



**BUILDING AMERICA<sup>®</sup>**

July 10, 2019

Ms. Karen Scott  
Industrial & Hazardous Waste Permits Section  
Texas Commission on Environmental Quality  
P.O. Box 13087, MC-130  
Austin, Texas 78711-3087

Re: Response to 4<sup>th</sup> Technical Notice of Deficiency Letter Dated April 11, 2019  
Permit Renewal/Compliance Plan with Major Amendment  
Union Pacific Railroad Company – Houston Wood Preserving Works  
Houston, Harris County, Texas  
Hazardous Waste Permit/Compliance Plan No.: 50343, ISWR No. 31547  
Tracking No. 18836453; CN600131098/RN100674613

Dear Ms. Scott:

Please find attached with this cover letter Union Pacific Railroad's (UPRR's) Response to the 4<sup>th</sup> Technical Notice of Deficiency (TNOD) on the RCRA Permit Renewal/Compliance Plan with Major Amendments for the facility listed above (the Site). UPRR prepared this response to address the deficiencies listed in the Texas Commission on Environmental Quality (TCEQ) letter to UPRR dated April 11, 2017. The Technical NOD listed several technical deficiencies in the renewal application and requested that UPRR provide certain additional information to complete the application. The attached table lists each deficiency identified in the April 2019 TCEQ letter as well as UPRR's response indicating how each deficiency has been or will be addressed.

As the TCEQ and UPRR discussed and agreed upon during the meeting on June 12, 2019, the attached responses to the 4<sup>th</sup> TNOD focus on the development of a Conceptual Response Action Plan (RAP) as the next step for providing a roadmap for Site remediation. UPRR prepared the Conceptual RAP to detail the proposed additional investigations that the TCEQ requested in the 4<sup>th</sup> TNOD letter for UPRR to conduct at the Site, and how the information obtained from those pre-design assessment activities will be used to refine and finalize Site response action plans. Responses to many of the technical deficiencies listed in the 4<sup>th</sup> TNOD are predicated on the completion of those additional assessment activities. Therefore, following the pre-design assessment activities, UPRR will submit a Revised RAP to the TCEQ with the proposed response actions to address the remedial objectives for the Site required under the Texas Risk Reduction Program (TRRP).

In addition, as UPRR and the TCEQ discussed during a meeting on April 24, 2019, we would like to propose a process that would allow us to expedite work at the Site. We believe that is what the community wants. However, the reality is that under the slow and cumbersome RCRA permit renewal program that currently governs the work to be accomplished, the work is unlikely to be done quickly under

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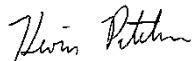
this regulatory scheme. However, the community's desire to have the site addressed more quickly could be accomplished by doing the work under a streamlined consent order between UPRR and the TCEQ. To do this, UPRR proposes to suspend the current RCRA permit renewal process and incorporate the additional pre-design assessment activities and potential response actions into a consent order<sup>1</sup> that could be readily prepared, finalized and implemented.

The USEPA recognizes that streamlined consent orders provide stakeholders (in this case the TCEQ, UPRR and the public) a results-based approach with performance standards that must be met by specific dates, thereby allowing a much shorter timeframe for corrective action implementation and the achievement of response action objectives desired by both UPRR and public stakeholders, relative to the current ponderous and inefficient RCRA Permit renewal process.

Toward that end, UPRR would like to meet with you and your team to further discuss opportunities to address the public's requests by expediting the corrective action process for the Site using this streamlined approach.

If you have any questions or need additional information, please feel free to call me at 414-267-4164.

Sincerely,



Kevin Peterburs  
Manager, Environmental Site Remediation

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<sup>1</sup> UPRR believes the TCEQ can base this Consent Order on a modified version of EPA's Model RCRA Section 3008(h) Consent Order (issued in September 2016) streamlined pursuant to EPA guidance "Enforcement Approaches for Expediting RCRA Corrective Action" (EPA, 2001).

Application Deficiencies – Technical NOD #4

ID <sup>1</sup>	App. Prt	App. Section	Location <sup>2</sup>	Citation	Error Type	Deficiency Description/Resolution	Responses/Comments
General T35(4) T42(4) T44(4) T45(4)	B	XI.	XI.A. through XI.D.	30 TAC 335.167 & 350	Inconsistent/ Incomplete	<p>Based on our review of the following documents:</p> <ul style="list-style-type: none"> <li>UPRR's June 21, 2017 Response to TCEQ's April 10, 2017 3<sup>rd</sup> Technical Notice of Deficiency (NOD) – Permit Renewal Application which includes the June 2017 Response Action Plan (RAP), Rev. 3;</li> <li>UPRR's August 13, 2018 Response to TCEQ's November 29, 2017 letter (Monitoring Report);</li> <li>UPRR's October 31, 2018 and January 9, 2019 Monthly Status Updates - Cap Repairs;</li> <li>UPRR's December 18, 2018 "DNAPL Recovery Activities Quarterly Report – 3<sup>rd</sup> Quarter 2018" and March 12, 2019 "DNAPL Recovery Activities Quarterly Report – 4<sup>th</sup> Quarter 2018"; and,</li> <li>UPRR's December 3, 2018 and February 12, 2019 "Off-site Notification Updates"</li> </ul> <p>The TCEQ notes the following concerns:                      Review of the August 13, 2018 Monitoring Report indicates that the groundwater plume has migrated approximately 200 feet to the north/northeast affecting additional off-site properties.</p> <ul style="list-style-type: none"> <li>Review of the December 3, 2018 and February 12, 2019, "Off-site Notification Updates" indicate the number of off-site properties impacted by the groundwater plume migration increased from 101 to 110 properties.</li> <li>UPRR's current monitoring well system fails to monitor groundwater protective concentration level exceedance (PCLE) and dense non-aqueous phase liquid (DNAPL) zones throughout each of the four transmission zones, therefore, further assessment is needed which includes the installation of additional wells and monitoring data. Additional assessment is discussed in more detail in comment nos. T35(4), T42(4), T43(3), T44(4), T45(4) and T48(3).</li> <li>The current assessment of the total petroleum hydrocarbon – non-aqueous phase liquid (TPH-NAPL) seep source(s) and extent is insufficient because only a limited soil assessment was performed. Additional soil and groundwater assessments is needed which shall include additional soil borings, well installation and monitoring. Additional assessment is discussed in more detail in comment nos. T35(4), T42(4), T43(3), T44(4), T45(4) and T48(3).</li> <li>The RAP does not include the implemented TPH-NAPL interim response actions for the Englewood Intermodal Yard cap area. The RAP needs to be revised to include the installed system design, procedures and a schedule for evaluation of the effectiveness of the response action as outlined in comment nos. T35(4), T42(4), T43(3), T44(4), T45(4) and T48(3).</li> <li>Evaluation of potential Vapor Intrusion (VI) is needed.</li> <li>Since the plume has migrated, the proposed corrective action program consisting of plume management zones (PMZs) with monitored natural attenuation (MNA), and monthly DNAPL recovery contained in the RAP Rev. 3 is inadequate and does not control nor adequately monitor the extent of the plume. The corrective action program in RAP Rev.3 requires revision as outlined in comment nos. T35(4), T42(4), T43(3), T44(4), T45(4) and T48(3).</li> </ul>	Specific responses provided below
General Cont. T35(4) T42(4) T44(4) T45(4)						<ul style="list-style-type: none"> <li>UPRR has failed to obtain the necessary consent from off-site affected property owners for an off-site PMZ. In the April 10, 2017 3<sup>rd</sup> NOD, the TCEQ denied UPRR's request for the Technical Impracticability (TI) for DNAPL removal because UPRR did not make an adequate demonstration in accordance with 30 TAC §350.33(f)(3)(E) requirements of TRRP.</li> </ul> <p>Therefore, for the proposed PMZ boundary to extend off-site, UPRR must obtain written consent from all off-site affected property owners to file a restrictive covenant (RC) prohibiting the use of groundwater on their property. However, some off-site property owners have declined consent or cannot be located to obtain consent. Without the consent of the off-site property owner's the TCEQ cannot approve an off-site PMZ. There are other avenues which would allow an off-site PMZ without the consent of property owners, but UPRR has not satisfied those requirements as specified in 30 TAC 350.111(e)(2) and TCEQ Guidance TRRP-16 (TCEQ RG-366/TRRP-16 May 2010).</p>	Per our meeting on June 12, 2019, UPRR proposes the Off-Site Plume Management Zone (PMZ) to include only the City of Houston right of way (ROW) and off-site properties bounded by Liberty Rd, Erastus St, Wylie St., and Cushing St. Signed restrictive covenants provided in Appendix 5 of the attached Conceptual RAP.
Specific T35(4) T42(4) T43(3) T44(4) T45(4) T48(3)	B	XI.A. - XI.D.	XI.A. - XI.D.2. & XI.D.6.	30 TAC 335.167 & §350	Inconsistent/ Incomplete	<p>Based on the above concerns, UPRR will need to revise and resubmit a complete RAP that includes updated RAP worksheets, associated figures, tables, and appendices as outlined below to address any newly identified historical TPH-NAPL release to soils and groundwater, prevent contaminant migration, and remediate groundwater:</p> <ul style="list-style-type: none"> <li>Remove all references to TI from the RAP and institutional controls.</li> <li>If UPRR intends to pursue a PMZ in accordance with 30 TAC §350.33(f)(4) then the proposed West and Main PMZs should be limited to only the UPRR owned property, and the City of Houston owned property (which contains only the capped-sidewalk just north of the site).</li> </ul>	<p>References to the technical impracticability (TI) have been removed from the Conceptual RAP.</p> <p>Per our meeting on June 12, 2019, the attached Conceptual RAP presents the preliminary Off-Site PMZ to include the City of Houston ROW and off-site properties bounded by Liberty Rd, Erastus St, Wylie St., and Cushing St., of which signed restrictive covenants (Appendix 5) have been acquired in accordance with TRRP Rules and Regulations.</p>

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						<p>• UPRR’s current response actions include the utilization of a cover/cap system to block exposure to surface soils and reduce rainwater infiltration, a Monitored Natural Attenuation (MNA) for dissolved phase constituent(s) of concern (COCs) within the PMZ, and removal of readily recoverable DNAPL from 13 selected monitoring wells to control the DNAPL source zone. As previously stated, the TCEQ does not concur with UPRR that the plume is stable nor has reached steady state condition. Therefore, the MNA, PMZ, and limited DNAPL recovery is insufficient and response actions should be reevaluated.</p> <p>Evaluation of plume stability should occur after active remediation systems (e.g. removing readily recoverable NAPL, pump and treat, etc.) have been discontinued. There are several factors the TCEQ evaluates to determine plume stability. These factors include: the groundwater PCLE zone is not expanding laterally and vertically, the presence of NAPL will not increase, and readily recoverable NAPL has been removed.</p> <p>Based on review of the RAP, one of UPRR’s groundwater model scenarios (current conditions with constant DNAPL source throughout time) predicted a minor degree of naphthalene migration, approximately 250 feet after 100 years. UPRR provided another modeled scenario which showed source reduction assuming the naphthalene decay rate at one-half every five years. UPRR explained that the model also indicated some migration, but UPRR did not specify the rate of migration although the naphthalene concentrations within the PCLE zone were greatly reduced. Despite models indicating minimal migration of the plume, the monitoring data indicates that the groundwater plume has not reached steady-state conditions and has migrated approximately 200 feet affecting additional off- site properties to the north/northeast. A comparison of the groundwater monitoring data from the July/August 2014 sampling event to the most recent May/June 2018 sampling event shows an indication of increasing concentrations of Dimethylphenol, Benzene, Naphthalene, 2-Methylnaphthalene and other COCs in monitoring wells MW-20A, MW-77A, MW-79A, MW-35B, MW-40B, MW-49B, MW-70B, MW-68B, MW-74B, MW-83B, MW-17C, and MW-18C. Benzo(a)pyrene was detected in DTZ monitoring well MW-36D above the Tier 1 residential protective concentration level (PCL) in the June 2018 sampling event. The plume migration is further confirmed by the installation of two more monitoring wells in the B-TZ/B-CZ (MW-89B and MW-90B) in June 2018, in addition to the three wells previously installed in the B-TZ/B-CZ (MW-82B, MW-83B and MW-84B) in January 2018 per RAP Rev. 3. The results of the 2018 groundwater monitoring events indicate repeated fluctuations of Benzene and Naphthalene concentrations above residential Tier 1 PCLs in MW-82B and MW-83B located on the leading edge of the plume. The plume now impacts 110 offsite properties.</p>	<p>As discussed in the Conceptual RAP, UPRR plans to re-evaluate the proposed response actions for the groundwater PCL exceedance (PCLE) Zones following the pre-design assessment activities (i.e., Additional Non-aqueous Phase Liquid (NAPL) Assessment and Groundwater Assessment activities discussed in Worksheet 2.0 of the attached Conceptual RAP). Once the pre-design assessment activities have been completed, UPRR will submit a Revised RAP detailing the proposed response activities, including a feasibility study. This may include recommendations for pilot studies or treatability studies to evaluate the feasibility of a selected response action or actions.</p> <p>Following the pre-design additional assessments detailed on Worksheet 2.0, UPRR will prepare a groundwater chemicals of concern (COC) concentration trend analysis to be used as part of the remedial alternative evaluation. The trend analysis will be provided in the Revised RAP.</p> <p>Per our meeting on June 12, 2019 and the follow-up email from Golder to the TCEQ dated June 18, 2019, the reference to monitoring well MW-82B having "repeated fluctuations of benzene and naphthalene concentrations above the residential Tier 1 PCLs" does not appear to be correct. After a review of the groundwater data from monitoring well MW-82B, there have been no detections of benzene or naphthalene concentration above the residential Tier 1 PCLs. The TCEQ provided a clarification of the deficiency in an email dated July 3, 2019 stating that the reference should be for monitoring wells MW83B and MW-84B, not MW-82B.</p>
						<p>Even though UPRR continues to remove readily recoverable creosote DNAPL monthly and DNAPL thickness has decreased in certain wells, the creosote DNAPL may be migrating away from the current recovery wells laterally to the north/northeast and vertically downward. Review of current well construction diagrams indicate the current DNAPL recovery system only consists of monitoring wells and are not designed as extraction wells to effectively and efficiently remove DNAPL. The monthly recovery frequency is also inadequate to capture and remove DNAPL. Secondly, based on review of boring logs, CPT logs, cross-sections and well construction details, an insufficient number of wells were installed at appropriate locations and screened at appropriate depths to remove and monitor where DNAPL has been observed. UPRR recently observed TPH-NAPL migrating upward into the Englewood Intermodal Yard cap area (the TPH-NAPL has not been fully delineated). Furthermore, the TCEQ reviewed the cross-sections, boring logs, and well construction specifications provided in the application, the 13 DNAPL pilot test recovery wells that are not provided in the application, the November 2014 Vadose Zone DNAPL Observations, and the ROST map provided in the January 9, 2019 Monthly Status Updates - Cap Repairs which indicate that additional wells should have been installed at locations where DNAPL is present or has been observed in the A-TZ, and B-TZ and C-TZ zones. For example; the TCEQ notes that no wells were installed at locations CPT-09R-95, CPT-28R-1, CPT-38-97/SB04, CPT-26R-95, nor CPT-33R-95 where NAPL is present in the A-TZ, B-TZ, and C-ZT. UPRR observed DNAPL which was noted in the boring logs and CPT logs at well locations MW-72B and MW-73B in the B-TZ/B-CZ zones, but UPRR did not install any wells to monitor or remove DNAPL in the A-TZ and CTZ where DNAPL was also observed.</p>	<p>As discussed in the response below and in the attached Conceptual RAP (Worksheet 2.0), UPRR plans to conduct a pre-design additional NAPL Assessment at the Site to evaluate the current NAPL nature and extent using optical screening techniques (i.e. TarGost). Following the additional NAPL Assessment activities, UPRR will evaluate potential alternatives for improving the effectiveness and efficiency of DNAPL recovery activities at the Site.</p> <p>Per our meeting on June 12, 2019, UPRR discussed the difficulty of installing recovery wells that are able to be used for DNAPL recovery. UPRR installed two large diameter wells for the purpose of recovering DNAPL in areas where DNAPL had been noted in boring logs, CPT-ROST logs, and nearby monitoring wells. Test well TW-56A 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. However, through 2016 (seven years), no DNAPL was 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 may have residual saturation of DNAPL in the sand matrix that is not mobile, especially given the high viscosity of the DNAPL material.</p> <p>Another example of the difficulty of encountering 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, 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. However, no DNAPL has been detected in TW-41B.</p>



