any matter above, please contact me.

Sincerely,

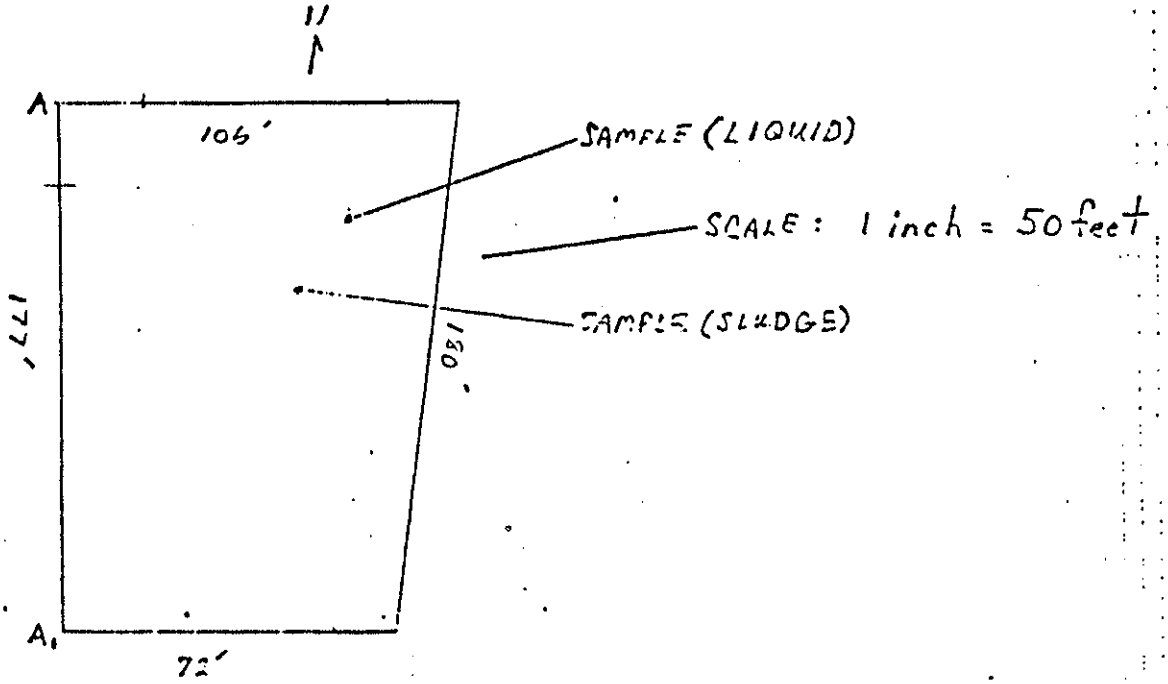
ROLLINS ENVIRONMENTAL SERVICES (TX) INC.

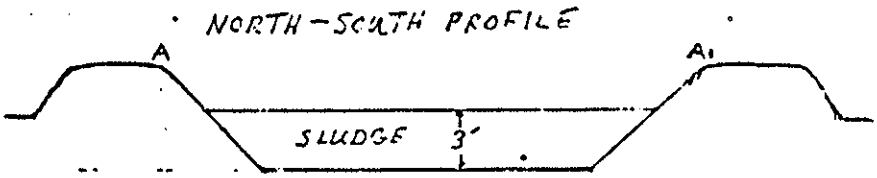
Daniel W. Bridge

Daniel W. Bridge
Project Manager
Field Service Group

DWB/pag

Attachments





VERTICAL SCALE: 1 inch = 10 feet

SLUDGE VOLUME: 1562 cubic yards

BERM VOLUME: 223 cubic yards

Exhibit A

COMPANY _______________ LOCATION _______________ DATE _______________

:e	Truck No.	B/L No.	TDWR No.	Gross wt.	Light wt.	Net wt.	Bulk Dens.	Cubic Yards

NUS CORPORATION

ANALYTICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488 1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: E. Hillier

WATER ANALYSIS

Client No. Q
Date Sampled 3-3-81
Date Received 3-3-81
Date Reported 4-3-81

le Source Liberty St. Water — NUS Sample No. 21030030

Client Sample No. P.O.# 81-2208-I

Test Results reported in mg/liter unless otherwise noted.

DETERMINATION*	DATE	NUS	
Acidity Free ($CaCO_3$)			
Acidity Total ($CaCO_3$)			
Alkalinity M.O. ($CaCO_3$)			
Alkalinity Pht. ($CaCO_3$)			
Aluminum (Al)			
Ammonia ( )			
Antimony (Sb)			
Arsenic (As)		0.03	
Barium (Ba)			
Beryllium (Be)			
Bicarbonate (HCO_3)			
Bio Oxygen Demand (O_2)			
Boron (B)			
Cadmium (Cd)			
Calcium (Ca)			
Carbon Inorganic (C)			
Carbon Organic (C)		1100	
Carbon Total (C)			
Carbonate (CO_3)			
Chem. Oxygen Dem. (O_2)			
Chloride (Cl)			
Chromate (CrO_4)			
Chromium (Cr^{+6})			
Chromium (Cr^{+3})			
Chromium Total (Cr).		0.10	
Color (APHA)			
Copper (Cu)		0.08	
Cyanide Free (CN)			
Cyanide Total (CN)		<0.01	
Fluoride (F)			
Hardness ($CaCO_3$)			
Hydroxide (OH)			
Iron ( ) (Fe)			
Iron Total (Fe)			
Lead (Pb)			
Magnesium (Mg)			
Manganese (Mn)			

DETERMINATION*	DATE	NUS	
Mercury (Hg), µg/l		<0.2	
Molybdenum (Mo)			
Nickel (Ni)			
Nitrate ( )			
Nitrite ( )			
Nitrogen, Kjeldahl (N)			
Odor, Method:			
pH			
Phenolic Cpds. (Phenol)		11	
Phosphorus Ortho ( )			
Phosphorus Total ( )			
Potassium (K)			
Selenium (Se)			
Silica Soluble ( )			
Silica Total ( )			
Silver (Ag)			
Sodium (Na)			
Solids Dissolved			
Solids Suspended			
Solids Total			
Solids Non-Settleable			
Solids Settleable			
Solids Volatile			
Solvent Extract (Oil) Method:		68	
Sp. Cond., 25°C µmhos			
Sulfate ( )			
Sulfide (S)			
Surfactants (MBAS)			
Thallium (Tl)			
Tin (Sn)			
Turbidity (NTU)			
Vanadium (V)			
Zinc (Zn)			

ecial Instructions (Methods, Etc.)

Project Manager

NUS CORPORATION

ANALYTICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488 1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: E. Hillier

Client No. 0
Date Sampled 3-3-81
Date Received 3-3-81
Date Reported 4-3-81

Liberty St. Water P.O.# 81-2208-I

NUS Sample No.	
21030030	Total PCB <1 µg/l

Special Instructions

Test results reported in mg/liter unless otherwise noted

NUS CORPORATION

ANALYTICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: E. Hillier

WATER ANALYSIS

Client No. Q
Date Sampled 3-3-81
Date Received 3-3-81
Date Reported 4-3-81

Source Liberty St. Sludge — NUS Sample No. 21030031

Client Sample No.

Test Results reported in mg/liter unless otherwise noted.

DETERMINATION*	DATE	NUS	
cidity Free ($CaCO_3$)			
cidity Total ($CaCO_3$)			
lkalinity M.O. ($CaCO_3$)			
lkalinity Pht. ($CaCO_3$)			
luminum (Al)			
mmonia ( )			
Antimony (Sb)			
rsenic (As)		<2	mg/kg
arium (Ba)			
Beryllium (Be)			
carbonate (HCO_3)			
o Oxygen Demand (O_2)			
oron (B)			
admium (Cd)			
alcium (Ca)			
arbon Inorganic (C)			
arbon Organic (C)		100,000	mg/kg
arbon Total (C)			
arbonate (CO_3)			
Chem. Oxygen Dem. (O_2)			
hloride (Cl)			
hromate (CrO_4)			
Chromium (Cr^{+6})			
hromium (Cr+3)			
hromium Total (Cr)		12	mg/kg
olor (APHA)			
opper (Cu)		16	mg/kg
yanide Free (CN)			
yanide Total (CN)		<1	mg/kg
luoride (F)			
ardness ($CaCO_3$)			
ydroxide (OH)			
ron ( ) (Fe)			
ron Total (Fe)			
ead (Pb)			
Magnesium (Mg)			
Manganese (Mn)			

DETERMINATION*	DATE	NUS	
Mercury (Hg), ~~wet~~ mg/kg		<0.2	
Molybdenum (Mo)			
Nickel (Ni)			
Nitrate ( )			
Nitrite ( )			
Nitrogen, Kjeldahl (N)			
Odor, Method:			
pH			
Phenolic Cpds. (Phenol)		120	mg/kg
Phosphorus Ortho ( )			
Phosphorus Total ( )			
Potassium (K)			
Selenium (Se)			
Silica Soluble ( )			
Silica Total ( )			
Silver (Ag)			
Sodium (Na)			
Solids Dissolved			
Solids Suspended			
Solids Total			
Solids Non-Settleable			
Solids Settleable			
Solids Volatile			
Solvent Extract (Oil) Method:		43,000	mg/kg
Sp. Cond., 25°C μmhos			
Sulfate ( )			
Sulfide (S)			
Surfactants (MBAS)			
Thallium (Tl)			
Tin (Sn)			
Turbidity (NTU)			
Vanadium (V)			
Zinc (Zn)			

cial Instructions (Methods, Etc.) Analysis performed on an "as received" sample.

Approved by: James Brickhouse

NUS CORPORATION

ANALYTICAL SERVICES LABORATORY
SOUTH CENTRAL OPERATIONS
900 GEMINI AVENUE • HOUSTON, TEXAS 77058
713-488-1810

Rollins Environmental Services, Inc.
P.O. Box 609
Deer Park, TX 77536

Attn: E. Hillier

Client No. Q
Date Sampled 3-3-81
Date Received 3-3-81
Date Reported 4-3-81

Liberty St. Sludge P.O.# 81-2208-I

NUS Sample No.	
21030031	Total PCB (Soxhlet) <1 mg/kg

Special Instructions

Jerry Bright

Test results reported in mg/liter unless otherwise noted

2. Contract

Southern Pacific Transportation Company

Southern Pacific Building • One Market Plaza • San Francisco, California 94105

H. B. BERKSHIRE
ASST. VICE PRESIDENT—MAINTENANCE OF WAY AND ENGINEERING

M. J. KARLOVIC
ENGINEER OF STANDARDS
J. F. LYNCH
ENGINEER, DESIGN AND CONSTRUCTION

G. L. MURDOCK
ENGINEER, MAINTENANCE OF WAY
G. D. WILSON
ENGINEER OF SIGNALS

November 30, 1983

IN REPLY PLEASE REFER TO

0812/071-02(HO)-C

Rollins Environmental Services, Inc.
P. O. Box 609
Deer Park, Texas 77536

Gentlemen:

Pursuant to our letter of August 26, 1983, attached for your records is a fully executed counterpart of our agreement with you, dated November 29, 1983, covering the following work:

> Remove hazardous waste, clean up clay lining in pond and backfill with clean material at the Wood Preserving Works Hazardous Waste Storage, Houston, Texas.

Please submit statement of charges on this project, making reference to Billing Order No. H800-94-48121, GMO 65769 directly to:

> Mr. L. W. Pepple, Engineer,
> Environmental & Utilities
> Southern Pacific Transportation Company
> One Market Plaza
> Southern Pacific Building - Room 1007
> San Francisco, California 94105

Very truly yours,

J. F. Lynch

Attach.

Approved as to form by General Counsel.
January 1979

5 7360
SHEET 1 of 4

This Agreement, made and entered into this 25th day of November, 19 85
by and between SOUTHERN PACIFIC TRANSPORTATION COMPANY, hereinafter called "RAILROAD," and ROLLINS ENVIRONMENTAL SERVICES, INC., P. O. Box 609
Deer Park, Texas 77536,

hereinafter called "CONTRACTOR,"

Witnesseth:

(1) WORK TO BE PERFORMED:

CONTRACTOR agrees to specifically perform at or near Houston,
County of Harris, State of Texas, the work of removing hazardous waste, cleaning up clay lining in pond and back-filling with clean material at the Wood Preserving Works Hazardous Waste Storage,

and as provided for herein, in strict conformance with the plans and/or specifications hereto attached and made a part of this agreement. (Exhibit "A")

CONTRACTOR, in performing the work provided for in this agreement, shall be an independent contractor, it being specifically agreed that CONTRACTOR, any subcontractor, or the employes of the CONTRACTOR or subcontractor, in performing said work shall not be in any way employes or agents of the RAILROAD.

(2) MATERIALS TO BE FURNISHED BY CONTRACTOR:

CONTRACTOR agrees to furnish at the location where said work is to be performed, with no extra charge, all labor, tools, implements and materials necessary for the complete performance of this agreement, unless otherwise provided for herein.

(3) PERMITS, MUNICIPAL FEES AND DEPOSITS:

CONTRACTOR agrees to secure all necessary permits in connection with the performance of said work and to pay all engineer's, municipal and other fees in connection therewith, and agrees to make any and all cash or other deposits, and furnish at its expense all bonds required by law or required by any lawful body having the right to make demand therefor.

(4) PLANS AND SPECIFICATIONS:

CONTRACTOR agrees to fully perform this agreement to the entire satisfaction of RAILROAD and in strict conformance with the plans and/or specifications attached hereto, and also in conformance with any plans and/or specifications in effect at the date of this agreement, required by any lawful body having the right to demand that said work should be performed in the manner specified by such body.

(5) COMMENCEMENT AND COMPLETION OF WORK:

CONTRACTOR agrees to begin said work ~~within~~ upon execution of this ~~days after the date of this~~ agreement and to proceed diligently with said work to completion and fully complete same two (2) weeks ~~days~~ from the date work is commenced. Time is of the essence of this agreement.

(6) INVESTIGATION OF FACTS BY CONTRACTOR:

It is distinctly understood and declared by the CONTRACTOR that this agreement is made for the consideration herein named and that the CONTRACTOR has, by careful examination, satisfied CONTRACTOR as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work under this agreement. No verbal agreement or conversation with any officer, agent or employe of the RAILROAD, either before or after the execution of this agreement, shall affect or modify any of the terms or obligations herein contained.

(7) DELAYS AND EXTENSIONS:

The time during which CONTRACTOR is delayed in said work by the acts of omission or commission of RAILROAD, or the employes or agents of RAILROAD, or by the acts of God or the elements, which CONTRACTOR could not reasonably foresee and provide against, or other causes beyond CONTRACTOR'S control, including strikes, boycotts, or like obstructive action by employes or labor organizations, or lockouts or other defensive action by other employers, whether general or individual, or by organizations of other employes, shall be added to the aforesaid time of completion of said work.

CONTRACTOR shall not be entitled to and hereby waives any and all damages which it may suffer by reason of RAILROAD hindering or delaying CONTRACTOR in the progress of said work, or any portion thereof or from any cause whatsoever.

(8) EXTRA WORK:

CONTRACTOR shall not be entitled to any payment for extra work performed in connection with the work provided for herein, unless such work shall have been previously authorized in writing by RAILROAD.

(9) DEVIATION FROM PLANS AND SPECIFICATIONS:

CONTRACTOR expressly agrees that RAILROAD may make any alterations RAILROAD deems proper by adding to, omitting or deviating from the aforesaid plans and/or specifications, and in all such cases RAILROAD and CONTRACTOR shall value or appraise such alterations in a fair and reasonable manner, and add to or deduct from the amount herein agreed to be paid to CONTRACTOR at pro rata rates, but in no case shall such alteration be made unless notice in writing is given to CONTRACTOR by RAILROAD.

(10) ADDITIONAL DRAWINGS:

RAILROAD will furnish to CONTRACTOR such further drawings and explanations as may be necessary to illustrate the work to be done, and CONTRACTOR agrees to conform to such drawings and explanations.

(11) INSPECTION:

CONTRACTOR agrees that RAILROAD, or any person appointed by RAILROAD, will be permitted to visit and inspect said work, or any part thereof, at all times and places during the progress of the work, and CONTRACTOR agrees to provide sufficient, safe and proper facilities for such inspection.

(12) PERFORMANCE OF WORK:

CONTRACTOR agrees to proceed with said work, and each and every part and detail thereof, in a prompt and diligent manner, and agrees to do the several parts thereof at such time and in such order as RAILROAD may designate, and agrees to finish such work in strict conformance to said plans and/or specifications, or any modifications or amplifications thereof made by RAILROAD.

(13) CONDEMNATION OF WORK:

CONTRACTOR agrees, within twenty-four (24) hours after receiving written notice from RAILROAD, to proceed to remove from the above mentioned premises all materials condemned by RAILROAD, whether worked or unworked, and to remove all portions of said work which RAILROAD shall, by like written notice, condemn as unsound or defective, or as in any way failing to conform with said plans and/or specifications, or any modifications or amplifications thereof made by RAILROAD.

(14) SUPERINTENDENCE:

CONTRACTOR agrees to keep a competent man in the immediate vicinity of the premises above described at all times during working hours with whom RAILROAD may communicate, and to supervise said work.

(15) TAKING OVER OR STOPPING OF WORK:

Should CONTRACTOR at any time during the progress of the work fail, or refuse or neglect to supply a sufficiency of material, tools, labor or properly skilled workmen to complete same with reasonable diligence and dispatch, except when due to circumstances which CONTRACTOR cannot be reasonably expected to control, and should such failure, neglect or refusal continue for five (5) days after written notice shall have been served by RAILROAD on CONTRACTOR, RAILROAD is hereby given the right to take over the said work and complete it. The cost to RAILROAD of doing such work shall be deducted from any moneys due CONTRACTOR under this agreement and if such cost exceeds any such moneys due CONTRACTOR, CONTRACTOR agrees to reimburse RAILROAD for all costs in excess of any moneys due CONTRACTOR hereunder.

RAILROAD hereby reserves the right to stop at any time the said work, it being understood, however, that in any such event, except as provided in the next preceding paragraph of this Section 15, RAILROAD shall pay CONTRACTOR for all work done in conformity with said plans and/or specifications, plus a reasonable amount, if any, to be determined by RAILROAD, representing loss CONTRACTOR would in such event sustain through money expended or necessary to be expended by CONTRACTOR through inhibition to complete the work contemplated. In the event of such stoppage of work or termination of agreement the consideration provided in this paragraph shall be paid days after such stoppage of work or termination of agreement, except where work is performed in the State of California or Nevada. Where work is performed in the State of California or Nevada, said consideration shall be paid thirty-five (35) days after notice of cessation of labor has been recorded in the Office of the County Recorder in the county in which said work is performed, as provided by law, such notice to be recorded within ten (10) days after there has been a cessation of labor thereon for a period of thirty (30) days; provided, however, in any event, final payment shall not be made until no liens remain undischarged of record or stop notices or attachments remain unsatisfied in connection with the work provided for herein.

(16) COMPENSATION:

RAILROAD agrees to pay CONTRACTOR for the entire work in conformance with said plans and/or specifications as follows:

Not to exceed the sum of One Hundred Five Thousand Dollars ($105,000.00) without RAILROAD'S prior written approval.

(17) TERMS OF PAYMENT:

RAILROAD, at the close of each month, through duly authorized representatives, shall estimate value of work done and materials furnished by CONTRACTOR during such month and RAILROAD shall pay to CONTRACTOR, in accordance with RAILROAD'S usual practice of vouchering accounts, -90- per cent of the amount estimated to be due CONTRACTOR for that month, the remaining -10- per cent of such amount shall be paid CONTRACTOR by RAILROAD (provided no liens remain undischarged of record, or stop notices or attachments remain unsatisified in connection with the work provided for herein), ninety (90) days after the completion and final acceptance of said work; except where work is performed in the State of California or Nevada, in which event, final payment shall be made CONTRACTOR by RAILROAD (provided no liens remain undischarged of record or stop notices or attachments remain unsatisfied) thirty-five (35) days after the recording by RAILROAD of Notice of Completion in the Office of the County Recorder of the county in which such work is performed, as provided by law, such notice to be recorded within ten (10) days after the completion of said work.

All estimates herein provided for shall be made by RAILROAD'S engineer, whose measurements and calculations as to the quantities and amounts of work performed shall be final, conclusive and binding upon the parties hereto.

(18) ACCEPTANCE OF WORK:

It is mutually agreed that no payment made under this agreement, except the final payment, shall be evidence of the performance of this agreement, either wholly or in part, and that no payment shall be construed to be an acceptance of defective work or improper materials.

(19) PATENT RIGHTS:

It is mutually agreed that CONTRACTOR shall pay all claims growing out of any patent rights covering work under this agreement, or any part thereof, or any tools, implements or appliances used on or in connection with said work, and CONTRACTOR agrees to fully reimburse RAILROAD for any royalties, damages or other payments that RAILROAD shall be called upon or be obligated to pay by virtue of any patent rights, originating or growing out of said work or any part thereof, or any tools, implements or appliances used on or in connection therewith.

(20) BOND: WAIVED

~~CONTRACTOR agrees to furnish RAILROAD with a good and sufficient bond from a surety company satisfactory to RAILROAD, in the full amount of the contract price at the time of award, before beginning work hereunder, to bind CONTRACTOR to carry out this agreement.~~

(21) LIABILITY:

CONTRACTOR expressly agrees to indemnify and save RAILROAD harmless from and against any and all claims, loss, damage, injury and liability, however caused, resulting from, arising out of or in any way connected with the work to be performed under this agreement, whether or not caused or contributed to by the operation of trains on RAILROAD'S adjacent track or by any negligence or alleged negligence on the part of any of RAILROAD'S agents or employees, except that the provisions of this Paragraph 21 shall not apply to loss or liability caused by the sole negligence of RAILROAD.

(22) LIENS:

CONTRACTOR expressly agrees to discharge at once all liens which may be filed in connection with said work and hold RAILROAD and the owner of the premises upon which the work is to be performed harmless therefrom.

(23) CONTRACTOR TO REMOVE DEBRIS AND MATERIAL:

Upon termination or completion of said work, CONTRACTOR shall remove all debris and waste material and leave the premises in a neat and clean condition, all to the satisfaction of RAILROAD.

(24) ASSIGNMENT:

This agreement shall not be assigned, sublet or transferred in whole or in part by CONTRACTOR, except with the previous written consent of RAILROAD.

In case said work consists of the construction, alteration, repair or improvement of any structure, CONTRACTOR will, at the expense of CONTRACTOR, place and maintain Builder's Fire Insurance on any such structure jointly in the names of RAILROAD and CONTRACTOR, payable as the several interests of RAILROAD and CONTRACTOR may appear, such insurance at all times to be of sufficient amount to fully cover all loss or damage to the work under this agreement, resulting from fire; such fire insurance policy shall be delivered to and held by RAILROAD.

(26) ATTORNEY'S FEES:

In case RAILROAD shall bring suit to compel performance of or to recover for breach of any covenant, agreement or condition herein written, CONTRACTOR shall and will pay to RAILROAD reasonable attorney fees in addition to the amount of judgment and costs.

(27) EMPLOYERS' LIABILITY, WORKMEN'S COMPENSATION AND INSURANCE:

The CONTRACTOR shall perform the work herein specified in strict conformance with the provisions of all applicable Federal and State enactments with reference to Employers' Liability, Workmen's Compensation, and Workmen's Insurance, and shall indemnify and hold harmless the RAILROAD from and against any and all liability, damages, claims, demands, costs and expenses of whatsoever nature, resulting from such enactments, or from any claim of subrogation provided in such enactments, or otherwise.

(28) CONTRACTOR warrants that CONTRACTOR has not employed any officer or employee of RAILROAD or of any subsidiary of RAILROAD or any member of their immediate families or near relatives to solicit or secure this contract under any agreement for a commission, percentage, brokerage, or compensation of any nature. Breach of this warranty shall give RAILROAD the right to cancel this contract and/or recover from CONTRACTOR amount of commission, percentage, brokerage, or other compensation without waiver of any legal right which RAILROAD may have under applicable statutes.

(29) CONTRACTOR agrees to provide insurance coverage as set forth in the attached insert captioned "Insurance".

(30) In the event of any conflict between the said Exhibit "A" and specifications and this agreement, the terms of this agreement shall govern.

*(except for the negligence of RAILROAD)

IN WITNESS WHEREOF, the parties hereto have executed these presents the day and year first above written.

WITNESSED BY:

SUPERVISOR OF CONTRACTS

WITNESSED BY:

SOUTHERN PACIFIC TRANSPORTATION COMPANY

By _____

(Title) Engr., Design & Constr.

ROLLINS ENVIRONMENTAL SERVICES, INC.,

(See Note) Contractor.

By _____

(Title) Sr. Vice President

Form Approved:

_____ Attorney

NOTE: — If an incorporated company, agreement should be executed by an authorized officer thereof and his title indicated; otherwise signature should be witness by an employe of Railroad if practicable, if not, by a disinterested party.

EXHIBIT "A"

COST BREAKDOWN

1. Excavate, Transport & Dispose of Slude:

   Approximately 1,800 cu yds @ $48.55/cu yd.

2. Backfill:

   Approximately 1,600 cu yds @ $10.00/cu yd.

3. Soil Analyses:

   Not to exceed Lump Sum of $1,000.00

4. Road Stabilization:

   Stabilize 20 ft. wide roadway @ $3.00/run. ft.

GENERAL CONDITIONS

Article 1 - PROJECT DESCRIPTION:

These specifications provide for the removal and disposal of waste from a waste storage pond and to finally backfill the pond located on Southern Pacific Transportation Company property at 4910 Liberty Road, Houston, Texas. The pond contains waste constituents generated by the adjacent wood preserving works.

Article 2 - DEFINITION OF TERMS:

a. Railroad - The Southern Pacific Transportation Co.

b. Engineer - Person acting through properly authorized representative of the Railroad to supervise within the scope of the particular duties delegated to him.

c. Contractor - Rollins Environmental Services (TX) Inc.

Article 3 - DRAWINGS

CE Drawing No. 39180, Sheet 1 of 1 is annexed to and made a part of these specifications. The area included in this project is outlined in red.

Article 4 - SUBCONTRACTORS:

The Contractor agrees that he is fully responsible to the Railroad for the acts and omissions of his subcontractor and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him. Nothing contained in the Contract Documents shall create any contractual obligation to any subcontractor from the Railroad.

SECTION 1.06 - [illegible]

Prior to backfillings contractor shall take at least two surface samples of remaining soil in the pond area and analyze for the waste constituents that were found in the removed sludge. Certified Laboratories shall be used to analyze soil and shall furnish the Railroad with copies of the laboratory report. Additional sampling and analyses shall be performed if it is determined necessary to find the limits of contamination.

SECTION 1.07 - NEGOTIATIONS

Contractor shall coordinate his work with the appropriate agencies to assure their concurrence before proceeding with work. The Contractor shall assist the Railroad in acquiring a statement from the Texas Department of Water Resources (TDWR) that the pond contaminates have been satisfactorily removed and that any contaminates remaining in the soil are below the hazardous limits.

SECTION 1.08 - ADDITIONAL WORK

In the event more material than provided for in this contract must be removed to meet regulations, the contractor shall submit an estimate of cost and shall not proceed without written approval from the Railroad.

SECTION 1.09 - WORK CONDITIONS & SUPERVISION

Railroad will coordinate yard traffic to minimize interference with Contractor's work. The Engineer will be available each day and will make every effort to keep clear access between the work site and Liberty Road. The Contractor will comply with yard traffic regulations. The Contractor will have a supervisor on the job any time he is progressing work. Unfinished work or exposed hazards shall be protected while work is not in progress with barricades, lights, etc. as necessary to avoid injury to Railroad's employees and the public.

SECTION 1.10 - ROAD STABILIZATION

If the yard roadway becomes unstable due to heavy rains the Contractor will furnish and place flue dust as necessary to carry the weight of the transport trucks. This work will be kept at an absolute minimum and will be done only after alternate routes or other solutions have been eliminated.

SPECIAL PROVISIONS

SECTION 1-01 - SCOPE

Furnish labor and material to complete the following work:

1. Excavate approximately 1800 cu.yds. of Pond Sludge.
2. Transport and dispose of all excavated waste material at an off site disposal facility approved by State Agencies to receive such waste.
3. Backfill excavated area with clean clay fill (approximately 1500 cu.yd.
4. Sample and test underlying soil to determine that all waste material has been removed.
5. Following sludge removal, assist Railroad in negotiating with the State Agencies to have the pond area declared clean.

SECTION 1-02 - WATER REMOVAL

The Railroad will make necessary arrangements and pay for removing ponded water prior to excavation work by the Contractor. Contractor will at his expense ditch and otherwise direct standing water to a depressed area for convenient removal.

SECTION 1-03 - EXCAVATION

Contractor shall remove all sludge from the pond and shall include underlying clay liner or other soil as necessary to comply with State and Federal regulations.

SECTION 1-04 - TRANSPORT AND DISPOSE

Contractor shall transport all sludge to an approved dump site and shall prepare manifest for each load as required by law. Contractor shall be responsible for all charges associated with the transportation and disposal of material.

SECTION 1-05 - BACKFILL

Contractor shall furnish and place clean clay fill material. The entire pond area shall be filled and graded to slope away from the Railroad's tracks. Fill shall be leveled and wheel rolled as necessary to provide a firm level finish surface.

COMPREHENSIVE GENERAL AND AUTOMOBILE LIABILITY ENDORSEMENT

Attached to certificate of insurance for and hereby certified to be part of the following policy or policies having the following expiration dates:

Policy No.	Company Providing Policy	Expiration Date

The scope of the insurance afforded by the policy(ies) designated in the attached certificate is not less than that which is afforded by the Insurance Service Organizations or other "Standard Provisions" forms in use by the insurance company in the territory in which coverage is afforded.

Such Policy(ies) provide for or are hereby amended to provide for the following:

1. The named insured is _____

2. _____ ("Railroad")* is included as an additional insured with respect to liability arising out of the hazards or operations under ALL AGREEMENTS entered into between the named insured and Railroad, whether or not liability is attributable to negligence of the named insured or Railroad. In the event it is intended that this endorsement is applicable to only one agreement, the agreement is described as follows:

The insurance provided hereunder applies as though separate policies are in effect for both the named insured and Railroad.

3. The limits of liability under the policy(ies) are not less than those shown on the certificate to which this endorsement is attached.

4. Cancellation or material reduction of this coverage will not be effective until thirty (30) days following written notice to:

Address

By registered or certified mail

5. Contractual liability coverage for liability assumed by this insured under said agreement or agreements with Railroad.