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					<p>Since the TCEQ is requiring UPRR to conduct further assessment of TPH-NAPL in the Englewood Intermodal Yard cap area as directed in the TCEQ February 6, 2019 letter and a VI assessment as directed in Comment T59 of this NOD, the additional assessment should include a re-assessment of creosote DNAPL using cone penetrometer/ rapid optical screening tool (CPT/ROST). The assessment should also include further evaluation of the dissolved phase plume for benzene and naphthalene to the east, west, and south in the A- TZ, B-TZ/BCZ and CTZ. For arsenic, additional assessment is needed to the west and north of the site in the A-TZ and B-TZ/BCZ. Regarding Benzo(a)pyrene detected in the June 2018 sampling event, if results of the January 2019 sampling event indicate Benzo(a)pyrene continues to be detected in any of the D-TZ monitoring wells, then further assessment may be required in the D-TZ and deeper zone(s). Update the RAP implementation schedule to include the additional assessments requested above.</p>	<p>The following proposed assessments to address this deficiency include (and discussed on Worksheet 2.0 of the Revised RAP):</p> <ul style="list-style-type: none"> <li>• Additional NAPL Assessment,</li> <li>• Additional Groundwater Assessment,</li> <li>• TPH-NAPL Assessment Englewood Intermodal Yard, and</li> <li>• Pentachlorophenol (PCP) Assessment in soils (per the June 12, 2019 meeting).</li> </ul> <p>The groundwater VI Assessment near MW-68B per Comment T59 (completed, a summary letter submitted on July 3, 2019) is provided in Appendix 3 of the Conceptual RAP.</p>
					<ul style="list-style-type: none"> <li>• Based on results of the assessment as described above, UPRR must re-evaluate the current DNAPL recovery system and defer proposed MNA until the plume reaches steady-state conditions and readily recoverable DNAPL removal is completed. At that time, UPRR may propose designating new attenuation monitoring point (AMP) wells and attenuation action levels (AALs). Until the assessments are completed, the existing proposed designated AMP wells and their respective AALs should be removed from current RAP (Rev. 3) and re-designated as corrective action observation (CAO) wells. Furthermore, the TCEQ does not concur with the proposed AALs; the AALs are excessively high and would not be protective of the downgradient alternate point of exposure (APOE).</li> </ul>	<p>UPRR will re-evaluate the current DNAPL recovery system following the pre-design NAPL Assessment activities discussed in Worksheet 2.0 in the Conceptual RAP. In addition, the location of proposed AMPs, AALs, and CAO wells will be evaluated following the additional Groundwater Assessment activities also discussed in Worksheet 2.0.</p>
					<ul style="list-style-type: none"> <li>• UPRR shall reevaluate the DNAPL recovery system configuration and consider the following factors to improve its effectiveness and efficiency.                             <ul style="list-style-type: none"> <li>o UPRR needs to consider installing additional recovery wells in the A-TZ, B-TZ/B- CZ, C-TZ and, if necessary, any lower affected transmissive zones. This may include modifications in well design to optimize DNAPL recovery such as utilizing preferred larger diameter wells and deeper sumps where in-well DNAPL separation can be achieved. The existing wells that UPRR installed were designed as monitoring wells, not as extraction wells with associated engineered systems.</li> <li>o Re-evaluate removal optimization frequency by collecting more frequent DNAPL measurements and alternative removal methods.</li> <li>o Re-evaluate the current integrity of the recovery wells.</li> <li>o As an interim measure, UPRR must gauge for DNAPL in all the existing on-site and off-site monitoring wells, continue DNAPL recovery at the existing 13 wells and any other wells where measurable DNAPL is encountered. UPRR should consider more frequent removal of DNAPL from those wells continuing to have consistent DNAPL thicknesses including: MW- 78A, MW-32B, MW-41B, MW-23C, MW44C and MW-46 C.</li> <li>o UPRR must submit quarterly progress reports until the system is re-evaluated and all improvements are implemented.</li> </ul> </li> </ul>	<p>UPRR will evaluate DNAPL recovery options after completion of the pre-design additional NAPL Assessment activities discussed on Worksheet 2.0 of the Conceptual RAP. Data collected from this pre-design assessment will be used to optimize DNAPL recovery through an assessment of remedial alternatives to improve effectiveness and efficiency. In the interim, UPRR will gauge for DNAPL in all the existing on-site and off-site monitoring wells, continue DNAPL recovery from the 13 wells where measurable DNAPL has been encountered, and increase the frequency to twice per month for the manual recovery activities. NAPL recovery methods, frequency, and wells included in the DNAPL Recovery Activities will be re-evaluated following the additional NAPL assessment activities. UPRR will continue to provide quarterly DNAPL recovery reports to the TCEQ (see Worksheet 6.0).</p>
					<p><input type="checkbox"/> The recovery system needs to be expanded to include a pump and treat system, or alternative method, to remove the dissolved phase COCs in the groundwater plume, to reduce concentrations, and address hot spots. As an interim measure, UPRR shall add the following monitoring wells to the groundwater recovery program (e.g. designated as corrective action system (CAS) wells): MW-17A, MW-18A, MW-20A MW-79A, NW-57B, MW- 68B, MW-72B, MW-74B, MW-17C and MW-18C. These wells were chosen based on the most recent May/June 2018 sampling. UPRR needs to further evaluate which wells continue to be utilized as CAS wells or if additional CAS wells need to be proposed based on assessment results.</p>	<p>As detailed on Worksheet 2.0 of the Conceptual RAP, UPRR will evaluate and develop remedial alternatives after completion of the additional Groundwater and NAPL Assessment activities with the goal of achieving the specific groundwater response objectives for the different Remedy Standard areas at the Site.</p>
					<p><input type="checkbox"/> The revised RAP shall include engineering designs for remediation system(s) to address both NAPL and dissolved phase groundwater plumes and collection, storage, and final disposition of recovered NAPL and dissolved phase COCs groundwater.</p>	<p>See previous response. The potential design of any system components for groundwater treatment and/or NAPL recovery will be generally described within the Revised RAP following completion of the additional assessment activities. This may include recommendations for pilot studies or treatability studies to evaluate the feasibility of a selected response action or actions prior to full scale implementation.</p>
					<p><input type="checkbox"/> The revised RAP shall include the installed interim revised response action system design detailed in the January 9, 2019 Monthly Status Update – Soil Cap and Concrete Repairs that address future seeping of the NAPL-TPH in the Englewood Intermodal Yard area. The revised RAP shall also include the monitoring system schedule and outlined procedures for evaluating the efficiency/effectiveness of the system in reducing NAPL-TPH seeps. UPRR is required to submit monthly status updates, until such a time an alternate schedule is approved by the TCEQ. The monitoring schedule should also be provided in CP Table VIII of the Permit Renewal application.</p> <p>Secondly, UPRR should also include a contingency plan for implementing additional measures to further prevent the seeping of NAPL such as in-situ chemical oxidation, thermal treatment, and/or other appropriate response actions. Be advised that if the proposed response action design is not effective as interim measure, the TCEQ may require that UPRR evaluate and implement additional response actions as necessary including future revisions to the Response Action Plan.</p>	<p>The NAPL Collection System design drawings that were submitted to the TCEQ in the January 9, 2019 Monthly Status Update are provided under Attachment 2A of this Conceptual RAP. The operation and maintenance of the NAPL Collection System is discussed on Worksheet 5.0.</p> <p>UPRR will develop a contingency plan for implementing additional measures to prevent seeps in the Englewood Intermodal Yard following the additional NAPL assessment and TPH-NAPL Assessment activities discussed on Worksheet 2.0 of the Conceptual RAP. The additional data collected from those assessments will be used to evaluate potential remedial actions in that area. The contingency plan and potential other remedial actions will be provided in the Revised RAP.</p>

Application Deficiencies – Technical NOD #4

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						<p><input type="checkbox"/> The revised RAP shall include modified Appendix 4 - institutional control (ICs) for the UPRR owned property to include TPH-NAPL area, TPH-NAPL interim measures, and update the maintenance and monitoring to include the on-site PMZ, groundwater monitoring, and remediation measures. Also, revise Appendix 5 to include removal of the ICs for the off- site affected residential properties.</p> <p>Modifications of the existing monitoring well system configuration and designation are needed to reflect changes in the PMZs, to include: background wells, APOE wells, CAO wells, and CAS wells. This includes continued monitoring of the four wells screened in the D-TZ. Specific revisions to the CP Tables and CP Attachment A maps are noted in the following comments below.</p>	<p>UPRR will revise the institutional controls for the UPRR-owned property to include the TPH-NAPL area and NAPL Collection System following the additional assessment activities detailed on Worksheet 2.0.</p> <p>Appendix 5 of the Conceptual RAP includes the signed institutional controls for the off-site City of Houston ROW and the private landowners bounded by Liberty Rd., Wylie St., Erastus St., and Cushing St.</p>
Specific T23(3)	B	XI.A.	XI.A.1, XI.A.2, & XI.A.3	30 TAC 335.167 & 350	Inconsistent/Incomplete	<p>Since the proposed PMZ shall be limited to the on-site UPRR owned property, revise the CP Attachment A Figures to include the following:</p> <p><input type="checkbox"/> CP Attachment A, Sheet 1 of 7, “<i>Facility Site Map</i>” is not legible. Provide a new map that clearly labels the facility name, facility property boundary, and nearby local roadway (e.g. interstate, highway, etc.) with respect to the City of Houston.</p> <p><input type="checkbox"/> CP Attachment A, Sheet 2 of 7, <i>Solid Waste Management Units (SWMUs)/ Areas of Concern (AOC) Location Map</i>. Revise this figure and legend by deleting <u>all</u> references to proposed on-site and off-site TI Zones, and the off-site PMZ boundary. The PMZ boundary should be limited to only the UPRR property. Also, the text in the legend and name of the specific SWMUs/AOCs is not legible.</p> <p><input type="checkbox"/> CP Attachment 3 of 7, <i>Compliance Monitoring Well Network</i>. The point-of compliance (POC) wells and background wells should have different symbols so the wells are easily distinguished from one another. Also, the name of the RCRA Permitted Unit which is identified as “<i>SWUM I</i>” needs to remain as “<i>RCRA-Regulated Waste Management Unit 001</i>” to be consistent with the facility Notice of Registration (NOR).</p>	<p>Per the meeting on June 12, 2019, the required Compliance Plan (CP) figures depicting the final PMZs will be prepared following completion of the additional Groundwater and NAPL Assessment activities detailed on Worksheet 2.0 and preparation of the Revised RAP. Per the TCEQ request, UPRR will not include the corrective action observation (CAO) wells, corrective action system (CAS) wells, and any future attenuation monitoring point (AMP) wells on the CP Tables. UPRR will revise the Part B Permit Renewal Application including the Compliance Plan as part of the Revised RAP submittal to the TCEQ.</p>
						<p><input type="checkbox"/> CP Attachment A, Sheet 4 of 7, PMZ Boundary Map, A-TZ. Remove all references to the off-site PMZ and TI. The title should be re-labeled to state, “PMZ Boundary and Well Location Map, A-TZ.” Remove references to AMP wells in the figure. Revise the figure to reflect the following list of wells as designated below:</p> <p>On-site Main PMZ:</p> <ul style="list-style-type: none"> <li>o Alternate point of exposure (APOE) wells: MW-15A, MW-17, MW-18A, MW-49A, MW-50A, MW-57A, MW-58A, MW-60A, MW-69A.</li> <li>o Corrective Action Observation (CAO) wells: MW-18A, MW-20A, MW-51A, MW-77A, MW-78A, MW-79A.</li> </ul> <p>On-site West PMZ:</p> <ul style="list-style-type: none"> <li>o APOE wells: MW-38A.</li> <li>o CAO wells: MW-9, MW-12A, MW-13.</li> </ul> <p>Off-site CAO wells: MW-25A, MW-26A, MW-32AR, MW-33A, MW-35A, MW-36A, MW-44A, MW-59A, MW-61A.</p> <p>Background well: MW-51A.</p> <p>Corrective Action System wells: MW-17A, MW-18A, MW-20A, and MW-79A.</p> <p><input type="checkbox"/> CP Attachment A, Sheet 5 of 7, PMZ Boundary Map, B-CZ/B-TZ. Remove all references to the off-site PMZ and TI. The title should be re-labeled to state, “PMZ Boundary and Well Location Map, B-CZ/B-TZ.” Remove references to AMP wells in the figure. Revise the figure to reflect the following list of wells as designated below:</p> <p>On-site Main PMZ:</p> <ul style="list-style-type: none"> <li>o APOE wells: MW-15B, MW-47B, MW-49B, MW-57B, MW-72B, MW-80B, MW-81B.</li> <li>o CAO wells: MW-14, MW-74B, MW-75B.</li> </ul> <p>On-site West PMZ:</p> <ul style="list-style-type: none"> <li>o APOE wells: MW-38B, MW-39B, MW-42B, MW-62B.</li> <li>o CAO wells: MW-12B, MW-40B.</li> </ul> <p>Off-site CAO wells: PMW-28BA, MW-26A, MW-32B, MW-33BR, MW-35B, MW-36B, MW-44A, MW-59B, MW-63B, MW-67B, MW-68B, MW-70B, MW-71B, MW-82B, MW-83B, MW-84B, MW-89B, MW-90B</p>	<p>See previous response.</p>

Application Deficiencies – Technical NOD #4

ID <sup>1</sup>	App. Part	App. Section	Location <sup>2</sup>	Citation	Error Type	Deficiency Description/Resolution	Responses/Comments
						<p><u>Corrective Action System wells:</u> MW-57B, MW-68B, MW-72B, and MW-74B.</p> <p><input type="checkbox"/> CP Attachment A, Sheet 6 of 7, <i>PMZ Boundary Map, C-TZ</i>. Remove all references to the off-site PMZ and TI. The title should be re-labeled to state, “<i>PMZ Boundary and Well Location Map, C-TZ</i>.” Remove references to AMP wells in the figure. Revise the figure to reflect the following list of wells as designated below:</p> <p><u>On-site Main PMZ:</u></p> <ul style="list-style-type: none"> <li>o <u>APOE wells:</u> MW-15C, MW-17C, MW-18C, MW-47C, MW-48C,</li> <li>o <u>CAO wells:</u> MW-19C, MW-23C, MW-45C, MW-51C, MW-76C, MW-75B. <u>On-site West PMZ:</u></li> <li>o <u>APOE wells:</u> MW-12C</li> </ul> <p><u>Off-site CAO wells:</u> MW-25C, MW-27C, MW-34CR, MW-44C, MW-45C, MW-46C, and MW-54C MW-68C, MW-83C, MW-87C,</p> <p><u>Corrective Action System wells:</u> MW-17C, and MW-18C</p> <p><input type="checkbox"/> CP Attachment A, Sheet 7 of 7, <i>Post-Response Action Care Well Location Map</i>. Remove all references to off-site PMZ and TI. The title should be re-labeled to state, “<i>Well Location Map, D-TZ</i>” because the TCEQ shall require UPRR to continue monitoring the deeper transmissive zone to verify the groundwater PCLE zone is not migrating vertically. Include D-TZ wells MW-36D, MW-59D MW-65D and MW-66 D as CAO wells.</p> <p>Since all the above CP Attachment A figures will be included in the Final Draft Permit (FDP) as a black and white copies, each well designation (i.e., APOE, background well, CAO well, etc.) should have a separate symbol that is easily distinguished. The font may need to be enlarged and/or darkened on <u>all</u> the maps. For future reference, please note that CAO wells, CAS wells, and any future AMP wells should not be listed in CP Tables. These wells are <u>only</u> depicted in the CP Attachment A maps so that once wells meet their respective PCLs, UPRR may propose to discontinue monitoring for those wells in future Groundwater Monitoring Report submittals to account for changing environmental conditions and/or plume morphology without modification to the Permit.</p>	<p>See previous response.</p>
Specific T27(3) T41(4)	B	XLA. & XLD.	XLA.3 & CP Tables I & II and XLD. RACR	30 TAC §335.167, §350, & §305.45 (a) (8)(C)3	Incomplete/Inconsistent	<p>On June 21, 2017, UPRR submitted revisions to the July 18, 2016, Response Action Completion Report (RACR) in response to the TCEQ April 10, 2017 3<sup>rd</sup> NOD. The RACR documents the completion of response action for the soil PCLE zones for SWMUs 2, 4, 5, 6, 7, 8, 9, 10, and 11; and AOCs 1, 4, 6, and 7. The response actions included soil excavation, consolidation, and capping. On September 27, 2017, UPRR submitted the first Post Response Action Report (PRACR) indicating several deficiencies were observed during the cap inspection which required necessary repairs to maintain the cap integrity. Many of the deficiencies were corrected by UPRR and verified by follow-up inspections documented in the PRACR - Monthly Status Reports, except for the seeps in the Englewood Intermodal Yard concrete cap. The TCEQ noted in the October 31, 2018; December 6, 2018; and February 6, 2019 letters that UPRR needed to implement interim response actions to address the TPH-NAPL seeps in Englewood Intermodal Yard cap. Furthermore, in the February 6, 2019 letter, the TCEQ directed UPRR to conduct additional assessment of the TPH-NAPL source(s) and extent of contamination. Since additional assessment and interim response action(s) are needed to address the TPH-NAPL, the TCEQ considers UPRR’s July 18, 2016 RACR as an interim response action report. Based on the outcome of the TPH-NAPL assessment and implemented interim response action(s), UPRR may need to submit a revised RACR. Any interim response actions implemented for the UPRR HWPW facility can be incorporated as part of the final response action. Therefore, please revise the Permit application as follows:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Modify Section XI.D. with a revised RACR to include the following:             <ul style="list-style-type: none"> <li>o Retitle the document as, “<i>Interim - Response Action Completion Report</i>.”</li> <li>o Either remove reference to groundwater in the Executive Summary since the interim response action only addresses soils or clarify that response actions for groundwater will be addressed in the revised RAP that will include alternative remedies for decontamination and removal in addition to the proposed on-site plume management zone and ICs.</li> <li>o Remove the ICs language from Appendix 3. Appendix 3 should be marked “reserved” and serve as a place holder. The TCEQ shall require revisions to the ICs to include the TPH-NAPL area and its associated response action(s). The revised ICs shall then be resubmitted with the final RACR.</li> </ul> </li> <li><input type="checkbox"/> Revise CP Table I, Item C. Remove the comment in right hand column. CP Table I is only for listing those units that are subject to groundwater monitoring.</li> <li><input type="checkbox"/> Revise CP Table II as follows:             <ul style="list-style-type: none"> <li>o Add TPH-NAPL area as a new AOC because additional assessment and implementation of necessary interim response action(s).</li> <li>o For SWMUs 2, 4, 5, 6, 7 8, 9, 10 and 11; and AOCs 1, 4, 6, and 7, UPRR may add a Foot Note # 4 at the bottom of the table to reflect implementation/completion of the soil interim response action.</li> </ul> </li> </ul>	<p>UPRR will evaluate additional response actions to address the TPH-NAPL in the Englewood Intermodal Yard after completion of the additional NAPL Assessment and TPH-NAPL Assessment detailed on Worksheet 2.0 of the Conceptual RAP. If necessary, the Revised RAP will include possible additional response actions and engineering designs. UPRR will submit the revised RACR as "Interim" per this deficiency with the Revised RAP and will revise CP tables as requested.</p>