6. This insurance is primary and insurer is not entitled to any contribution from insurance in effect for Railroad.

7. All policy or endorsement limitations relating specifically to operations on or near railroad property are eliminated.

8. Broad Form Property Damage endorsement.

9. So-called X, C and U (or similar) limitations are not effective as respects operations by or for the named insured on or adjacent to Railroad's property.

10. In the event of reduction or exhaustion of the applicable aggregate limit or limits of liability under the primary policy or policies referred to in the attached certificate of insurance solely by reason of losses paid thereunder on account of occurrences during the policy period, the excess policy, if any, referred to herein shall (i) in the event of reduction, apply as excess of the reduced limit of liability thereunder; and (ii) in the event of exhaustion, continue in force as though it were primary insurance.

The term "Railroad" includes successors, assigns and affiliated companies of Railroad and affiliates thereof, and other railroad company operating upon or over Railroad's tracks with Railroad's permission, and the officers, employees and agents of any of the foregoing.

_____
Insurance Company

Date: _____, 19____ By _____
Signature of Authorized Representative

INSURANCE

(1) CONTRACTOR agrees to carry and/or furnish the following at CONTRACTOR'S sole cost and expense:

(a) Workmen's Compensation and Employer's Liability Insurance covering all employees of CONTRACTOR and any subcontractors wherever they may be in the United States so long as they are engaged in the work covered by this contract. The policy or policies shall cover the entire liability of CONTRACTOR and any subcontractors as determined by the compensation laws of the state or states under which such liability arises, and shall contain, so far as it is lawful to obtain the same, a waiver of insurer's right of subrogation against RAILROAD for payments made to or on behalf of employees of CONTRACTOR or subcontractors.

(b) Contractor's Public Liability Insurance (Bodily Injury and Property Damage) which shall provide a combined single limit of not less than $2,000,000 for bodily injury and/or property damage resulting from any one occurrence. They will protect CONTRACTOR and any subcontractors from liability arising out of the contract work for: (a) bodily injury, sickness or disease, including death at any time resulting therefrom, sustained by any person, and (b) damage to or destruction of property, including loss of use thereof.

(c) Insurance referred to in item (b) above shall include RAILROAD and any person or entity requiring RAILROAD to provide insurance in connection with the work to be performed hereunder as an additional insured and shall contain a so-called "cross liability" endorsement (the effect of which shall be to cause the insurance to apply as though separate policies were written for both CONTRACTOR and RAILROAD). The insurance shall protect RAILROAD from liability arising out of the contract work, whether caused or contributed to by any act or omission, negligent or otherwise, of RAILROAD, its agents or employees.

(2) In case CONTRACTOR and/or subcontractors, in carrying on the contract operations, should use and operate automobiles or other vehicles elsewhere than upon the contract premises, they shall carry, at their expense, Automobile Liability Insurance (Bodily Injury and Property Damage) with a combined single limit of not less than $2,000,000.

(3) CONTRACTOR further agrees to furnish RAILROAD with a certificate or certificates of insurance to which will be attached an endorsement in the form attached and made a part hereof, or certified copy of insurance policy or policies.

3. Closure Plan

Rollins Environmental Services (TX) Inc.
P. O. Box 609, Deer Park, Texas 77536 (713) 479-6031

Rollins

December 15, 1983

Mr. L. W. Pepple
Southern Pacific Transportation Company
One Market Plaza, Room 1007
San Francisco, California 94105

Dear Mr. Pepple:

Mr. Jeff Webb of T.D.W.R. has requested that a sampling program be added to the closure document to validate the complete removal of contaminants from your facility. We have, therefore, revised the closure plan to reflect Mr. Webb's comments regarding the sampling program and its analytical requirements.

The cost associated with implementing this sampling program will be billed as labor, materials, and analytical costs plus 15 per cent.

Please review the revised closure document and send it to Mr. Webb with a cover letter stating that, per your consultant, a sampling program section and more specific information concerning the analytical requirements for the sampling program have been added.

Please call me if you have any questions.

Sincerely yours,

ROLLINS ENVIRONMENTAL SERVICES (TX) INC.

Dan Bridge

Dan Bridge, Ph. D.
Project Manager
Field Services Group

DB/jml

Attachments

CLOSURE PLAN FOR SOUTHERN PACIFIC

TRANSPORTATION COMPANY

HOUSTON, TEXAS

INTRODUCTION

Southern Pacific Transportation Company will close a creosote tank bottom surface impoundment (RCRA Facility #31547) on their 4910 Liberty Road site in Houston, Texas in accordance with the following plan. This closure plan will comply with the provisions of Texas Administrative Code Sections 335.211-335.220, 335.1-335.15 and 335.281-335.288 and will minimize the post closure escape of hazardous constituents to the environment.

Facility Description

The impoundment, originally constructed in 1979 to contain creosote tank bottoms (K001), is located on the west side of the Liberty Road site; It is a rectangular shaped facility with the following dimensions: 106' x 180' x 72' x 177'. The impoundment which contains approximately 3' of creosote sludge has a total surface area of 18,762 ft.2 and an approximate volume of 1600 cubic yards. Earthen berms surrounding the impoundment are two to three feet above ground level and account for an additional 200 cubic yards of soil. The maximum waste inventory is estimated at approximately 1800 cubic yards. (335.213,(a),(2))

During the life of this impoundment, rainwater collecting on the surface of the creosote sludge has been repeatedly pumped into vacuum trucks and taken to a nearby Class I Disposal site.

CLOSURE PLAN

This closure plan involves 3 phases:

Phase 1. - Excavation of the creosote sludge and all contaminated portions of the walls and bottom. The material will be transported to Rollins Class I Landfill in Deer Park, where it will be solidified with flue dust prior to compaction in place. Site background samples will be analyzed for benzene, benz(a)anthracene, benzo(a)pyrene, chrysene, 4-nitrophenol, toluene, naphthalene phenol, 2-chlorophenol, 2,4-dimethylphenol, 2,4,6-trichlorophenol, pentachlorophenol, 4,6-dinitro-o-cresol and tetrachlorophenol. The contaminated zones will be considered sufficiently cleaned when the concentration of remaining materials is statistically equal to a "clean" background level (within the 95% confidence interval). See attached sampling plan.

All equipment will be decontaminated (335.213(a)(3) and 335.215) over a water collection pad. Decontamination will be accomplished with a mild detergent and hot water sprayed from a portable high pressure sprayer. The residue will be collected and disposed at a Class I disposal site.

Phase 2. - The excavated area will be backfilled with clay soil and the soil will be compacted with heavy equipment to accommodate further site expansion. No continued maintainance (with the exception of the ground-water study) will be required on the facility, since the waste material will be removed. (335.212(1))

Phase 3. - A ground-water monitoring system will be installed within the compliance zone to demonstrate the containment integrity of the facility. Four ground-water monitoring wells (4) will be constructed according to TAC 335.192 specifications. This system will be monitored for 1 year for the same chemical components listed in Phase 1 for soil contamination. If it is determined, after 1 year, that the active facility has no impact on the subsurface/ground water the monitoring program will be discontinued.

ESTIMATED CLOSURE SCHEDULE

Southern Pacific will implement this closure plan within 1 month after its approval by TDWR(335.214(a)), with an anticipated final closure date of January,1984.(335.212(a)(4))

7 working days: Excavation, transportation, disposal of all contaminated material.

3 working days: Backfill, compaction.

5 working days: Ground water monitoring well installation, surveying and initial sampling.

Weather permitting, the entire closure plan will be accomplished within 12 working days, allowing for sampling and sample analysis.

POST CLOSURE CARE

Being that this closure plan follows TAC 335.286(b) to remove all waste residues and contaminated subsoils, post closure care is not required.

CERTIFICATION OF CLOSURE

A registered professional engineer will inspect the closure project and, if the facility has been closed in accordance with the closure plan, the engineer will endorse a letter stating this fact to TDWR.

ESTIMATED CLOSURE COST

Excavation, Transportation, Disposal of Waste at $48.55/yd x 1800 yds	$87,390.00
Clay backfill and compaction at $10/yd x 1800 yds	$18,000.00
Ground-water Monitoring System	$10,000.00
Certification by Registered Professional	- 0 -
TOTAL	$115,390.00

Addendum to Closure Plan for Southern Pacific

RCRA Facility #31547

SAMPLING PROGRAM

A sampling program will be incorporated into the closure procedure to insure complete removal of the hazardous material. The program, based on a non-bias grid selection method, will minimize the analytical burden without jeopardizing the reliability of the sampling program.

Specifically, the visual hazardous material and apparent contaminated soil will be removed from the facility. Prior to sampling, an additional 3" of material below the visual endpoint will be removed as an added insurance buffer.

As shown in Figure 1., the facility will be surveyed and divided into 50' grids, which will be randomly selected and sampled. Within each grid 10 to 15 grab samples will be combined, homogenized and subsampled as representative samples of that particular grid area. The individual grab samples will not exceed 6" in depth from the excavated surface.

These samples will be analyzed for: benzene, benz(a)anthracene, benzo(a)pyrene, chrysene, 4-nitrophenol, toluene, napthalene phenol, 2

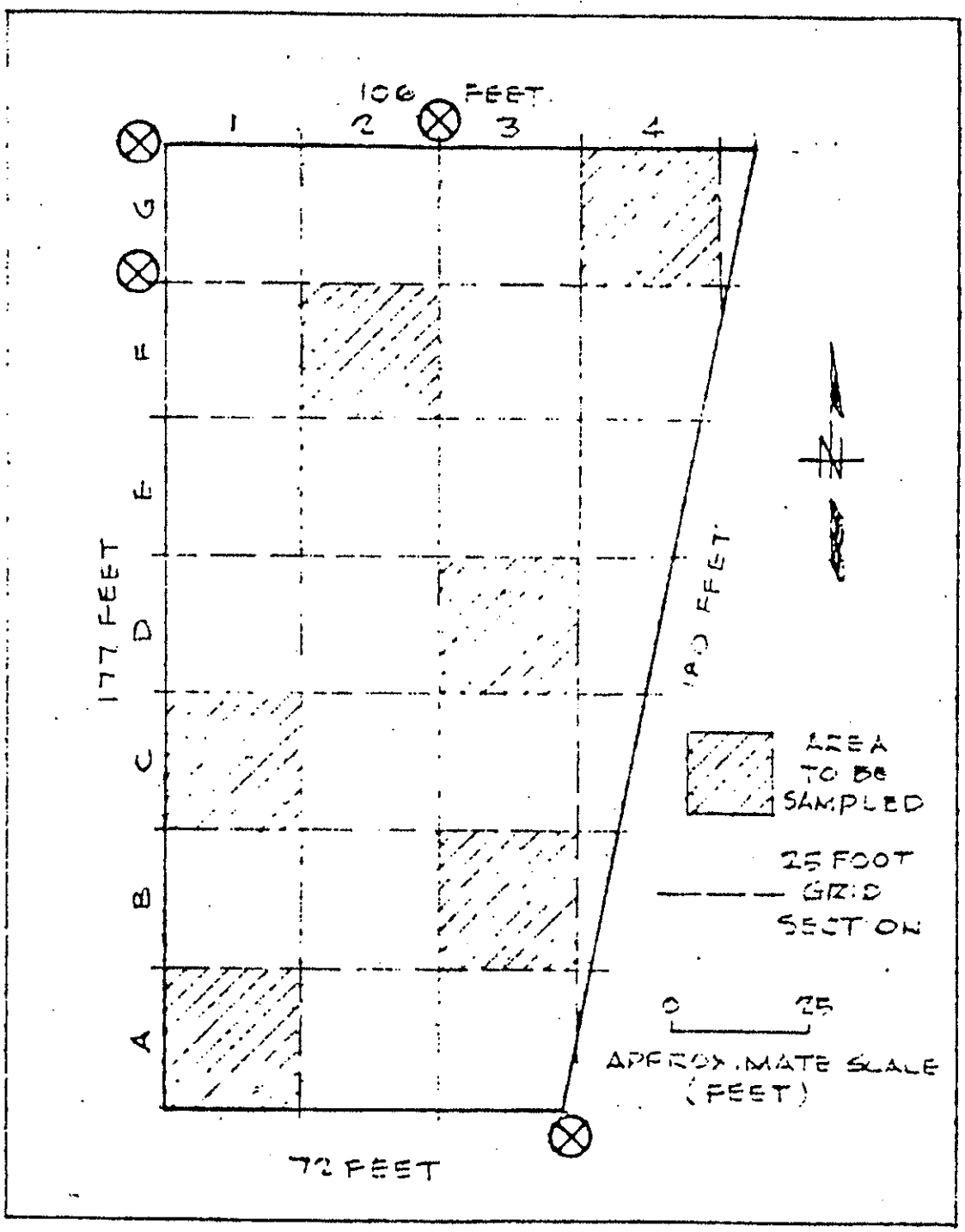


FIGURE 1
CREOSOTE IMPOUNDMENT AT
SOUTHERN PACIFIC TRANSPORTATION CO.
HOUSTON, TEXAS

⊗ - MONITORING WELLS

4. T.D.W.R. Approval of Closure Plan

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

TEXAS WATER DEVELOPMENT BOARD
Louis A. Beecherl, Jr., Chairman
George W. McCleskey, Vice Chairman
Glen E. Roney
W. O. Bankston
Lonnie A. "Bo" Pilgrim
Louie Welch

Charles E. Nemir
Executive Director

TEXAS WATER COMMISSION
Paul Hopkins, Chairman
Lee B. M. Biggart
Ralph Roming

February 28, 1984

Mr. H. B. Berkshire
Southern Pacific Transportation Company
Southern Pacific Building
One Market Plaza
San Francisco, CA 94105

Dear Mr. Berkshire:

Re: Industrial Solid Waste Registration No. 31547
Closure of On-Site Hazardous Waste Landfill
Harris County, Texas

We have completed a review of the closure plan, submitted by your letter of November 29, 1983 and as amended by your letter of December 23, 1983. This closure represents full facility closure and was accordingly reviewed under 31 Texas Administrative Code (TAC) Sections 335.212-.216 and 31 TAC Section 335.286(b).

This letter constitutes approval by the Executive Director of the closure plan contained in the referenced letters, provided that all analytical results shall be submitted to the Central Office and the District 7 Office of the Department within 15 days of receipt by the company.

Upon completion of the closure, certification shall be submitted by the owner or operator of the subject facility and by an independent Registered Professional Engineer that the facility has been closed in accordance with the approved closure plan. Also, an Affidavit of Exclusion (see enclosed form) indicating that this facility meets the "Accumulation Time" requirements of 31 TAC Section 335.69 should be submitted along with the closure certification, if applicable.

If you have any questions, please contact our Solid Waste Section at AC512/475-2041.

Sincerely,

Charles E. Nemir
Executive Director

Enclosure
cc: TDWR District 7 Office - Deer Park
Frank Bozeman, Southern Pacific Transportation Company
Dr. Daniel W. Bridge, Rollins Environmental Services (TX) Inc.

1836-1986

5. Public Notification of Closure

Southern Pacific
Transportation Company
913 Franklin Ave., P. O. Box 1319, Houston, Texas 77251

MAINTENANCE OF WAY

T. P. REILLY
Asst. Engineer MofW
Eastern Lines

January 30, 1984

File 071.1

Mr. Dan Bridge, Ph.D.
Rollings Environmental Services, Ltd.
P. O. Box 609
Deer Park, TX 77536

Dear Mr. Bridge:

Reference to previous correspondence concerning disposal of creosote contaminated soil at Wood Preserving Works, Houston.

Enclosed for your information is copy of notice published in the Houston Chronicle concerning final facility closure, along with copy of Publisher's Affidavit and copy of letter of transmittal to the Texas Department of Water Resources.

Yours truly,

G. F. Bozeman

G. F. Bozeman
E&M Manager

cc: Mr. L. W. Pepple - with
copies of enclosures

GFB/css

Encls.

Southern Pacific
Transportation Company
913 Franklin Ave., P. O. Box 1319, Houston, Texas 77251
MAINTENANCE OF WAY

L. P. REILLY
Asst. Engineer MofW
Eastern Lines

January 27, 1984

071.1

Mr. Jeff Webb
Texas Department of Water Resources
1700 N. Congress Avenue
Austin, TX

Dear Sir:

Reference Mr. Messenger's letter of December 12, 1983, subject: Southern Pacific Transportation Company, Industrial Solid Waste Registration No. 31547, Publication of Notice of the Receipt of Closure Plan concerning Hazardous Waste Management Facilities.

Enclosed is the original sworn affidavit from the Houston Chronicle, showing notice published on January 13, 1984. Also enclosed is copy of said notice.

Yours truly,

G. F. Bozeman
E&M Manager

Enclosure

GFB/css

PUBLISHER'S AFFIDAVIT

STATE OF TEXAS

COUNTY OF Harris

Before me on this day personally appeared Lee Benton, the Supervisor-Accts Rec of the Houston Chronicle, a newspaper which is regularly published or circulated in Harris County, Texas, who being by me duly sworn deposes and says:

That the foregoing notice was published in said newspaper on January 13, 1984

Lee Benton

Subscribed and sworn to before me this the 26th day of January ~~1983~~ 1984

Carol Hanson

Notary Public in and for Harris County, Texas

CAROL HANSON
Notary Public State of Texas
My Commission Expires November 25, 1985
Bonded by L. Alexander Loven, Lawyers Surety Corp.

Notice of Final Facility Closure

31 Texas Administrative Code (TAC) Section 335.213(d), the Director of the Texas Department of Water Resources notice of the receipt on December 2, 1983 of a closure plan dous waste management facility associated with Southern sportation Company located at 4910 Liberty Road, Houss County. Pursuant to the closure plan submitted, South- Transportation Company intends to close a 0.43-acre sur- ndment used to receive wastewater treatment sludge from ing operations.

of this notice is to give members of the public the opportu- bmit written comments on the closure plan and request g of the plan. Any comments must be submitted within 30 date of publication of this notice to Allen Messenger, Solid n, Texas Department of Water Resources, P.O. Box 13087, ation, Austin, Texas 78711. Pursuant to 31 TAC Section the Executive Director is required to approve, modify, or the plan within 90 days of receipt. Copies of the closure plan public inspection at the central office of the Texas Depart- ter Resources, 1700 North Congress Avenue, Austin, Texas at the Department's District 7 Office, 4301 Center Street, Texas 77011.

pursuant to 31 TAC Section 335.213(d), the Executive Direc- is responsible to a request or at his own discretion, hold a public the closure plan whenever such a hearing might clarify one ues concerning the plan. Any request for a public hearing submitted within 10 days of the date of publication of this Allen Messenger, Solid Waste Section, Texas Department of ources, P.O. Box 13087, Capitol Station, Austin, Texas 78711, 512/475-3041.

Issued in Austin, Texas on December 13, 1983.

C. H. Mortischin
Assistant Executive Director

6. Bulk Density Values, Sampling Analyses

Rollins Environmental Services (FS) Inc.
2027 Battleground Road, P.O Box 609, Dee Park, Texas 77536
(713) 479-6001

Rollins

March 30, 1984

TO WHOM IT MAY CONCERN:

Bulk Density Values for Waste From 4910 Liberty Rd.

1.	1345
2.	1821.2
3.	2181.3
4.	1885.2
5.	2337.6
6.	1835.3
7.	1973.1
8.	1650.1
9.	2760.9
10.	2647.1
11.	2746.4
12.	2370
13.	2709.2
14.	2215.9

30478.3 ÷ 14 = 2177 Pounds Per Cubic Yard

Sincerely,

ROLLINS ENVIRONMENTAL SERVICES INC.

Dan Bridge

Dan Bridge, Ph. D.
Project Manager

DB/jml

MBA LABORATORIES
P.O. Box 9461 340 S. 66th St.
Houston, Texas 77261
(713)928-2701

LABORATORY REPORT #: H-6914

SAMPLE SUBMITTED BY: ROLLINS

DATE RECEIVED: 4-4-84

DATE COMPLETED: 4-4-84

SAMPLE IDENTIFICATION: ONE SOIL SAMPLE

THE SAMPLE WAS ANALYZED BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY, USING A HEWLETT-PACKARD MODEL #5985 GC/MS SYSTEM.

SAMPLE PREPARATION

1. BASE NEUTRALS, ACID EXTRACTABLES
   50 GMS OF SAMPLE WAS PLACED INTO A STAINLESS STEEL BLENDER ALONG WITH 50 GMS. OF SODIUM SULFATE. 150 MLS. OF METHYLENE CHLORIDE WAS ADDED, AND THE SAMPLE WAS BLENDED FOR 5 MINUTES AT HIGH SPEED. THE EXTRACT WAS FILTERED THROUGH GLASS WOOL INTO A KJDERNA-DANISH CONCENTRATOR. TWO MORE EXTRACTIONS WERE MADE USING 50 MLS. OF MECL2, AND THESE WERE ADDED TO THE ORIGINAL EXTRACT. THE SAMPLE EXTRACT WAS THEN CONCENTRATED TO 0.25 MLS. FOR GC/MS ANALYSIS. NEXT, THE SOIL WAS ACIDIFIED, AND AGAIN 3 EXTRACTIONS WERE PERFORMED JUST LIKE THE NEUTRAL FRACTION. THIS EXTRACT WAS ALSO CONCENTRATED TO 0.25 MLS., AND THIS WAS COMBINED WITH THE NEUTRAL EXTRACT AND ANALYZED.
2. BENZENE AND TOLUENE
   2 GMS OF SOIL WAS PLACED INTO A VIAL ALONG WITH 5 MLS. OF MECL2. THIS WAS SONICATED FOR 10 MINUTES, AND SHAKEN FOR 1 HOUR ON A SHAKER TABLE. THIS EXTRACT WAS THEN INJECTED DIRECTLY INTO THE GC/MS.

THE SAMPLE WAS ANALYZED FOR THE FOLLOWING SUBSTANCES:

SPECIFIC ORGANICS

Joe Kraus

THE GC/MS PARAMETERS WERE AS FOLLOWS:

COLUMN - 30 METER FUSED SILICA CAPILLARY COATED WITH SPB-5
CARRIER GAS - HELIUM @ 30 CM/SEC (0.9 ML/MIN)
INJECTOR TEMP - 260 DEGREES
COLUMN TEMP - 3 MIN @ 50 DEGREES, THEN 8 DEGREES PER MINUTE TO 280 DEGREES, HOLD @ 280 DEGREES
INJECTION MODE - SPLIT
SPLIT RATIO - 15:1

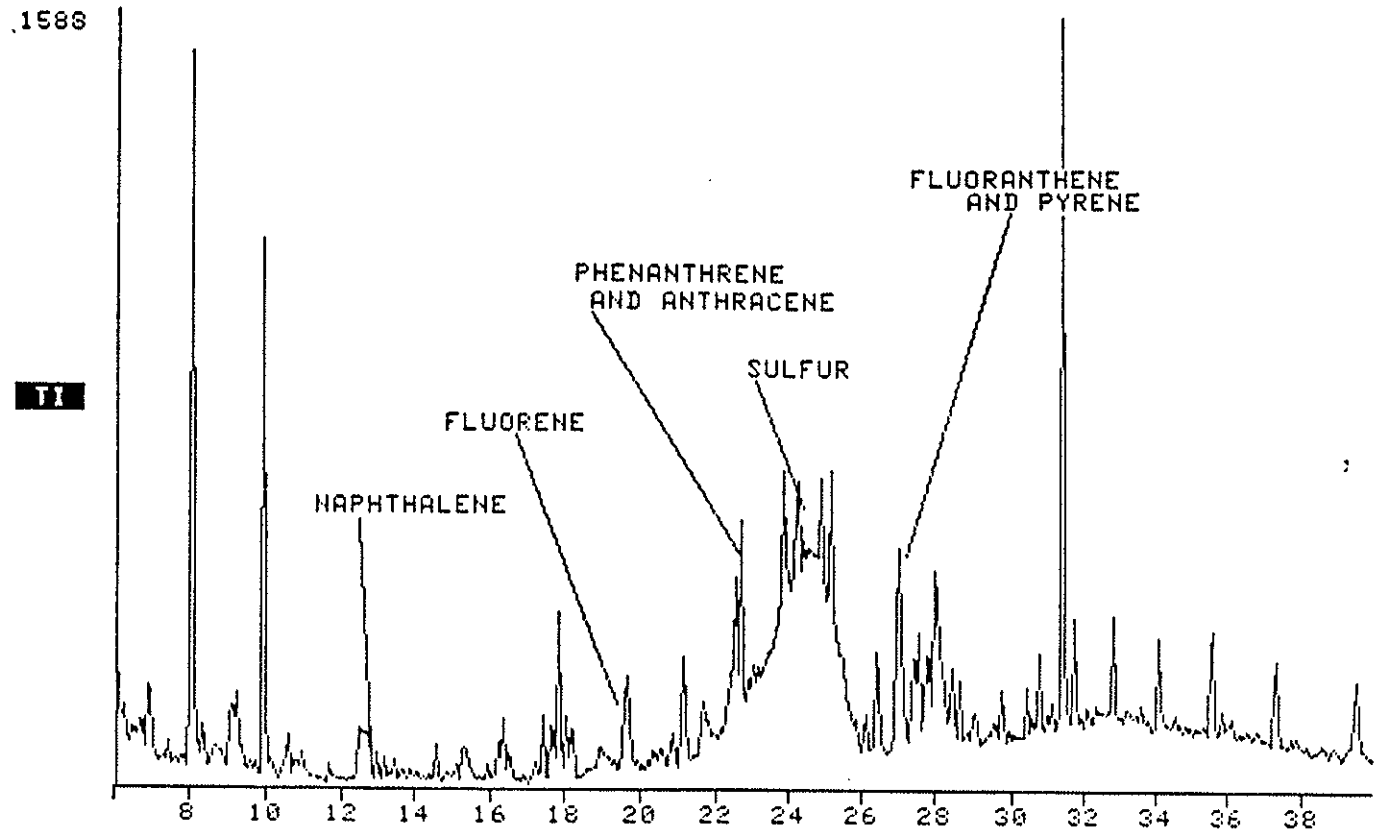
GC/MS INTERFACE - DIRECT
IONIZATION MODE - ELECTRON IMPACT
ELECTRON ENERGY - 70 V
MASS RANGE SCANNED - 40 TO 360 AMU
SCAN TIME - 0.4 SEC

COPIES OF THE TOTAL ION CHROMATOGRAMS ARE INCLUDED WITH THIS REPORT. ALL GC/MS DATA IS PERMANENTLY STORED AT MBA LABORATORIES ON MAGNETIC TAPE.

Joel Kreps

NAME H-6914,50 GMS:0.5 ML MECL2,6 ULS,15:1 SPLIT
MISC 4-4-84,JK

FRN 11805



COMPOUNDS FOUND

NAME	*RETENTION TIME (MINUTES)*	*CONCENTRATION*
Naphthalene	*12.6*	*4.0 ugs/kg*
Fluorene	*19.7*	*2.4 ugs/kg*
Phenanthrone	*22.7*	*31.8 ug/kg*
Anthracene	*22.9*	*5.3 ug/kg*
Fluoranthene	*26.5*	*13.00 ug/kg*
Pyrene	*27.1*	*2.2 ug/kg*
Chrysene	*31.0*	*9.1 ug/kg*

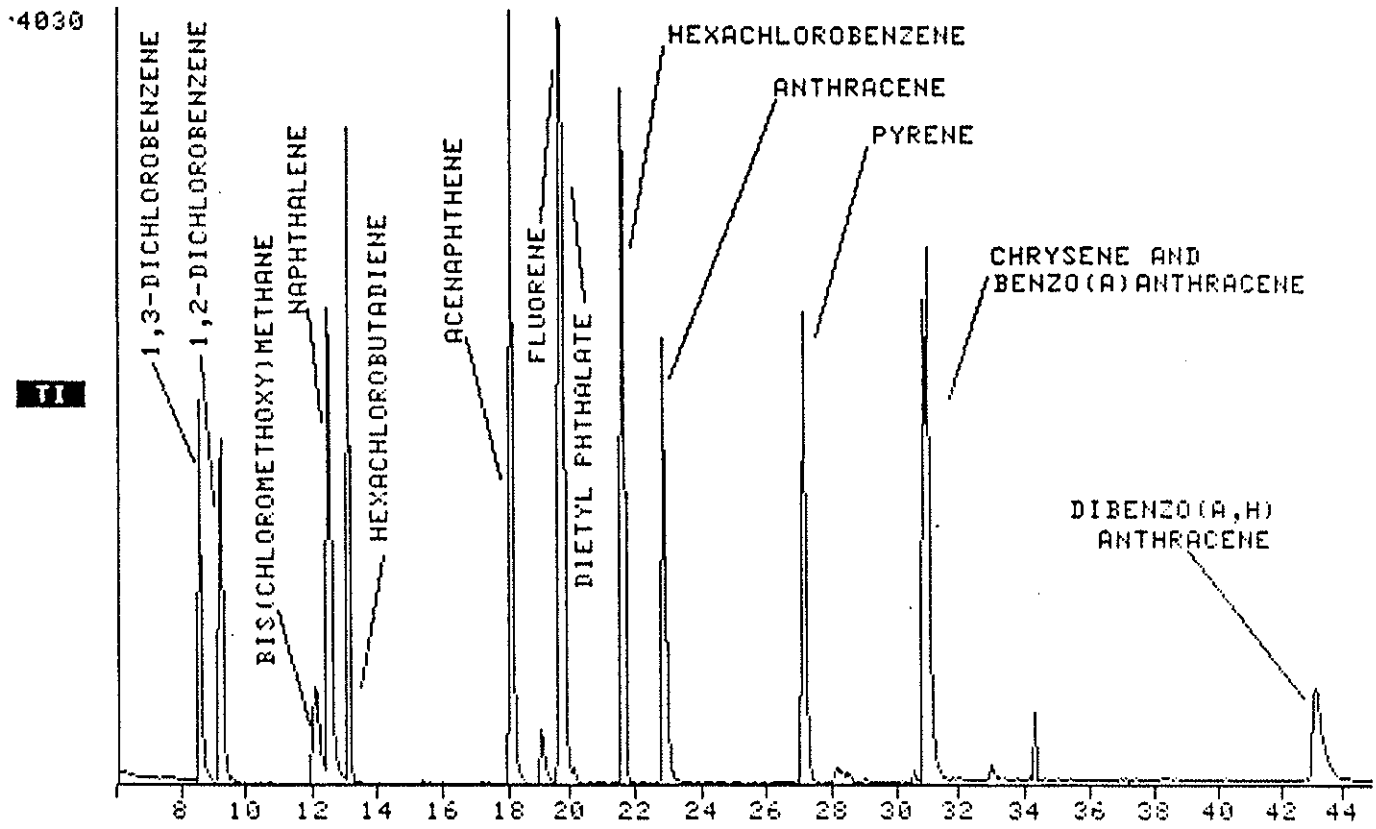
COMPOUNDS NOT FOUND

NAME	*CONCENTRATION*
Benzene	*<100 ug/kg*
Toluene	*<100 ug/kg*
Phenol	*< 2.4 ug/kg*
4-Nitrophenol	*< 18.0 ug/kg*
2-Chlorophenol	*< 3.6 ug/kg*
2,4-dimethyl phenol	*< 3.6 ug/kg*
2,4,6-trichlorophenol	*< 5.4 ug/ig*
pentachlorophenol	*< 13.8 ug/kg*
2-methyl, 4,6-dinitrophenol	*< 24.0 ug/kg*
tetrachlorophenol	*< 9.6 ug/kg*
benzo(a)anthracene	*< 1.0 ug/kg*
benzo(a)pyrene	*< 1.0 ug/kg*

Joe Kreny

NAME BN#2 STD,1:10,20 PPM EA.,6 ULS,15:1 SPLIT
MISC 4-4-84,JK

FRN 11806



Joe Kress

MBA LABORATORIES
P.O. Box 9461 340 S. 66th St.
Houston, Texas 77261
(713)938-2701

LABORATORY REPORT #: *H-6870*

SAMPLE SUBMITTED BY: ROLLINS

DATE RECEIVED: *3-29-84*

DATE COMPLETED: 4-2-84

SAMPLE IDENTIFICATION: *SIX* SOIL SAMPLES

THE SAMPLE WAS ANALYZED BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY, USING A HEWLETT-PACKARD MODEL #5985 GC/MS SYSTEM.

SAMPLE PREPARATION

1. BASE NEUTRALS, ACID EXTRACTABLES
   50 GMS OF SAMPLE WAS PLACED INTO A STAINLESS STEEL BLENDER ALONG WITH 50 GMS OF SODIUM SULFATE. 150 MLS OF METHYLENE CHLORIDE WAS ADDED, AND THE SAMPLE WAS BLENDED FOR 5 MINUTES AT HIGH SPEED. THE EXTRACT WAS FILTERED THROUGH GLASS WOOL INTO A KJERNA-DANISH CONCENTRATOR. TWO MORE EXTRACTIONS WERE MADE, USING 50 MLS. OF METHYLENE CHLORIDE, AND THESE WERE ADDED TO THE ORIGINAL EXTRACT. THE SAMPLE EXTRACT WAS THEN CONCENTRATED TO 0.25 MLS. FOR GC/MS ANALYSIS. NEXT, THE SOIL WAS ACIDFIED, AND AGAIN 3 EXTRACTIONS WERE PERFORMED JUST LIKE THE NEUTRAL FRACTION. THIS EXTRACT WAS ALSO CONCENTRATED TO 0.25 MLS, AND THIS WAS COMBINED WITH THE NEUTRAL EXTRACT AND ANALYZED.
2. BENZENE AND TOLUENE
   2 GMS OF SOIL WAS PLACED INTO A VIAL ALONG WITH 5 MLS. OF METHYLENE CHLORIDE. THESE WERE SONICATED FOR 10 MINUTES. AND SHAKEN FOR 1 HOUR ON A SHAKER TABLE. THIS EXTRACT WAS THEN INJECTED DIRECTLY INTO THE GC/MS FOR ANALYSIS.
3. SOIL SAMPLES HEAVILY CONTAMINATED
   TWO OF THE SAMPLES WERE OBVIOUSLY OILY. 1 GM. OF EACH WAS PLACED INTO A VIAL. THE SOIL WAS ACIDIFIED, AND 10 MLS. OF METHYLENE CHLORIDE WAS ADDED. THE SAMPLES WERE SONICATED FOR 10 MINUTES, AND SHAKEN FOR 1 HOUR ON A SHAKER TABLE.

THE SAMPLE WAS ANALYZED FOR THE FOLLOWING SUBSTANCES: *SPECIFIC ORGANICS*

Joe Krend

THE GC/MS PARAMETERS WERE AS FOLLOWS:

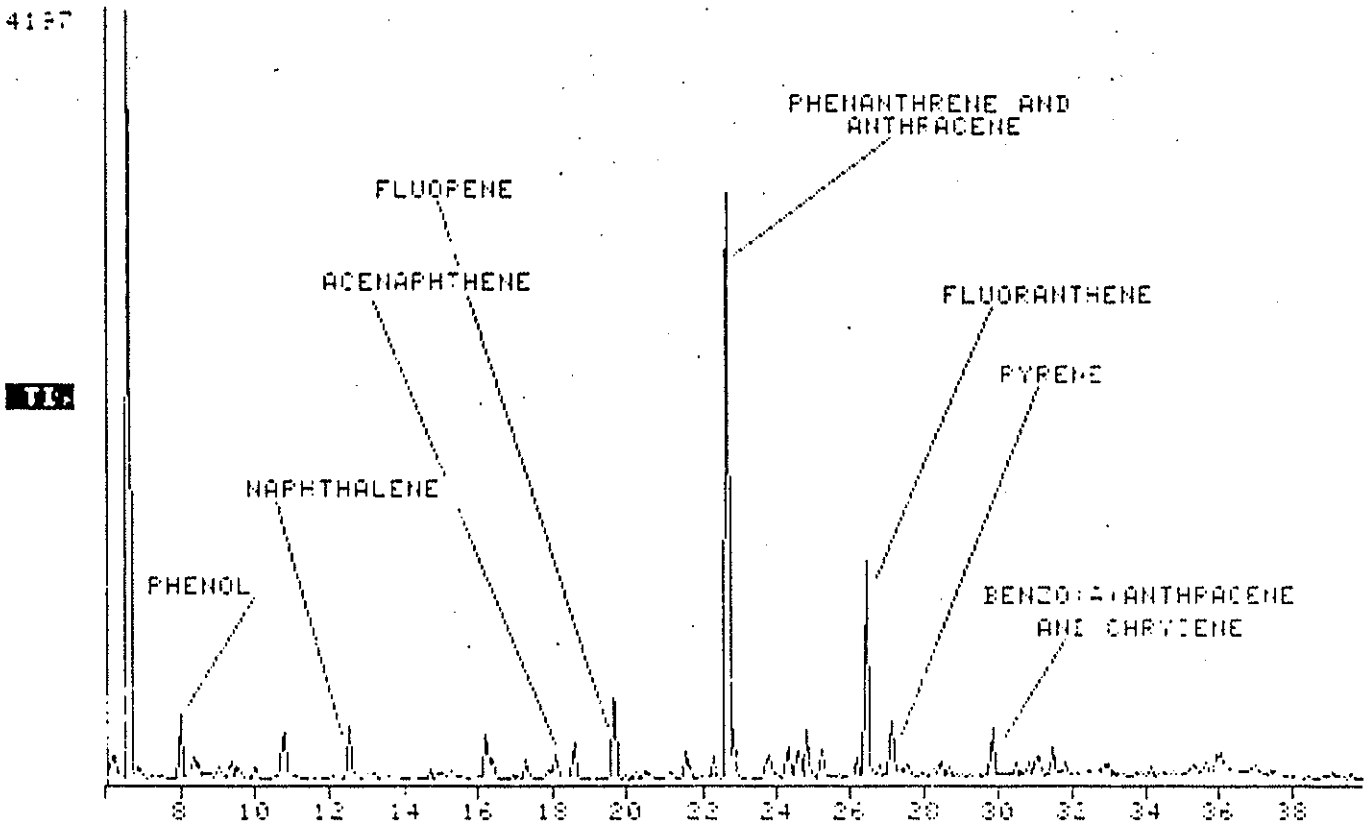
COLUMN - 30 METER FUSED SILICA CAPILLARY COATED WITH SPB-5
CARRIER GAS - HELIUM @ 30 CM/SEC (0.9 ML/MIN)
INJECTOR TEMP - 260 DEGREES
COLUMN TEMP - 3 MIN @ 50 DEGREES, THEN 8 DEGREES PER MINUTE TO 280 DEGREES, HOLD @ 280 DEGREES
INJECTION MODE - SPLIT
SPLIT RATIO - 15:1

GC/MS INTERFACE - DIRECT
IONIZATION MODE - ELECTRON IMPACT
ELECTPON ENERGY - 70 V
MASS RANGE SCANNED - 33 TO 360 AMU
SCAN TIME - 0.4 SEC

COPIES OF THE TOTAL ION CHROMATOGRAMS ARE INCLUDED WITH THIS REPORT. ALL GC/MS DATA IS PERMANENTLY STORED AT MBA LABORATORIES ON MAGNETIC TAPE.

Joy Kruse

NAME 4-8870,A-1,100 GMS:0.5 ML,6 UL:3,15:1 SPLIT FRN 11614
MISC 3-29-84,JK



COMPOUNDS FOUND

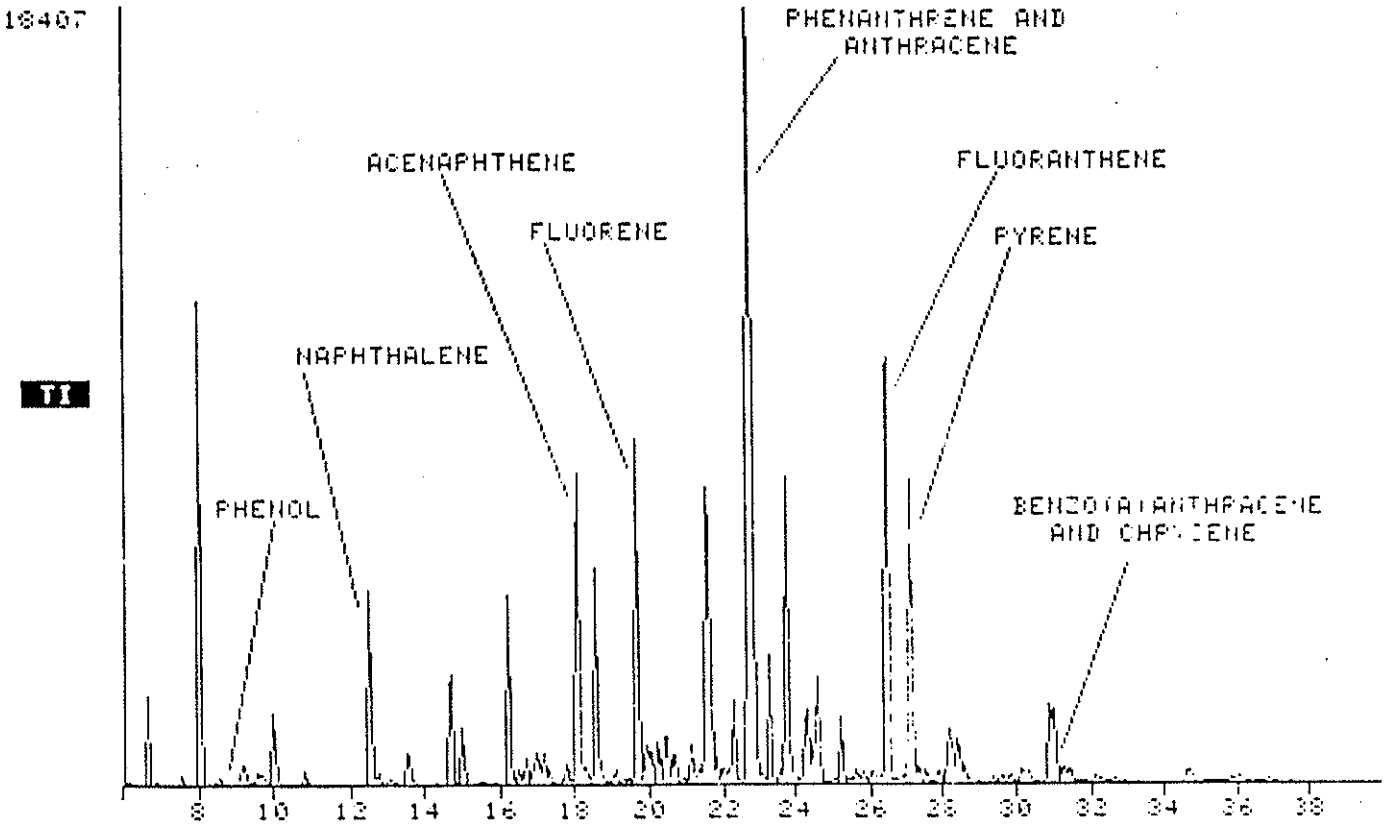
NAME	RETENTION TIME (minutes)	CONCENTRATION
Phenol	8.7	4.5 ugs/kg
Naphthalene	12.5	23.0 ug/kg
Acenaphtene	18.1	6.0 ug/kg
Fluorene	19.7	25.0 ug/kg
Phenanthreen	22.7	206.0 ug/kg
Anthracene	22.8	19.0 ug/kg
Fluoranthene	26.5	89.0 ug/kg
Pyrene	27.1	27.0 ug/kg
Benzo(a)anthracene	30.9	11.0 ug/kg
Chrysene	31.1	15.3 ug/kg

COMPOUNDS NOT FOUND

NAME	DETECTION LIMIT
Benzene	< 100.0 ug/kg
Toluene	< 100.0 ug/kg
Benzo(a)pyrene	< 0.4 ug/kg
4-Nitrophenol	< .6.0 ug/kg
2-Chlorophenol	< 1.2 ug/kg
2,4-dimethyl phenol	< 1.2 ug/kg
2,4,6-trichlorophenol	< 1.8 ug/kg
Pentachlorophenol	< 4.6 ug/kg
2-methyl,4,6,-dinitrophenol	< 8.0 ug/kg
tetrachlorophenol	< 3.2 ug/kg

Joe Kresse

NAME 4-6870, ,B-3,100 GM:0.5 ML,6 UL,15:1 SPLIT FRN 11615
MISC 3-29-84,JK



COMPOUNDS FOUND

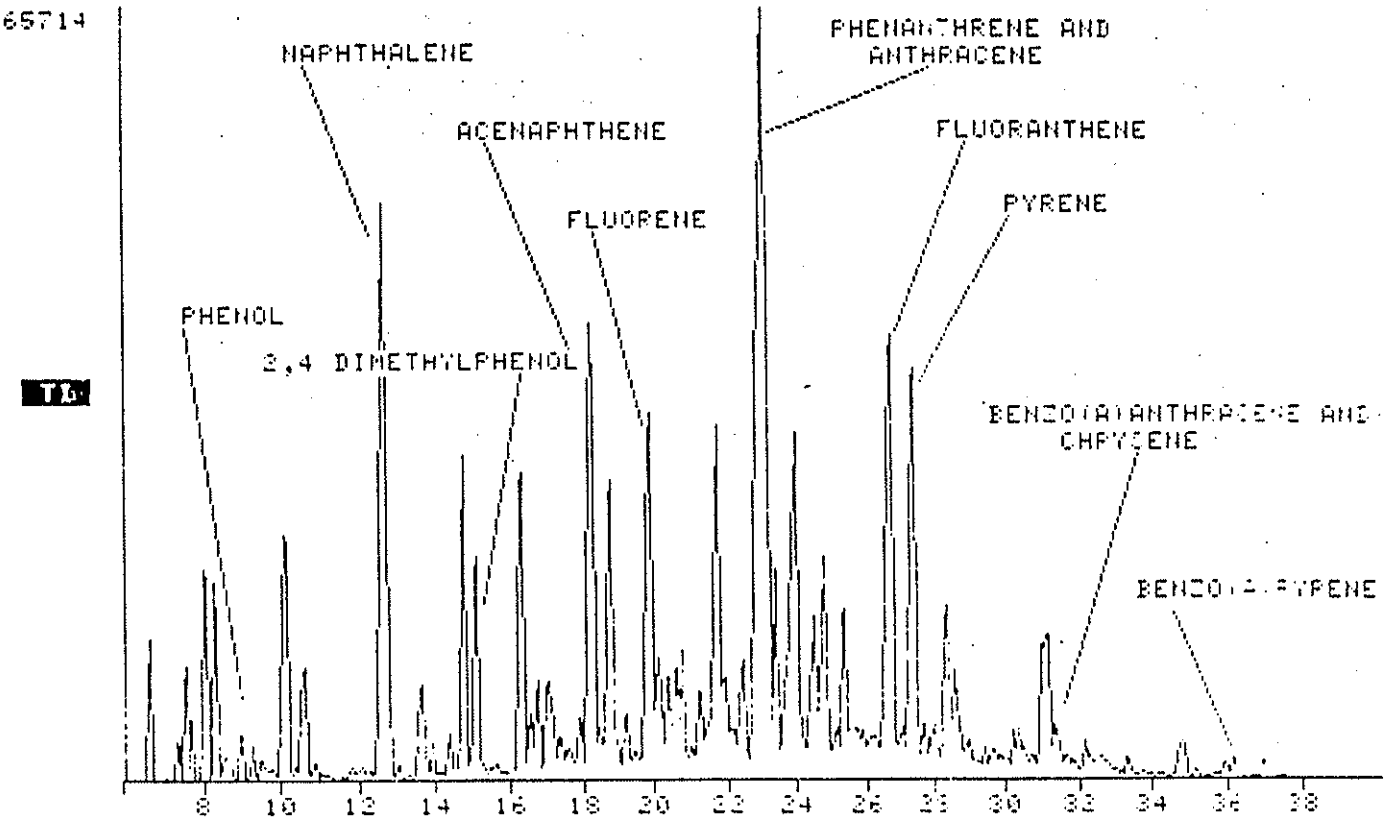
NAME	*RETENTION TIME (minutes)*	*CONCENTRATION*
Pehnol	*8.6*	*28 ug/kg*
Naphthalene	*12.5*	*135 ug/kg*
Acenaphtene	*18.1*	*121 ug/kg*
Fluorene	*19.7*	*180 ug/kg*
Phenanthrene	*22.7*	*749 ug/kg*
Anthracene	*22.8*	*119 ug/kg*
Fluoranthene	*26.5*	*381 ug/kg*
Pyrene	*27.1*	*225 ug/kg*
Benzo(a)anthracene	*30.9*	*70 ug/kg*
Chrysene	*31.0*	*49 ug/kg*
Benzo(a)pyrene	*36.1*	*12 ug/kg*

COMPOUNDS NOT FOUND

NAME		*DETECTION LIMIT*
Benzene	<	*100 ug/kg*
Toluene	<	*100 ug/kg*
2-chlorophenol	<	*0 ug/kg*
4-nitrophenol	<	*3 ug/kg*
2,4-dimethylphenol	<	*0.6 ug/kg*
2,4,6-trichlorophenol	<	*0.9 ug/kg*
Pentachlorophenol	<	*2.3 ug/kg*
2-methyl,4,6-dinitrophenol	<	*0.9 ug/kg*
tetrachlorophenol	<	*1.6 ug/kg*

Joe Kreml

NAME H-6870,C-1,100 GM:0.5 ML,1 UL.15:1 SPLIT FRN :1701:
INJ SCH 3-29-84,JK



COMPOUNDS FOUND

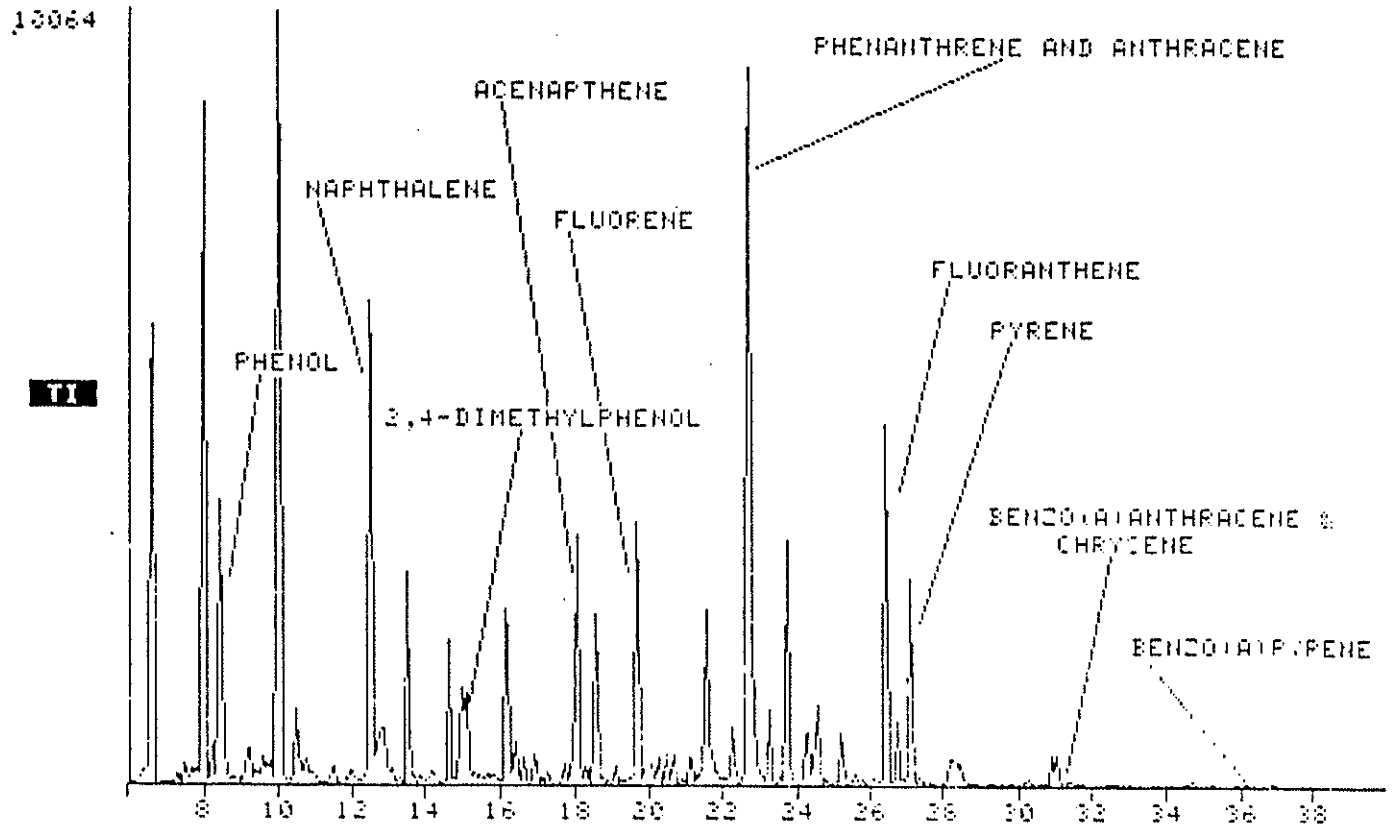
NAME	*RETENTION TIME*	*CONCENTRATION*
Phenol	*8.6*	*4.07 mg/kg*
2,4,-Dimethylphenol	*12.0*	*0.387 mg/kg*
Naphthalene	*12.6*	*29.840 mg/kg*
Fluorene	*19.8*	*11.1 mg/kg*
Phenanthrene	*22.9*	*44.9 mg/kg*
Anthracene	*23.2*	*5.4 mg/kg*
Fluoranthene	*26.6*	*20.5 mg/kg*
Pyrene	*27.2*	*12.1 mg/kg*
Benzo(a)anthracene	*31.0*	*3.1 mg/kg*
Chrysene	*31.1*	*2.0 mg/kg*
Benzo)a)pyrene	*36.1*	*0.6 mg/kg*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg ppb*
Toluene	*< 100.0 ug/kg*
4-Nitrophenol	*< 18.0 ug/kg*
2-Chlorophenol	*< 3.6 ug/kg*
2,4,6-trichlorophenol	*< 5.4 ug/kg*
Pentachlorophenol	*< 14.0 ug/kg*
2-methyl,4,6-dinitrophenol	*< 24.0 ug/kg*
tetrachlorophenol	*< 9.6 ug/kg*

Joe Kress

NAME A-6870,D-3,100 GMS:0.5 ML,1 ULC,15:1 SPLIT FRN :1702
MISC 3-29-84,JK



COMPOUNDS FOUND

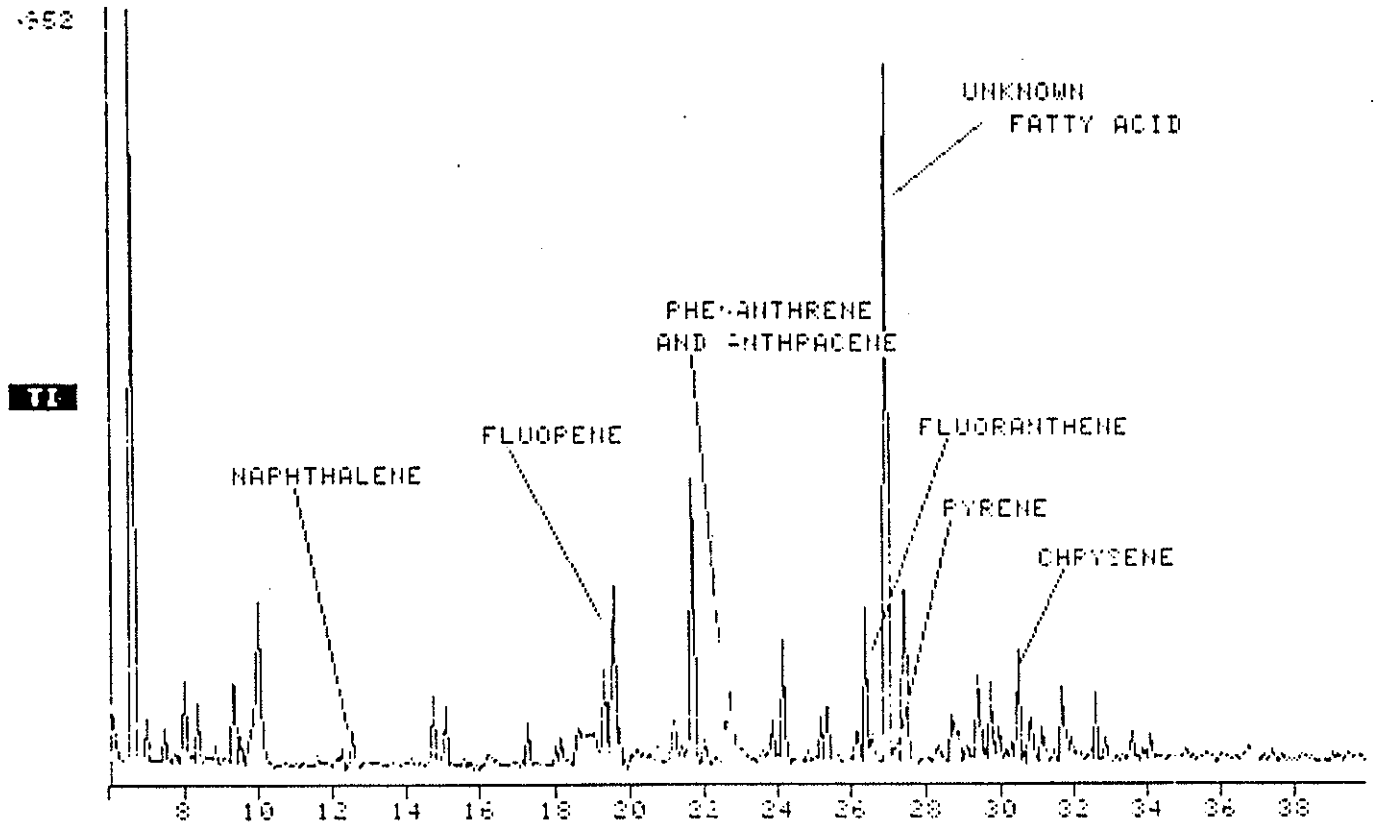
NAME	*RETENTION TIME (minutes)*	*CONCENTRATION*
Phenol	*8.5*	*3.0 mg/kg*
2,4-dimethylphenol	*15.0*	*0.3 mg/kg*
Naphthalene	*12.5*	*1.1 mg/kg*
Acenaphthene	*18.0*	*0.3 mg/kg*
Fluorene	*19.7*	*0.4 mg/kg*
Phenanthrene	*22.7*	*1.8 mg/kg*
Anthracene	*22.8*	*0.3 mg/kg*
Fluoranthene	*26.4*	*0.8 mg/kg*
Pyrene	*27.1*	*0.5 mg/kg*
Benzo(a)anthracene	*30.9*	*0.1 mg/kg*
Chrysene	*31.0*	*0.1 mg/kg*
Benzo(a)pyrene	*36.1*	*0.02 mg/kg*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg ppb*
Toluene	*< 100.0 ug/kg ppb*
4-Nitrophenol	*< 3.0 ug/kg ppb*
2-chlorophenol	*< 0.6 ug/kg ppb*
2,46-trichlorophenol	*< 0.9 ug/kg ppb*
Pentachlorophenol	*< 2.3 ug/kg ppb*
2-methyl,4,6-dinitrophenol	*< 4.0 ug/kg ppb*
tetrachlorophenol	*< 1.6 ug/kg ppb*