Application Deficiencies – Technical NOD #4

ID <sup>1</sup>	App. Section	Location <sup>2</sup>	Citation	Error Type	Deficiency Description/Resolution	Responses/Comments	
Specific T31(3) T34(4), T55(4) T56(4)	B	XLB & XLD.	XLB CP Tables III & IIIA, XLD.6	30 TAC §335.167 & §350	Inconsistent/incomplete	<p>Include the following revisions to CP Tables III and IIIA.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Revise the groundwater protection standard (GWPS) in CP Tables III and IIIA based on updated TRRP 2018 Tier 1 PCLs.</li> <li><input type="checkbox"/> Since there are two proposed on-site PMZs (west and main-plant) CP Tables III and IIIA should include separate lists of COCs and GWPS to be achieved for each PMZ.</li> <li><input type="checkbox"/> Since both PMZ boundaries shall be limited to the on-site UPRR HWPW property, remove all references to off-site PMZ in both CP Tables III and IIIA.</li> <li><input type="checkbox"/> Revise column B. Remove reference to all attenuation monitoring point (AMP) wells and attenuation action levels (AALs) in CP Tables III and IIIA. The Permit application directions specify that any proposed AMP and their respective AALs only need to be depicted in the CP Attachment A maps. Each AMP well should be depicted in CP Attachment A Maps with their respective AAL for each contaminate in the text box next the AMP well.</li> <li><input type="checkbox"/> To verify the contaminant plume does not migrate off the UPRR owned property at levels exceeding residential PCLs, revise Column B in CP Tables III and IIIA so the GWPS for each COC is based on commercial/industrial PCLs within the PMZ; and revise Column C in CP Tables III and IIIA to include the GWPS for each COC based on residential PCLs to be achieved at the POE.</li> <li><input type="checkbox"/> Revise Column A in CP Tables III and IIIA to include the same. list of COCs for each groundwater transmissive zone.</li> <li><input type="checkbox"/> Add Arsenic as a COC and its GWPS to both CP Tables III and IIIA, since the COC was reported above residential and commercial/industrial Tier 1 PCLs in the UPRR August 13, 2018 Monitoring Report.</li> <li><input type="checkbox"/> Add the D-TZ transmissive unit with a proposed list of COCs and GWPS to CP Tables III and IIIA. The D-TZ should be part of the monitoring program since Benzo(a)pyrene has been detected in MW-36D during the March and June 2018 sampling events above residential and commercial/industrial Tier 1 PCLs as reported in the UPRR August 13, 2018 Monitoring Report. The list of COC for the D-TZ should include the same list of all COCs associated with the above transmissive zones.</li> <li><input type="checkbox"/> Benzo(a)pyrene, Fluorene, Pyrene, and Phenanthrene should be added to CP Table IIIA because the March and June 2018 sampling events indicate concentrations in certain wells above residential and commercial/industrial Tier 1 PCLs in the UPRR August 13, 2018 Monitoring Report.</li> </ul>	Per the meeting on June 12, 2019, UPRR will update the required CP tables following completion of the additional Groundwater and NAPL Assessment activities detailed on Worksheet 2.0. UPRR will revise the Part B Permit Renewal Application including the Compliance Plan as part of the Revised RAP submittal to the TCEQ.
Specific T30(3) T38(3)	B	XLC	CP Tables IV & IVA	30 TAC §335.165	Inconsistent	Revise Columns A and B in CP Tables IV and IVA so the list of COCs and their respective concentration levels or GWPS are the same for each groundwater transmissive zone.	See previous response.
Specific T30(3)	B	XLA & XLC	CP Tables I, II, IV, IVA, V and VI	30 TAC §335.165	Inconsistent	Remove reference to "SWMU-1" and replace it with "RCRA- Regulated Waste Management Unit 001"	See previous response.
Specific T47(3)	B	XLD.	XLD.3.a.(2). D. and CP Table V	30 TAC §335.165 & §350	Inconsistent/Incomplete	<p>Please revise CP Table V to reflect the following list of wells as designated below:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <u>Alternate Point of Exposure (APOE) wells On-site Main PMZ:</u></li> <li><u>A-TZ:</u> MW-15A, MW-17A, MW-18A, MW-49A, MW-50A. MW-57A, MW-58A, MW-60A, and MW-69A.</li> <li><u>B-TZ/B-CZ</u> MW-15B, MW-47B, MW-49B, MW-57B, MW-72B, MW-80B, MW-81B <u>C-TZ:</u> MW-15C, MW-17C, MW-18C, MW-47C, MW-48C</li> <li><u>On-site West PMZ:</u> <u>A-TZ:</u> MW-38A</li> <li><u>B-TZ:</u> MW-38B, MW-39B, MW-42B, MW-62B <u>C-TZ:</u> MW-12C</li> <li><input type="checkbox"/> Add the following well to the current list of Background Wells: <u>On-site Main PMZ:</u> <u>A-TZ:</u> MW-51A</li> <li><input type="checkbox"/> Since there is no off-site PMZ, remove the two (2) asterisks at the bottom of the page.</li> </ul>	See previous response. This deficiency refers to MW-47B, however, monitoring well MW-47B does not exist at the Site.

Application Deficiencies – Technical NOD #4

ID <sup>1</sup>	App. Section	Location <sup>2</sup>	Citation	Error Type	Deficiency Description/Resolution	Responses/Comments	
Specific T58				Incomplete/Inconsistent	In the current RAP (Rev. 3), UPRR explains that the groundwater-to-air ( <sup>Air</sup> GW <sub>ln-v</sub> ) PCL was evaluated for each COC and concluded that the potential for vapor migration from groundwater is low. For clarification, the TCEQ points out that the comparison of groundwater monitoring data to the <sup>Air</sup> GW <sub>ln-v</sub> PCL is an evaluation of only the outdoor air exposure to vapors from affected groundwater. The Permit application failed to consider the on-site vapor intrusion (VI) exposure pathway completely by not including an evaluation for potential indoor-air VI pathway. Since there are no structures currently on the affected UPRR owned property currently, the TCEQ is not requiring that UPRR evaluate the potential for indoor-air VI pathway on-site. If UPRR intends to install any structure(s) on the UPRR-owned property, then the VI pathway may need to be evaluated prior to development. UPRR should evaluate the potential indoor-air VI pathway for the off-site affected properties for the reasons included in comment T59 of this NOD. Be advised that if assessment results indicate there is a VI concern for the off-site affected properties, then UPRR must evaluate and implement additional response actions as necessary which may require future revisions to the RAP.	See response to Specific T59 below.	
Specific T59	B	XI.D	XI.D.6.	30 TAC 335.167 & 350	Incomplete/Inconsistent	Based on review of the August 13, 2018 Monitoring Report, UPRR needs to conduct further assessment to evaluate the potential in-door air VI pathways into structures located north of the HWPW Facility near the intersection of Clementine and Wylie Street. The highest concentration of naphthalene in off-site wells screened in the second transmissive unit, B- CZ/B-TZ, was reported in monitoring well MW-68B (23 mg/l). Concentrations of COCs in off- site monitoring wells screened in the uppermost transmissive unit, A-TZ, were either non- detect or less than the residential Tier 1 PCLs for Class 1 groundwater. However, there are no wells near MW-68B that are screened in the ATZ to determine if the ATZ has been affected in this area. Considering that naphthalene is a petroleum hydrocarbon and the vertical separation distance between the ground surface and observed water table at well location MW-68B, if the uppermost transmissive zone (A-TZ) at MW-68B is not impacted, the VI pathway would be incomplete for the off-site affected properties. However, there are no wells near MW-68B that are screened in the A-TZ to determine if the groundwater in Zone A-TZ has been affected in this area. Therefore, UPRR should install additional monitoring wells screened in the ATZ at well location MW-68B. Please submit an interim assessment work plan and schedule that describes a proposed assessment strategy for the VI pathway.	UPRR prepared a response to Deficiency No. Specific T59 in a letter dated July 3, 2019 detailing the investigation activities to address the TCEQ comment. A copy of the letter is provided in Appendix 3 of the attached Conceptual RAP.
Specific T52(3)	B	XI.D.	XI.D.8. CP Table VIII	30 TAC §335.167 and §350	Incomplete	The activities outlined in the revised RAP Implementation Schedule and as outlined in this 4 <sup>th</sup> NOD should be included in a revised CP Table VIII. <ul style="list-style-type: none"> <li><input type="checkbox"/> Include activities for completing assessment for off-site VI, TPH-NAPL and creosote DNAPL and dissolved phase COCs as explained above.</li> <li><input type="checkbox"/> Include a schedule and outline the activities for completing evaluation of NAPL and dissolved phase plume recovery system, and possible implementation of other measures and engineered response action system design.</li> <li><input type="checkbox"/> Include a revised schedule for providing proof of filing of ICs for the proposed West and Main PMZs (shall be limited to only the UPRR owned property and the City of Houston owned property which contains only the capped-sidewalk just north of the site).</li> </ul>	Per the meeting on June 12, 2019, UPRR will update the required CP tables following completion of the additional Groundwater and NAPL Assessment activities detailed on Worksheet 2.0. UPRR will revise the Part B Permit Renewal Application including the Compliance Plan as part of the Revised RAP submittal to the TCEQ. The schedule for the additional assessment activities outlined in the attached Conceptual RAP is provided on Worksheet 6.0.
Specific T60	B	XI.E	Tables XI.E.1- XI.E.3	30 TAC §335.167	Incomplete	Please revise the Financial Assurance calculations in Tables XI.E.1- XI.E.3 to include cost for changes to the corrective action monitoring as addressed in comments of this table.	The Financial Assurance calculations will be updated as part of the Revised RAP submittal after the additional investigation activities are completed.

<sup>1</sup>Deficiency ID – Key: A#=Administrative deficiency (ex. A12); T#=Technical deficiency (ex. T10); C#=Comment only (ex. C1); Number in parenthesis (n) = n<sup>th</sup> instance of same deficiency (ex. T1(2) is the second instance of deficiency T1 originally identified in previous NOD).

<sup>2</sup>Location of deficiency in submittal/application. Items in square brackets [ ] refer to applicant’s supplemental information submitted as attachments to the application form.

**CONCEPTUAL RESPONSE ACTION PLAN – Revision No. 4**

**UNION PACIFIC RAILROAD  
HOUSTON WOOD PRESERVING WORKS  
HOUSTON, TEXAS  
SWR No. 31547 / IHW No. 50343**

**JULY 9, 2019**

*Prepared for:*

**Mr. Kevin Peterburs.  
UNION PACIFIC RAILROAD COMPANY**

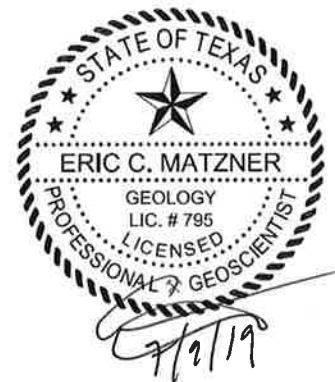
**4823 N 119<sup>th</sup> Street  
Milwaukee, WI 53225**

*Prepared by:*

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**Texas Geoscience Firm No. 50369**



# 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:  Initial submittal for this on-site property  Subsequent submittal for this on-site property  
Report date: July 9, 2019 – Rev 4 TCEQ Region No.: 12

### TCEQ Program (check one)

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

### 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: Kevin Peterburs Title: Manager, Site Remediation  
Mailing Address: 4823 N 119<sup>th</sup> Street  
City: Milwaukee State: WI Zip: 53225 E-mail address kjpeterb@up.com  
Phone: 414-267-4164 Fax:     

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  Name, print: Kevin Peterburs Date: 7/9/19

## RAP Executive Summary

ID No.: SWR No. 31547

Report Date: July 9, 2019 – Rev 4

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.

**This Conceptual Response Action Plan (RAP) is being submitted with revisions based on the Texas Commission on Environmental Quality (TCEQ) 4th Technical Notice of Deficiency (TNOD) dated April 11, 2019 on the Union Pacific Railroad (UPRR) Houston Wood Preserving Works Permit Renewal/Compliance Plan with Major Amendment, Permit/Compliance Number 50343, ISWR 31547. Following the additional assessment activities as required per the 4<sup>th</sup> TNOD and discussed in this Conceptual RAP, UPRR will prepare the Revised RAP.**

### 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 did not identify any 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 June 10, 2000 (ERM, 2000). A revised APAR was submitted to the TCEQ dated June 10, 2004. Pastor, Behling & Wheeler, LLC (PBW) prepared an APAR Addendum dated July 2009 (PBW, 2009). Following comments from the TCEQ, PBW submitted an 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 submittals, the Affected Property consists of surface soils, subsurface soils, and groundwater affected by chemicals 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 to 5 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).

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 Protective Concentration Levels (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 PCL Exceedance (PCLE) Zone in surface and subsurface soils. Groundwater data from the most recent sampling event (January 2019) were evaluated to assess COC exceedances in groundwater.

### PCLE Zones

#### *Soils*

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

- $^{Tot}Soil_{Comb}$  (Tier 1);
- $^{Air}Soil_{Inh-v}$  (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 16 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
- TPH

#### 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 projecting the surface PCLE zone for those two COCs to the subsurface. By using the surface PCLE zone, this projection assumes the PCLE zone extends from the ground surface to the top of the uppermost GWBU (i.e. A-TZ). However, except for one sample in MW-18A, none of the groundwater samples analyzed for pentachlorophenol from A-TZ wells collected during the 2018 and 2019 groundwater monitoring events had detected pentachlorophenol concentrations above the RAL, suggesting the pentachlorophenol concentrations in surface and subsurface soils are protective of groundwater. Pentachlorophenol was detected in MW-18A during the January 2019 sampling event, which was the first detection in the well since 2002. The detection will be confirmed during the July 2019 site-wide groundwater sampling event. 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.

The surface soil and subsurface soil PCLE Zones will be re-evaluated following a proposed assessment for total petroleum hydrocarbons (TPH) in surface and subsurface soils. In response to the TCEQ 4<sup>th</sup> TNOD stating that “the current assessment of the total petroleum hydrocarbon – non-aqueous phase liquid (TPH-NAPL) seep source(s) and extent is insufficient because only a limited soil assessment was performed” and the TCEQ letter dated February 6, 2019 requesting additional TPH delineation in soils, UPRR proposes to conduct a TPH-NAPL Assessment primarily within the Englewood Intermodal Yard area consisting of rapid optical screening technology approaches (i.e. TarGOST) and soil sampling for TPH to evaluate the affected soils laterally and vertically pursuant to 30 TAC §350.51(d). Details of the additional assessment are provided on Worksheet 2.0.

#### *Groundwater*

A total of 109 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 generally flows to the northeast; groundwater in B-CZ/B-TZ generally flows across the Site to the east; groundwater in the C-TZ flows from northeast to southwest, and groundwater in the D-TZ appears to flow to the northwest.