Joe Kuzo

NAME: F-6870,F-2,100 GMC:0.5 ML,3 ULC,15:1 .-LIT FRN 11-03
MISC: 3-29-84,JK



COMPOUNDS FOUND

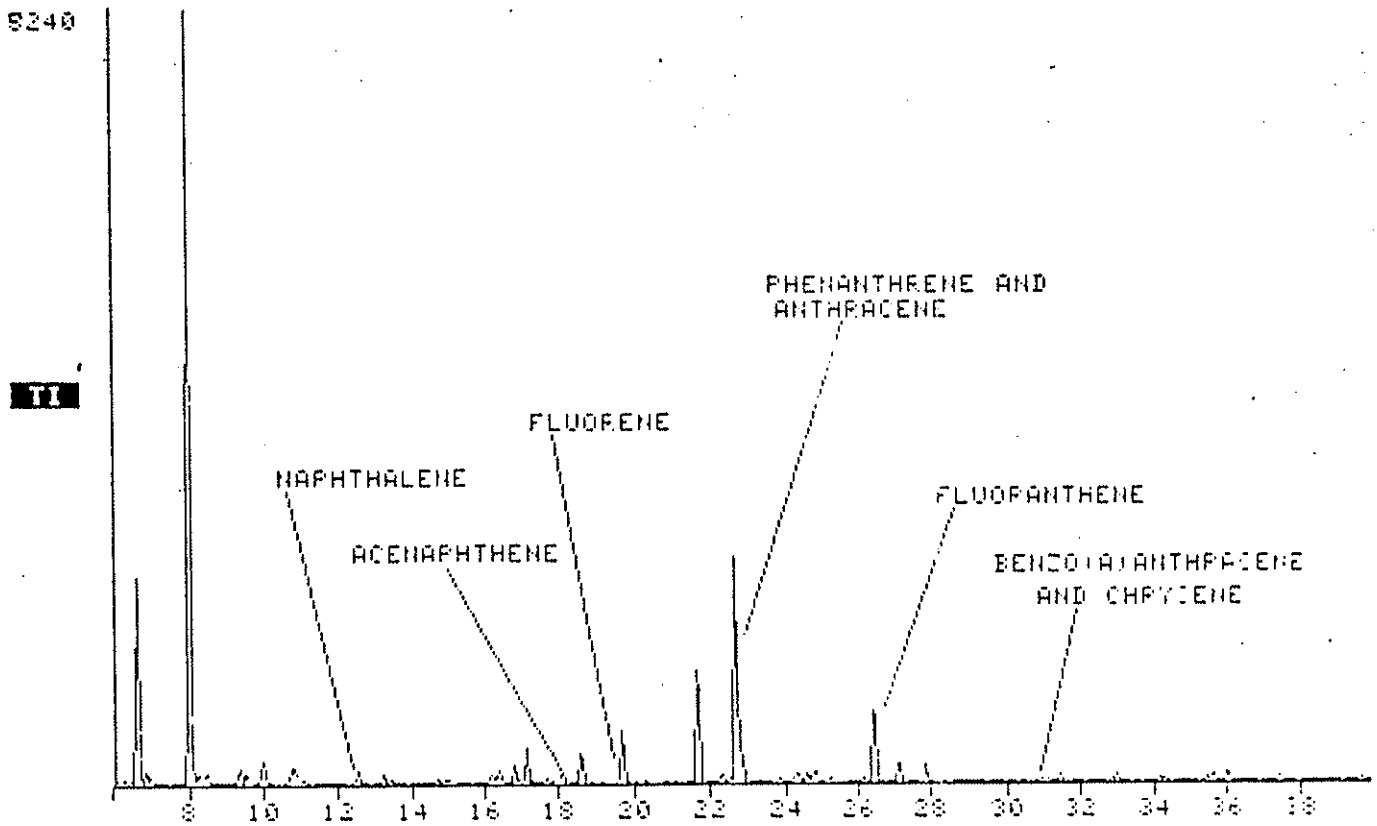
NAME	*RETENTION TIME(minutes)*	*CONCENTRATION*
Naphthalene	*12.5*	*12 ug/kg*
Fluorene	*19.7*	*1.1 ug/kg*
Phenanthrene	*22.7*	*14.6 ug/kg*
Anthracene	*22.9*	*2.2 ug/kg*
Fluoranthene	*26.5*	*4.8 ug/kg*
Pyrene	*27.1*	*2.5 ug/kg*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg ppb*
Toluene	*< 100.0 ug/kg ppb*
Benzo(a)pyrene	*< 0.2 ug/kg ppb*
4-Nitrophenol	*< 3.0 ug/kg ppb*
Phenol	*< 0.4 ug/kg ppb*
2-chlorophenol	*< 0.6 ug/kg ppb*
2,4-dimethylphenol	*< 0.6 ug/kg ppb*
2,4,6-trichlorophenol	*< 0.9 ug/kg ppb*
Pentachlorophenol	*< 2.3 ug/kg ppb*
2-methyl,4,6-dinitrophenol	*< 0.9 ug/kg ppb*
tetrachlorophenol	*< 1.6 ug/kg ppb*

Joe Kuss

NAME H-6870,6-4,100 GMS:0.5 ML,6 UL:,15:1 SPLIT FRN :1704
MISC 3-29-84,JK



COMPOUNDS FOUND

NAME	*RETENTION TIME (minutes)*	*CONCENTRATION*
Naphthalene	*12.5*	*4.0 ug/kg*
Acenaphthene	*18.1*	*2.4 ug/kg*
Fluorene	*19.7*	*9.2 ug/kg*
Phenanthrene	*22.7*	*49.0 ug/kg*
Anthracene	*22.8*	*9.8 ug/kg*
Fluoranthene	*26.5*	*19.2 ug/kg*
Pyrene	*27.1*	*6.4 ug/kg*
Benzo(a)Anthracene	*30.9*	*3.0 ug/kg*
Chrysene	*31.1*	*3.5 ug/kg*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg ppb*
Benzo(a)pyrene	*< .0.2 ug/kg ppb*
Toluene	*< 100.0 ug/kg ppb*
4-Nitrophenol	*< 3.0 ug/kg ppb*
Phenol	*< 0.4 ug/kg ppb*
2-chlorophenol	*< 0.6 ug/kg ppb*
2,4-dimethylphenol	*< 0.6 ug/kg ppb*
2,4,6-trichlorophenol	*< 0.9 ug/kg ppb*
Pentachlorophenol	*< 2.3 ug/kg ppb*
2-methyl,4,6-dinitrophenol	*< 4.0 ug/kg ppb*
Tetrachlorophenol	*< 1.6 ug/kg ppb*

Joe Kuss

MBA LABORATORIES
P.O. Box 9461 340 S. 66th St.
Houston, Texas 77261
(713)928-2701

LABORATORY REPORT #: H-6855

SAMPLE SUBMITTED BY: ROLLINS

DATE RECEIVED: 3-28-84

DATE COMPLETED: 4-2-84

SAMPLE IDENTIFICATION: FIVE SOIL SAMPLES

THE SAMPLE WAS ANALYZED BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY, USING A HEWLETT-PACKARD MODEL #5985 GC/MS SYSTEM.

SAMPLE PREPARATION

1. BASE NEUTRALS, ACID EXTRACTABLES
   50 GMS OF SAMPLE WAS PLACED INTO A STAINLESS STEEL BLENDER ALONG WITH 50 GMS OF SODIUM SULFATE. 150 MLS OF METHYLENE CHLORIDE WAS ADDED, AND THE SAMPLE WAS BLENDED FOR 5 MINUTES AT HIGH SPEED. THE EXTRACT WAS FILTERED THROUGH GLASS WOOL INTO A KJERNA-DANISH CONCENTRATOR. TWO MORE EXTRACTIONS WERE MADE, USING 50 MLS. OF METHYLENE CHLORIDE, AND THESE WERE ADDED TO THE ORIGINAL EXTRACT. THE SAMPLE EXTRACT WAS THEN CONCENTRATED TO 0.25 MLS. FOR GC/MS ANALYSIS. NEXT, THE SOIL WAS ACIDFIED, AND AGAIN 3 EXTRACTIONS WERE PERFORMED JUST LIKE THE NEUTRAL FRACTION. THIS EXTRACT WAS ALSO CONCENTRATED TO 0.25 MLS, AND THIS WAS COMBINED WITH THE NEUTRAL EXTRACT AND ANALYZED.
2. BENZENE AND TOLUENE
   2 GMS OF SOIL WAS PLACED INTO A VIAL ALONG WITH 5 MLS. OF METHYLENE CHLORIDE. THESE WERE SONICATED FOR 10 MINUTES, AND SHAKEN FOR 1 HOUR ON A SHAKER TABLE. THIS EXTRACT WAS THEN INJECTED DIRECTLY INTO THE GC/MS FOR ANALYSIS.
3. SOIL SAMPLES HEAVILY CONTAMINATED
   TWO OF THE SAMPLES WERE OBVIOUSLY OILY. 1 GM. OF EACH WAS PLACED INTO A VIAL, THE SOIL WAS ACIDIFIED, AND 10 MLS. OF METHYLENE CHLORIDE WAS ADDED. THE SAMPLES WERE SONICATED FOR 10 MINUTES, AND SHAKEN FOR 1 HOUR ON A SHAKER TABLE.

THE SAMPLE WAS ANALYZED FOR THE FOLLOWING SUBSTANCES: *SPECIFIC ORGANICS*

Joe Krenz

THE GC/MS PARAMETERS WERE AS FOLLOWS:

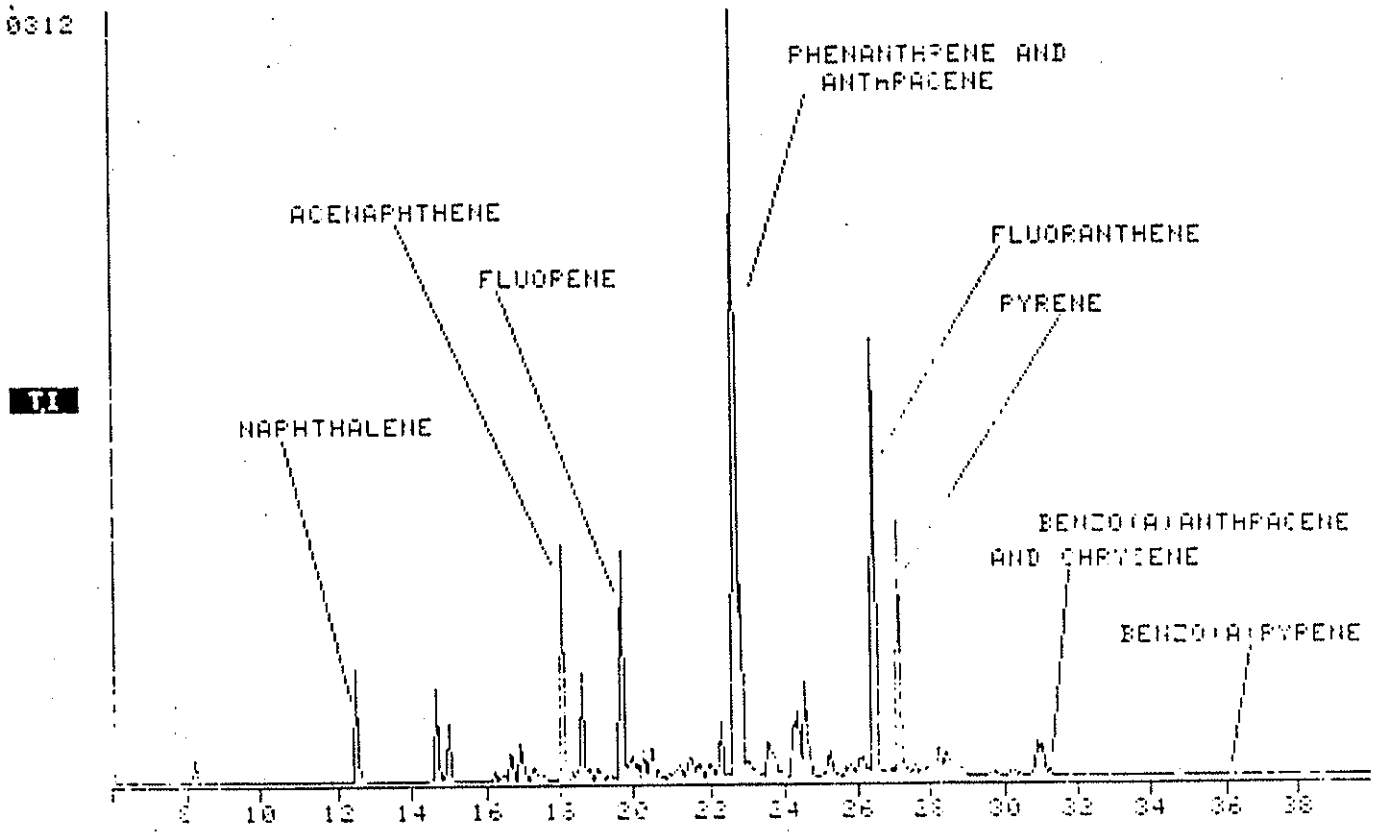
COLUMN - 30 METER FUSED SILICA CAPILLARY COATED WITH SPB-5
CARRIER GAS - HELIUM @ 30 CM/SEC (0.9 ML/MIN)
INJECTOR TEMP - 260 DEGREES
COLUMN TEMP - 3 MIN @ 50 DEGREES, THEN 8 DEGREES PER MINUTE TO 280 DEGREES, HOLD @ 280 DEGREES
INJECTION MODE - SPLIT
SPLIT RATIO - 15:1

GC/MS INTERFACE - DIRECT
IONIZATION MODE - ELECTRON IMPACT
ELECTRON ENERGY - 70 V
MASS RANGE SCANNED - 33 TO 360 AMU
SCAN TIME - 0.4 SEC

COPIES OF THE TOTAL ION CHROMATOGRAMS ARE INCLUDED WITH THIS REPORT. ALL GC/MS DATA IS PERMANENTLY STORED AT MBA LABORATORIES ON MAGNETIC TAPE.

Joe Kerr

NAME --8SST,HIGH CONC.,1GM:10ML.MECL2,1 UL,15:1 SPLIT FRN 11609
DISC 3-2?-84,JK



COMPOUNDS FOUND

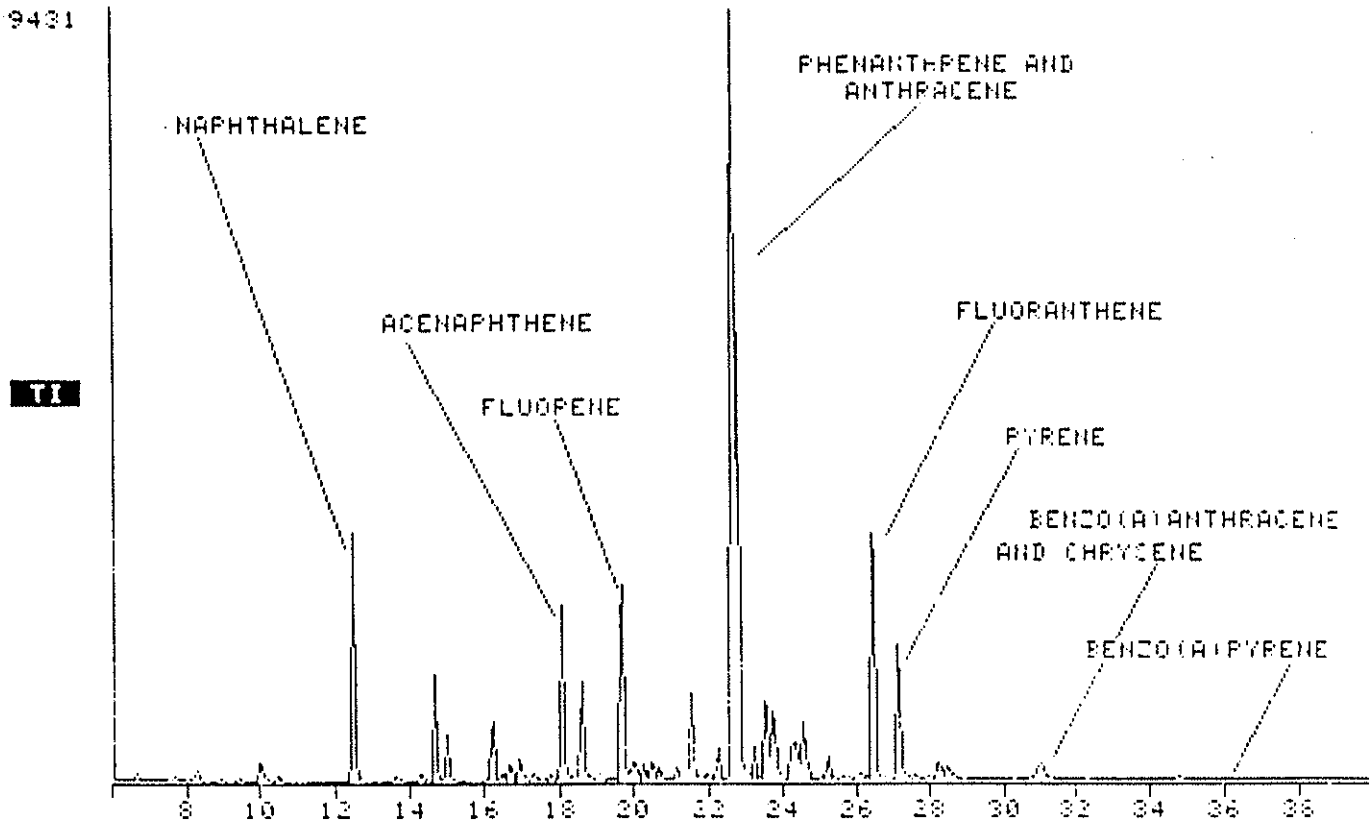
	NAME	RETENTION TIME (minutes)		CONCENTRATION (mg/kg, ppm)		
1.	Benzo(a)anthracene	30.9	mins.	280	mg/kg	(ppm)
2.	Chrysene	31.1	"	231	"	"
3.	Benzo(a)pyrene	36.1	"	231	"	"
4.	Phenanthrene	22.7	"	3329	"	"
5.	Fluoranthene	26.5	"	2438	"	"
6.	Anthracene	22.8	"	697	"	"
7.	Pyrene	27.1	"	1497	"	"
8.	Benzo(a)anthracene	30.9	"	280	"	"
9.	Chrysene	31.1	"	231	"	"
10.	Benzo(a)Pyrene	36.1	"	60	"	"

COMPOUNDS NOT FOUND

	NAME	DETECTION LIMIT
1.	Benzene	< 0.10 mg/kg
2.	Toluene	< 0.10 mg/kg
3.	Phenol	< 0.4 mg/kg
4.	4-Nitrophenol	< 3.4 mg/kg
5.	2-Chlorophenol	< 0.6 mg/kg
6.	2,4 - dimethylphenol	< 0.6 mg/kg
7.	2,4,6,-trichlorophenol	< 1.1 mg/kg
8.	Pentachlorophenol	< 2.7 mg/kg
9.	2-methyl, 4,6 - dinitrophenol	<24.0 mg/kg
10.	Tetrachlorophenol	< 1.6 mg/kg

Joe Kreml

NAME H-6855,INTERMEDIATE,1GM:10 ML,2 ULS,15:1 SPLIT FRN 1:210
MISC 3-29-84,JK



COMPOUNDS FOUND

NAME	*RETENTION TIME(minutes)*	*CONCENTRATION (mg/kg, ppm)*
1. *Naphthalene*	*12.5 minutes*	*620 mg/kg (ppm)*
2. *Acenaphthene*	*18.1 minutes*	*228 mg/kg (ppm)*
3. *Fluorene*	*19.7 minutes*	*328 mg/kg (ppm)*
4. *Phenanthrene*	*22.7 minutes*	*1350 mg/kg (ppm)*
5. *Anthrocene*	*22.8 minutes*	*951 mg/kg (ppm)*
6. *Fluoranthene*	*26.4 minutes*	*636 mg/kg (ppm)*
7. *Pyrene*	*27.1 minutes*	*383 mg/kg (ppm)*
8. *Benzo(a) Anthracene*	*30.9 minutes*	*58 mg/kg (ppm)*
9. *Chrysene*	*31.1 minutes*	*69.2 mg/kg (ppm)*
10. *Benzo(a)pyrene*	*36.2 minutes*	*11 mg/kg (ppm)*

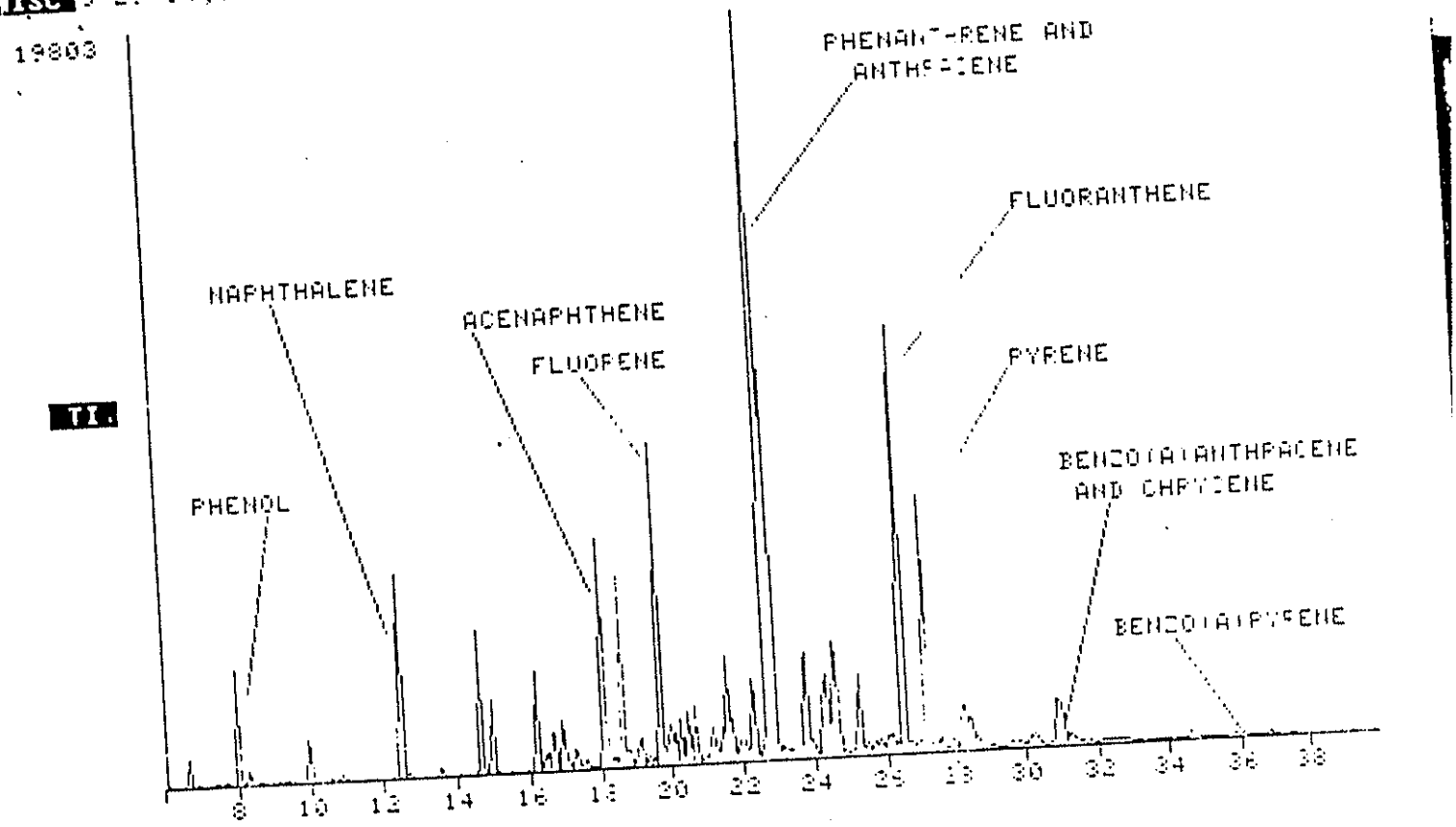
Joe Krenz

COMPOUNDS NOT FOUND

NAME	DETECTION LIMIT
1). Benzene	< 0.10 mg/kg
2). Toluene	< 0.10 mg/kg
3). Phenol	< 0.2 mg/kg
4). 4-Nitrophenol	< 1.7 mg/kg
5). 2-Chlorophenol	< 0.3 mg/kg
6). 2,4 - dimethyl phenol	< 0.3 mg/kg
7). 2,4,6 - trichlorophenol	< 0.5 mg/kg
8). Pentachlorophenol	< 1.4 mg/kg
9). 2-methyl, 4,6 - dinitrophenol	<12.0 mg/kg
10). Tetrachlorophenol	< 0.8 mg/kg

Joe Krese

NAME H-6855,LOW CON:,100 GM:0.5 ML,1 UL,15:1 SPLIT
MISC 3-29-84,JH



COMPOUNDS FOUND

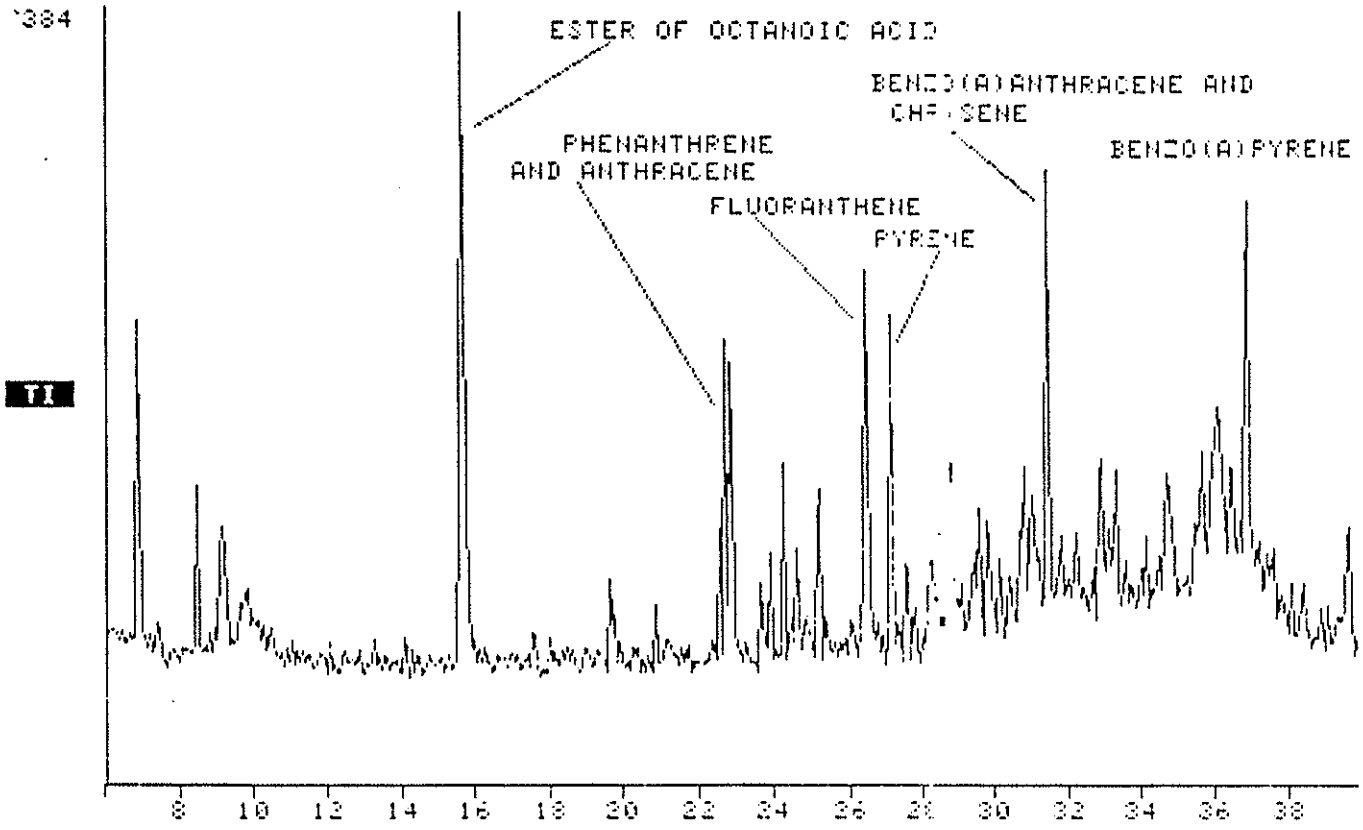
	NAME	RETENTION TIME (minutes)	CONCENTRATION
1).	Phenol	8.6	0.203 mg/kg
2).	Naphthalene	12.5	1.05 mg/kg
3).	Acenaphthene	18.1	0.630 mg/kg
4).	Fluorone	19.7	1.159 mg/kg
5).	Phenanthrene	22.7	10.3 mg/kg
6).	Anthracene	22.8	3.4 mg/kg
7).	Pyrene	27.1	2.7 mg/kg
8).	Fluoranthene	26.4	5.0 mg/kg
9).	Pyrene	27.1	2.7 mg/kg
10).	Fluoranthene	26.4	5.0 mg/kg
11).	Benzo(a)anthracene	30.9	0.6 mg/kg
12).	Chrysene	31.1	0.5 mg/kg
13).	Benzo(a)pyrene	36.2	0.1 mg/kg

COMPOUNDS NOT FOUND

	NAME	DETECTION LIMIT
1).	Benzene	< 0.100 mg/kg
2).	Toluene	< 0.100 mg/kg
3).	4-Nitrophenol	< 0.018 mg/kg
4).	2-Chlorophenol	< 0.004 mg/kg
5).	2,4-dimethylphenol	< 0.004 mg/kg
6).	2,4,6-Trichlorophenol	< 0.005 mg/kg
7).	Pentachlorophenol	< 0.014 mg/kg
8).	Tetrachlorophenol	< 0.096 mg/kg
9).	2-methyl,4,6-deinitrophenol	< 0.024 mg/kg