Based on the recent groundwater analytical data from the 2018 and January 2019 groundwater sampling events, 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:

#### VOCs

- 1,2-Dichloroethane (B-TZ, one well)
- Benzene (A-TZ, B-TZ, C-TZ)
- Toluene (C-TZ only)
- Vinyl Chloride (A-TZ and C-TZ)

#### SVOCs

- 1,2-Diphenylhydrazine (B-TZ & C-TZ)
- 2,4-Dimethylphenol (A-TZ, B-TZ, C-TZ)
- 2,6-Dinitrotoluene (B-CZ/B-TZ & C-TZ)
- 2-Methylnaphthalene (A-TZ, B-CZ/B-TZ, & C-TZ)

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### Metals

- Arsenic (A-TZ, B-CZ/B-TZ, C-TZ)
- Lead (A-TZ, C-TZ, & D-TZ)

- 4,6-Dinitro-2-methylphenol (B-TZ, one well)
- Benzo(a)anthracene (B-CZ/B-TZ)
- Benzo(a)pyrene (B-CZ/B-TZ, C-TZ, and D-TZ)
- bis(2-Chloroethoxy)methane (B-TZ, one well)
- bis(2-Ethylhexyl)phthalate (A-TZ, one well)
- Dibenzofuran (A-TZ, B-CZ/B-TZ, & C-TZ)
- Fluoranthene (B-TZ only, one well)
- Fluorene (B-TZ only, one well)
- Naphthalene (A-TZ, B-CZ/B-TZ, & C-TZ)
- Pentachlorophenol (A-TZ, B-CZ/B-TZ, & C-TZ)
- Phenanthrene (B-TZ only, one well)
- Phenol (A-TZ & B-TZ)
- Pyrene (B-TZ, one well)

As noted above, semi-volatile organic compounds (SVOCs) fluoranthene, fluorene, phenanthrene, and pyrene were detected above cPCLs in only one well, MW-74B, during the March 2018 sampling event. During the other three sampling events in 2018 and 2019, the concentrations of fluoranthene, fluorene, phenanthrene, and pyrene were detected below cPCLs.

SVOCs 4,6-dinitro-2-methylphenol (MW-84B, June 2018), bis(2-Chloroethoxy)methane (MW-68B, January 2019), and bis(2-Ethylhexyl)phthalate (MW-15A, May 2018) were detected above cPCLs in one well during one sampling event. During the other three sampling events in 2018 and 2019, the concentrations of 4,6-dinitro-2-methylphenol, bis(2-Chloroethoxy)methane, and bis(2-Ethylhexyl) phthalate were detected below cPCLs.

Lead was detected above cPCL in MW-36A and MW-36D during the March/April 2018 sampling event and in MW-27C during the January/February 2018 sampling event. All other lead concentrations were below cPCL during all other sampling events in 2018 and 2019, indicating that the detections were not verified.

The location and extent of the groundwater PCLE zones were identified as areas where COCs are present in groundwater at concentrations that exceed the critical PCL ( $^{GW}GW_{ing}$ ) using the most recent groundwater data (January 2019). 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 two groundwater sampling events in 2018. The benzo(a)pyrene concentration detected during the January 2019 sampling event was below the RAL and J-flagged (estimated). UPRR will evaluate further investigation of the D-TZ following the next sampling event in July 2019.

Based on groundwater data collected in 2018 and 2019, arsenic concentrations have been detected above the residential PCL in some of the monitoring wells at the Site, but have varied between sampling events in 2018 and 2019. The January 2019 groundwater data indicate that arsenic concentrations have not been delineated to residential PCLs in the A-TZ and B-CZ/B-TZ GWBUs. As discussed on Worksheet 2.0, UPRR plans to install additional monitoring wells in response to the TCEQ 4<sup>th</sup> TNOD dated April 11, 2019 requesting additional assessment for arsenic in groundwater to the west and north of the Site in the A-TZ and B-CZ/B-TZ.

The TCEQ 4<sup>th</sup> TNOD Deficiency No. Specific T59 requested that UPRR evaluate the A-TZ groundwater near monitoring well MW-68B as a possible source for potential vapor intrusion (VI) exposure. UPRR conducted the interim assessment of the A-TZ groundwater with the installation and

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sampling of monitoring well MW-68A in May 2019. The analytical results for the groundwater sample indicated that the COC concentrations detected in MW-68A were well below the conservative Environmental Protection Agency's (EPA's) vapor intrusion screening level (VISL) calculator (EPA, 2015a, EPA, 2019) screening levels. Details of the assessment were provided to the TCEQ in a letter dated July 3, 2019 (Golder, 2019).

No affected or threatened receptors are associated with the groundwater PCLE zones. 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).

### *Dense Non-Aqueous Phase Liquids (DNAPL)*

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. Over the past 25 years, UPRR has conducted numerous DNAPL investigations at the Site, including 98 cone-penetrometer testing (CPT) with rapid optical screening tool (ROST) borings.

However, in response to the TCEQ 4<sup>th</sup> TNOD requesting a re-assessment of creosote DNAPL using CPT/ROST, UPRR proposes to conduct an additional NAPL assessment in areas where NAPL has been observed in previous borings to evaluate the potential for migration and assess additional NAPL recovery responses. Details of the pre-design additional NAPL Assessment are provided on Worksheet 2.0.

### 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 either proposed or have been completed at the Site to achieve this objective:

- Surface/subsurface soil – The surface/subsurface soil PCLE Zones at the Site have been/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 and asphalt roadway. This response was completed in 2016 as detailed in the Response Action Completion Report (RACR) dated July 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017). Pursuant to the RACR, quarterly inspections and maintenance of the cap and roadway have been implemented;
  - 2) Englewood Intermodal Yard: Remedy Standard B closure by implementing Physical Control using the existing concrete pavement as a cap as detailed in the RACR dated July 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017). In 2019, a NAPL Collection System was constructed as part of an interim response action consisting of two shallow collection trenches to address tar-like substance seeps identified in the Englewood Intermodal Yard. Details of the construction activities were provided in the RACR dated March 29, 2019 (Golder, 2019). Additional responses may be necessary in this area once the TPH-NAPL Assessment is conducted, as discussed on Worksheet 2.0. Pursuant to the RACR, quarterly inspections and maintenance of the cap have been implemented;
  - 3) Railroad mainlines and siding tracks: The response action for the operational area between the Former HWPW area and the Englewood Intermodal Yard has followed a

Remedy Standard B closure using the existing railroad ballast as a protective barrier as detailed in the RACR dated July 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017). Quarterly inspections and maintenance of the ballast area have been implemented.

- 4) City of Houston ROW along Liberty Road: Remedy Standard B closure through limited excavation of surface soils, consolidating impacted soils within the AOC, and implementing Physical Control through an engineered concrete sidewalk as detailed in the RACR dated July 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017). Quarterly inspections and maintenance of the cap and roadway have been implemented.
- Groundwater – A combination of Remedy Standard A and Remedy Standard B closure using a Plume Management Zone (PMZ) is proposed to address the groundwater PCLE Zones at the Site. The groundwater PCLE Zones that extend off-site outside of the proposed PMZs will be addressed under Remedy Standard A with the response action objective of groundwater decontamination. The groundwater PCLE Zones within the proposed PMZs will have the response action objective of control. For the purposes of this RAP submittal, there are three proposed preliminary PMZ areas:
    - 1) On-Site PMZ (Main) - The on-site PMZ (Main) will include the cumulative groundwater PCLE Zone within the UPRR-owned property from the center to the east portion of the Site.
    - 2) On-Site PMZ (West) - The on-site PMZ (West) will include the B-CZ/B-TZ PCLE Zone on the west side of the Site within the UPRR-owned property.
    - 3) Off-Site PMZ - The off-site PMZ includes the cumulative groundwater PCLE Zone that extends off-site to the north and east of the Site within the City of Houston ROW, including the privately-owned properties bound by Liberty Rd, Erastus St., Wylie St., and Cushing St.

For the Off-Site PMZ, UPRR has acquired the six signed restrictive covenants from private landowners throughout the proposed Off-Site PMZ and the signed restrictive covenant from the City of Houston for the Off-Site PMZ City of Houston ROW (Appendix 5). UPRR will continue to pursue institutional controls for the properties within the groundwater PCLE Zones and outside the proposed PMZs.

Prior to finalizing the boundaries of the proposed PMZs and to address the TCEQ 4<sup>th</sup> TNOD deficiency that requested UPRR further assess the “dissolved phase plume for benzene and naphthalene to the east, west, and south in the A-TZ, B-TZ/B-CZ and C-TZ”, UPRR will conduct the pre-design Additional Groundwater Assessment as discussed on Worksheet 2.0.

Following the Additional Groundwater and NAPL Assessment activities, a Revised RAP summarizing the additional assessment activities will be submitted to the TCEQ with the proposed final PMZs and associated proposed response actions. UPRR will evaluate and develop remedial alternatives with the goal of achieving the specific response objectives for the different Remedy Standard areas at the Site. A feasibility study and potential design of any system components for groundwater treatment and/or NAPL recovery will be generally described within the Revised RAP. This may include recommendations for pilot studies or treatability studies to evaluate the feasibility of a selected response action or actions. UPRR proposes to utilize the Interstate Technology Regulatory Council (ITRC) Integrated DNAPL Site Strategy (IDSS) Technical/Regulatory Guidance Document dated November 2011 (ITRC, 2011) as a guide for developing the framework for response actions to achieve the project

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goals. As detailed in the IDSS Document, establishing realistic remedial objectives (functional objectives) that are specific, measurable, attainable, relevant, and time-bound ('SMART' acronym) are key in achieving those objectives. Specifics of potential groundwater remedial actions to achieve the response objectives following the IDSS will be submitted in the Revised RAP. In the interim, UPRR proposes to monitor groundwater in the site-wide wells as part of the corrective action groundwater monitoring program. Data collected from the monitoring wells will be used to evaluate possible response actions to address the groundwater PCLE Zone pending approval of the Off-Site PMZ.

What is the selected remedy standard for this affected property?  A  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 <sup>1</sup>	Removal	Decontamination	Control		
				Physical Control	Modified Groundwater Response Objective <sup>2</sup>	
					PMZ	WCU
Surface Soil	Benzene, SVOCs, metals			X		
Subsurface Soil	SVOCs			X		
Groundwater (within PMZ)	Benzene, SVOCs				X	
Groundwater (within PMZ)	Arsenic				X	
Groundwater (outside PMZ)	Benzene, SVOCs		X			
Groundwater (outside PMZ)	Arsenic		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  Commercial/Industrial  
 Off-site land use:  Residential  Commercial/Industrial (check all that apply)

Is this a re-submittal or revision of a previous RAP?  Yes  No

If yes, explain why the RAP is being revised or resubmitted.

<sup>1</sup> 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).

<sup>2</sup> If a modified groundwater response objective is proposed, check the type(s) of proposed modifications.

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This conceptual RAP is being submitted with revisions based on the TCEQ 4th Technical Notice of Deficiency (NOD) dated April 11, 2019 on the UPRR Houston Wood Preserving Works Permit Renewal/Compliance Plan with Major Amendment, Permit/Compliance Number 50343, ISWR 31547.

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

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## 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
June 2019	Union Pacific Railroad (UPRR) receives letter granting extension to July 10, 2019 for submittal of response to 4 <sup>th</sup> Technical Notice of Deficiency (NOD) Letter dated April 11, 2019 from the Texas Commission on Environmental Quality (TCEQ); Meeting with UPRR, Golder Associates (Golder), and TCEQ to discuss 4 <sup>th</sup> Technical NOD on June 12, 2019; Golder submits the 1 <sup>st</sup> Quarter 2019 Dense Non-Aqueous Phase Liquid (DNAPL) Recovery Activities Quarterly Report to the TCEQ; and Golder submits the Post-Response Action Completion Report (PRACR) Monthly Update to the TCEQ (June 28, 2019).
May 2019	UPRR submits an Extension Request for response to 4 <sup>th</sup> Technical NOD Letter dated April 11, 2019 to TCEQ; UPRR installs additional well as requested in 4 <sup>th</sup> Technical NOD letter; and Golder submits the PRACR Monthly Update to the TCEQ (May 31, 2019).
April 2019	UPRR receives 4 <sup>th</sup> Technical NOD; Meeting with UPRR, Golder Associates (formerly Pastor, Behling & Wheeler, LLC (PBW)), and TCEQ to discuss 4 <sup>th</sup> Technical NOD on April 24, 2019; and Golder submits the PRACR Monthly Update to the TCEQ (April 30, 2019).
March 2019	UPRR submits Response Action Completion Report (RACR) summarizing the NAPL Collection System installation in the Englewood Intermodal Yard with the HWPW Site; and Golder submits the PRACR Monthly Update to the TCEQ (March 29, 2019).
February 2019	TCEQ issues a comment letter dated February 6, 2019 on the Response to Comments dated January 9, 2019; Golder completes the interim remedial activities by installing the non-aqueous phase liquid (NAPL) collection system; and Golder submits the PRACR Monthly Update to the TCEQ (February 28, 2019) that includes a response to TCEQ comment letter dated February 6, 2019. The response includes details on the proposed additional total petroleum hydrocarbon (TPH) assessment in soils at the Englewood Intermodal Yard.
January 2019	Golder begins the interim remedial excavation activities for the installation of the NAPL collection system at the Englewood Intermodal Yard; Golder submits to the TCEQ the response to comments dated January 9, 2019 responding to TCEQ comment letter dated December 6, 2018 on the October 2018 PRACR Monthly Update; and Golder submits the PRACR Monthly Update to the TCEQ (February 4, 2019). Golder submits to the TCEQ the Corrective Action Monitoring Report: 2018 Second Semi-Annual Event dated January 4, 2019; Golder conducts 2019 first semi-annual groundwater monitoring event for the SWMU No. 1 and site-wide groundwater sampling event.



Date	Description
December 2018	TCEQ issues a comment letter dated December 6, 2018 on the October 2018 PRACR Monthly Update; and Golder submits the PRACR Monthly Update to the TCEQ (December 31, 2018).
November 2018	Golder submits the PRACR Monthly Update to the TCEQ (November 30, 2018).
October 2018	Golder conducts test pits in the Englewood Intermodal Yard to evaluate the NAPL seeps observed in the primary area (slots B100-B109) and other areas (parking slots B13 and B54). Golder submits the PRACR Monthly Update to the TCEQ (October 31, 2018) detailing the results of a test pit evaluation at the Englewood Intermodal Yard.
September 2018	Golder submits the PRACR Monthly Update to the TCEQ (September 28, 2018).
August 2018	UPRR submits the response to TCEQ comment and request for groundwater information letter dated November 29, 2017 – UPRR Groundwater Monitoring Data (included groundwater data from the three site-wide sampling events conducted from January – July 2018) , August 13, 2018; TCEQ issues a comment letter dated August 22, 2018 on the June 2018 PRACR Monthly Update; and Golder submits the PRACR Monthly Update to the TCEQ (August 31, 2018), including a response to the TCEQ August 22, 2018 comment letter. Response includes preliminary design for the NAPL collection system.
July 2018	Golder installs two additional wells to evaluate the lateral extent of chemicals of concern (COCs). Golder submits to the TCEQ the Corrective Action Monitoring Report: 2018 First Semi-Annual Event dated July 20, 2018; Golder conducts 2018 second semi-annual groundwater monitoring event for the SWMU No. 1; Golder submits the PRACR Monthly Update to the TCEQ (July 20, 2018).
June 2018	Golder conducts repairs to the soil cap and submits PRACR Monthly Update to the TCEQ.
May 2018	Golder conducts site-wide groundwater sampling event (through June 2018). Golder submits PRACR Monthly Update to the TCEQ (May 21, 2018).
April 2018	PBW submits the PRACR Monthly Update to the TCEQ (April 20, 2018).
March 2018	TCEQ issues comment letter on the Updated PRACR requesting monthly updates on the soil and concrete cap repairs (March 20, 2018). Golder conducts site-wide groundwater sampling event (through April 2018).
January 2018	PBW submits to the TCEQ the Corrective Action Monitoring Report: 2017 Second Semi-Annual Event dated January 18, 2018; PBW conducts 2018 first semi-annual groundwater monitoring event for the SWMU No. 1. PBW also submits the Updated PRACR (post-Hurricane Harvey) and response to TCEQ comment letter dated October 20, 2017 on January 17, 2018.
	PBW installed the additional alternate point of exposure (APOE) wells and monitoring/replacement wells (MW-22AR, MW-22BR, MW-82B, MW-83B,

Date	Description
	MW-83C, MW-84B, MW-85C, MW-86C, MW-87C, and MW-88C) as requested November 28, 2017. The site-wide groundwater sampling event was also conducted (through February 2018).
November 2017	Meeting with UPRR, PBW, Baker-Wotring and the TCEQ (Corrective Action and Law Division) at the TCEQ offices in Austin on November 29, 2017. TCEQ issues letter dated November 28, 2017 requesting UPRR to install additional APOE wells and conduct additional groundwater sampling of the site-wide wells.
October 2017	TCEQ issues a comment letter dated October 20, 2017 on the post- Hurricane Harvey assessment of the capped areas PRACR.
July 2017	PBW submits to the TCEQ the Corrective Action Monitoring Report: 2017 First Semi-Annual Event dated July 7, 2017; PBW conducts 2017 second semi-annual groundwater monitoring event for the SWMU No. 1.
June 2017	UPRR submits the RCRA Part A and B Permit Renewal Application (Revision No. 4) with Response Action Plan (RAP) (Revision No. 3) to the TCEQ dated June 2017 in response to the 3rd Technical Notice of Deficiency (NOD) Letter dated April 10, 2017. This includes submitting the Response Action Completion Report (RACR) (Revision No.1), June 24, 2017.
May 2017	Meeting with UPRR, PBW, Baker-Wotring and the TCEQ (Corrective Action and Law Division) on May 31, 2017 discussing the 3 <sup>rd</sup> Technical NOD Letter dated April 10, 2017 on the RCRA Part A and B Permit Renewal Application and Response Action Plan (RAP), specifically for issues regarding the restrictive covenants/deed notices for the off-site properties.
April 2017	UPRR receives the 3 <sup>rd</sup> Technical NOD Letter dated April 10, 2017 on the RCRA Part A and B Permit Renewal Application (Revision No. 3) and RAP (Revision 2) from the TCEQ.
February 2017	Meeting with UPRR, PBW, Baker-Wotring and the TCEQ (Corrective Action and Law Division) on February 16, 2017 discussing the draft comments on the RAP (Revision No. 2) and restrictive covenants for the off-site properties.
January 2017	PBW submits to the TCEQ the Corrective Action Monitoring Report: 2016 Second Semi-Annual Event dated January 17, 2017; PBW conducts 2017 first semi-annual groundwater monitoring event for the SWMU No. 1
July 2016	UPRR submits the RCRA Part A and B Permit Renewal Application (Revision No. 3) with RAP (Revision No. 2) to the TCEQ dated July 2016 in response to the Technical NOD Letter dated June 2, 2016. This includes submitting a Response Action Completion Report (RACR). PBW submits to the TCEQ the Corrective Action Monitoring Report: 2016 First Semi-Annual Event dated July 12, 2016; PBW conducts 2016 second semi-annual groundwater monitoring event for the SWMU No. 1

Date	Description
June 2016	UPRR receives Technical NOD Letter dated June 2, 2016 on the RCRA Part A and B Permit Renewal Application and Response Action Plan from the TCEQ.
May 2016	UPRR completes the response actions authorized under the Area of Contamination to address the surface and subsurface soil Protective Concentration Level Exceedance (PCLE) Zones as detailed in the updated RAP (Revision No. 1) dated December 7, 2015.
February 2016	TCEQ approves the request to extend the termination date for the Area of Contamination from February 15, 2016 to March 7, 2016 in a letter dated February 22, 2016
January 2016	Begin response actions (excavation/placement and cap construction) activities to address surface soil PCLE Zones. PBW conducts 2016 first semi-annual groundwater monitoring event for the Solid Waste Management Unit (SWMU) 1. PBW submits on behalf of UPRR a request to extend the termination date from February 15, 2015 to March 7, 2016 for the Area of Contamination set by the TCEQ.
December 2015	Union Pacific Railroad (UPRR) submits the RCRA Part A and B Permit Renewal Application (Revision No. 2) with Response Action Plan (RAP) (Revision No. 1) to the TCEQ dated December 7, 2015. Remediation contractor begins site preparation for response actions under the Area of Contamination.
November 2015	Union Pacific Railroad (UPRR) receives the Texas Commission on Environmental Quality (TCEQ) letter dated November 5, 2015 detailing the agency's review of the September 18, 2015 submittal titled Additional Information for Clean Closure Equivalence Demonstration. The TCEQ Industrial and Hazardous Waste (I&HW) Permits Section was unable to accept the request for discontinuing post-closure care of the former surface impoundment, Solid Waste Management Unit (SWMU) 1.
November 2015	Meeting with UPRR, Pastor, Behling & Wheeler (PBW), and the TCEQ on November 4, 2015 discussing the October 23, 2015 technical comment letter from the TCEQ.
October 2015	UPRR receives additional technical comments from the TCEQ in a letter dated October 23, 2015 on the Response Action Plan (RAP) regarding the Plume Management Zones and Technical Impracticability Demonstration provided in the Response Action Plan.
September 2015	PBW submits to the TCEQ the Additional Information for Clean Closure Equivalence Demonstration dated September 18, 2015 that included historical data and letters from 1983, 1984, and 1991 to demonstrate clean closure of the soils under the former surface impoundment (SWMU 1). The letter also included a request to cease the post-closure care for SWMU 1.

Date	Description
August 2015	UPRR receives Technical Notice of Deficiency (NOD) Letter dated August 5, 2015 on the RCRA Part A and B Permit Renewal Application and Response Action Plan from the TCEQ.
July 2015	PBW submits to the TCEQ the Corrective Action Monitoring Report: 2015 First Semi-Annual Event dated July 16, 2015; PBW conducts 2015 second semi-annual groundwater monitoring event for the SWMU No. 1.
April 2015	PBW submits to the TCEQ newspaper tear sheets and affidavits that public notice was published in English and Spanish in the <i>Houston Chronicle</i> on April 2 and <i>La Subasta</i> on March 31, respectively as required once the RCRA Permit Renewal/Compliance Plan with Major Amendment was administratively complete.
March 2015	TCEQ issues a letter dated March 13, 2015 declaring the RCRA Permit Renewal/Compliance Plan with Major Amendment was administratively complete on March 13, 2015.
February 2015	PBW submits a response letter to the TCEQ dated February 13, 2015 for the TCEQ Administrative NOD on the RCRA Part A and B Permit Renewal Application.
January 2015	PBW submits to the TCEQ the Corrective Action Monitoring Report: 2014 Second Semi-Annual Event dated January 15, 2015; PBW conducts 2015 first semi-annual groundwater monitoring event for the SWMU No. 1.
December 2014	UPRR submits the RCRA Part A and B Permit Renewal Application with Response Action Plan (RAP) to the TCEQ dated December 10, 2014. UPRR receives the TCEQ Administrative NOD Letter dated December 17, 2014.
November 2014	RCRA Permit Pre-Application Meeting with UPRR, PBW, and TCEQ dated November 6, 2014.
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.

Date	Description
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.
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.

Date	Description
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
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
August 19, 1994	Operation and Maintenance Plan and Compliance Schedule submitted on behalf of SPTCo

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Date	Description
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.

			Report Contents
		Required	<b>Cover Page</b> <input checked="" type="checkbox"/>
		Required	<b>Executive Summary</b> <input checked="" type="checkbox"/>
		Required	<b>Checklist for Report Completeness</b> <input checked="" type="checkbox"/>
		Required	<b>Worksheet 1.0</b> Response Action Objectives <input checked="" type="checkbox"/>
No <input type="checkbox"/>	Have new data been collected that was not previously submitted?	<input checked="" type="checkbox"/> Yes	<b>Attachment 1A*</b> Maps and Cross Sections <input checked="" type="checkbox"/>
			<b>Attachment 1B*</b> Graphs of Concentration versus Time <input checked="" type="checkbox"/>
		Required	<b>Worksheet 2.0</b> Response Action Design <input checked="" type="checkbox"/>
		Required	<b>Attachment 2A*</b> Response Action Diagrams and Component/Equipment Descriptions <input checked="" type="checkbox"/>
		Required	<b>Attachment 2B*</b> Proposed Well Design <input checked="" type="checkbox"/>
No <input checked="" type="checkbox"/>	Is an ecological services analysis or compensatory restoration plan part of the proposed response action?	<input type="checkbox"/> Yes	<b>Attachment 2C*</b> ESA and Compensatory Restoration Plan <input type="checkbox"/>
No <input type="checkbox"/>	Is a plume management zone proposed as part of the response action?	<input checked="" type="checkbox"/> Yes	<b>Worksheet 2.1</b> Plume Management Zone <input checked="" type="checkbox"/>
	<b>Preliminary PMZ Maps, will be updated in the Revised RAP</b>		<b>Attachment 2D*</b> Plume Management Zone Map <input checked="" type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>		<b>Attachment 2E*</b> Attenuation Action Levels Determination <input type="checkbox"/>
No <input checked="" type="checkbox"/>	Is a waste control unit proposed as part of the response action?	<input type="checkbox"/> Yes	<b>Worksheet 2.2</b> Waste Control Unit <input type="checkbox"/>
			<b>Attachment 2F*</b> Map of Waste Control Unit <input type="checkbox"/>
No <input checked="" type="checkbox"/>	Is a technical impracticability area proposed as part of the response action?	<input type="checkbox"/> Yes	<b>Worksheet 2.3</b> Technical Impracticability <input type="checkbox"/>
			<b>Attachment 2G*</b> Map of Technical Impracticability Area <input type="checkbox"/>



# Checklist for Report Completeness

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				Report Contents
No <input type="checkbox"/>	Is the response action a remedy standard B?	<input checked="" type="checkbox"/> Yes	→	<b>Worksheet 2.4</b> Institutional Controls <input checked="" type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>	Required		<b>Worksheet 3.0</b> Performance Measures and Potential Problems <input type="checkbox"/>
		Required		<b>Worksheet 3.1</b> Monitoring and Sampling <input checked="" type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>	Required		<b>Attachment 3A*</b> Map of Monitoring and Sampling Points <input type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>	Required		<b>Worksheet 3.2</b> Operation and Maintenance <input type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>	Required		<b>Worksheet 4.0</b> Confirmation Sampling Plan <input type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>	Required		<b>Attachment 4A*</b> Map of Confirmation Sampling Points <input type="checkbox"/>
No <input type="checkbox"/>	Is the response action a Remedy Standard B?	<input checked="" type="checkbox"/> Yes	→	<b>Worksheet 5.0</b> Post Response Action Care <input checked="" type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>			<b>Attachment 5A*</b> Map of PRAC Monitoring and Sampling Points <input type="checkbox"/>
	<b>Will be updated in the Revised RAP</b>			<b>Attachment 5B*</b> PRAC Costs <input type="checkbox"/>
No <input checked="" type="checkbox"/>	Does the person, who is a small business, desire to modify the financial assurance requirement?	<input type="checkbox"/> Yes	→	<b>Attachment 5C*</b> Small Business Affidavit <input type="checkbox"/>
		Required		<b>Worksheet 6.0</b> Implementation Schedule <input checked="" type="checkbox"/>
		Required		<b>Appendix 1*</b> References <input checked="" type="checkbox"/>
No <input type="checkbox"/>	Was any data collected that was not previously reported?	<input checked="" type="checkbox"/> Yes	→	<b>Appendix 2*</b> Data Tables and Boring Logs <input checked="" type="checkbox"/>
No <input type="checkbox"/>	Were any studies or tests conducted?	<input checked="" type="checkbox"/> Yes	→	<b>Appendix 3*</b> Studies and Tests Documentation <input checked="" type="checkbox"/>
No <input type="checkbox"/>	Is the response action a Remedy Standard B?	<input checked="" type="checkbox"/> Yes	→	<b>Appendix 4*</b> Proposed Institutional Controls <input type="checkbox"/>
No <input type="checkbox"/>	Are any institutional controls proposed/required on property not owned by the person?	<input checked="" type="checkbox"/> Yes	→	<b>Appendix 5*</b> Landowner Concurrence <input checked="" type="checkbox"/>
No <input checked="" type="checkbox"/>	Are any of the sample collection or handling procedures different from those reporting in the APAR or other previously submitted report?	<input type="checkbox"/> Yes	→	<b>Appendix 6*</b> Sampling Procedures <input type="checkbox"/>
No <input checked="" type="checkbox"/>	Are statistics or geostatistics proposed to be used as part of the response action?	<input type="checkbox"/> Yes	→	<b>Appendix 7*</b> Statistical Methodology <input type="checkbox"/>
No <input checked="" type="checkbox"/>	Was approval received from the TCEQ regarding the use of different rules to address a media?	<input type="checkbox"/> Yes	→	<b>Appendix 8*</b> Split Media Approval <input type="checkbox"/>

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

<b>Response Action Objectives</b> Associated Information: Attachment 1A, 1B	<b>RAP Worksheet 1.0</b> Page 1 of 9	
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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)).

Three key approaches have been/will be implemented to protect commercial/industrial workers from exposure to COCs in surface and subsurface soils. The following approaches were detailed in the Response Action Completion Report (RACR) dated July 18, 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017):

- Former HWPW area: The response actions (soil relocation, soil capping) were completed to address the surface and subsurface soil PCLE zones at the former HWPW area. Repairs to the soil cap are periodically conducted to ensure the prevention of human exposure to the impacted soils.
- Englewood Intermodal Yard area: Most of the Englewood Intermodal Yard, which is used for the temporary parking of trailer-mounted intermodal container boxes, has a concrete pavement cover, which prevents exposure to surface and subsurface soils in the area. As part of the post-response action care, the concrete pavement in the area of the surface and subsurface soil PCLE Zone is inspected quarterly to ensure continued on-site worker protection.

During the July 2017 quarterly inspection of the capped areas, a tar-like substance was observed surfacing through the joints and cracks in the concrete and asphalt surfaces within the Englewood Intermodal Yard (in the area of parking slots B100 to B109). The response action implemented to address the tar-like material seeps was to install a NAPL collection system by removing a section of asphalt or concrete cover, excavating the underlying soils, backfilling with high permeability fill, installing slotted pipe to allow the accumulation of NAPL and backfilling the remaining few feet with compacted selected fill and reinforced concrete. The NAPL collection system was installed in January 2019 (see Attachment 2A for details). The Interim RACR for the NAPL Collection System dated March 26, 2019 (Golder, 2019) summarizing the response actions completed was submitted to the TCEQ. The interim response action was appropriate to capture the tar-like material in the shallow subsurface prior to the material reaching the surface. UPRR continues to conduct weekly inspections of the area as part of the operation and maintenance of the NAPL Collection System.

- 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.

## Response Action Objectives

Associated Information: Attachment 1A, 1B

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To address potential exposure to surface soil PCLE Zone off-Site, the following was implemented to protect occasional trespassers from exposure to COCs in surface and subsurface soils:

- City of Houston Right of Way (ROW): The area immediately north of the AST Area (SWMU No. 8) within the City of Houston right of way (ROW) between the UPRR property boundary and Liberty Road (approximately 6 feet wide and 550 feet long) was addressed through a combination of soil excavation (placed within the capped area) and construction of a concrete sidewalk to restrict exposure to the surface soil PCLE zone.

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.

Unless otherwise noted, the response actions to address the surface soils are detailed in the RACR dated July 18, 2016 (PBW, 2016) and Revised RACR dated June 2017 (PBW, 2017). Soil responses across the Site were implemented differently depending on the area within the Site, with controls placed in the following areas:

Former Houston Wood Preserving Works (HWPW) Operational Areas: Surface soils with cPCL exceedances from the following Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs) were excavated and consolidated within the Recent Process Area (SWMU 4), Original Process Area (SWMU 5) and AST Area (SWMU 8) under the Area of Contamination policy (RACR, PBW, 2016):

- Inactive Wastewater Lagoon (AOC 6),
- Location of the Former Incinerator (AOC 4),
- Surrounding the Tank Car Storage Area (SWMU 7),
- Oil/Water Separator (SWMU 11),
- Areas north of the Recent Process Area (SWMU 4),
- Areas north of the Original Process Area (SWMU 5) and
- Areas north of the AST Area (SWMU 8)

Confirmation samples collected along the walls and base of the excavations verified that surface soil PCLE Zones were removed to cPCLs assuming commercial/industrial land use. In these areas where surface soils were excavated, the base of excavation confirmation samples also confirmed that the subsurface soils do not appear to be impacted above cPCLs. The areas excavated were backfilled with clean fill.

Two Remedy Standard B physical controls were constructed within the Former HWPW operational areas: 1) a Soil Cap and 2) an Asphalt Cap (roadway improvement). The Soil Cap construction includes installation of a vapor barrier, with geotextile fabric and placement of an engineered soil cap (12 inches

## Response Action Objectives

Associated Information: Attachment 1A, 1B

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of clayey soil and 6 inches of topsoil) to cover the consolidated soil and remaining surface soil PCLE zone on the former operational areas. The Soil Cap is vegetated and sloped to minimize infiltration to control potential leachate migration from the surface and subsurface soils to the GWBUs. The Soil Cap serves to contain and prevent exposure to COCs above cPCLs within the surface and subsurface soil PCLE Zones at the Site.

The surface soil PCLE zone along the Southern Drainage Ditch (SDD) (SWMU No. 2), including the oil/water separator (SWMU 11) east of the former AST Area (SWMU 8), was capped in place using an asphalt cover (2.5-in thick over gravel road base) as part of a roadway improvement. The Soil Cap and Asphalt Cap will be maintained under the post-response action care period.

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 with the soil PCLE Zone and infiltration. As part of the post-response action care, the concrete pavement in the area of the surface and subsurface soil PCLE Zone is inspected quarterly to ensure continued on-site worker protection.

During the July 2017 quarterly inspection of the capped areas, a tar-like substance was observed surfacing through the joints and cracks in the concrete and asphalt surfaces in the area of parking slots B100 to B109. When significant amounts of the tar-like substance surfaced, a remediation contractor (United States Environmental Services (USES)) was notified to mobilize to the Site to remove and properly dispose of the material. A NAPL collection system was installed in January 2019 to address the tar-like material seeps and to recover NAPL sufficiently to eliminate NAPL discharge. The installation included removing a section of asphalt or concrete cover, excavating the underlying soils, backfilling with high permeability fill, installing slotted pipe to allow the accumulation of NAPL and backfilling the remaining few feet with compacted selected fill and reinforced concrete (see Attachment 2A for the design details). The Interim RACR for the NAPL Collection System dated March 26, 2019 (Golder, 2019) describes the response actions that were completed. Impacted soils and NAPL excavated as part of the construction were placed in roll-off bins or drums and property disposed of in accordance with state and federal regulations. The NAPL and recovered fluids from the NAPL Collection System will be disposed of in accordance with state and federal regulations and requirements. UPRR is currently assessing the effectiveness of the NAPL Collection System. Weekly inspections and monthly updates are submitted to the TCEQ.