Joe Kressel

NAME H-6855,BACK GD-1,100 GMS:0.5 ML,1 UL,15:1 SPLIT FRN 11612
MISC 3-29-84,JK



COMPOUNDS FOUND

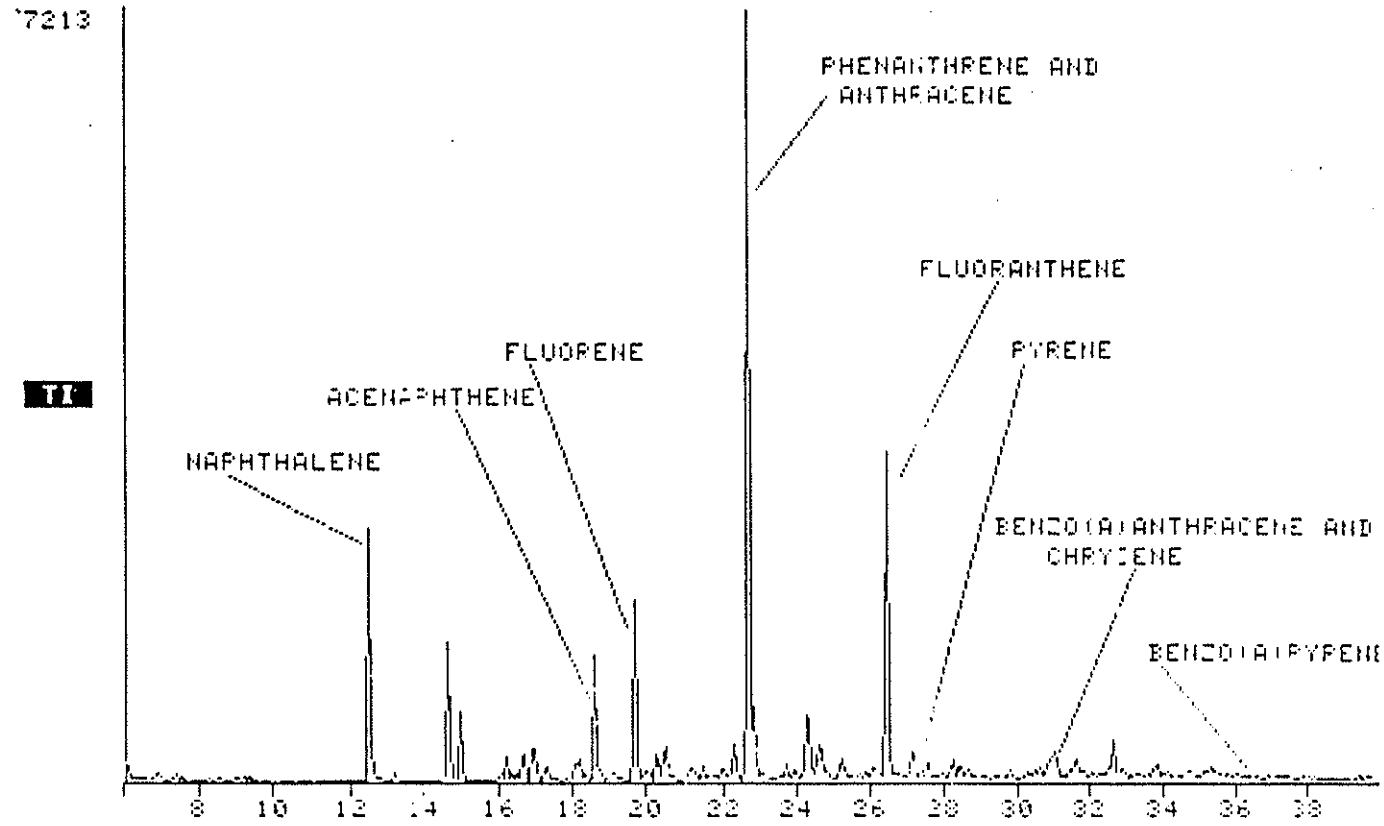
NAME	*RETENTION TIME (minutes)*	*CONCENTRATION*
Fluorene	*19.7*	*5.0 ug/kg=ppb*
Phenanthrene	*22.7*	*41.0 ug/kg=ppb*
Anthracene	*22.9*	*56.0 ug/kg=ppb*
Fluoranthene	*26.5*	*55.0 ug/kg=ppb*
Pyrene	*27.2*	*47.0 ug/kg=ppb*
Benzo(a)antracene	*30.9*	*22.0 ug/kg=ppb*
Chrysene	*31.0*	*22.0 ug/kg=ppb*
Benzo(a)pyrene	*36.1*	*14.0 ug/kg=ppb*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg*
Toluene	*< 100.0 ug/kg*
4-Nitrophenol	*< 18.0 ug/kg*
Phenol	*< 2.4 ug/kg*
2-Chlorophenol	*< 3.6 ug/kg*
2,4-dimethylphenol	*< 3.6 ug/kg*
2,4,6-trichlorophenol	*< 5.4 ug/kg*
Pentachlorophenol	*< 13.8 ug/kg*
2-methyl, 4,6-dinitrophenol	*< 24.0 ug/kg*
Tetrachlorophenol	*< 9.6 ug/kg*

Joe Krend

NAME 4-6855,GD-2,BACK,100 GMS:0.5 ML,2 ULS,15:1 SPLIT FRN 11613
MISC 3-29-84,JK



COMPOUNDS FOUND

NAME	*RETENTION TIME*	*CONCENTRACTION*
Naphthalene	*12.5*	*240.0 ug/kg=ppm*
Acenapthene	*18.1*	*5.0 ug/kg=ppm*
Fluorene	*19.7*	*119.0 ug/kg=ppm*
Phenanthrene	*22.7*	*627.0 ug/kg=ppm*
Anthracene	*22.8*	*62.0 ug/kg=ppm*
Fluoranthene	*26.5*	*303.0 ug/kg=ppm*
Pyrene	*27.1*	*13.0 ug/kg=ppm*
Benzo(a)antracene	*30.9*	*36.0 ug/kg=ppm*
Chrysene	*31.1*	*37.0 ug/kg=ppm*
Benzo(a)pyrene	*35.9*	*5.0 ug/kg=ppm*

COMPOUNDS NOT FOUND

NAME	*DETECTION LIMIT*
Benzene	*< 100.0 ug/kg*
Toluene	*< 100.0 ug/kg*
4-Nitrophenol	*< 9.0 ug/kg*
Phenol	*< 1.2 ug/kg*
2-chlorophenol	*< .1.8 ug/kg*
2,4-dimethylphenol	*< 1.8 ug/kg*
2,4,6-trichlorophenol	*< 2.7 ug/kg*
Pentachlorophenol	*< 6.9 ug/kg*
2-methyl,4,6-dinitrophenol	*< 12.0 ug/kg*
Tetrachlorophenol	*< 4.8 ug/kg*

Joe Krezel

7. Monitoring Well Installation Report

Professional Service Industries, Inc.
National Soil Services Division

Report No. 286-45062
April 25, 1984

Rollins Environmental Services, Inc.
P. O. Box 609
Deer Park, Texas 77536

Attention: Mr. Daniel W. Bridge
Project Manager

MONITOR WELL INSTALLATIONS
CREOSOTE FACILITY
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

Gentlemen:

Submitted here is our report relative to the installation of monitor wells at the above referenced facility. This work was verbally authorized during the latter part of March, 1984.

Monitor wells were installed at locations staked by Rollins and as shown on the plan, Plate 1. Descriptions of the soils encountered, together with installation details for the wells, are shown on the logs of borings, Plates 2 through 6.

Drilling was done with a truck mounted rotary rig. The initial location, SP-1, was wash bored to a completion depth of 50 feet and the cuttings were visually classified by a geotechnician, in order to determine the soils stratigraphy. Boring SP-2, located within five feet of SP-1, was dry augered into the sand stratum at a depth of 14 feet and water level measurements were made to verify the presence of groundwater. The borehole was then advanced to completion depth by the rotary

wash method. The screen and pipe were inserted in the borehole and sand, bentonite pellets and grout were placed in the annulus. A well protector, consisting of a section of four inch steel pipe with a locking cap, was grouted in place at the surface. Boreholes at locations SP-3 through SP-5 were made using the rotary wash method, and the wells were installed as at SP-2. On completion of the installations, an air compressor was used to surge and pump each well.

We appreciate the opportunity to perform this work for you. Should you have any questions or need additional information, please feel free to call.

Very truly yours,

NATIONAL SOIL SERVICES DIVISION

Darryl E. Carlson,
Chief Geologist

DEC:ig
Copies submitted: 3

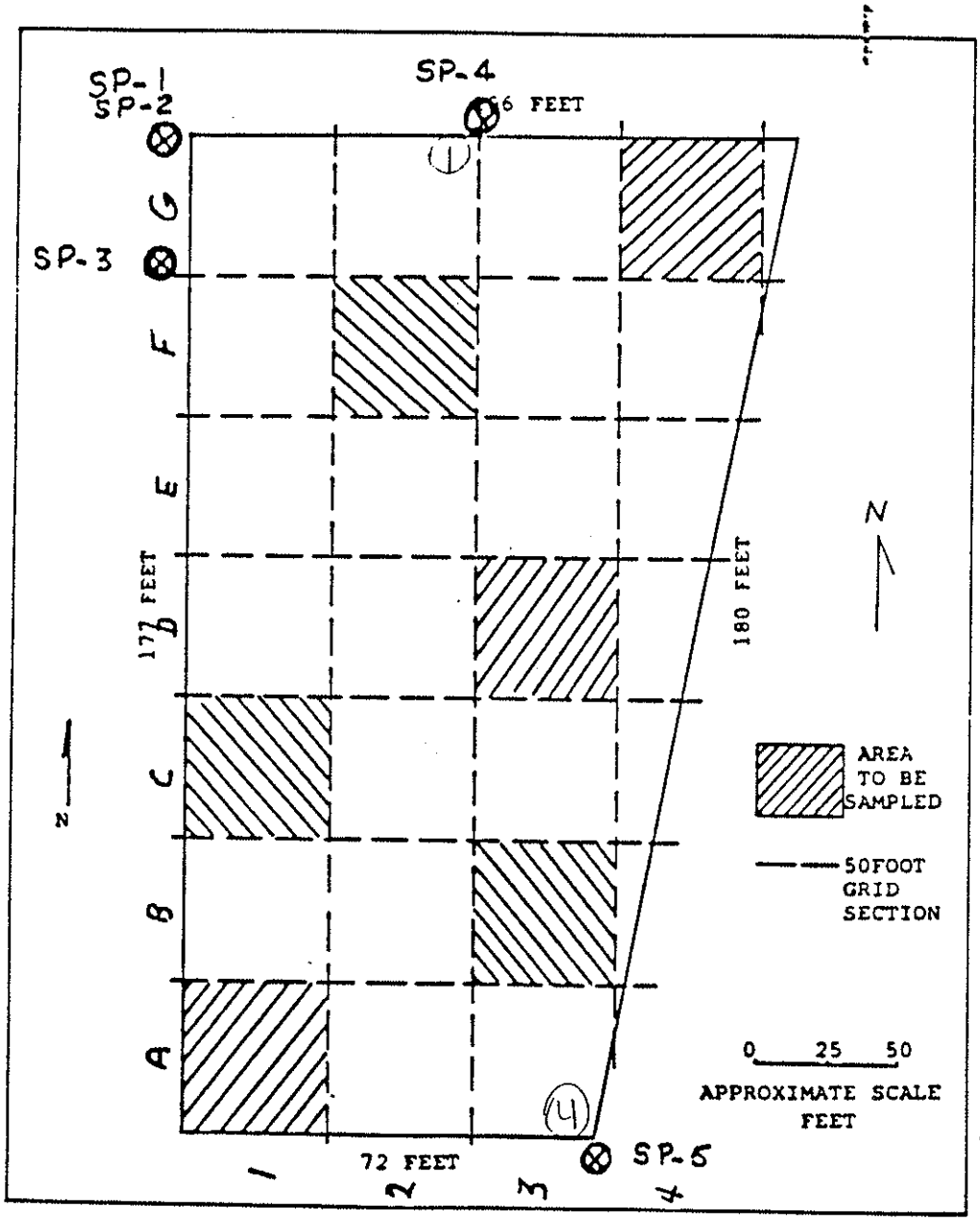


Figure 1.
Creosote facility at
Southern Pacific Transportation Company
Houston, Texas

⊗ MONITORING WELLS

JOB No. 286-45062

LOG OF BORING No. SP-1 (2)

MONITOR WELL INSTALLATIONS
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

TYPE BORING: Wash

LOCATION: See Plate 1

DEPTH, FT.	SAMPLE No.	SAMPLE	SOIL DESCRIPTION	MONITOR WELL INSTALLATION
			SUR. ELEV.:	
0			Black sandy clay	NOTE: This boring was made to determine soil stratigraphy, and therefore a well was not installed. A well was installed in SP-2, located within five feet of SP-1.
5			- tan and light gray below 3' - light gray and tan below 5'	
10			- tan and light gray below 12'	
15			Tan sand	
20			Tan and light gray clay	
25				
30			Tan and light gray clay w/sand seams	
35				
40			Red clay	
45			Tan and light gray clay w/sand seams	
50			Note: Backfilled with cuttings on completion.	

COMPLETION DEPTH: 50'
DATE: April 17, 1984

DEPTH TO WATER:
DATE:

NATIONAL SOIL SERVICES
CONSULTING ENGINEERS

PLATE 2

JOB No. 286-45062

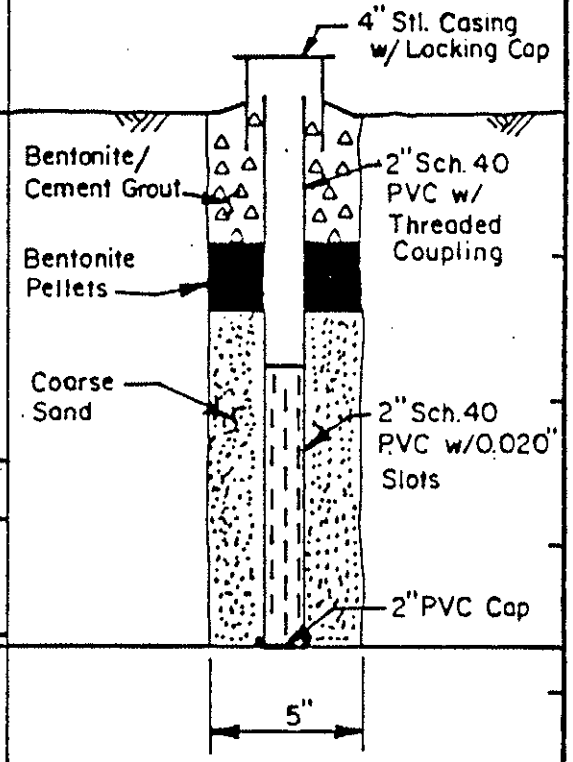
LOG OF BORING No. SP-2 (2)

MONITOR WELL INSTALLATIONS
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

TYPE BORING: Auger & Wash

LOCATION: See Plate 1

DEPTH, FT.	SAMPLE No.	SAMPLE	SOIL DESCRIPTION	MONITOR WELL INSTALLATION
			SUR. ELEV.:	
0			Dark gray clay - light gray and tan w/calcareous nodules below 7' - tan and light gray w/silt pockets 10' - 11'	
10			Light gray silty clay	
15			Tan and light gray sand w/chemical odor - free water at 14'	
20			Light gray clay	



COMPLETION DEPTH: 18.5'
DATE: April 17, 1984

DEPTH TO WATER:
DATE:

NATIONAL SOIL SERVICES CONSULTING ENGINEERS

PLATE 3

JOB No. 286-45062

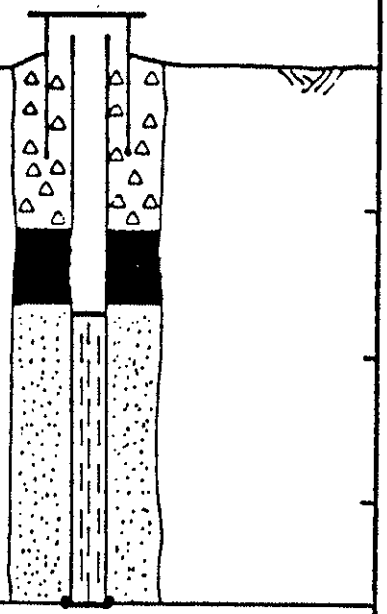
LOG OF BORING No. SP-3 (3)

MONITOR WELL INSTALLATIONS
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

TYPE BORING: Wash

LOCATION: See Plate 1

DEPTH, FT.	SAMPLE No.	SAMPLE	SOIL DESCRIPTION	MONITOR WELL INSTALLATION
			SUR. ELEV.:	
0			Black sandy clay	
5			- tan and light gray below 3'	
			- light gray and tan below 7'	
10			- tan and light gray w/sand seams below 9'	
15			Tan and light gray sand	
20				
25				
30				
35				
40				
45				



Note:
For Description Of Material Used, See Plate 3.

COMPLETION DEPTH: 18.5'
DATE: April 17, 1984

DEPTH TO WATER:
DATE:

JOB No. 286-45062

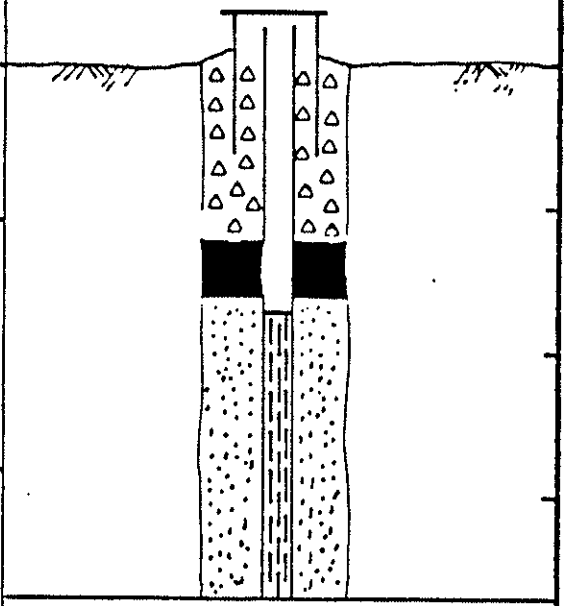
LOG OF BORING No. SP-4 (1)

MONITOR WELL INSTALLATIONS
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

TYPE BORING: Wash

LOCATION: See Plate 1

DEPTH, FT.	SAMPLE No.	SAMPLE	SOIL DESCRIPTION	MONITOR WELL INSTALLATION
			SUR. ELEV.:	
0			Red clay - black below 3'	
5			Light gray and tan sandy clay - tan and light gray below 9'	
10				
15			Light gray and tan sand	
20				
25				
30				
35				
40				
45				



Note:
For Description Of Material Used, See Plate 3.

COMPLETION DEPTH: 18.5'
DATE: April 17, 1984

DEPTH TO WATER:
DATE:

NES / NATIONAL SOIL SERVICES
CONSULTING ENGINEERS

JOB No. 286-45062

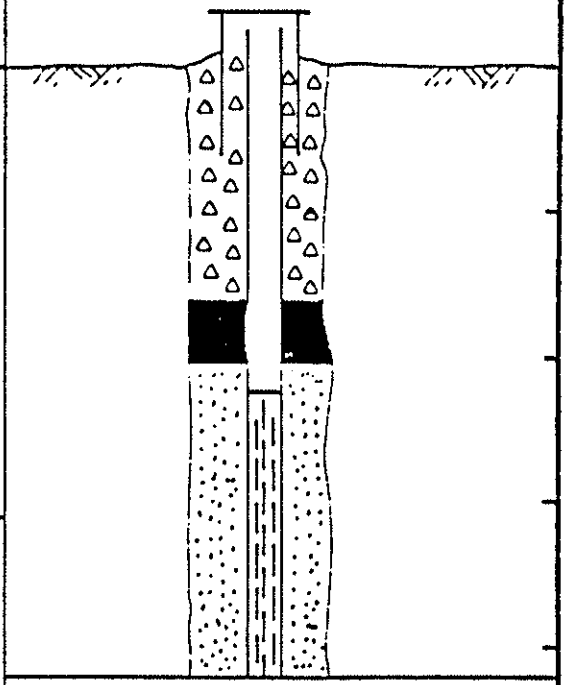
LOG OF BORING No. SP-5 (4)

MONITOR WELL INSTALLATIONS
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HOUSTON, TEXAS

TYPE BORING: Wash

LOCATION: See Plate 1

DEPTH, FT.	SAMPLE No.	SAMPLE	SOIL DESCRIPTION	MONITOR WELL INSTALLATION
			SUR. ELEV.:	
0			Tan and dark gray sandy clay	
			- dark gray below 3'	
5			- light gray and tan below 7'	
10			- tan and light gray w/calcareous nodules below 12'	
15			Light gray sand	
20				
25				
30				
35				
40				
45				



Note:
For Description Of Material Used, See Plate 3.

COMPLETION DEPTH: 21'
DATE: April 18, 1984

DEPTH TO WATER:
DATE:

NATIONAL SOIL SERVICES
CONSULTING ENGINEERS

PLATE 6

8. "Closure of Facilities" Letter by
Independent Registered Engineer

ETC ENGINEERS, INC.
Engineering Technical Construction Services For Industry
510 COLLEGE SO. HOUSTON, TEXAS 77587 713/941-8420

April 18, 1984

Texas Department of Water Resources
P.O. Box 13087, Capitol Station
Austin, Texas 78711

CLOSURE OF FACILITIES

This is a statement of the closure of a creosote tank bottom surface impoundment (RCRA Facility #31547) at the Southern Pacific Transportation Company facility, 4910 Liberty Road, Houston, Texas.

The owner has removed all the impoundment materials in accordance with Texas Administrative Code Section 335.286a. The excavated area has been backfilled and compacted with clay soil. Four ground-water monitoring wells have been constructed. This system will be monitored for one year. If after one year it is determined that there is no affect on the ground-water, there is sufficient proof that the impoundment is clear of any contamination.

I hereby certify that I have examined the facility and being familiar with the provisions of the Texas Administrative Code Subchapter N, Surface Impoundment Sections 335.281-335.288 attest that this closure has been conducted in accordance with good engineering practices.

Henry T. Gramann

Printed Name
of

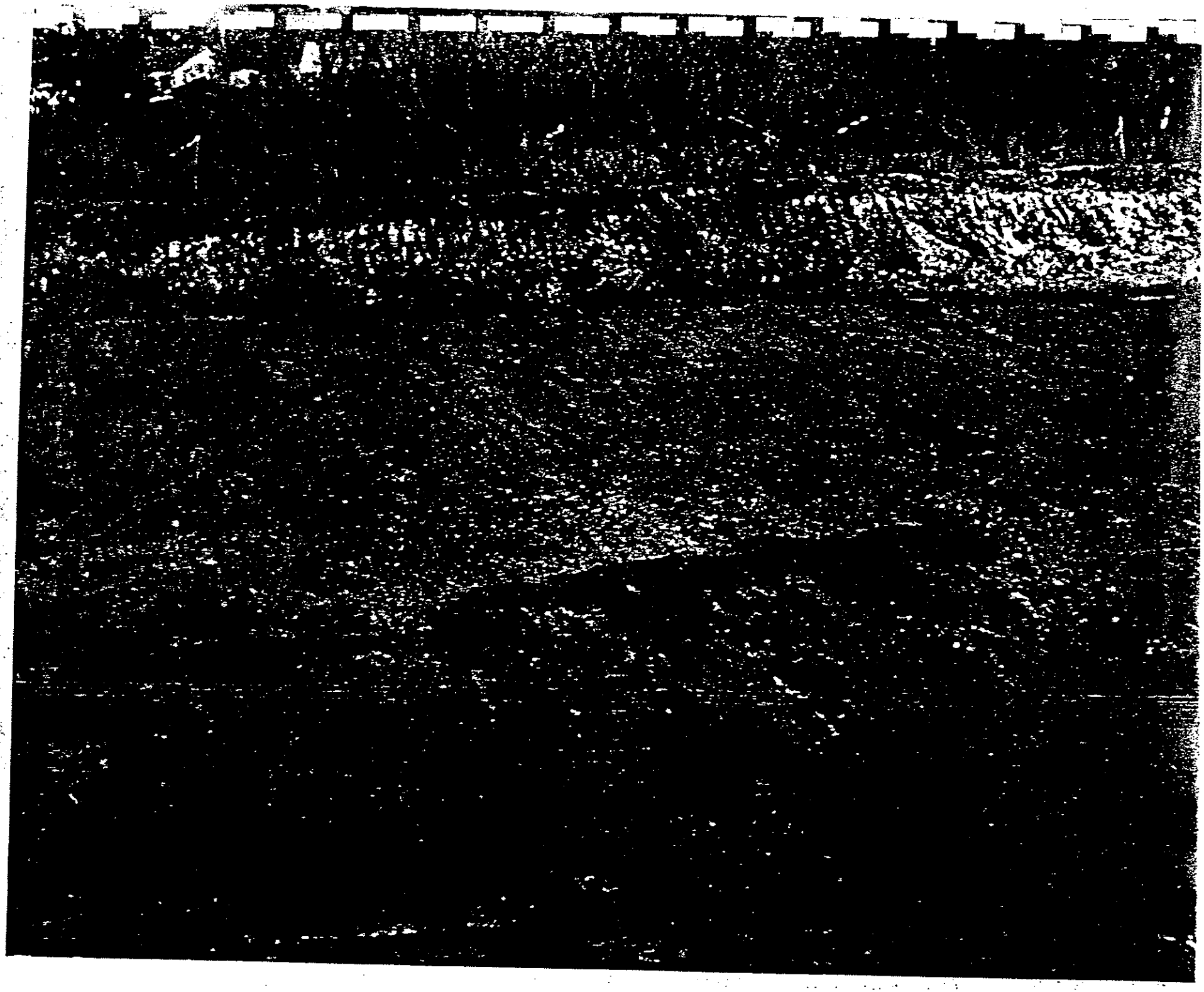
Henry T. Gramann

Signature of
Registered Professional Engineer
Regis. No. 28163 State Texas

Date April 18, 1984

APPENDIX B

PROJECT PHOTOGRAPHS



APPENDIX B

DETECTED HAZARDOUS AND SOLID WASTE CONSTITUENT LIMITS

TABLE III - CORRECTIVE ACTION PROGRAM
Table of Detected Hazardous and Solid Waste Constituents and
Concentration Limits for the Ground-Water Protection Standard

Closed Surface Impoundment (NOR Unit No. 001, SWMU No. 01)

A-Transmissive Zone		B-Transmissive Zone	
COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)	COLUMN A Hazardous Constituents	COLUMN B Concentration Limits (mg/l)
Acenaphthene	1.5[PCL]	Acenaphthene	1.5[PCL]
Acenaphthylene	1.5[PCL]	Acenaphthylene	1.5[PCL]
Anthracene	7.3[PCL]	Anthracene	7.3[PCL]
Dibenzofuran	0.098[PCL]	Dibenzofuran	0.098[PCL]
Bis(2-ethylhexyl)phthalate	0.006[PCL]	Bis(2-ethylhexyl)phthalate	0.006[PCL]
Fluoranthene	0.98[PCL]	Fluoranthene	0.98[PCL]
Fluorene	0.98[PCL]	Fluorene	0.98[PCL]
2-Methylnaphthalene	0.098[PCL]	Di-n-butyl phthalate	2.4[PCL]
Naphthalene	0.49[PCL]	Naphthalene	0.49[PCL]
Phenanthrene	0.73[PCL]	Phenol	7.3[PCL]
Pyrene	0.73[PCL]	Pyrene	0.73[PCL]

PCL Alternate Concentration Limit pursuant to 30 TAC §335.160(b) based upon the Protective Concentration Level determined under 30 TAC Chapter 350 for Residential Land Use. The PCL value, Column B, will change as updates to the rule are promulgated. Changes to the rule automatically change the concentration value established in Column B in this table.

APPENDIX 3D

REQUEST FOR PRELIMINARY REVIEW OF AREA OF CONTAMINATION (AOC)

PBW

Consulting Engineers and Scientists

PASTOR, BEHLING & WHEELER, LLC
2201 Double Creek Drive, Suite 4004
Round Rock, TX 78664

Tel (512) 671-3434
Fax (512) 671-3446

November 20, 2014
PBW Project No. 1358

Ms. Maureen Hatfield
MC-127
VCP-CA Section, Team 1, Remediation Division
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Re: Request for Preliminary Review of Area of Contamination (AOC)
Houston Wood Preserving Works Facility
4910 Liberty Road Facility, Houston, Texas
Post-Closure Care Permit No. HW-50343; Industrial SWR No. 31547

Dear Ms. Hatfield:

Pastor, Behling & Wheeler, LLC (PBW), on behalf of Union Pacific Railroad Company (UPRR), is pleased to submit the following information regarding the proposed Area of Contamination (AOC) approach for the UPRR Houston Wood Preserving Works site (the Site) in Houston, Texas. As discussed in the preamble to the National Contingency Plan (55FR 8758-8760, March 8, 1990), the United States Environmental Protection Agency (EPA) clarified that movement of hazardous wastes within certain discrete areas of generally dispersed contamination (called "areas of contamination" or "AOCs") would not be considered land disposal and would not trigger the RCRA land disposal restrictions. As a result, a RCRA facility owner/operator with a large contiguous area of soil contamination could consolidate such soils into a single area or engineered unit within an AOC without triggering the RCRA land disposal restrictions or minimum technology requirements[1]. For the purposes of this AOC, the area of contamination is defined at the Site by the Soil Affected Property and Protective Concentration Level (PCL) Exceedance (PCLE) Zones (Figure 1).

UPRR is proposing to use the AOC policy for surface soils with critical PCL (cPCL) exceedances in the Sothern Drainage Ditch (SDD) (SWMU 2), Inactive Wastewater Lagoon (Area of Concern 6), and areas north of the Aboveground Storage Tank (AST) Area (SWMU 8) (Figure 1). Surface soils with cPCL exceedances in these areas will be consolidated within AOC around SWMUs 4, 5, and 8. Soils removed from the proposed excavation areas will be conducted under Remedy Standard A. The removal action is designed to remove surface soils containing chemicals of concern (COCs) at concentrations exceeding cPCLs as shown on Figure 2. The soils will be excavated to the vertical extent of the PCLE zone, estimated to be a maximum of approximately 3 feet deep (no greater than 5 feet deep). Soils will be placed within the AOC near SWMU 4, 5 and 8 and covered with an engineered soil cap (Figure 1).

[1] U.S. EPA, 1996. *Use of the Area of Contamination (AOC) Concept During RCRA Cleanups*. EPA Memorandum, March 13.

Verification sampling will be performed at the excavation areas following excavation of soils to ensure that the affected soils containing COCs at concentrations in excess of the applicable cPCLs have been removed. A closure report will be submitted with the overall Response Action Completion Report (RACR) following completion of the proposed response actions detailed in the Response Action Plan (RAP) that will be submitted to the Texas Commission on Environmental Quality (TCEQ) in December 2014. Details on the post-closure care of the proposed soil cap and associated financial assurance will be provided in the RAP.

Based on the current areas delineated, the estimated volume of soil to be consolidated is approximately 23,000 cubic yards. However, prior to consolidation of the soils and construction of the cap, additional soil samples will be collected to refine the surface soil PCLE Zone to ensure the proper area to be excavated and for the construction of the cap area (Figures 1 and 2). The additional soil sampling will be conducted to also evaluate the representative concentrations of COCs in surface soil using statistics assuming a ½-acre default area for the current surface soil PCLE Zone near the Inactive Waste Water Lagoon (AOC 6) and the southern end of the SDD (SWMU 2) in accordance with 30 TAC §350.51(l). The proposed additional sampling was developed based on at least eight surface soil samples collected within a ½-acre exposure area. The 95 percent upper confidence limit (UCL) of the arithmetic mean for each ½-acre study area will be calculated using PRO UCL and the Student's *t*-statistic. Soil data sets will be evaluated for outliers to identify hot spots for excavation. The primary COC in this area defining the PCLE Zone is benzo(a)pyrene, which limiting PCL is the $^{Tot}Soil_{Comb}$ PCL.