UPRR Main Lines Ballast Area: The area between the former HWPW operational areas and the Englewood Intermodal Yard (approximately 100 feet width) is covered with railroad ballast, ties, and rail. The existing railroad ballast serves as an engineering control for preventing onsite worker exposure to impacted surface soils in this area.

City of Houston Right-of-Way (ROW): The area immediately north of the Recent Process Area (SWMU 4), Original Process Area (SWMU 5), and AST Area (SWMU No. 8) within the City of Houston right of way (ROW) between the UPRR property boundary and Liberty Road (approximately 8 feet wide and 550 feet long) was addressed through a combination of soil excavation of the top 9-inches (consolidated within the on-site soil-capped area) and construction of a physical barrier (concrete sidewalk) preventing contact with remaining surface soils and limiting infiltration. After the soils were excavated, UPRR constructed a concrete sidewalk approximately 8 feet wide and 690 feet long serving as the physical barrier covering the remaining surface soil PCLE zone within the City of Houston ROW. As part of the post-response action care, the concrete sidewalk is inspected to ensure the physical barrier provides protection for residential receptors against exposure to the COCs above

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cPCLs in surface soils in this area.

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.

The response actions to address potential exposures to soil PCLE Zones have been completed.

List the environmental media to which this **Groundwater** applies

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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 RAOs to address the PCLE Zones in groundwater will be through a combination of Remedy Standard A and Remedy Standard B using a modified groundwater response objective through a PMZ. The groundwater PCLE Zones that extend off-site outside of the proposed preliminary PMZs will be addressed under Remedy Standard A with the response action objective of groundwater decontamination. UPRR will develop appropriate remedial alternatives to address the groundwater PCLE Zone that extends outside of the proposed PMZs discussed below. The groundwater remedial alternatives will be submitted in a Revised RAP following completion of the Additional Groundwater Assessment and NAPL Assessment activities discussed on Worksheet 2.0.

Per §350.33, a preliminary PMZ is proposed for the Site for the three GWBUs: A-TZ, B-CZ/B-TZ, and C-TZ. For the purposes of this RAP submittal, the overall preliminary PMZ consists of the following three separate PMZs:

1. On-Site PMZ (Main) – The on-site PMZ (Main) will include the cumulative groundwater PCLE Zone within the UPRR-owned property from the center to the east portion of the Site.
2. On-Site PMZ (West) – The on-site PMZ (West) will include the B-CZ/B-TZ PCLE Zone on the west side of the Site within the UPRR-owned property.
3. Off-Site PMZ - The off-site PMZ includes the cumulative groundwater PCLE Zone that extends off-site to the north and east of the Site within the City of Houston ROW, including the privately-owned properties bound by Liberty Rd, Erastus St., Wylie St., and Cushing St.

The exact boundaries of the preliminary PMZs will be revised following the pre-design assessments to be conducted at the Site (see Worksheet 2.0). Once the pre-design additional Groundwater Assessment and NAPL Assessment activities are completed, the Revised RAP will have the proposed final PMZ boundaries established.

## Response Action Objectives

Associated Information: Attachment 1A, 1B

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The on-site PMZs (Main and West), including the former HWPW and Englewood Intermodal Yard 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. UPRR has posted signs at the Site indicating restrictions on soil excavation at the Site. For the Off-Site PMZ, UPRR has acquired the six signed restrictive covenants from private landowners (Appendix 5) throughout the proposed Off-Site PMZ and the signed restrictive covenant from the City of Houston for the Off-Site PMZ City of Houston ROW. UPRR will continue to pursue institutional controls for the properties within the groundwater PCLE Zones and outside the proposed PMZs.

The current response triggers for NAPL in accordance with the TCEQ Risk-Based NAPL Management Guidance (TRRP-32, TCEQ, 2013) is the NAPL in contact with groundwater trigger. The response actions for that trigger include the following:

1. For areas outside of the preliminary PMZ, the Remedy Standard A NAPL response objective will be to recover soluble NAPL fraction sufficient to eliminate source contributions to the groundwater PCLE Zones; and
2. Once the final PMZs are established, the NAPL response objectives will include compliance with PMZ performance criteria at the NAPL zone through recovery (recover readily recoverable creosote DNAPL from wells with DNAPL present) and institutional controls (UPRR-owned property and six off-site properties/City of Houston ROW) on groundwater use to protect exposure to residual NAPL and COCs in the GWBUs.

As detailed in the TCEQ 4<sup>th</sup> TNOD dated April 11, 2019, the TCEQ requested UPRR to conduct a “re-assessment of creosote DNAPL” at the Site as part of the overall re-evaluation of a DNAPL recovery system. UPRR plans to conduct the pre-design NAPL Assessment (see Worksheet 2.0) to evaluate the Site and reassess the NAPL triggers detailed in the TCEQ Risk-Based NAPL Management Guidance (TRRP-32, TCEQ, 2013). UPRR will re-evaluate the DNAPL recovery activities and potential improvements to the recovery approach for the Site following that assessment in response to the TCEQ 4<sup>th</sup> TNOD deficiency. In the interim, UPRR will continue the DNAPL recovery activities from wells with NAPL present on a twice a month basis and will prepare quarterly status reports to the TCEQ.

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.

During the additional assessments, groundwater will be sampled from site-wide 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 007 on the NOR), and disposed of in accordance with state and federal regulations and requirements.

Recovered creosote DNAPL 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 profiled, transported and disposed of in accordance with state and federal requirements within the required timeframes.

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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 PCLE Zones that will be addressed under Remedy Standard A, the reasonable timeframe to achieve Remedy Standard A response objectives will be evaluated and discussed in the Revised RAP after the proposed additional Groundwater Assessment (discussed on Worksheet 2.0) is completed and potential response actions have been evaluated.

For the groundwater being addressed under Remedy Standard B (PMZ areas), the response action will be implemented once the final PMZ boundaries are established and institutional controls are in place. Institutional controls through deed recordation (UPRR-owned property – on-site PMZs) and restrictive covenants/deed notices (Off-Site PMZ City of Houston ROW and six contiguous off-site properties) 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. The signed deed restriction and restrictive covenants are included in Appendix 5. 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.

**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.

See Response Action Objects for surface and subsurface soils in above section.

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), including the City of Houston ROW.

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.

In the areas where surface soils were excavated, confirmation samples were collected to confirm that the COC concentrations in the remaining soils were below critical soil PCLs. Excavated surface soils were consolidated under the Area of Contamination policy, and an engineered soil cap was constructed to cover the area to prevent exposure to and migration of COCs beyond the soil PCLE Zone.





## Response Action Objectives

Associated Information: Attachment 1A, 1B

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the A-TZ had naphthalene concentrations below the  $^{Air}GW_{Inh-v}$  PCL. Therefore, potential for vapor migration from groundwater in these deeper GWBUs is low.

Regarding potential indoor vapor intrusion related to the Site, the TCEQ issued the following Deficiency No. Specific T59 in the 4<sup>th</sup> TNOD dated April 11, 2019:

*Based on review of the August 13, 2018 Monitoring Report, UPRR needs to conduct further assessment to evaluate the potential in-door air VI pathways into structures located north of the HWPW Facility near the intersection of Clementine and Wylie Street. The highest concentration of naphthalene in off-site wells screened in the second transmissive unit, B- CZ/B-TZ, was reported in monitoring well MW-68B (23 mg/l). Concentrations of COCs in off-site monitoring wells screened in the uppermost transmissive unit, A-TZ, were either non-detect or less than the residential Tier 1 PCLs for Class 1 groundwater. However, there are no wells near MW-68B that are screened in the ATZ to determine if the ATZ has been affected in this area.*

*Considering that naphthalene is a petroleum hydrocarbon and the vertical separation distance between the ground surface and observed water table at well location MW-68B, if the uppermost transmissive zone (A-TZ) at MW-68B is not impacted, the VI pathway would be incomplete for the off-site affected properties. However, there are no wells near MW-68B that are screened in the A-TZ to determine if the groundwater in Zone A-TZ has been affected in this area. Therefore, UPRR should install additional monitoring wells screened in the ATZ at well location MW-68B. Please submit an interim assessment work plan and schedule that describes a proposed assessment strategy for the VI pathway.*

UPRR prepared a response to the Deficiency No. Specific T59 in a letter dated July 3, 2019 detailing the investigation activities completed to address the TCEQ comment. A copy of the letter is provided in Appendix 3. Below is a summary of the investigation and findings:

- Monitoring well MW-68A was installed in the uppermost water-bearing zone A-TZ near monitoring well MW-68B on May 21, 2019 to evaluate potential petroleum vapor intrusion (PVI) impacts from the A-TZ. The monitoring well was completed to the base of the A-TZ and constructed with a 10-foot screened interval. Following the well installation and development activities, a groundwater sample and field duplicate groundwater sample were collected at MW-68A on May 29, 2019 and analyzed for site-specific COCs.
- The U.S. Environmental Protection Agency's (EPA's) vapor intrusion screening level (VISL) calculator (EPA, 2015, EPA, 2019) was used to calculate conservative, non-site specific, risk-based potential VI screening values for the identified COCs. The EPA tool calculates the COC concentration in groundwater, based on certain default conditions, at which the COC is not expected to pose an unacceptable VI risk and, as such, can be eliminated from further consideration.
- EPA's VISL calculator uses a conservative default attenuation factor of 0.001 for the attenuation of vapors between the groundwater source and the overlying receptor. This attenuation factor is not adjusted for the more rapid attenuation observed in petroleum hydrocarbon vapors and is therefore likely overly conservative for these compounds.
- Groundwater COC concentrations at monitoring well MW-68A from the May 2019 sampling event are below the conservative screening values estimated by EPA's VISL calculator (EPA, 2019) and indicate that VI pathway is not complete.

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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.

<p>Groundwater discharges to surface water are not a concern at the Site and no further action is required.</p>
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Explain how the response action will prevent human and ecological receptor exposure to the groundwater PCLE zone.

<p>There are no potential or unprotective human health exposures at the Site from groundwater ingestion since none of the properties in the area use groundwater for drinking; and the properties are provided drinking water by the City of Houston.</p> <p>As previously discussed, potential vapor intrusion (VI) from the A-TZ was evaluated per the TCEQ 4<sup>th</sup> TNOD Deficiency No. Specific T59 where the TCEQ requested UPRR evaluate the A-TZ groundwater near monitoring well MW-68B for potential VI exposure pathways. The analytical results for the groundwater sample indicated that the COC concentrations detected in MW-68A during the May 2019 sampling event were well below the conservative EPA’s VISL calculator (EPA, 2015a, EPA, 2019) screening levels.</p> <p>For the proposed response action of implementing the PMZ and associated application of institutional controls will also limit future use of shallow groundwater found within the PMZ. Following the additional groundwater and NAPL assessments, remediation systems will be evaluated for the areas outside the preliminary PMZ to reduce COC concentrations to below 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.</p> <p>In regard 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.</p>
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**ATTACHMENT 1A**

**MAPS AND CROSS SECTIONS**

*(SEE APPENDIX 2 FOR THE JANUARY 2019 GROUNDWATER MONITORING REPORT FIGURES)*

**ATTACHMENT 1B**

**GRAPHS OF CONCENTRATION VERSUS TIME**

*(SEE APPENDIX 2 FOR THE JANUARY 2019 GROUNDWATER MONITORING REPORT GRAPHS)*

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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: Groundwater – A-TZ, B-CZ/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).

As previously discussed, the remedial objectives to address the PCLE Zones in groundwater will be through a combination of the following remedy standards:

1. Remedy Standard A - The groundwater response action objective for the PCLE Zones outside of the preliminary PMZs will be to decontaminate the groundwater by reducing the concentration of COCs to the critical PCL throughout the groundwater PCLE zone and prevent COC concentrations above the critical PCL from migrating beyond the existing boundary of the groundwater PCLE zone. UPRR will develop a response action design by evaluating appropriate remedial alternatives to address the groundwater PCLE Zone that extends outside of the proposed PMZs. As requested in the TCEQ 4<sup>th</sup> TNOD dated April 11, 2019, UPRR will conduct an additional groundwater assessment to evaluate the dissolved phase plume for benzene and naphthalene in the A-TZ, B-TZ/B-CZ, and C-TZ units and arsenic in the A-TZ and B-TZ/B-CZ. Following that pre-design assessment, groundwater remedial alternatives will be submitted in the Revised RAP, and
2. Remedy Standard B - The response action design for the groundwater PCLE Zones will be to implement the modified Remedy Standard B groundwater response action by establishing PMZs (On-Site (Main and West), and Off-Site City of Houston ROW) for the groundwater PCLE Zones in the A-TZ, B-CZ, B-TZ, and C-TZ.

For the purposes of this RAP submittal, there are three preliminary PMZ areas:

1. On-Site PMZ (Main) – The on-site PMZ (Main) will include the cumulative groundwater PCLE Zone within the UPRR-owned property from the center to the east portion of the Site.
2. On-Site PMZ (West) – The on-site PMZ (West) will include the B-CZ/B-TZ PCLE Zone on the west side of the Site within the UPRR-owned property.
3. Off-Site PMZ– The off-site PMZ includes the cumulative groundwater PCLE Zone that is a continuation of the On-Site PMZ (Main) and extends off-site to the north and west of the Site within the land designated as City of Houston ROW and one block of contiguous properties for which UPRR has obtained signed restrictive covenants/deeds.

The On-Site PMZs (Main and West, including the former HWPW, Englewood Intermodal Yard) 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

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property. The Off-Site PMZ City of Houston ROW will be deed restricted to restrict future use of groundwater on-site, as well as restrictions on soil excavation activities within the surface soil PCLE Zone along a portion of the northern boundary of the Site. UPRR has obtained signed restrictive covenants from six private landowners whose properties are adjacent to the City of Houston ROW property.

For both groundwater remedial objectives, response actions for the groundwater PCLE Zones will be evaluated following the Additional Groundwater and NAPL Assessments as part of the remedial pre-design activities discussed on this Worksheet 2.0. UPRR proposes to utilize the Interstate Technology Regulatory Council (ITRC) Integrated DNAPL Site Strategy (IDSS) Technical/Regulatory Guidance Document dated November 2011 (ITRC, 2011) as a guide for developing the framework for response actions to achieve the project goals. As detailed in the IDSS Document, establishing realistic remedial objectives (functional objectives) that are specific, measurable, attainable, relevant, and time-bound ('SMART' acronym) are key in achieving those objectives. Specifics of potential groundwater remedial actions to achieve the response objectives following the IDSS will be submitted in the Revised RAP. In the interim, UPRR proposes to monitor groundwater in the site-wide wells as part of the corrective action groundwater monitoring program. Data collected from the monitoring wells will be used to evaluate possible response actions to address the groundwater PCLE Zone pending approval of the Off-Site PMZ.

*DNAPL in Contact with Groundwater*

To address the NAPL present in the GWBUs, the NAPL response action objectives and endpoints using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will include the following:

1. Outside of the preliminary PMZ, the Remedy Standard A NAPL response objective will be to recover soluble NAPL fraction sufficient to eliminate source contributions to the groundwater PCLE Zones; and
2. Within the PMZ - the NAPL response objective will include compliance with PMZ performance criteria at the NAPL zone through recovery (recover readily recoverable creosote DNAPL from wells with DNAPL present) and institutional controls (UPRR-owned property and six off-site properties/City of Houston ROW) on groundwater use to protect exposure to residual NAPL and COCs in the GWBUs.

As detailed in the TCEQ 4<sup>th</sup> TNOD dated April 11, 2019, the TCEQ requested UPRR to conduct a “re-assessment of creosote DNAPL” at the Site as part of the overall re-evaluation of the nature and extent of DNAPL at the Site and assist in developing a more efficient recovery system. UPRR plans to conduct the pre-design NAPL Assessment to evaluate the Site and reassess the NAPL triggers detailed in the TCEQ Risk-Based NAPL Management Guidance (TRRP-32, TCEQ, 2013). This assessment will include conducting reconnaissance investigation activities such as CPT/TarGOST borings. Following that pre-design assessment, UPRR will develop remedial alternatives through pilot testing or treatability studies to address additional NAPL recovery at the Site. The DNAPL remedial alternatives will be included in the Revised RAP.

UPRR is currently conducting bi-monthly (twice a month) DNAPL Recovery Activities to evaluate the recoverability of the DNAPL at the Site. The DNAPL recovery consists of pumping events from wells with sufficient volumes of DNAPL that can be recovered. DNAPL recovery will continue on a bi-

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monthly basis, but the recovery methods, frequency, and wells included in the DNAPL Recovery Activities will be re-evaluated following the additional NAPL assessment activities.

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

Following the additional Groundwater and NAPL Assessments, UPRR will evaluate and develop remedial alternatives with the goal of achieving the specific response objectives for the different Remedy Standard areas at the Site. Feasibility studies and potential designs of any system components for groundwater treatment and/or NAPL recovery will be generally described within the Revised RAP. This may include recommendations for pilot studies or treatability studies to evaluate the feasibility of a selected response action or actions. In the interim, UPRR will continue to recover creosote DNAPL from selected wells using manual pumping (or equivalent) methods, stored on-site at the Container Storage Area (NOR 007), 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 groundwater use restriction (On-Site PMZs and Off-Site PMZ (including City of Houston ROW))	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 submitted 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.

Based on the TCEQ 4<sup>th</sup> TNOD dated April 11, 2019, additional assessment activities were requested by the TCEQ to further assess the nature and extent of DNAPL at the Site and better define the extent of the groundwater PCLs at the Site. Specifically, the TCEQ stated that:

*“Since the TCEQ is requiring UPRR to conduct further assessment of TPH-NAPL in the Englewood Intermodal Yard cap area as directed in the TCEQ February 6, 2019 letter and a VI assessment as directed in Comment T59 of this NOD, the additional assessment should include a re-assessment of creosote DNAPL using cone penetrometer/ rapid optical screening tool (CPT/ROST). The assessment*

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*should also include further evaluation of the dissolved phase plume for benzene and naphthalene to the east, west, and south in the A-TZ, B-TZ/BCZ and CTZ. For arsenic, additional assessment is needed to the west and north of the site in the A-TZ and B-TZ/BCZ. Regarding Benzo(a)pyrene detected in the June 2018 sampling event, if results of the January 2019 sampling event indicate Benzo(a)pyrene continues to be detected in any of the D-TZ monitoring wells, then further assessment may be required in the D-TZ and deeper zone(s). Update the RAP implementation schedule to include the additional assessments requested above.*

The following pre-design studies will be conducted at the Site to address specific deficiencies raised by the TCEQ:

1. Additional NAPL Assessment.
2. Additional Groundwater Assessment
3. TPH-NAPL Assessment Englewood Intermodal Yard
4. Pentachlorophenol (PCP) Assessment in soils

*Additional NAPL Assessment*

In response to the TCEQ’s request for re-assessment of DNAPL and to refine the observed subsurface distribution of DNAPL at the Site, the pre-design additional DNAPL assessment activities will be implemented. The assessment is intended to ultimately support the development of the Revised RAP that will address both DNAPL and associated dissolved-phase COCs present in affected groundwater at the Site. A brief summary of the primary objectives of the assessment activities are presented below:

- Refine previous assessments of the lateral and vertical extent of DNAPL in the subsurface;
- Further update the historical DNAPL/subsurface migration conceptual site model (CSM) by integrating results from previous investigations (over 90 previous CPT/ROST borings) with the activities proposed as part of this investigation;
- Support design of potential DNAPL recovery activities (e.g., additional recovery wells) or systems, as appropriate;
- Update the subsurface DNAPL CSM to support the risk-based DNAPL management plan to be developed in accordance with TCEQ guidance provided in RG-366 (Risk-Based NAPL Management; TRRP-32).

A direct push drilling rig or CPT rig equipped with a Tar-specific Green Optical Screening Tool™ (TarGOST) will be used to conduct the additional NAPL assessment for the Site. TarGOST is a proprietary site characterization tool designed by Dakota Technologies for delineating NAPL, including DNAPL commonly encountered at wood treatment sites that used creosote-based preservation. Creosote DNAPLs typically contain large amounts of naturally fluorescent PAHs and TarGOST was specifically designed to precisely log the NAPL versus depth (Dakota Technologies, 2015). The subsurface will be logged with the CPT probe simultaneously with the TarGOST. The data obtained from the TarGOST borings will be compared to the field observations of NAPL and observed lithology in the soil borings to evaluate correlation of the observed TarGOST responses. In addition, TarGOST borings will be installed immediately adjacent to both an existing monitoring well where DNAPL has historically been observed and near a well historically affected by only dissolved-phase COCs. The TarGOST results will be compared to observed DNAPL apparent thickness and available analytical data obtained from the wells to confirm that elevated fluorescence for TarGOST borings corresponds with areas where DNAPL and higher dissolved-phase groundwater impacts are known to exist in the shallow alluvium. TarGOST borings will also be advanced near previous CPT-ROST borings to compare the fluorescence signals between the two optical screening methods.



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The NAPL Assessment will be conducted to evaluate three areas of the Site (see Attachment 2A-1a):

1. Englewood Intermodal Yard – Up to 20 CPT-TarGOST borings are proposed within the Englewood Intermodal Yard area to evaluate the distribution of NAPL in the subsurface in the areas of the former Above Ground Storage Tanks (ASTs) and the former lagoons identified on historical aerials and maps;
2. Perimeter of the HWPW Site – CPT-TarGOST borings are proposed along the perimeter of the Site, including the west side of the Site (four locations near MW-41B and MW-12B), along the north northeast side of the Site (10 locations from MW-17 to MW-18C), and along the east side of the Site (four location between MW-49B and MW-80B).
3. Off-Site – Up to eight CPT-TarGOST borings are proposed north of the UPRR property within the City of Houston ROW in the residential area.

The proposed CPT-TarGOST locations shown on Attachment 2A-1a are approximate and may be adjusted in the field due to field observations and/or conflicts such as underground or overhead utilities. Data collected from this pre-design assessment will be used to evaluate the current nature and extent of NAPL in the subsurface, evaluate additional NAPL recovery methods, and optimize DNAPL recovery activities through an assessment of potential remedial alternatives to improve effectiveness and efficiency.

*Additional Groundwater Assessment*

UPRR proposed to install additional monitoring wells to address the 4<sup>th</sup> TNOD deficiency and to refine the lateral and vertical extent of the dissolved phase plume in the A-TZ, B-TZ/B-CZ, and C-TZ (Attachment 2B-1). This will include further assessment of the benzene and naphthalene concentrations detected in the A-TZ, B-CZ/B-TZ, and C-TZ, and of arsenic detected in the A-TZ and B-CZ/B-TZ. UPRR will also evaluate the groundwater geochemistry to assess possible sources for the dissolved arsenic detected at the Site. Proposed monitoring wells will be installed in the following GWBUs:

- A-TZ – Seven monitoring wells are proposed to be installed on-site (three) and off-site (four);
- B-CZ/B-TZ – Six monitoring wells are proposed to be installed on-site (two) and off-site (four);
- C-TZ – Two monitoring well is proposed to be installed off-site.

Proposed locations shown on Attachment 2B-1 are based on the June 12, 2019 meeting with the TCEQ and from COC concentrations in groundwater during the January 2019 sampling event (Appendix 2). Proposed monitoring well locations are approximate and may be adjusted in the field due to utility and/or other conflicts. The monitoring well will be constructed to evaluate the potential presence of DNAPL in each of the GWBUs. Following installation, wells will be developed and sampled for the Site-specific COCs, including arsenic. The site-wide groundwater dissolved phase dataset will be used to develop a remediation plan to be included in the Revised RAP.

*TPH-NAPL Assessment Englewood Intermodal Yard*

To address the horizontal and vertical assessment for TPH concentrations in soils, UPRR proposes to drill and sample 23 soil boring locations. The proposed sample locations are presented on Attachment 2A-1a, but may be adjusted based on field conditions and underground utilities. Soil borings will be drilled to the top of the uppermost GWBU (A-TZ) to assess the surface and subsurface soils. Soil samples will be collected continuously for the total depth of each boring and logged by field personnel and field screened using an organic vapor meter (OVM). At each boring location, up to two soil samples will be submitted for laboratory analyses for TPH by Method TX1005. Soil samples will be collected from the following intervals:

- A soil sample from the 0 to 5-foot interval (Surface Soil) where the highest OVM reading or visual hydrocarbon staining is observed; or, if no OVM readings or staining observed,

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a sample from the 2 to 5-foot interval will be collected (below the existing asphalt/concrete); and

- A soil sample from a depth below 5 feet to the top of the A-TZ (Subsurface Soil) where the highest OVM reading or visual hydrocarbon staining is observed; or, if no OVM readings or staining observed, a sample from the top of A-TZ.

Following review of the TX1005 analytical results, up to 10 soil samples will be further analyzed for TPH fractions by Method TX1006 to develop a site-specific TPH mixture PCL.

The soil investigation will follow a “focused on-site soil assessment” as detailed in the TCEQ Guidance Document Affected Property Assessment Requirements under TRRP, RG-366/TRRP12, Revised May 2010 and 30 Texas Administrative Code (TAC) §350.51(c), which states “*for soils only, the person can focus the horizontal on-site assessment to define the area exceeding the applicable critical PCL (i.e., residential or commercial/industrial).*” Therefore, the soil TPH data will be initially compared to the critical PCL (i.e., Tier 2, Commercial/Industrial, 30-acre source area PCLs, except for the locations along the perimeter of the Site that will be compared to Tier 2, Residential, 30-acre source area PCLs).

Following the initial review of the soil data, UPRR will assess if additional sampling is necessary to satisfy the horizontal and vertical delineation requirements detailed in 30 TAC §350.51. The sampling activities and analytical data will be submitted to the TCEQ in the Revised RAP.

*Pentachlorophenol (PCP) Assessment in soils*

As discussed during the meeting with the TCEQ on June 12, 2019, the TCEQ requested additional surface soil sampling for pentachlorophenol (PCP) along the western and northern boundary of the former HWPW area to confirm the delineation of PCP to the critical PCL in surface soil samples. The method detection limit for PCP in some of the surface soil samples collected during previous investigations was higher than the critical PCL. UPRR will collect surface samples in the vicinity of the previous locations for PCP analysis, as shown on Attachment 2A-1b.

## **ATTACHMENT 2A**

### **RESPONSE ACTION DIAGRAMS AND COMPONENT/EQUIPMENT DESCRIPTIONS**

Attachment 2A-1a – Response Action Design – Proposed CPT/TarGOST Locations

Attachment 2A-1b – Response Action Design – Proposed Surface Soil Sample Locations –  
Pentachlorophenol

Attachment 2A-2 – Response Action Design – Proposed Groundwater Monitoring Well Locations

Attachment 2A-3 – Response Action Design – NAPL Collection System Figures (As-Built)

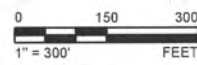
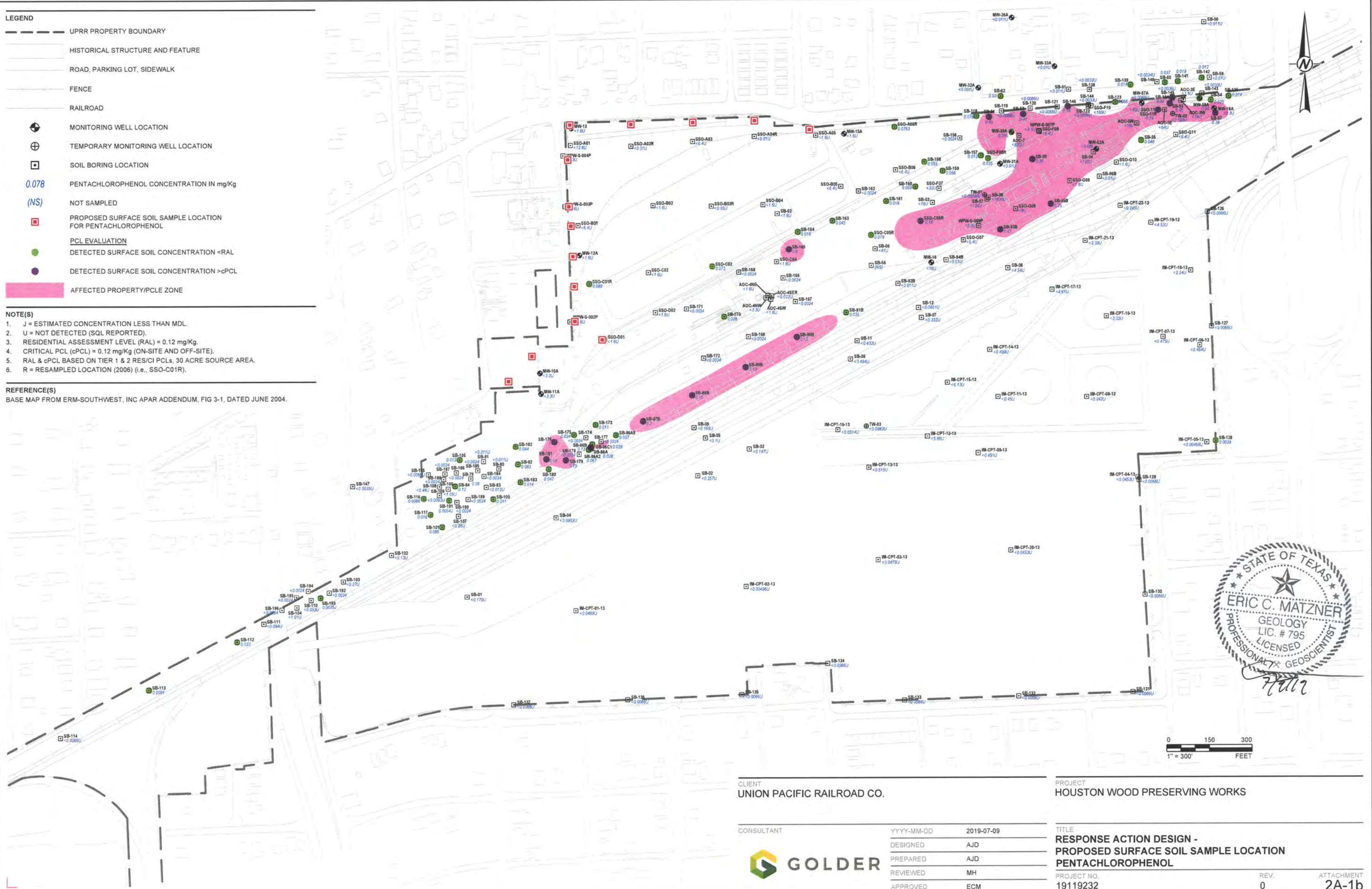




- LEGEND**
- UPRR PROPERTY BOUNDARY
  - HISTORICAL STRUCTURE AND FEATURE
  - ROAD, PARKING LOT, SIDEWALK
  - FENCE
  - RAILROAD
  - ⊕ MONITORING WELL LOCATION
  - ⊕ TEMPORARY MONITORING WELL LOCATION
  - SOIL BORING LOCATION
  - 0.078 PENTACHLOROPHENOL CONCENTRATION IN mg/Kg
  - (NS) NOT SAMPLED
  - PROPOSED SURFACE SOIL SAMPLE LOCATION FOR PENTACHLOROPHENOL
  - PCL EVALUATION**
  - DETECTED SURFACE SOIL CONCENTRATION <RAL
  - DETECTED SURFACE SOIL CONCENTRATION >cPCL
  - AFFECTED PROPERTY/PCL ZONE

- NOTE(S)**
- J = ESTIMATED CONCENTRATION LESS THAN MDL.
  - U = NOT DETECTED (SQL REPORTED).
  - RESIDENTIAL ASSESSMENT LEVEL (RAL) = 0.12 mg/Kg.
  - CRITICAL PCL (cPCL) = 0.12 mg/Kg (ON-SITE AND OFF-SITE).
  - RAL & cPCL BASED ON TIER 1 & 2 RES/CI PCLs, 30 ACRE SOURCE AREA.
  - R = RESAMPLED LOCATION (2006) (i.e., SSO-C01R).

**REFERENCE(S)**  
 BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



CLIENT	UNION PACIFIC RAILROAD CO.	PROJECT	HOUSTON WOOD PRESERVING WORKS
CONSULTANT	GOLDER	TITLE	RESPONSE ACTION DESIGN - PROPOSED SURFACE SOIL SAMPLE LOCATION PENTACHLOROPHENOL
DATE	2019-07-09	PROJECT NO.	19119232
DESIGNED	AJD	REV.	0
PREPARED	AJD	ATTACHMENT	2A-1b
REVIEWED	MH		
APPROVED	ECM		

Path: \\c:\data\p19119232 - Houston Wood Preserving Works - Response Action Design\Bulldoz Soil Samples.mxd | User: erickm | Date: 2019-07-09 11:13:29 AM | Printed By: erickm | Date: 2019-07-09 11:13:29 AM

1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B



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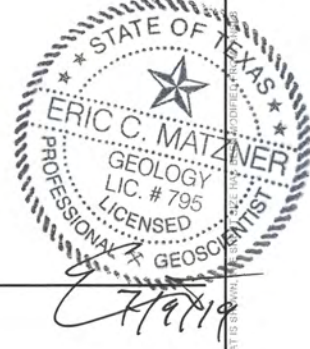


**LEGEND**

- 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
- CORRECTIVE ACTION SYSTEM WELL (DNAPL RECOVERY)
- PLUGGED AND ABANDONED
- GROUNDWATER PCLE ZONES (A-TZ, B-CZ/B-TZ AND C-TZ)
- GROUNDWATER PCLE ZONE - ARSENIC (A-TZ, B-CZ/B-TZ AND C-TZ)
- RCRA UNIT NO. 1 POINT OF COMPLIANCE (POC) WELL
- PROPOSED MONITORING WELL
- PROPOSED CUMULATIVE PMZ (A-TZ, B-CZ/B-TZ, AND C-TZ)
- PRELIMINARY ON-SITE PMZ (PENDING ADDITIONAL GROUNDWATER ASSESSMENT)
- PRELIMINARY OFF-SITE PMZ
- PRELIMINARY OFF-SITE PMZ CITY OF HOUSTON ROW
- PRELIMINARY OFF-SITE PMZ - PRIVATE PROPERTY (SIGNED RESTRICTIVE COVENANT/DEED)
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

- NOTE(S)**
1. VERTICAL DATUM BASED ON CITY OF HOUSTON VERTICAL DATUM (HVD).
  2. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
  3. \*\* - CORRECTIVE ACTION OBSERVATION WELL.
  4. (B) - BACKGROUND WELL.