During consolidation activities, Site workers will operate under a site-specific health and safety plan (HASP) and impacted soils will be consolidated within the surface soil Affected Property. Any equipment and tooling that comes in contact with impacted soils will be decontaminated and managed within the AOC. Storm water protection (i.e., Storm Water Pollution Prevention Plan (SWPPP), silt fencing) and fugitive dust monitoring for site-related COCs will be conducted during remediation activities to ensure the activities will not result in additional exposure conditions. Upon completion of verification sampling, the excavation area will be restored by backfilling with clean fill and/or grading.

The estimated schedule for the proposed activities regarding soil consolidation within the AOC consists of the following:

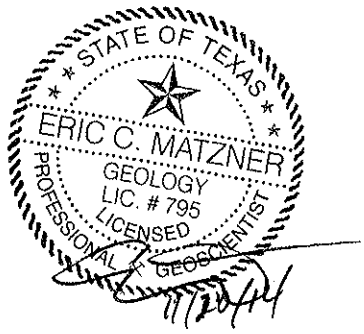
- Additional soil sampling to confirm the soil excavation area within AOC 6/SWMU 2 and for the soil cap area in the Former HWPW – Within 60 days of RAP Approval;
- HWPW Area Surface Soil Response Action (soil consolidation and cap construction, to be refined following additional soil sampling of HWPW area) – Begin 120 days of RAP Approval with an anticipated 180 days for completion;
- RACR – Within 60 days of completion of response actions.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Geoffrey Reeder of UPRR at (281) 350-7197.

Sincerely,

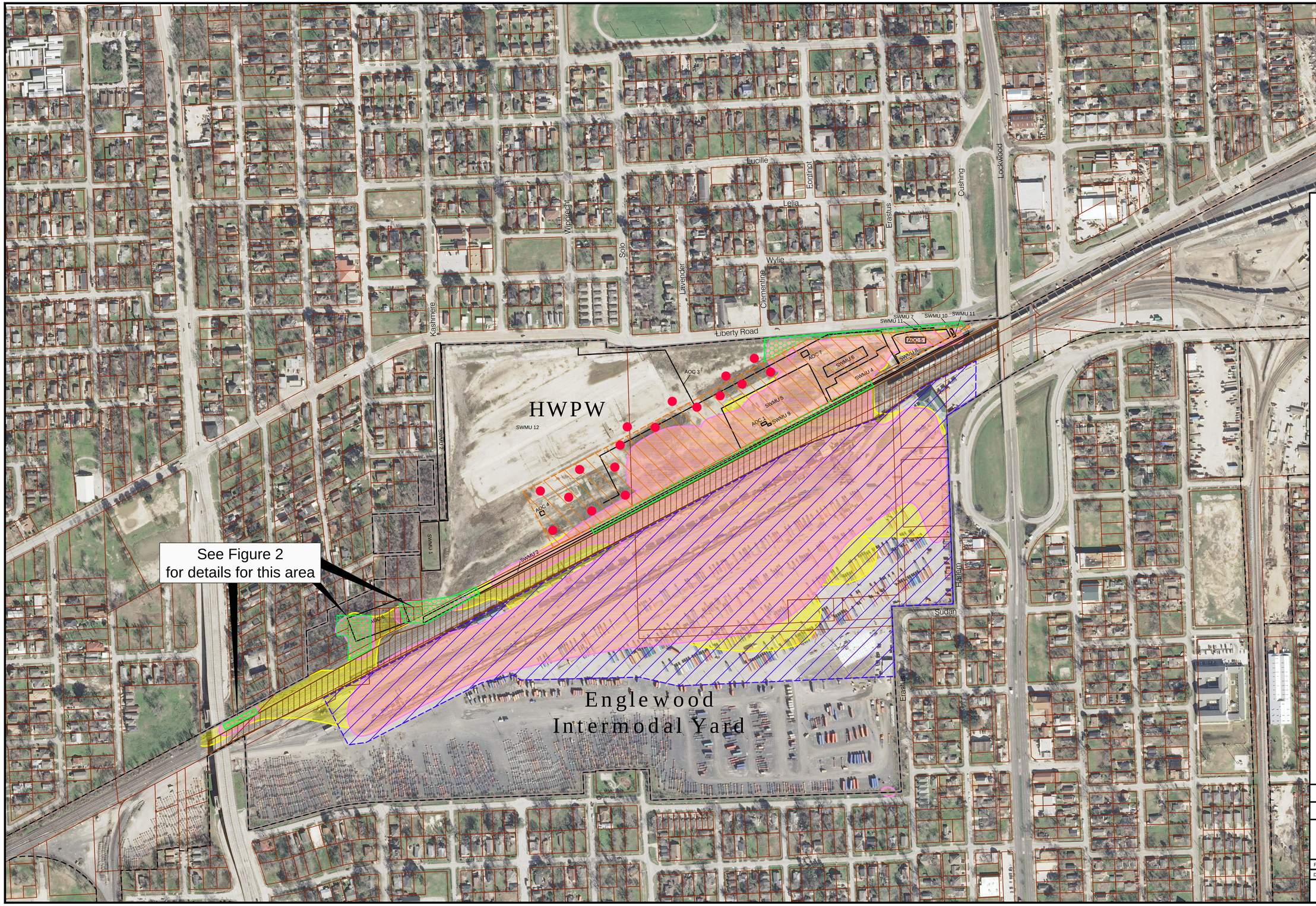
PASTOR, BEHLING & WHEELER, LLC

Eric C. Matzner, P.G.
Associate Hydrogeologist



cc: Mr. Geoffrey Reeder, P.G., UPRR – Spring, TX

AREA OF CONTAMINATION FIGURES



EXPLANATION

- UPRR Property Boundary
- Property Boundary (GIMS)

Area of Contamination:

- Soil Affected Property
- Soil PCLE Zone
- Railroad Ballast Cap Area
- Concrete Cap Area
- Extent of Soil Cap
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area
- Proposed Surface Soil Boring

Note:
Vertical datum based on City of Houston Vertical Datum (HVD).

SWMU/AOC AREAS

No.	Description
SWMU 1	Closed Surface Impoundment
SWMU 2	Northern and Southern Drainage Ditches
SWMU 4	Recent Process Area
SWMU 5	Original Process Area
SWMU 6	Water Treatment and Boiler System
SWMU 7	Tank Car Storage Area
SWMU 8	Aboveground Storage Tank Area
SWMU 9	Location of Former UST No. 44-023-05
SWMU 10	Location of Former Sap Water Treatment Tank
SWMU 11	Oil/Water Separators
SWMU 12	Railroad Tie Storage Area
AOC 1	Diesel Storage Tank
AOC 3	Contaminated Portion of City Water Line
AOC 4	Location of Former Incinerator
AOC 5	City Storm Sewer
AOC 6	Inactive Wastewater Lagoon
AOC 7	Location of Former UST No. 44-023-21

Note:
Locations of SWMU-9 and AOCs 1, 3, 5 and 7 area approximate.

N

Scale in Feet

0 200 400

Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Figure 1

RESPONSE ACTION DESIGN SOILS

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

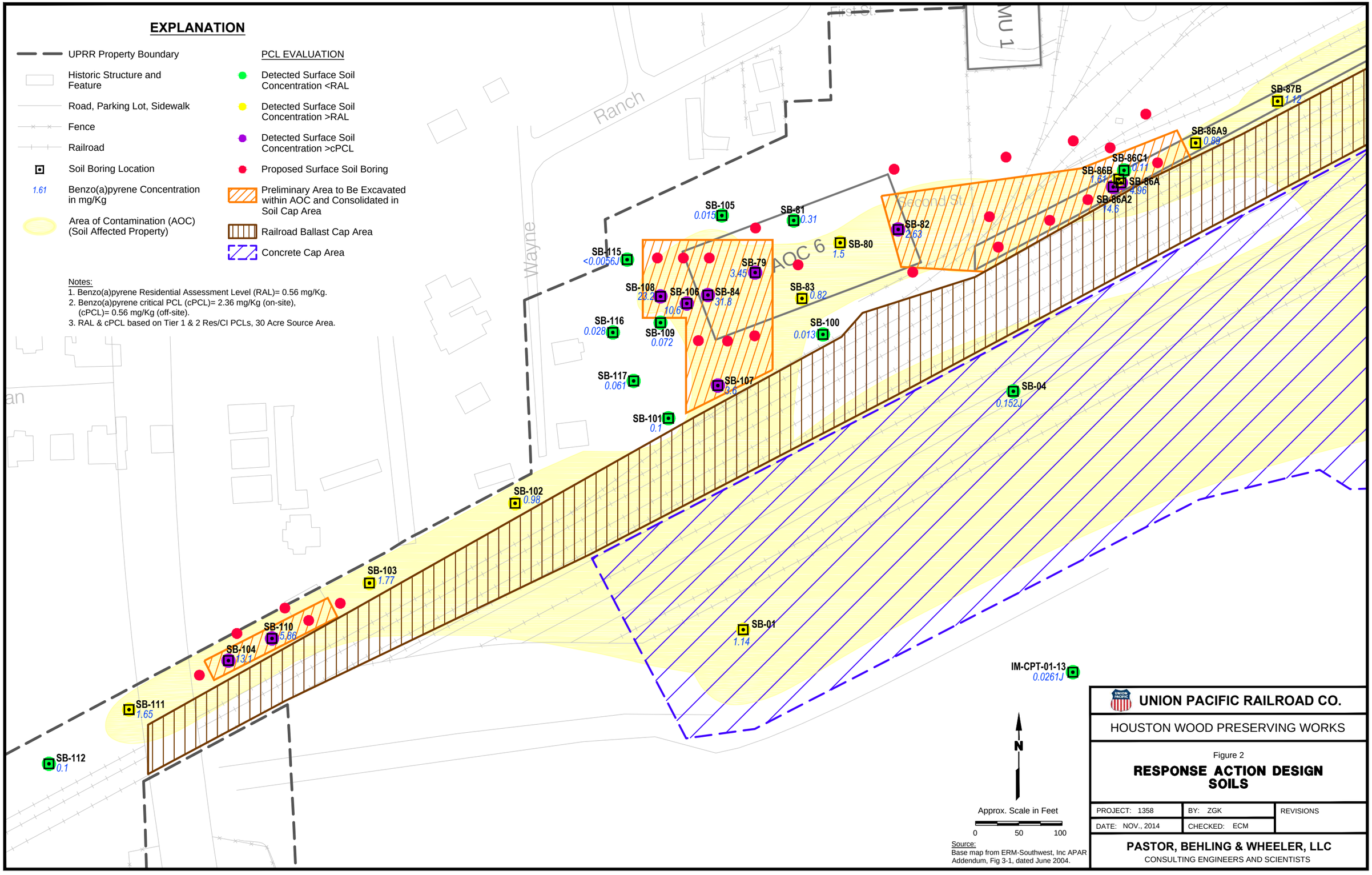
EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- Soil Boring Location
- 1.61 Benzo(a)pyrene Concentration in mg/Kg
- Area of Contamination (AOC) (Soil Affected Property)

PCL EVALUATION

- Detected Surface Soil Concentration <RAL
- Detected Surface Soil Concentration >RAL
- Detected Surface Soil Concentration >cPCL
- Proposed Surface Soil Boring
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area
- Railroad Ballast Cap Area
- Concrete Cap Area

Notes:
1. Benzo(a)pyrene Residential Assessment Level (RAL)= 0.56 mg/Kg.
2. Benzo(a)pyrene critical PCL (cPCL)= 2.36 mg/Kg (on-site), (cPCL)= 0.56 mg/Kg (off-site).
3. RAL & cPCL based on Tier 1 & 2 Res/CI PCLs, 30 Acre Source Area.



Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Figure 2

RESPONSE ACTION DESIGN SOILS

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

APPENDIX 4

PROPOSED INSTITUTIONAL CONTROLS

APPENDIX 4A – PROPOSED ON-SITE DEED RECORDATION

DEED NOTICE

STATE OF TEXAS §
COUNTY OF § KNOW ALL MEN BY THESE PRESENTS THAT:
HARRIS §

This Notice is filed to provide information concerning certain environmental conditions and/or use restrictions pursuant to the Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) found at 30 Texas Administrative Code (TAC), Chapter 350, and affects the real property (Property) described as follows:

(Exhibit A, the legal description of the entire recorded tract of land held by UPRR including the former HWPW Area, Englewood Intermodal Yard, and railroad ballast area)

Portions of the soil and groundwater underlying the Property contain identified chemicals of concern causing those portions of the Property to be considered an Affected Property as that term is defined in the TRRP. The portion considered to be Affected Property is described as follows:

(The Affected Property is more particularly described by metes and bounds on Exhibit A, attached hereto and incorporated herein by reference, and depicted on the map portion of Exhibit A.)

As detailed in the Response Action Plan (RAP) (PBW, 2014), target COCs in soil and groundwater media were detected within the Affected Property and Protective Concentration Level (PCL) Exceedance (PCLE) Zone in surface and subsurface soils.

PCLE Zones

Soils

Comparing the surface and subsurface soil analytical data to the appropriate critical PCLs, concentrations of 15 COCs exceeded their respective critical PCLs:

Surface Soils

- 1,2-Diphenylhydrazine
- 2,4-Dinitrotoluene
- 2-Methylnaphthalene
- Benzene
- Benzo(a)anthracene
- Benzo(a)pyrene
- Dibenzofuran
- Naphthalene
- Pentachlorophenol
- Arsenic
- Lead

Subsurface Soils

- 2-Methylnaphthalene
- Benzene
- Naphthalene
- Pentachlorophenol

Groundwater
Based on the maximum groundwater analytical data detailed in the RAP, concentrations of the following 23 target COCs exceeded their critical PCLs:

VOCs

- Benzene
- Ethylbenzene
- Methylene Chloride
- Toluene
- Vinyl Chloride

SVOCs

- 2,4-Dimethylphenol
- 2,6-Dinitrotoluene
- 2-Methylnaphthalene
- Acenaphthene*
- Anthracene *
- Benzo(a)anthracene
- Benzo(a)pyrene
- Bis(2-chloroethoxy)methane*
- Chlorobenzene
- Chrysene *
- Dibenzofuran
- Fluoranthene *
- Fluorene *
- Naphthalene
- Pentachlorophenol
- Phenanthrene *
- Phenol
- Pyrene *

* - COC only detected in wells with DNAPL present

Creosote DNAPL has been detected in the groundwater bearing units A-TZ, B-CZ, B-TZ, and C-TZ as noted in soil borings and monitoring wells.

This Notice is required for the following reasons:

Commercial/Industrial Land Use
The Affected Property currently meets TRRP standards for commercial/industrial land use, as the property may not be protective for residential use. If any person desires in the future to use the Property for residential purposes, the TCEQ must be notified at least 60 days in advance of such use and additional response actions may be necessary before the Property may be used for residential purposes. Persons contemplating a change in land use for the Property are encouraged to review the definitions for commercial/industrial and residential land use contained in TRRP as the definition of residential land use is broad.

Use of Physical Control on Soil
The Affected Property is subject to the TRRP requirements for properties containing concentrations of chemicals of concern in soil and is subject to the requirements in 30 TAC §350.33(e)(2) to prevent exposure to soils that contain a chemical of concern in excess of the protective concentration level. The attached Exhibit B describes and provides the location of the

physical control and extent of the soil that exceeds the TCEQ-approved protective concentration levels for certain chemicals of concern. The attached Exhibit C also describes the required maintenance and monitoring required for the physical control. This program must be implemented unless and until TCEQ approves any modification. This deed notice must not be removed or modified without prior approval from TCEQ.

Plume Management Zone

The Affected Property is subject to the TRRP requirements for properties with an area overlying a TCEQ-approved plume management zone (PMZ). A PMZ is defined as an area of groundwater containing concentrations of COCs exceeding the TCEQ-approved protective concentration levels for the site, plus any additional area allowed by the TCEQ in accordance with 30 TAC §350.33(f)(4). The undersigned has established a PMZ so that the chemicals of concern in the groundwater are managed such that human exposure is prevented and that other groundwater resources are protected. The attached Exhibit B provides the location and extent of the PMZ. The Response Action Plan (RAP) submitted for the Site describes the maintenance and monitoring required. The maintenance and monitoring is required until TCEQ approves some modification to those requirements. Exposure to groundwater within the PMZ for any purpose is not advised until such time that all of the chemicals of concern no longer exceed their respective PCLs. This deed notice must not be removed or modified without prior approval from TCEQ.

Non-Aqueous Phase Liquid

The Affected Property is subject to the TRRP requirements for the management of mobile NAPL. The attached Exhibit B provides the location and extent of the NAPL present at the Property. Drilling, excavation, and groundwater pumping within or into the NAPL zone is prohibited unless proper safeguards are taken to protect human health and safety from any hazards associated with the NAPL. Any NAPL removed during any future subsurface activity must be properly handled and managed in accordance with all applicable state and federal rules and regulations. This deed notice must not be removed or modified without prior approval from TCEQ.

As of the date of this notice, the record owner of fee title to the Property is
Union Pacific Railroad, with an address of 1400 Douglas Street, Omaha, Nebraska 68179.

For additional information, contact:

TCEQ
Central Records
12100 Park 35 Circle, Building E
Austin, TX 78753

Mail: TCEQ – MC 199
P.O. Box 13087
Austin, TX 78711-3087

TCEQ Program and Identifier No.: T2204

This Notice may be rendered of no further force or effect only by a superseding deed notice executed by the TCEQ or its successor agencies and filed in the same Real Property Records as those in which this Notice is filed.

EXECUTED this _____ day of _____, 20____.

Union Pacific Railroad [OWNER & RESPONDER]

By:_____

Name: Mr. Tony Love
Title: Assistant Vice President of Real Estate
Union Pacific Railroad Company, a Delaware Corporation

STATE OF NEBRASKA §
DOUGLAS COUNTY §

BEFORE ME, on this the _____ day of _____, Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation, known to me to be the person whose name is subscribed to the foregoing instrument, and he acknowledged to me that he executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this ___ day of _____, 20____.

_____

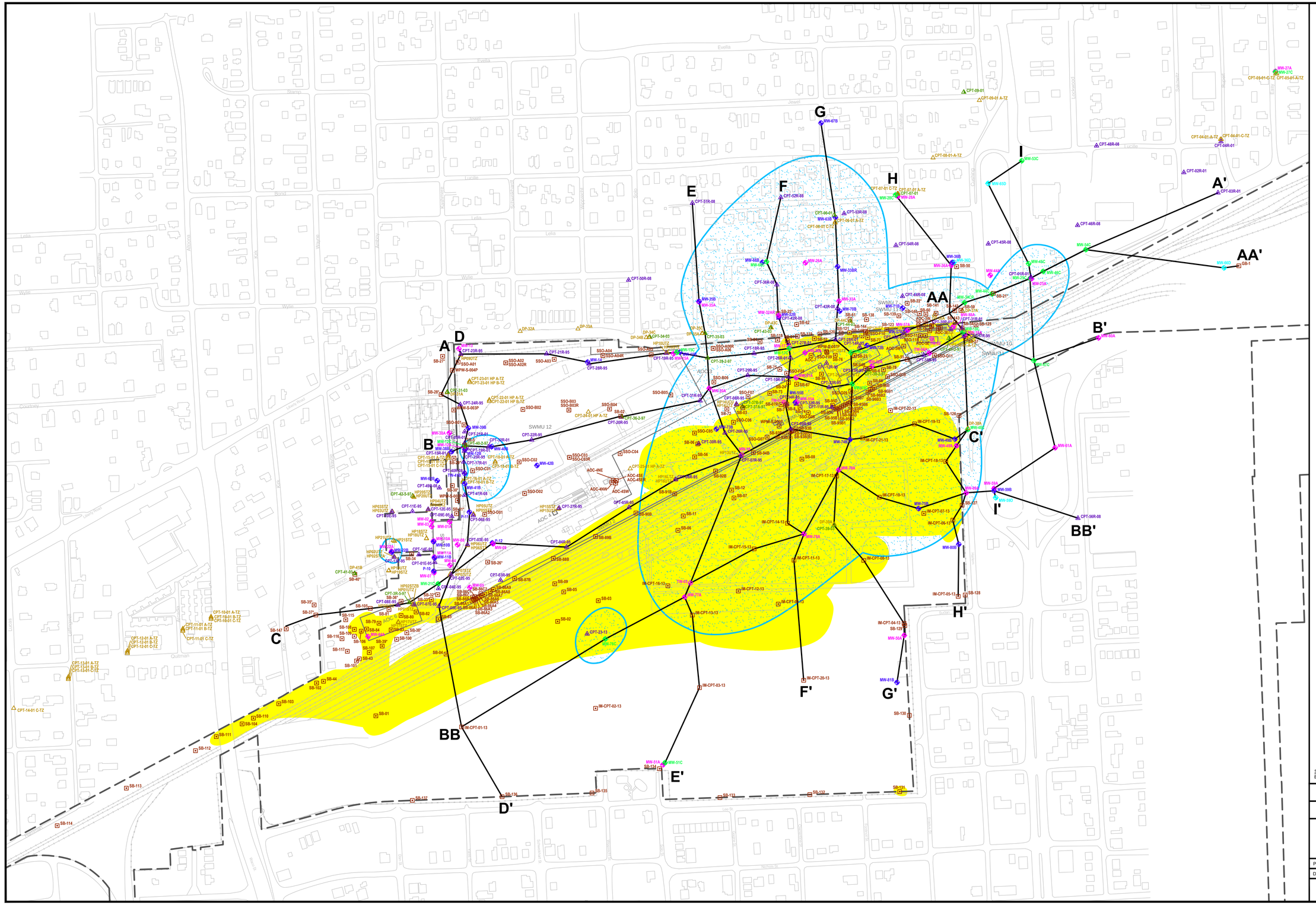
Notary Public in and for the State of Nebraska

County of _____

My Commission Expires: _____

EXHIBIT "A"
LEGAL DESCRIPTION OF AFFECTED PROPERTY

(to be surveyed following approval of Response Action Plan (RAP)



EXPLANATION

- UPRR Property Boundary
- Historic Structure and Feature
- Road, Parking Lot, Sidewalk
- Fence
- Railroad
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- A-TZ Temporary Monitoring Well Location
- CPT with Rost Location
- CPT Location
- Hydropunch Sample Location
- Soil Boring Location
- A A' Cross Section Location
- Soil Affected Property
- Groundwater Affected Property

Note:
* Soil analytical data rejected by validator.

SWMU/AOC AREAS

No.	Description
SWMU 1	Closed Surface Impoundment
SWMU 2	Northern and Southern Drainage Ditches
SWMU 4	Recent Process Area
SWMU 5	Original Process Area
SWMU 6	Water Treatment and Boiler System
SWMU 7	Tank Car Storage Area
SWMU 8	Aboveground Storage Tank Area
SWMU 9	Location of Former UST No. 44-023-05
SWMU 10	Location of Former Sap Water Treatment Tank
SWMU 11	Oil/Water Separators
SWMU 12	Railroad Tie Storage Area
AOC 1	Diesel Storage Tank
AOC 3	Contaminated Portion of City Water Line
AOC 4	Location of Former Incinerator
AOC 5	City Storm Sewer
AOC 6	Inactive Wastewater Lagoon
AOC 7	Location of Former UST No. 44-023-21

Note:
Locations of SWMU-9 and AOCs 1, 3, 5 and 7 area approximate.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED PROFESSIONAL GEOSCIENTIST

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

N

Scale in Feet
0 200 400

Source:
Base map from ERM-Southwest, Inc APAR Addendum, Fig 3-1, dated June 2004.

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Figure 1B

AFFECTED PROPERTY MAP

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

EXHIBIT "B"
LEGAL DESCRIPTION OF USE OF PHYSICAL CONTROL ON SOIL, EXTENT OF PMZ AND NAPL AREAS

(to be surveyed following approval of Response Action Plan (RAP)

EXPLANATION

- UPRR Property Boundary
- A-TZ Monitoring Well Location
- B-CZ/B-TZ Monitoring Well Location
- C-TZ Monitoring Well Location
- D-TZ Monitoring Well Location
- Soil Affected Property
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- Alternate Groundwater Point of Exposure (POE)
- Attenuation Monitoring Point (AMP)
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
- Proposed Well for PMZ
- Railroad Ballast Cap Area
- Concrete Cap Area
- Extent of Soil Cap
- Preliminary Area to Be Excavated within AOC and Consolidated in Soil Cap Area

Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Houston-Galveston Area Council (HGAC) 2012 Aerial.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

Lucille
Fontinot
Lelia
Wipprecht
Erastus
Cushing
Lockwood
Lavender
Clementine
Wylie
Kashmere
Liberty Road
Harlem
Sudan
Erastus

MW-67B
PMW-83B
PMW-84B
PMW-85C
MW-28C
MW-63B
MW-65D
MW-68C
MW-33BR
MW-26A
MW-36B
MW-36D
MW-44A (DNAPL)
MW-45C (DNAPL)
MW-46C (DNAPL)
MW-54C
MW-66D
PMW-82B
MW-35A
MW-36A
MW-34CR
MW-44C (DNAPL)
MW-25A
MW-32B (DNAPL)
MW-70B (DNAPL)
MW-18AR
MW-60A
MW-15C
MW-15A
MW-14
MW-17C
MW-47C
MW-39B
MW-48C
MW-61A
MW-38B
MW-12B (DNAPL)
MW-41B (DNAPL)
MW-62B
P-11
MW-59A
MW-59B
MW-59D
MW-69A
MW-75B (DNAPL)
MW-78A (DNAPL)
MW-80B
MW-22A
MW-22B
MW-21C
MW-77A
MW-76C
MW-50A
MW-81B
MW-51C

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED PROFESSIONAL GEOSCIENTIST

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Attachment 5A

POST-RESPONSE ACTION CARE MONITORING MAP

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

APPENDIX 4B – PROPOSED OFF-SITE RESTRICTIVE COVENANT

Exhibit 1

RESTRICTIVE COVENANT

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS THAT:
COUNTY OF HARRIS §

This Restrictive Covenant is filed to provide information concerning certain environmental conditions and use limitations pursuant to the Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program Rule (TRRP) found at 30 Texas Administrative Code (TAC), Chapter 350, and affects the real property (Property) described in Exhibit 1 attached hereto and incorporated herein by reference.

(Exhibit 1, the legal description of the entire recorded tract of land held by the owner executing this restrictive covenant, will be inserted here.)

Portions of the groundwater underlying the Property contain certain identified chemicals of concern (COCs) causing those portions of the Property to be considered an Affected Property as that term is defined in the TRRP. The portion considered to be Affected Property is described on Exhibit 2, which is part of the plume management zone shown in Exhibit 3 attached hereto and incorporated herein by reference.

This Restrictive Covenant is required for the following reasons:

> The Affected Property is subject to the TRRP requirements for properties with an area overlying a TCEQ-approved plume management zone. A plume management zone is defined as an area of groundwater containing concentrations of chemicals of concern exceeding the TCEQ-approved protective concentration levels for the site, plus any additional area allowed by the TCEQ in accordance with 30 TAC §350.33(f)(4). A plume management zone was established so that the chemicals of concern in the groundwater are managed such that human exposure is prevented and that other groundwater resources are protected. The attached Exhibit 3 provides the location and extent of the plume management zone and describes the maintenance and monitoring required. This maintenance and monitoring is required until TCEQ approves some modification of those requirements.

As of the date of this Restrictive Covenant, the record owner of fee title to the Property is_____ (Owner) with an address of _____.
In consideration of the Response Actions by Union Pacific (Responder), approval of the Response Action Completion Report, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Owner has agreed to place the following restrictions on the Property in favor of the TCEQ and the State of Texas, to-wit:

1. Exposure to groundwater underlying the Affected Property for any purpose is prohibited until such time when all of the chemicals of concern no longer exceed their respective protective concentration levels. The maintenance and monitoring described in Exhibit 3 is required. Any modification of this restrictive covenant is prohibited without prior approval of TCEQ.

2. These restrictions shall be a covenant running with the land.

For additional information, contact:

TCEQ
Central Records
12100 Park 35 Circle,
Building E
Austin, Texas 78753

Mail: TCEQ - MC 199
P O Box 13087
Austin, Texas 78711-3087

TCEQ Program and Identifier No.: TCEQ SWR No. 31547

This Restrictive Covenant may be rendered of no further force or effect only by a release executed by the TCEQ or its successor agencies and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

Executed this _____ day of _____, 2014.

[OWNER]
By: _____
Name: _____
Title: _____

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the _____ day of _____, 2014, personally appeared _____[name]_____, _____[title]_____, of [owner], known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the _____ day of _____, 2014.

Notary Public in and for the State of Texas,
County of Harris

My Commission Expires: _____

Executed this _____day of _____, 2014.

Union Pacific Railroad Company

By: _____
Name: _____
Title: _____

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the _____day of _____, 2014, personally appeared _____[name]_____ , _____[title]_____,of Union Pacific Railroad Company, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the _____ day of _____, 2014.

Notary Public in and for the State of Texas,
County of Harris

My Commission Expires: _____

Accepted as Third Party Beneficiary this _____day of _____, 2014.

Texas Commission on Environmental Quality

By: _____
Name: _____
Title: _____

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the _____ day of _____, 2014, personally appeared _____[name]_____ , _____[title]_____,of the Texas Commission on Environmental Quality, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the _____ day of _____, 2014.

Notary Public in and for the State of Texas,
County of Harris

My Commission Expires: _____

EXHIBIT 2

AFFECTED PROPERTY MAP

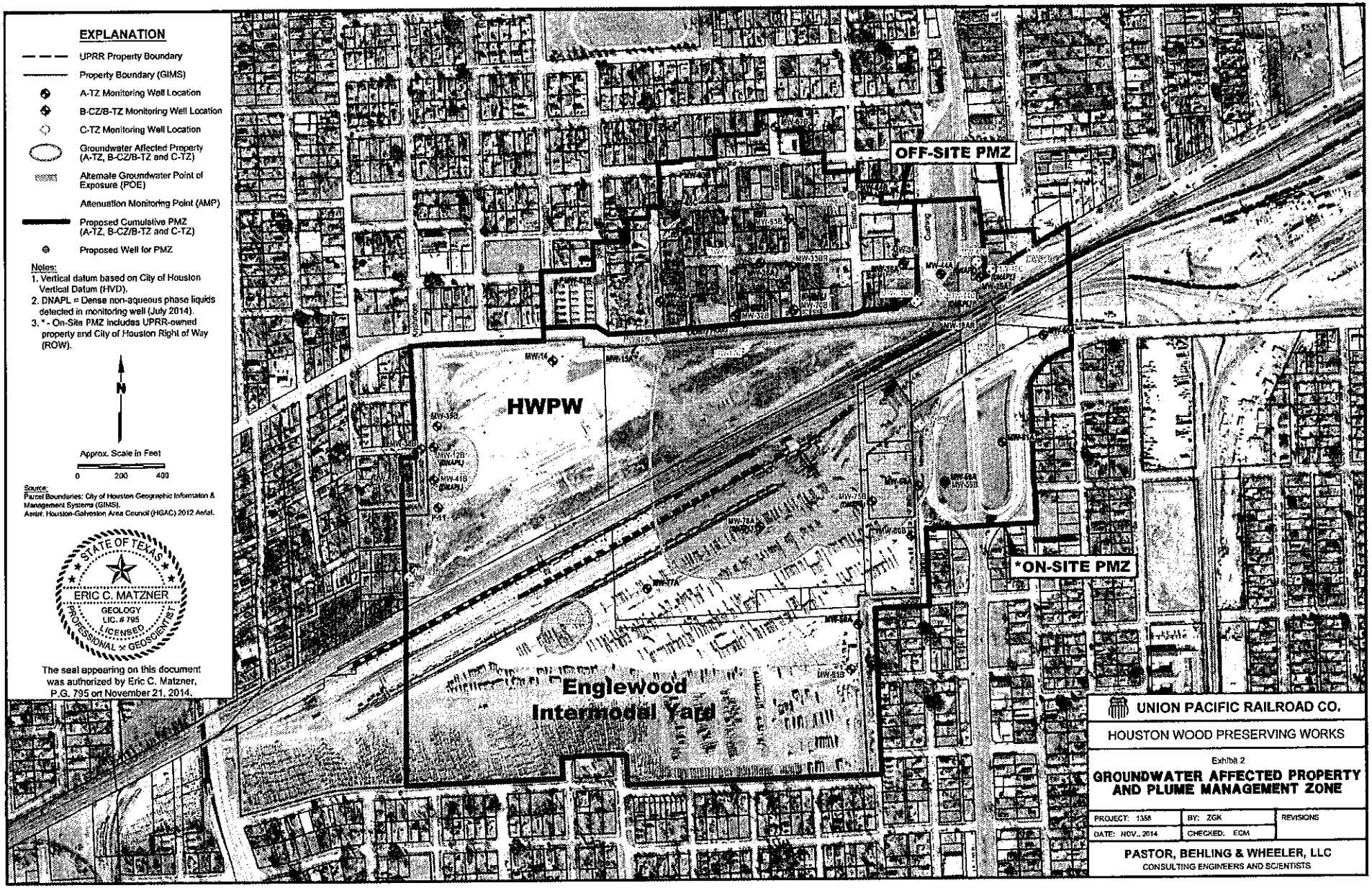

EXPLANATION
UPRR Property Boundary
Property Boundary (GIMS)
A-TZ Monitoring Well Location
B-CZ/B-TZ Monitoring Well Location
C-TZ Monitoring Well Location
Groundwater Affected Property (A-TZ, B-CZ/B-TZ and C-TZ)
Alternate Groundwater Point of Exposure (POE)
Attenuation Monitoring Point (AMP)
Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
Proposed Well for PMZ
Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. DNAPL = Dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).
N
Approx. Scale in Feet
0
200
400
Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.
STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST
The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.
OFF-SITE PMZ
HWPW
*ON-SITE PMZ
Englewood
Intermodal Yard
UNION PACIFIC RAILROAD CO.
HOUSTON WOOD PRESERVING WORKS
Exhibit 2
GROUNDWATER AFFECTED PROPERTY AND PLUME MANAGEMENT ZONE
PROJECT: 1358
BY: ZGK
REVISIONS
DATE: NOV., 2014
CHECKED: EGM
PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

EXHIBIT 3

PLUME MANAGEMENT ZONE MAP AND MAINTENANCE/MONITORING REQUIREMENTS

APPENDIX 5

LAND OWNER CONCURRENCE

APPENDIX 5

TABLE 1 – OFF-SITE LANDOWNER SUMMARY TABLE

FIGURE 1 – PROPOSED OFF-SITE PROPERTIES FOR RESTRICTIVE COVENANTS

FIGURE 2 – PROPOSED CITY OF HOUSTON ROW RESTRICTIVE COVENANT

INDIVISUAL LANDOWNERS – INSTITUTIONAL CONTROL RAP WORKSHEET 2.4

LANDOWNER CONCURRENCE – *IN PROGRESS*

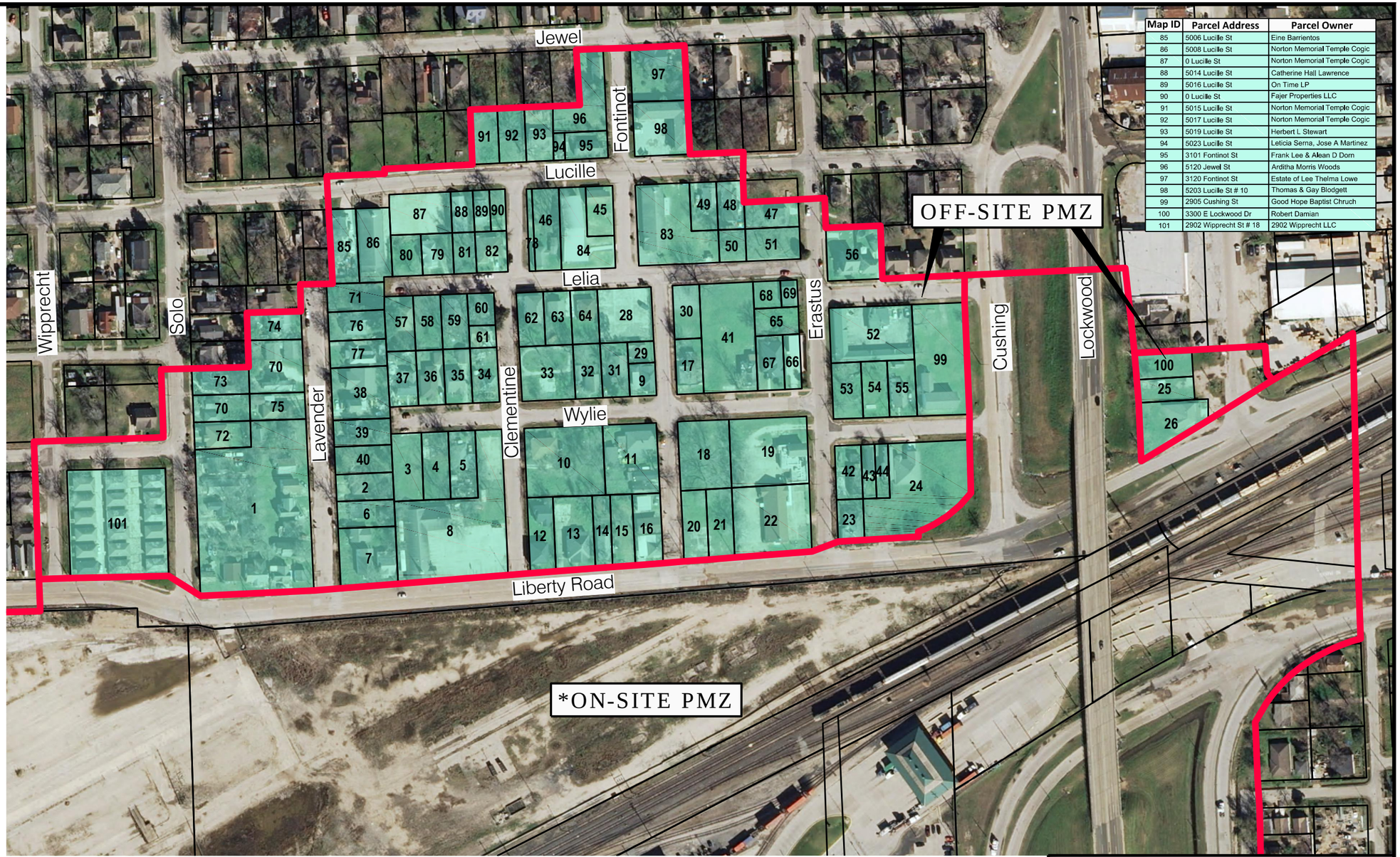
APPENDIX 5 - TABLE 1
SUMMARY OF OFF-SITE PROPERTIES FOR RESTRICTIVE COVENANTS
UPRR HOUSTON WOOD PRESERVING WORKS

MAP ID[2]	HCAD ID[3]	PARCEL ADDRESS	PARCEL OWNER	OWNER MAILING ADDRESS
1	0402660100007	2909 Lavender St, Houston,TX 77026	Clark Investment Co	4901 Liberty Rd, Houston, TX 77026-5263
2	0402660100004	2910 Lavender St, Houston,TX 77026	Ray Carrington	4102 Waterstone St, Missouri City, TX 77459-1837
3	0141440000001	0 Wylie St, Houston,TX 77026	Greater Mt Nebo Baptist Church	5005 Liberty Rd, Houston, TX 77026-5217
4	0141440000002	5006 Wylie St, Houston,TX 77026	Greater Mt Nebo Baptist Church	2602 Caplin St, Houston, TX 77026-1104
5	0141440000003	5010 Wylie, Houston,TX 77026	Alberta Smith	5010 Wylie St, Houston, TX 77026-5226
6	0402660100003	2906 Lavender St, Houston,TX 77026	Eloise Beal	2906 Lavender St, Houston, TX 77026-5212
7	0402660100001	2904 Lavender St, Houston,TX 77026	Clark Investment Co	4901 Liberty Rd, Houston, TX 77026-5263
8	0141440000004	505 Liberty, Houston,TX 77026	Greater Mount Nebo Baptist Church	4511 Eddie St, Houston, TX 77026-7610
9	0141400000006	5119 Wylie St, Houston,TX 77026	Martha Gilliam	5119 Wylie St, Houston, TX 77026-5227
10	0141430000001	2820 Clementine St, Houston,TX 77026	Estate Of Tillie Potts Benson	2820 Clementine St, Houston, TX 77026-5202
11	0141430000004	2813 Fontinot St, Houston,TX 77026	Jose A & Reina I Coto	2819 Fontinot St, Houston, TX 77026-5205
12	0141430000010	5101 Liberty Rd, Houston,TX 77026	Janie & Wallace Longoria	1510 Beall St, Houston, TX 77008-3444
13	0141430000008	5105 Liberty Rd, Houston,TX 77026	Alejandro Gonzalez	4088 Pamela Way, Montgomery, TX 77316-2779
14	0141430000007	5109 Liberty Rd, Houston,TX 77026	Joe H Martinez	5109 Liberty Rd, Houston, TX 77026-5218
15	0141430000011	5113 Liberty Rd, Houston,TX 77026	Harris County Cause No 2003-22512	PO Box 1525, Houston, TX 77251-1525
16	0141430000006	5117 Liberty Rd, Houston,TX 77026	Jorge D Rivera	5117 Liberty Rd, Houston, TX 77026-5218
17	0141410000010	5201 Wylie St, Houston,TX 77026	Doris Jean Jefferson	PO Box 23611, Houston, TX 77228-3611
18	0141420000001	5201 Wylie St, Houston,TX 77026	Charity Baptist Church	5217 Liberty Rd, Houston, TX 77026-5313
19	0141420000003	2809 Erastus St, Houston,TX 77026	Charity Baptist Church C/O Rev F W Mcilveen	2809 Erastus St, Houston, TX 77026-5303
20	0141420000009	5201 Liberty Rd, Houston,TX 77026	Full Gospel Christian Assn	5201 Liberty Rd, Houston, TX 77026-5313
21	0141420000008	5201 Liberty Rd, Houston,TX 77026	Full Gospel Christian Assn	5201 Liberty Rd, Houston, TX 77026-5313
22	0141420000006	2809 Erastus St, Houston,TX 77026	Charity Baptist Church C/O Rev F W Mcilveen	2809 Erastus St, Houston, TX 77026-5303
23	0140410000007	5301 Liberty Rd, Houston,TX 77026	Geneva Henry	7546 S Hall St, Houston, TX 77028-2410
24	0140410000002	5311 Liberty Rd, Houston,TX 77026	Elmer Preston Trust	3319 Liberty Rd , Houston, TX 77026-6238
25	0651290800937	3300 E Lockwood Dr, Houston,TX 77026	Robert Damian	3300 E Lockwood Dr, Houston, TX 77026-1811
26	0402600000019	3300 E Lockwood Dr, Houston,TX 77026	Robert Damian	7938 Capitol St, Houston, TX 77012-1649
28	0141400000004	5118 Lelia St, Houston,TX 77026	Greater True Vine Baptist Church	3010 Fontinot St, Houston, TX 77026-5210
29	0141400000010	2913 Fontinot St, Houston,TX 77026	Perez Paul M	2913 Fontinot S, Houston, TX 77026-5210
30	0141410000002	0 Lelia St, Houston,TX 77026	Greater True Vine Missionary Baptist Church	3010 Fontinot St, Houston, TX 77026-5210
31	0141400000007	5111 Wylie St, Houston,TX 77026	Aquilina Perez	5111 Wylie St, Houston, TX 77026-5227
32	0141400000008	5107 Wylie St, Houston,TX 77026	Reginald & Leticia Tolbert	5107 Wylie St, Houston, TX 77026-5227
33	0141400000009	5105 Wylie St, Houston,TX 77026	Maryland Potts Estate	6308 Crane St, Houston, TX 77026-4318
34	0141390000005	2901 Clementine St, Houston,TX 77026	Mary Bass Ross	2901 Clementine St, Houston, TX 77026-5203
35	0141390000006	5011 Wylie St, Houston,TX 77026	Estate Of Carrie Mae Carr	5011 Wylie St, Houston, TX 77026-5225
36	0141390000007	5007 Wylie St, Houston,TX 77026	Andrew J Johnson	5007 Wylie St, Houston, TX 77026-5225
37	0141390000008	5005 Wylie St, Houston,TX 77026	Banda Monico Duque & Martha Z	5005 Wylie St, Houston, TX 77026-5225
38	0402660100018	2926 Lavender St, Houston,TX 77026	Clark Investment Co	4901 Liberty Rd, Houston, TX 77026-5263
39	0402660100022	2924 Lavender St, Houston,TX 77026	Lucille Long	2924 Lavender St, Houston, TX 77026-5212
40	0402660100005	2922 Lavender St, Houston,TX 77026	Tommy R Williams	2922 Lavender St, Houston, TX 77026-5212
41	0141410000001	5202 Lelia St, Houston,TX 77026	Greater True Vine Mbc	3010 Fontinot St, Houston, TX 77026-5210
42	0140410000006	2806 Erastus St, Houston,TX 77026	Margaret Roberts, Etal	3802 Lochmire Ln, Houston, TX 77039-2523
43	0140410000013	5304 Wylie St, Houston,TX 77026	Irene Perez Juarez	20726 I A Cote Cir Spring, Spring, TX 77388
44	0140410000005	5304-1/2 Wylie St, Houston,TX 77026	Susie I Delgado	5304 1/2 Wylie St, Houston, TX 77026-5322
45	0140330000001	3013 Fontinot St, Houston,TX 77026	Estate Of Emma Byrd % Lincoln A Vital	1111 Heath Ct, Houston, TX 77016
46	0140330000003	705 Lucille, Houston,TX 77026	Taylor Crawford	5105 Lelia St, Houston, TX 77026-5215
47	0140400000002	3009 Erastus St, Houston,TX 77026	Mary Crowley	3009 Erastus St, Houston, TX 77026-5307
48	0140400000003	5212 Lucille St, Houston,TX 77026	Jose F & Yolanda Ruiz	5212 Lucille St, Houston, TX 77026-5316
49	0140400000004	5210 Lucille St, Houston,TX 77026	Alfred B & Freddie Randolph	8614 Shotwell St, Houston, TX 77016-5912
50	0140400000010	0 Lelia St, Houston,TX 77026	Percy Vital	304 Sandman Ave, Crosby, TX 77532-6244
51	0140400000013	3005 Erastus St, Houston,TX 77026	Frank Thomas	3005 Erastus St, Houston, TX 77026-5307
52	0140420000004	5301 Lelia St, Houston,TX 77026	Mukesha & Mahendra Patel	3617 E Crosstimbers St, Houston, TX 77093-8801
53	0140420000007	0 Wylie, Houston,TX 77026	Harris County ET AL Cause NO 2005-18299	PO BOX 1525 , Houston, TX 77251-1525
54	0140420000008	5303 Wylie St, Houston,TX 77026	Richard Robertson	8108 Dockal Rd, Houston, TX 77028-3334

APPENDIX 5 - TABLE 1
SUMMARY OF OFF-SITE PROPERTIES FOR RESTRICTIVE COVENANTS
UPRR HOUSTON WOOD PRESERVING WORKS

MAP ID[2]	HCAD ID[3]	PARCEL ADDRESS	PARCEL OWNER	OWNER MAILING ADDRESS
55	0140420000009	5305 Wylie St, Houston,TX 77026	Victor Delgado Ibarra	5305 Wylie St, Houston, TX 77026-5321
56	0140430000007	5703 Lelia St, Houston,TX 77026	Fifth Ward Community Redevelopment Corp	PO Box 21502, Houston, TX 77226-1502
57	0141390000001	5008 Lelia St, Houston,TX 77026	Emitt Holmes	5002 Lelia St, Houston, TX 77026-5214
58	0141390000002	5010 Lelia St, Houston,TX 77026	Nicholas R Alvarado	3410 Chapman St, Houston, TX 77009-5812
59	0141390000003	5014 Leila, Houston,TX 77026	Lonnie & Mary Roberts	5014 Lelia St, Houston, TX 77026-5214
60	0141390000004	2421 Clementine, Houston,TX 77026	Rogelio R & Olivia Pineda	2921 Clementine St, Houston, TX 77026-5203
61	0141390000009	0 Lelia St, Houston,TX 77026	Guadalupe Rivera	3401 Erastus St, Houston, TX 77026-5335
62	0141400000001	2920 Clementine St, Houston,TX 77026	Jack Perkins	2920 Clementine St, Houston, TX 77026-5204
63	0141400000002	5116 Lelia St, Houston,TX 77026	Carter Thomas	5108 Lelia St, Houston, TX 77026-5216
64	0141400000003	5112 Lelia St, Houston,TX 77026	Avie Potts	5112 Lelia St, Houston, TX 77026-5216
65	0141410000004	0 Lelia St, Houston,TX 77026	Mallie Pittman	6127 Westover St, Houston, TX 77033-1235
66	0141410000006	5211 Wylie, Houston,TX 77026	Leroy Mock	5207 Jewel St, Houston, TX 77026-5345
67	0141410000007	0 Wylie, Houston,TX 77026	Leroy Mock	5207 Jewel St, Houston, TX 77026-5345
68	0141410000011	0 Lelia St, Houston,TX 77026	Leroy Mock	5207 Jewel St, Houston, TX 77026-5345
69	0141410000012	2925 Erastus St, Houston,TX 77026	Leroy Mock	5207 Jewel St, Houston, TX 77026-5345
70	0402660100007	2909 Lavender St, Houston,TX 77026	Clark Investment Co	4901 Liberty Rd, Houston, TX 77026-5263
71	0402660100008	2942 Lavender St, Houston,TX 77026	Sandra Rena Thompson	PO Box 671646, Houston, TX 77267-1646
72	0402660100010	2922 Solo St, Houston,TX 77026	Gerry Wortham	2922 Solo St, Houston, TX 77026-7637
73	0402660100011	2930 Solo St, Houston,TX 77026	Howell S. Evan	PO BOX 55753, Houston, TX 77255-5753
74	0402660100015	2937 Lavender St, Houston,TX 77026	Francis A Wyatt	2937 Lavender St, Houston, TX 77026-5211
75	0402660100017	2925 Lavender St, Houston,TX 77026	Johnnie Ellis	2925 Lavender St, Houston, TX 77026-5211
76	0402660100019	2938 Lavender St, Houston,TX 77026	Essie Lee Hutchins	2938 Lavender St, Houston, TX 77026-5212
77	0402660100021	2934 Lavender St, Houston,TX 77026	Zearlene Osborn	2934 Lavender St, Houston, TX 77026-5212
78	0522570000001	Leila St, Houston,TX 77026	Samuel J Schrinsky	152 W Wisconsin Ave, Milwaukee, WI 53203-2508
79	0522570000006	5009 Lelia St, Houston,TX 77026	Clara C Humphrey	5009 Lelia St, Houston, TX 77026-5213
80	0522570000007	5007 Lelia St, Houston,TX 77026	Johnnie M York	9231 Oak Knoll Ln, Houston, TX 77078-4025
81	0522570000008	0 Lelia St, Houston,TX 77026	Herbert Hall	5014 Lucille St, Houston, TX 77026-5222
82	0522570000009	5015 Lelia St, Houston,TX 77026	Hubert Horn	5015 Lelia St, Houston, TX 77026-5213
83	1280850010001	3010 Fontinot, Houston,TX 77026	Greater True Vine Baptist Church	3010 Fontinot St, Houston, TX 77026-5210
84	1280850020001	3011 Fontinot, Houston,TX 77026	Greater True Vine Baptist Church	3011 Fontinot St, Houston, TX 77026-5210
85	0402660010007	5006 Lucille St, Houston,TX 77026	Eine Barrientos	5006 LUCILLE ST Houston , TX 77026-5222
86	0402660010008	5008 Lucille St, Houston,TX 77026	Norton Memorial Temple Cogic	5008 LUCILLE ST Houston , TX 77026-5222
87	0522570000004	0 Lucile, Houston,TX 77026	Norton Memorial Temple Cogic	5008 LUCILLE ST Houston , TX 77026-5222
88	0522570000003	5014 Lucille St, Houston,TX 77026	Catherine Hall Lawrence	5014 LUCILLE ST Houston , TX 77026-5222
89	0522570000002	5016 Lucille St, Houston,TX 77026	On Time Lp	2141 W GOVERNORS CIR Houston , TX 77092-8715
90	0522570000012	0 Lucille, Houston,TX 77026	Fajer Properties Llc	8621 WESTHEIMER RD Houston , TX 77063-4201
91	0522560000009	5015 Lucille St, Houston,TX 77026	Norton Memorial Temple Cogic	5008 LUCILLE ST Houston , TX 77026-5222
92	0522560000010	5017 Lucille St, Houston,TX 77026	Norton Memorial Temple Cogic	5008 LUCILLE ST Houston , TX 77026-5222
93	0140340000010	5019 Lucille St, Houston,TX 77026	Herbert L Stewart	4029 MELBOURNE ST Houston , TX 77026-1547
94	0140340000013	5023 Lucille St, Houston,TX 77026	Leticia Serna, Jose A Martinez	12414 PINE GLEN LN Cypress, TX 77429-2815
95	0140340000011	3101 Fontinot St, Houston,TX 77026	Frank Lee & Alean D Dorn	3101 FONTINOT ST Houston , TX 77026-5245
96	0140340000001	5120 Jewel St, Houston,TX 77026	Arditha Morris Woods	5120 JEWEL ST Houston , TX 77026-5254
97	0140390000005	3120 Fontinot St, Houston,TX 77026	Estate Of Lee Thelma Lowe	3120 FONTINOT ST Houston , TX 77026-5246
98	0140390000007	5203 Lucille St # 10, Houston,TX 77026	Thomas & Gay Blodgett	17 STONEWALL IRVINE, CA 92620-2649
99	0140420000002	2905 Cushing St, Houston,TX 77026	Good Hope Baptist Chruch	2905 CUSHING ST Houston , TX 77026-5301
100	0651290800938	3300 E Lockwood Dr, Houston,TX 77026	Robert Damian	3300 E Lockwood Dr Houston, TX 77026-1811
101	0040580000001	2902 Wipprecht St # 18, Houston,TX 77026	2902 Wipprecht Llc	4110 RAND ST Houston, TX 77026-2659

Map ID	Parcel Address	Parcel Owner
1	2909 Lavender St	Clark Investment Co
2	2910 Lavender St	Ray Carrington
3	0 Wylie St	Greater Mt Nebo Baptist Church
4	5006 Wylie St	Greater Mt Nebo Baptist Church
5	5010 Wylie	Alberta Smith
6	2906 Lavender St	Jessie and Eloise Beal
7	2904 Lavender St	Clark Investment Co
8	505 Liberty	Greater Mount Nebo Baptist Church
9	5119 Wylie St	Martha Gilliam
10	2820 Clementine St	Estate Of Tillie Potts Benson
11	2813 Fontinot St	Jose Alexander & Reina Isabel Coto
12	5101 Liberty Rd	Robert & Janie Longoria
13	5105 Liberty Rd	Alejandro Gonzalez
14	5109 Liberty Rd	Mary Jane Gonzalez, Daniel Martinez, Guadalupe Mata, Joe R. Martinez, Jr. and Isabel Gallegos
15	5113 Liberty Rd	Harris County Cause No 2003-22512
16	5117 Liberty Rd	Jorge D Rivera
17	5201 Wylie St	A.E. Dixon Ford
18	5201 Wylie St	Charity Baptist Church
19	2809 Erastus St	Charity Baptist Church
20	5201 Liberty Rd	Charity Baptist Church
21	5201 Liberty Rd	Charity Baptist Church
22	2809 Erastus St	Charity Baptist Church C/O Rev F W Mcilveen
23	5301 Liberty Rd	Geneva Henry, a/k/a Geneva Crump
24	5311 Liberty Rd	Elmer Preston Trust
25	3300 E Lockwood Dr	Eliuth Jimenez Damian - et al.
26	3300 E Lockwood Dr	Eliuth Jimenez Damian - et al.
28	5118 Lelia St	Greater True Vine Baptist Church
29	2913 Fontinot St	The heirs and devisees of Perez Paul M
30	0 Lelia St	Greater True Vine Missionary Baptist Church
31	5111 Wylie St	Aquilina Perez
32	5107 Wylie St	Reginald & Leticia Tolbert
33	5105 Wylie St	Maryland Potts Estate
34	2901 Clementine St	Mary Bass Ross
35	5011 Wylie St	J.C. Carr and Carrie Mae Carr
36	5007 Wylie St	Andrew Jerry & Rebecca Johnson
37	5005 Wylie St	Monico Duque & Martha Zuiga Banda
38	2926 Lavender St	Clark Investment Co
39	2924 Lavender St	Clark Investment Co
40	2922 Lavender St	Greater MT. Nebo Baptist Church
41	5202 Lelia St	Greater True Vine Mbc
42	2806 Erastus St	Margaret Roberts, Etal
43	5304 Wylie St	Irene Perez Juarez
44	5304-1/2 Wylie St	Saturnino Delgado and Susie I Delgado
45	3013 Fontinot St	Lenora Young and Clifton Scott
46	705 Lucille	Joyce Marie Taylor
47	3009 Erastus St	Mary Elizabeth Crowley
48	5212 Lucille St	Jose F & Yolanda Ruiz
49	5210 Lucille St	Alfred B & Freddie Randolph
50	0 Lelia St	Percy Vital
51	3005 Erastus St	Jose Raymundo Govea
52	5301 Lelia St	Ambe Sai, LLC
53	0 Wylie	Harris County ET AL Cause NO 2005-18299
54	5303 Wylie St	Shannon Leo Lund
55	5305 Wylie St	Victor Delgado Ibarra
56	5703 Lelia St	Lashameka and Derrick Williams
57	5008 Lelia St	Emitt Holmes
58	5010 Lelia St	Dickson Investment Company
59	5014 Leila	Guadalupe Rivera Jr. & Flor Estela Rivera
60	2421 Clementine	Rogelio Ruiz & Olivia Pineda
61	0 Lelia St	Guadalupe Rivera
62	2920 Clementine St	Amidee Capital Group, LLC
63	5116 Lelia St	Elizabeth Thomas
64	5112 Lelia St	Estate of Francis Potts
65	0 Lelia St	Mallie Pittman & Belinda Pittman
66	5211 Wylie	Sterling Trust for benefit of Charles Mock
67	0 Wylie	Sterling Trust for benefit of Charles Mock
68	0 Lelia St	Leroy Mock
69	2925 Erastus St	Leroy Mock
70	2909 Lavender St	Clark Investment Co
71	2942 Lavender St	Sandra Rena Thompson
72	2922 Solo St	Gerry Wortham
73	2930 Solo St	Barbara A Jackson
74	2937 Lavender St	Francis A Wyatt
75	2925 Lavender St	Johnnie Ellis
76	2938 Lavender St	Essie Lee Hutchins
77	2934 Lavender St	Clark Investment Co
78	Leila St	Frank Lippow
79	5009 Lelia St	Clara Christinar Humphrey
80	5007 Lelia St	Johnnie M York
81	0 Lelia St	Herbert Hall
82	5015 Lelia St	Manuel Castillo
83	3010 Fontinot	Greater True Vine Baptist Church
84	3011 Fontinot	Greater True Vine Baptist Church



Map ID	Parcel Address	Parcel Owner
85	5006 Lucille St	Eine Barrientos
86	5008 Lucille St	Norton Memorial Temple Cogic
87	0 Lucille St	Norton Memorial Temple Cogic
88	5014 Lucille St	Catherine Hall Lawrence
89	5016 Lucille St	On Time LP
90	0 Lucille St	Fajer Properties LLC
91	5015 Lucille St	Norton Memorial Temple Cogic
92	5017 Lucille St	Norton Memorial Temple Cogic
93	5019 Lucille St	Herbert L Stewart
94	5023 Lucille St	Leticia Serna, Jose A Martinez
95	3101 Fontinot St	Frank Lee & Alean D Dorn
96	5120 Jewel St	Arditha Morris Woods
97	3120 Fontinot St	Estate of Lee Thelma Lowe
98	5203 Lucille St # 10	Thomas & Gay Blodgett
99	2905 Cushing St	Good Hope Baptist Chruch
100	3300 E Lockwood Dr	Robert Damian
101	2902 Wipprecht St # 18	2902 Wipprecht LLC

EXPLANATION

- UPRR Property Boundary
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ and C-TZ)
- Off-Site Properties Needing IC for PMZ

Note:
* - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

Source:
Aerial photo from Harris-Galveston Area Council (HGAC), flown Jan-Feb 2012, and property information from Harris County Appraisal District (HCAD), 2014.

N

Scale in Feet
0 100 200

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Appendix 5 - Figure 1

PROPOSED OFF-SITE PROPERTIES FOR RESTRICTIVE COVENANTS

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

EXPLANATION

- UPRR Property Boundary
- Property Boundary (GIMS)
- Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- City of Houston ROW
- Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)

Notes:
1. Vertical datum based on City of Houston Vertical Datum (HVD).
2. * - On-Site PMZ includes UPRR-owned property and City of Houston Right of Way (ROW).

N

Approx. Scale in Feet

0 200 400

Source:
Parcel Boundaries: City of Houston Geographic Information & Management Systems (GIMS).
Aerial: Houston-Galveston Area Council (HGAC) 2012 Aerial.

OFF-SITE PMZ

*ON-SITE PMZ

HWPW

Englewood Intermodal Yard

Fontinot
Lucille
Lelia
Wylie
Liberty Road
Wipprecht
Solo
Lavender
Clementine
Erastus
Cushing
Lockwood
Kashmere
Harlem
Sudan

The seal appearing on this document was authorized by Eric C. Matzner, P.G. 795 on November 21, 2014.

STATE OF TEXAS
ERIC C. MATZNER
GEOLOGY
LIC. # 795
LICENSED
PROFESSIONAL GEOSCIENTIST

UNION PACIFIC RAILROAD CO.

HOUSTON WOOD PRESERVING WORKS

Appendix 5 - Figure 2

PROPOSED CITY OF HOUSTON ROW RESTRICTIVE COVENANT

PROJECT: 1358	BY: ZGK	REVISIONS
DATE: NOV., 2014	CHECKED: ECM	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

Institutional Control	RAP Worksheet 2.4	Page 1 of 101
Associated Information: Appendices 4, 5	ID No.: SWR ID 31547	Report Date: November 21, 2014

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2909 Lavender St (Map ID 1, HCAD ID 0402660100007)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[1]				Property Ownership		Anticipated Filing Date[2]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[1] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[2] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2910 Lavender St (Map ID 2, HCAD ID 0402660100004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[3]				Property Ownership		Anticipated Filing Date[4]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[3] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[4] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Wylie St (Map ID 3, HCAD ID 0141440000001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[5]				Property Ownership		Anticipated Filing Date[6]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[5] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[6] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5006 Wylie St (Map ID 4, HCAD ID 0141440000002)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[7]				Property Ownership		Anticipated Filing Date[8]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[7] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[8] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5010 Wylie (Map ID 5, HCAD ID 0141440000003)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[9]				Property Ownership		Anticipated Filing Date[10]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[9] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[10] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2906 Lavender St (Map ID 6, HCAD ID 0402660100003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[11]				Property Ownership		Anticipated Filing Date[12]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[11] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[12] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2904 Lavender St (Map ID 7, HCAD ID 0402660100001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[13]				Property Ownership		Anticipated Filing Date[14]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[13] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[14] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **505 Liberty (Map ID 8, HCAD ID 0141440000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[15]				Property Ownership		Anticipated Filing Date[16]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[15] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[16] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5119 Wylie St (Map ID 9, HCAD ID 0141400000006)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[17]				Property Ownership		Anticipated Filing Date[18]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[17] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[18] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2820 Clementine St (Map ID 10, HCAD ID 0141430000001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[19]				Property Ownership		Anticipated Filing Date[20]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[19] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[20] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2813 Fontinot St (Map ID 11, HCAD ID 0141430000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[21]				Property Ownership		Anticipated Filing Date[22]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[21] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[22] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5101 Liberty Rd (Map ID 12, HCAD ID 0141430000010)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[23]				Property Ownership		Anticipated Filing Date[24]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[23] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[24] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5105 Liberty Rd (Map ID 13, HCAD ID 0141430000008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[25]				Property Ownership		Anticipated Filing Date[26]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[25] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[26] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5109 Liberty Rd (Map ID 14, HCAD ID 0141430000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[27]				Property Ownership		Anticipated Filing Date[28]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[27] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[28] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5113 Liberty Rd (Map ID 15, HCAD ID 0141430000011)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[29]				Property Ownership		Anticipated Filing Date[30]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[29] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[30] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5117 Liberty Rd (Map ID 16, HCAD ID 0141430000006)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[31]				Property Ownership		Anticipated Filing Date[32]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[31] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[32] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5201 Wylie St (Map ID 17, HCAD ID 0141410000010)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[33]				Property Ownership		Anticipated Filing Date[34]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[33] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[34] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5201 Wylie St (Map ID 18, HCAD ID 0141420000001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[35]				Property Ownership		Anticipated Filing Date[36]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[35] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[36] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2809 Erastus St (Map ID 19, HCAD ID 0141420000003)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[37]				Property Ownership		Anticipated Filing Date[38]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[37] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[38] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5201 Liberty Rd (Map ID 20, HCAD ID 0141420000009)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[39]				Property Ownership		Anticipated Filing Date[40]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[39] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[40] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5201 Liberty Rd (Map ID 21, HCAD ID 0141420000008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[41]				Property Ownership		Anticipated Filing Date[42]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[41] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[42] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2809 Erastus St (Map ID 22, HCAD ID 0141420000006)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[43]				Property Ownership		Anticipated Filing Date[44]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[43] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[44] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5301 Liberty Rd (Map ID 23, HCAD ID 0140410000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[45]				Property Ownership		Anticipated Filing Date[46]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[45] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[46] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5311 Liberty Rd (Map ID 24, HCAD ID 0140410000002)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[47]				Property Ownership		Anticipated Filing Date[48]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		X				X	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		X				X	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		X				X	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[47] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[48] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3300 E Lockwood Dr (Map ID 25, HCAD ID 0651290800937)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[49]				Property Ownership		Anticipated Filing Date[50]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[49] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[50] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3300 E Lockwood Dr (Map ID 26, HCAD ID 0402600000019)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[51]				Property Ownership		Anticipated Filing Date[52]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[51] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[52] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3320 E Lockwood Dr (Map ID 27, HCAD ID 0402600000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[53]				Property Ownership		Anticipated Filing Date[54]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[53] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[54] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5118 Lelia St (Map ID 28, HCAD ID 0141400000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[55]				Property Ownership		Anticipated Filing Date[56]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[55] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[56] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2913 Fontinot St (Map ID 29, HCAD ID 0141400000010)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[57]				Property Ownership		Anticipated Filing Date[58]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[57] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[58] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Lelia St (Map ID 30, HCAD ID 0141410000002)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[59]				Property Ownership		Anticipated Filing Date[60]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[59] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[60] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5111 Wylie St (Map ID 31, HCAD ID 0141400000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[61]				Property Ownership		Anticipated Filing Date[62]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[61] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[62] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5107 Wylie St (Map ID 32, HCAD ID 0141400000008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[63]				Property Ownership		Anticipated Filing Date[64]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[63] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[64] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5105 Wylie St (Map ID 33, HCAD ID 0141400000009)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[65]				Property Ownership		Anticipated Filing Date[66]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[65] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[66] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2901 Clementine St (Map ID 34, HCAD ID 0141390000005)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[67]				Property Ownership		Anticipated Filing Date[68]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[67] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[68] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5011 Wylie St (Map ID 35, HCAD ID 0141390000006)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[69]				Property Ownership		Anticipated Filing Date[70]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[69] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[70] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5007 Wylie St (Map ID 36, HCAD ID 0141390000007)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[71]				Property Ownership		Anticipated Filing Date[72]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[71] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[72] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5005 Wylie St (Map ID 37, HCAD ID 0141390000008)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[73]				Property Ownership		Anticipated Filing Date[74]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[73] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[74] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2926 Lavender St (Map ID 38, HCAD ID 0402660100018)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[75]				Property Ownership		Anticipated Filing Date[76]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[75] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[76] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2924 Lavender St (Map ID 39, HCAD ID 0402660100022)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[77]				Property Ownership		Anticipated Filing Date[78]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[77] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[78] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2922 Lavender St (Map ID 40, HCAD ID 0402660100005)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[79]				Property Ownership		Anticipated Filing Date[80]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[79] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[80] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5202 Lelia St (Map ID 41, HCAD ID 0141410000001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[81]				Property Ownership		Anticipated Filing Date[82]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[81] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[82] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2806 Erastus St (Map ID 42, HCAD ID 0140410000006)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[83]				Property Ownership		Anticipated Filing Date[84]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[83] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[84] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5304 Wylie St (Map ID 43, HCAD ID 0140410000013)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[85]				Property Ownership		Anticipated Filing Date[86]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[85] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[86] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5304-1/2 Wylie St (Map ID 44, HCAD ID 0140410000005)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[87]				Property Ownership		Anticipated Filing Date[88]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[87] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[88] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3013 Fontinot St (Map ID 45, HCAD ID 0140330000001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[89]				Property Ownership		Anticipated Filing Date[90]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[89] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[90] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **705 Lucille (Map ID 46, HCAD ID 0140330000003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[91]				Property Ownership		Anticipated Filing Date[92]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[91] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[92] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3009 Erastus St (Map ID 47, HCAD ID 0140400000002)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[93]				Property Ownership		Anticipated Filing Date[94]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[93] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[94] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5212 Lucille St (Map ID 48, HCAD ID 0140400000003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[95]				Property Ownership		Anticipated Filing Date[96]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[95] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[96] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5210 Lucille St (Map ID 49, HCAD ID 0140400000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[97]				Property Ownership		Anticipated Filing Date[98]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[97] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[98] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Lelia St (Map ID 50, HCAD ID 0140400000010)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[99]				Property Ownership		Anticipated Filing Date[100]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[99] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[100] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3005 Erastus St (Map ID 51, HCAD ID 0140400000013)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[101]				Property Ownership		Anticipated Filing Date[102]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[101] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[102] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5301 Lelia St (Map ID 52, HCAD ID 0140420000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[103]				Property Ownership		Anticipated Filing Date[104]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[103] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[104] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Wylie (Map ID 53, HCAD ID 0140420000007)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[105]				Property Ownership		Anticipated Filing Date[106]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[105] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[106] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5303 Wylie St (Map ID 54, HCAD ID 0140420000008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[107]				Property Ownership		Anticipated Filing Date[108]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[107] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[108] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5305 Wylie St (Map ID 55, HCAD ID 0140420000009)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[109]				Property Ownership		Anticipated Filing Date[110]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[109] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[110] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5703 Lelia St (Map ID 56, HCAD ID 0140430000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[111]				Property Ownership		Anticipated Filing Date[112]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[111] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[112] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5008 Lelia St (Map ID 57, HCAD ID 0141390000001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[113]				Property Ownership		Anticipated Filing Date[114]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[113] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[114] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5010 Lelia St (Map ID 58, HCAD ID 0141390000002)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[115]				Property Ownership		Anticipated Filing Date[116]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[115] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[116] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5014 Leila (Map ID 59, HCAD ID 0141390000003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[117]				Property Ownership		Anticipated Filing Date[118]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[117] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[118] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2421 Clementine (Map ID 60, HCAD ID 0141390000004)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[119]				Property Ownership		Anticipated Filing Date[120]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[119] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[120] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **0 Lelia St (Map ID 61, HCAD ID 0141390000009)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[121]				Property Ownership		Anticipated Filing Date[122]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[121] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[122] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2920 Clementine St (Map ID 62, HCAD ID 0141400000001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[123]				Property Ownership		Anticipated Filing Date[124]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[123] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[124] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5116 Lelia St (Map ID 63, HCAD ID 0141400000002)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[125]				Property Ownership		Anticipated Filing Date[126]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[125] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[126] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5112 Lelia St (Map ID 64, HCAD ID 0141400000003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[127]				Property Ownership		Anticipated Filing Date[128]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[127] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[128] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Lelia St (Map ID 65, HCAD ID 0141410000004)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[129]				Property Ownership		Anticipated Filing Date[130]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[129] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[130] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5211 Wylie (Map ID 66, HCAD ID 0141410000006)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[131]				Property Ownership		Anticipated Filing Date[132]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[131] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[132] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Wylie (Map ID 67, HCAD ID 0141410000007)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[133]				Property Ownership		Anticipated Filing Date[134]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[133] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[134] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **0 Lelia St (Map ID 68, HCAD ID 0141410000011)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[135]				Property Ownership		Anticipated Filing Date[136]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[135] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[136] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2925 Erastus St (Map ID 69, HCAD ID 0141410000012)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[137]				Property Ownership		Anticipated Filing Date[138]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[137] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[138] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2909 Lavender St (Map ID 70, HCAD ID 0402660100007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[139]				Property Ownership		Anticipated Filing Date[140]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[139] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[140] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2942 Lavender St (Map ID 71, HCAD ID 0402660100008)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[141]				Property Ownership		Anticipated Filing Date[142]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[141] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[142] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2922 Solo St (Map ID 72, HCAD ID 0402660100010)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[143]				Property Ownership		Anticipated Filing Date[144]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[143] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[144] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2930 Solo St (Map ID 73, HCAD ID 0402660100011)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[145]				Property Ownership		Anticipated Filing Date[146]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[145] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[146] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2937 Lavender St (Map ID 74, HCAD ID 0402660100015)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[147]				Property Ownership		Anticipated Filing Date[148]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[147] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[148] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2925 Lavender St (Map ID 75, HCAD ID 0402660100017)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[149]				Property Ownership		Anticipated Filing Date[150]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[149] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[150] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **2938 Lavender St (Map ID 76, HCAD ID 0402660100019)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[151]				Property Ownership		Anticipated Filing Date[152]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[151] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[152] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2934 Lavender St (Map ID 77, HCAD ID 0402660100021)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[153]				Property Ownership		Anticipated Filing Date[154]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[153] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[154] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **Leila St (Map ID 78, HCAD ID 0522570000001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[155]				Property Ownership		Anticipated Filing Date[156]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[155] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[156] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5009 Lelia St (Map ID 79, HCAD ID 0522570000006)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[157]				Property Ownership		Anticipated Filing Date[158]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[157] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[158] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5007 Lelia St (Map ID 80, HCAD ID 0522570000007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[159]				Property Ownership		Anticipated Filing Date[160]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[159] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[160] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **0 Lelia St (Map ID 81, HCAD ID 0522570000008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[161]				Property Ownership		Anticipated Filing Date[162]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[161] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[162] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5015 Lelia St (Map ID 82, HCAD ID 0522570000009)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[163]				Property Ownership		Anticipated Filing Date[164]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[163] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[164] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **3010 Fontinot (Map ID 83, HCAD ID 1280850010001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[165]				Property Ownership		Anticipated Filing Date[166]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[165] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[166] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3011 Fontinot (Map ID 84, HCAD ID 1280850020001)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[167]				Property Ownership		Anticipated Filing Date[168]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[167] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[168] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5006 Lucille St (Map ID 85, HCAD ID 0402660010007)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[169]				Property Ownership		Anticipated Filing Date[170]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[169] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[170] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5008 Lucille St (Map ID 86, HCAD ID 0402660010008)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[171]				Property Ownership		Anticipated Filing Date[172]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[171] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[172] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Lucile (Map ID 87, HCAD ID 0522570000004)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[173]				Property Ownership		Anticipated Filing Date[174]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[173] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[174] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5014 Lucille St (Map ID 88, HCAD ID 0522570000003)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[175]				Property Ownership		Anticipated Filing Date[176]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[175] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[176] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5016 Lucille St (Map ID 89, HCAD ID 0522570000002)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[177]				Property Ownership		Anticipated Filing Date[178]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[177] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[178] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **0 Lucille (Map ID 90, HCAD ID 0522570000012)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[179]				Property Ownership		Anticipated Filing Date[180]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[179] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[180] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5015 Lucille St (Map ID 91, HCAD ID 0522560000009)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[181]				Property Ownership		Anticipated Filing Date[182]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[181] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[182] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5017 Lucille St (Map ID 92, HCAD ID 0522560000010)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[183]				Property Ownership		Anticipated Filing Date[184]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[183] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[184] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **5019 Lucille St (Map ID 93, HCAD ID 0140340000010)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[185]				Property Ownership		Anticipated Filing Date[186]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[185] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[186] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5023 Lucille St (Map ID 94, HCAD ID 0140340000013)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[187]				Property Ownership		Anticipated Filing Date[188]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[187] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[188] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **3101 Fontinot St (Map ID 95, HCAD ID 0140340000011)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[189]				Property Ownership		Anticipated Filing Date[190]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[189] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[190] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5120 Jewel St (Map ID 96, HCAD ID 0140340000001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[191]				Property Ownership		Anticipated Filing Date[192]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[191] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[192] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **3120 Fontinot St (Map ID 97, HCAD ID 0140390000005)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[193]				Property Ownership		Anticipated Filing Date[194]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[193] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[194] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **5203 Lucille St # 10 (Map ID 98, HCAD ID 0140390000007)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[195]				Property Ownership		Anticipated Filing Date[196]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[195] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[196] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2905 Cushing St (Map ID 99, HCAD ID 0140420000002)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[197]				Property Ownership		Anticipated Filing Date[198]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[197] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[198] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.

Specify the property for which this applies. **3300 E Lockwood Dr (Map ID 100, HCAD ID 0651290800938)**

Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[199]				Property Ownership		Anticipated Filing Date[200]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[199] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[200] Specify date or amount of time after RAP approval.

Complete this worksheet if an institutional control will be used as part of the response action. Include a draft of the proposed institutional controls in Appendix 4. Provide a list of landowners from whom landowner concurrence will be requested, as necessary, in Appendix 5.
Specify the property for which this applies. **2902 Wipprecht St # 18 (Map ID 101, HCAD ID 0040580000001)**
Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control[201]				Property Ownership		Anticipated Filing Date[202]
	Deed Notice	Restrictive Covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))		**X**				**X**	**Within 720 days of RAP approval**
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(l))		**X**				**X**	**Within 720 days of RAP approval**
Document the demonstration of technical impracticability (§350.33(f)(3)(F))		**X**				**X**	**Within 720 days of RAP approval**
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

[201] Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.
[202] Specify date or amount of time after RAP approval.

APPENDIX 6

SAMPLING PROCEDURES - PROPOSED GROUNDWATER SAMPLING AND ANALYSIS PLAN

SEE RCRA PERMIT PART B COMPLIANCE PLAN ATTACHMENT XI.C FOR SAMPLING AND ANALYSIS PLAN (SAP)

APPENDIX 7

STATISTICAL METHODOLOGY

APPENDIX 7

STATISTICAL METHODOLOGY

APPENDIX 7 – STATISTICAL OR GEOSTATISTICAL METHODOLOGIES

The statistical methodologies that will be employed at the Union Pacific Railroad (UPRR) Houston Wood Preserving Works (HWPW) Site include the following:

1. Calculating statistical trends for chemicals of concern (COCs) in groundwater to evaluate potential increases in COCs; and
2. Calculating 95% upper confidence levels (UCLs) to demonstrate compliance with direct exposure criteria for surface soils.

Other statistical approaches may be used as appropriate for soil and groundwater data. The two approaches listed are discussed below.

Groundwater Trend Analysis

As part of the response action to address COCs in groundwater, monitored natural attenuation (MNA) is proposed to address the groundwater protective concentration limit (PCL) exceedance (PCLE) Zones identified at the Site. Trend analysis may be necessary to evaluate increasing trends when groundwater concentrations at the alternate points of exposure (POE) wells exceed the critical PCLs. Two approaches that may be conducted to evaluate statistical trends include the following:

- The Mann-Kendall Analysis; and
- Linear Regression Analysis

The selection of the statistical method will be assessed based on the data set. Typically, the Mann-Kendall test for trend is a nonparametric test that has no distributional assumptions and irregularly spaced measurement periods are permitted, where the Linear Regression is a parametric statistical procedure that is used for analyzing trends in data over time. However, other statistical approaches may also be used to evaluate trends. Details of the Mann-Kendall and linear regression analyses are provided below.

Mann-Kendall Analysis

General

The Mann-Kendall test is a non-parametric statistical procedure that is well suited for analyzing trends in data over time (Gilbert, 1987). The Mann-Kendall test can be viewed as a nonparametric test for zero slope of the first-order regression of time-ordered concentration data versus time. The Mann-Kendall test does not require any assumptions as to the statistical distribution of the data (e.g. normal, lognormal, etc.) and can be used with data sets which include irregular sampling intervals and missing data. The Mann-Kendall test is designed for analyzing a single groundwater constituent, multiple constituents are analyzed separately.

Mann-Kendall Statistic (S)

The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall Statistic (i.e., larger magnitudes indicate a stronger trend).

Data for performing the Mann-Kendall Analysis should be in time sequential order. The first step is to determine the sign of the difference between consecutive sample results. $Sgn(x_j - x_k)$ is an indicator function that results in the values 1, 0, or –1 according to the sign of $x_j - x_k$ where $j > k$, the function is calculated as follows

$sgn(x_j - x_k) = 1$ if $x_j - x_k > 0$
$sgn(x_j - x_k) = 0$ if $x_j - x_k = 0$
$sgn(x_j - x_k) = -1$ if $x_j - x_k < 0$

The Mann-Kendall statistic (S) is defined as the sum of the number of positive differences minus the number of negative differences or

$$S = \sum_{k=1}^{n-1} \sum_{j=k+1}^{n} \operatorname{sgn}\left(x_j - x_k\right).$$

The confidence on the Mann-Kendall statistic can be measured by assessing the S result along with the number of samples, n, to find the confidence in the trend by utilizing a Kendall probability table found in many statistical textbooks (e.g. Hollander, M. and Wolfe, D.A., 1973). The resulting confidence in the trend is applied in the Mann Kendall trend analysis.

Average

The arithmetic mean of a sample of n values of a variable is the average of all the sample values written as

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Standard Deviation

The standard deviation is the square root of the average of the square of the deviations from the sample mean written as

$$s = \sqrt{\frac{\sum_{i=1}^{n} \left(x_i - \bar{x}\right)^2}{n-1}}.$$

The standard deviation is a measure of how the value fluctuates about the arithmetic mean of the data.

Coefficient of Variation (COV)

The Coefficient of Variation (COV) is a statistical measure of how the individual data points vary about the mean value. The coefficient of variation, defined as the standard deviation divided by the average or

$$C.O.V. = \frac{s}{\bar{x}}$$

Values less than or near 1.00 indicate that the data form a relatively close group about the mean value. Values larger than 1.00 indicate that the data show a greater degree of scatter about the mean.

Interpretation of Results: Mann-Kendall Analysis

- The COV is a statistical measure of how the individual data points vary about the mean value. Values less than or near 1.00 indicate that the data form a relatively close group about the mean value. Values larger than 1.00 indicate that the data show a greater degree of scatter about the mean.

- The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall Statistic (i.e., larger magnitudes indicate a stronger trend).

- The "Confidence in Trend" is the statistical confidence that the constituent concentration is increasing (S>0) or decreasing (S<0).

- The "Concentration Trend" for each well is determined according to the following rules, where COV is the coefficient of variation:

MANN-KENDALL ANALYSIS DECISION MATRIX

Mann-Kendall Statistic	Confidence in Trend	Concentration Trend
S > 0	> 95%	Increasing
S > 0	90 - 95%	Probably Increasing
S > 0	< 90%	No Trend
S ≤ 0	< 90% and COV ≥ 1	No Trend
S ≤ 0	< 90% and COV < 1	Stable
S < 0	90 - 95%	Probably Decreasing
S < 0	95%	Decreasing

Linear Regression Analysis

General

As discussed in the EPA Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance (EPA, 2009), a common method to measure a linear trend is to compute a linear regression of concentration data when plotted against the time or date of sample collection. Each point along a linear regression trend line is an estimate of the true mean concentration at that point in time. Therefore, a linear regression can be used to assess whether or not the population mean at an alternate point of exposure (POE) well has significantly increased or decreased.

Linear regression is valid if the data set is parametric. Other assumptions for using the statistical technique is that the difference between each concentration measurement and its predicted value from the regression equation are approximately normal in distribution and homoscedastic (*i.e.*, equal in variance at different times and for different mean concentration levels). Significant skewness or the presence of outliers can invalidate the trend analysis based on linear regression. Also, standard linear regression methods do not account for non-detects or missing data values at selected sampling events. Therefore, linear regression is best used for data sets that have few if any non-detects (EPA, 2009).

A minimum of 8 to 10 measurements is generally necessary to compute a linear regression. The regression residuals should be statistically independent and the analysis should be based on reliably quantified measurements. If not, a calculated "trend" may be an artifact induced by changes in quantitation limits over time. Such artifacts of plotting and data reporting should not be considered real trends.

The procedures for calculating the linear regression are taken from the EPA Unified Guidance (EPA, 2009):

Step 1. Construct a time series plot of the compliance point measurements. If a discernible trend is evident, compute a linear regression of concentration against sampling date (time), letting x_i denote the *i*th concentration value and *t*i denote the *i*th sampling date. Estimate the linear slope $\hat{b}$ with the formula:

$$\hat{b} = \sum_{i=1}^{n} \frac{(t_i - \bar{t})x_i}{n-1} \times s_i^2$$

This estimate then leads to the regression equation, given by:

$$\hat{x_i} = \bar{x} + \hat{b}\,(t - \bar{t}\,)$$

where $\bar{t}$ denotes the mean sampling date, s_t^2 is the variance of sampling dates, $\bar{x}$ is the mean concentration level, and $\hat{x_i}$ represents the estimated mean concentration at time *t*.

Note: though the variable *t* above represents time, it could just as easily signify another variable, perhaps a second constituent for which an association with *x* is estimated.

Step 2. Compute the regression residual at each sampling event *i* with equation:

$$r_i = x_i - \hat{x_i}$$

Check the set of residuals for lack of normality and significant. Also, plot the residuals against the estimated regression values ($\hat{x_i}$) to check for non-uniform vertical thickness in the scatter cloud. Make a similar check by plotting the residuals against the sampling dates (t_i).

If the residuals are non-normal and substantially skewed and/or the scatter clouds appear to have a definite pattern (*e.g.*, funnel-shaped; "U"-shaped; or, residuals mostly positive on one end of graph and mostly negative on the other end, instead of randomly scattered around the horizontal line $r = 0$), repeat **Steps 1** and **2** after first attempting a normalizing transformation.

Step 3. Calculate the estimated variance around the regression line (also known as the *mean squared error* [MSE]) with the following equation:

$$s_e^2 = \frac{1}{n-2} \sum_{i=1}^{n} r_i^2$$

Step 4. Compute the standard error of the linear regression slope coefficient using the s_e^2 result from Step 3.

$$se(\hat{b}) = \sqrt{s_e^2 / \sum_{i=1}^{n} (t - \bar{t})^2}$$

Step 5. Test whether the trend is significantly different from zero by forming the *t*-statistic ratio in the following equation:

$$t_b = \hat{b} / se(\hat{b})$$

This *t*-statistic (t_b) has *n*–2 degrees of freedom [*df*]. Given a level of significance (α), choose the critical point (t_{cp}) for the test as the (1– α) × 100th percentage point of the Student's *t*-distribution with (*n*–2) *df* or $t_{cp} = t_{1-\alpha,n-2}$. Compare t_b against the critical point. If $t_b > t_{cp}$, conclude that the slope of the trend is both positive and significantly different from zero at the α-level of significance. If $t_b < -t_{cp}$, conclude there is a significant decreasing trend. If neither exists, there is insufficient evidence of an increasing or decreasing trend.

Both of these calculations can be conducted using various computer statistical software. One approach is to use the Monitoring and Remediation Optimization System (MAROS) Software (AFCEE, 2006) or U.S. Environmental Protection Agency (EPA) ProUCL software program (EPA, 2013).

Statistical Determination of 95% Upper Confidence Limit (UCL) for COC Concentrations in Surface Soils

As discussed in the Response Action Plan (RAP), surface soils with cPCL exceedances in the Southern Disposal Ditch (SDD) (SWMU 2), Inactive Wastewater Lagoon (AOC 6), and areas north of the AST Area (SWMU 8) will be consolidated in the area of SWMUs 4, 5, and 8 using the EPA Area of Contamination (AOC) policy. As allowed under the EPA AOC policy, soils may be consolidated within the AOC (defined at the Site as the "Affected Property") and not be considered to be removed from the land or generated. Based on the current areas delineated, the estimated volume of soil to be consolidated from these areas is approximately 23,000 cubic yards. However, prior to consolidation of the soils and construction of the cap, additional soil samples will be collected to refine the surface soil PCLE Zone to ensure the proper area of excavation and cap area construction (see RAP Attachments 2A-1a and 2A-1b).

Additional soil sampling will be conducted to evaluate the representative concentrations of chemicals of concern (COCs) in surface soil using statistics assuming a ½-acre default area for the current surface soil PCLE Zone near the Inactive Waste Water Lagoon (AOC 6) and the southern end of the SDD (SWMU 2) in accordance with 30 TAC §350.51(l). The proposed additional sampling was developed based on at least eight surface soil samples collected within a ½-acre exposure area.

In accordance with 30 TAC§350.79(2)(A), the statistical test will be performed to determine if COCs in surface soils at the Site exceeded the critical PCL ($^{Tot}SOIL_{Comb}$) established during the critical PCL development process conducted as part of the APAR (PBW, 2010). 30 TAC§350.79(2)(A) states that the requirement of a response action may be determined by using an appropriate statistical method. The statistical method identified in the TRRP rule is as follows:

(i) The null hypothesis (H_o) is that the mean of the COC concentrations in the affected property is equal to or greater than the critical PCL;
(ii) The alternative hypothesis (H_a) is that the mean COC concentration is less than the critical PCL;
(iii) The test is performed at a Type I error rate of 5%; and
(iv) Any statistical model used for testing this hypothesis set must be demonstrated to meet these performance standards.

For the surface soil COCs, the analysis will be performed to determine the mean concentration in surface soils in the area of AOC 6 with a Type I error rate of 5%. This analysis will be performed using the EPA's ProUCL software program (EPA, 2013) to calculate a distribution-free (i.e., nonparametric) 95% upper confidence limit (UCL) concentration from the selected data set, including non-detect concentration values (i.e., represented by the sample quantitation limit). ProUCL calculates various types of the 95% UCLs, and then makes a recommendation for the most appropriate UCL type. The 95% UCL of the arithmetic mean for each ½-acre study area will be calculated using ProUCL. Soil data sets will be evaluated for outliers to identify hot spots for excavation. The statistical analysis will evaluate removal of hot spot areas and reassess the 95% UCL for a given COC to the cPCL for that exposure area. The primary COC in this area defining the PCLE Zone is benzo(a)pyrene, which limiting PCL is the $^{Tot}Soil_{Comb}$ PCL.

References

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U.S. Environmental Protection Agency (EPA), 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance, March.

EPA, 20013. ProUCL Statistical Support Software for Site Investigation and Evaluation, Version 5.0.00, September.

Gilbert, R. O., 1987, *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York, NY, ISBN 0-442-23050-8.

Hollander, M. and Wolfe, D.A., 1973, *Nonparametric Statistical Methods*, Wiley, New York, NY.

Pastor, Behling & Wheeler, LLC (PBW), 2010. Updated Affected Property Assessment Report (APAR) Addendum. October 2010.

APPENDIX 8

SPLIT MEDIA APPROVAL
(NOT APPLICABLE)