**REFERENCE(S)**  
 PARCEL BOUNDARIES: CITY OF HOUSTON GEOGRAPHIC INFORMATION & MANAGEMENT SYSTEMS (GIMS).  
 AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.



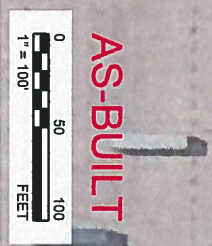
**CLIENT**  
 UNION PACIFIC RAILROAD CO.

**PROJECT**  
 HOUSTON WOOD PRESERVING WORKS

**TITLE**  
 RESPONSE ACTION DESIGN - GROUNDWATER

CONSULTANT	YYYY-MM-DD	2019-07-09
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM





**LEGEND**

- TEST PIT LOCATIONS (6L X 2.5W X 5D)
- ENVIRONMENTAL SAMPLE BORING LOCATIONS (PBW, 2018)
- AFFECTED AREA (NAPL SURFACING THROUGH SOME CRACKS AND JOINTS)

*R. Bryman Lipper*  
3-25-19



**REFERENCES**  
BASE MAP TAKEN FROM GOOGLE EARTH IMAGE DATED 01-23-2017.

**CLIENT**  
UNION PACIFIC RAILROAD CO.

**PROJECT**  
ENGLEWOOD INTERMODAL YARD - NAPL SEEP REMEDIATION

**TITLE**  
SITE MAP

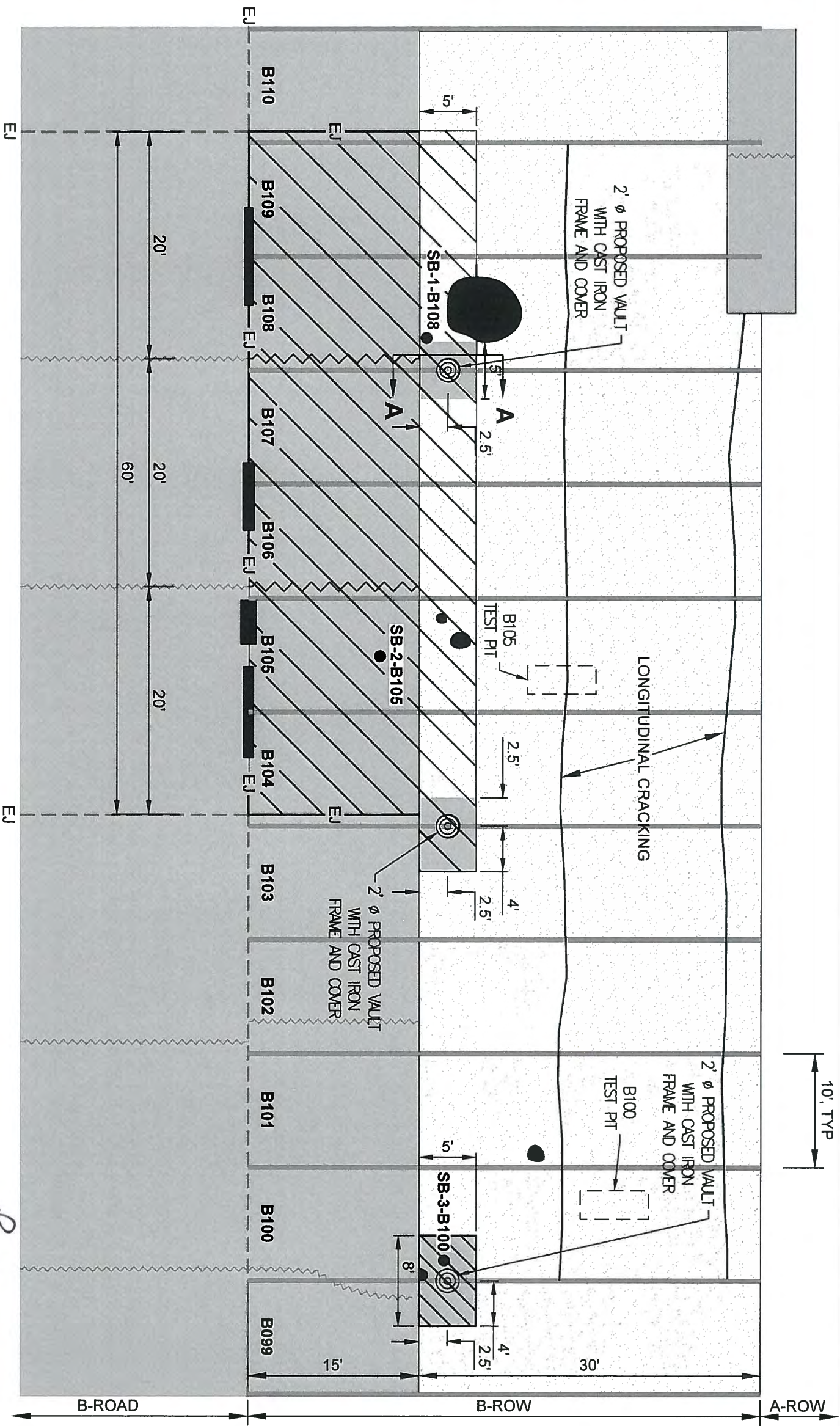
**CONSULTANT**  
YYYY-MM-DD 2019-03-25



DESIGNED: BZH  
PREPARED: AAD  
REVIEWED: RBL  
APPROVED: ECM

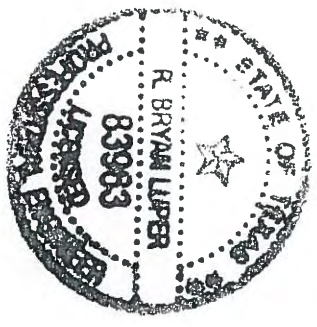
**PROJECT NO** 30401358-640  
**REV** 0  
**FIGURE** 1





- LEGEND**
- REINFORCED CONCRETE PAVEMENT
  - EXISTING ASPHALT PAVEMENT/ROAD BASE
  - PARKING STALL YELLOW LINE (4" WIDE)
  - EXISTING SEEP LOCATION
  - PROPOSED AREA OF EXCAVATION
  - EXISTING EXPANSION JOINT
  - PROPOSED EXPANSION JOINT
  - EXISTING CONTROL JOINT
  - PROPOSED CONTROL JOINT
  - PROPOSED NAPL COLLECTION VAULT (2' Ø)
  - SOIL BORING LOCATION
  - TEST PIT (6' L x 2.5' W x 5' D)

*R.B. Bingham-Jumper*  
3-25-19



**CLIENT**  
UNION PACIFIC RAILROAD CO.

**PROJECT**  
ENGLEWOOD INTERMODAL YARD - NAPL SEEP REMEDIATION

**TITLE**  
PROPOSED REMEDIAL EXCAVATION

**CONSULTANT**  
GOLDER

DESIGNED	BZH	2019-03-25
PREPARED	AJD	
REVIEWED	RBL/ECM	
APPROVED	RBL/ECM	

PROJECT NO. 30401358-640

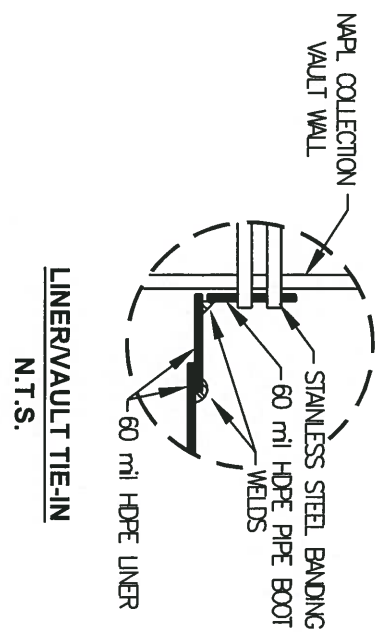
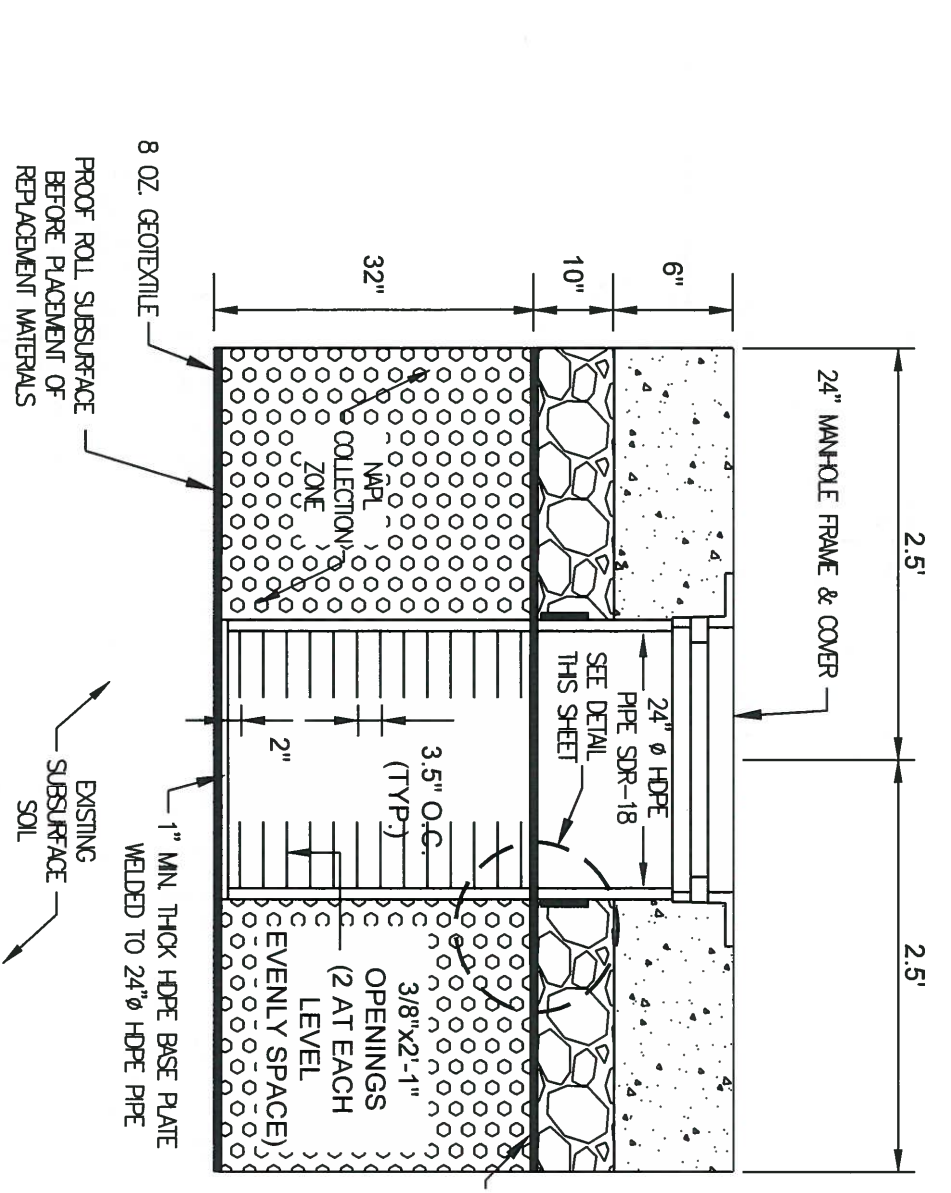
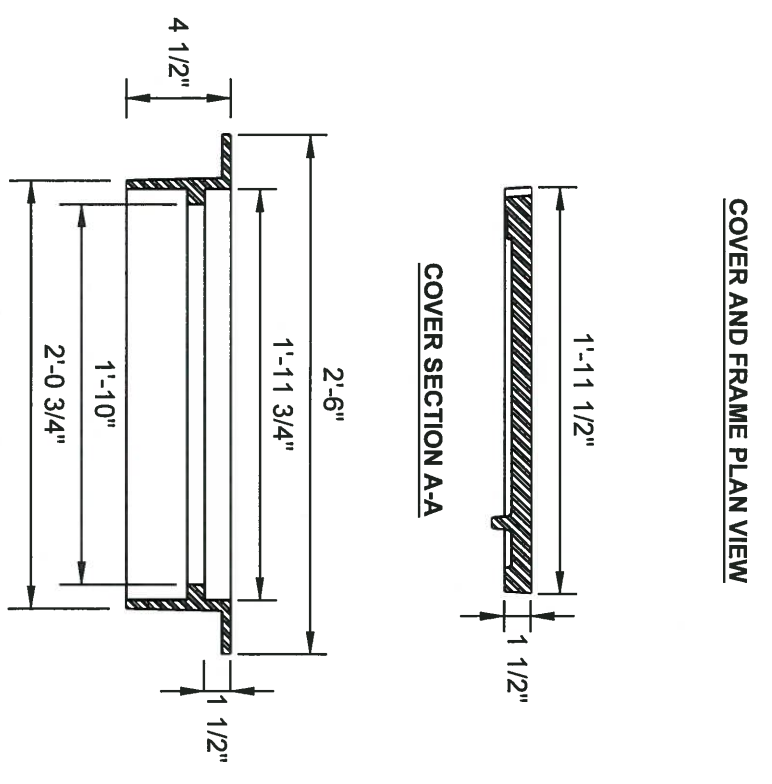
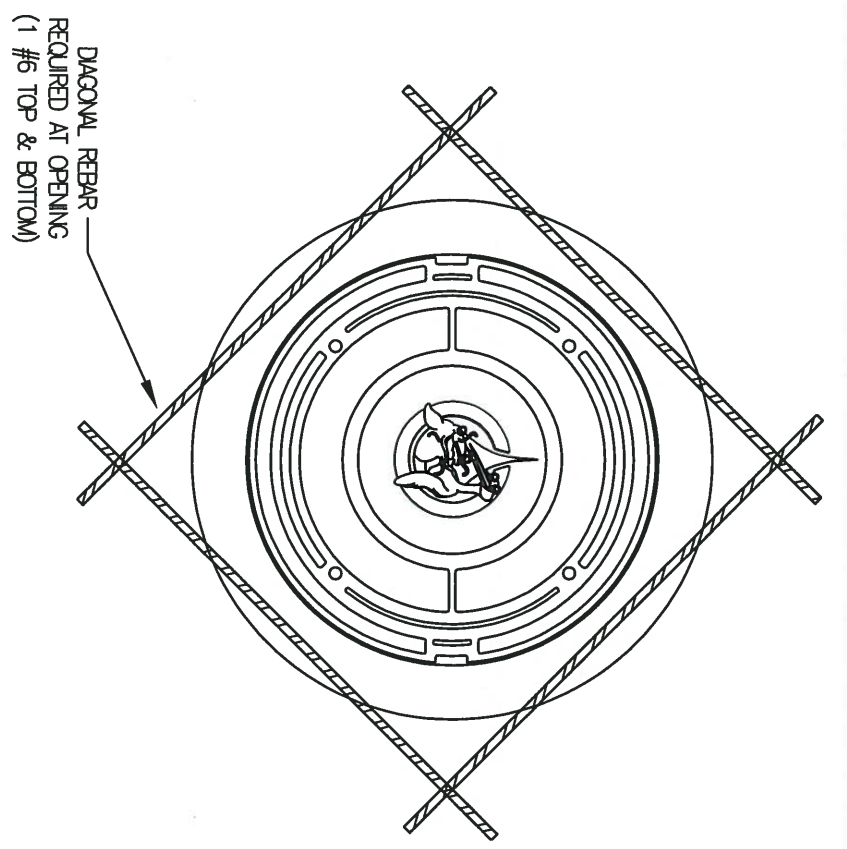
REV 0

FIGURE 2

**AS-BUILT**

0 5 10  
1" = 10'  
FEET





SECTION A-A  
N.T.S.

NOTE:  
1. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS MODEL V-1814 FRAME AND V-1418 COVER OR APPROVED EQUAL.

- REINFORCED CONCRETE
- COMPACTED BASE MATERIAL (TXDOT GRADE 1 AGGREGATE)
- COMPACTED SELECT FILL
- COMPACTED HIGH PERMEABILITY FILL
- 2" BUNKER ROCK FROM GULFOAST MATERIAL, INC. (PRODUCT 122002-2 INCH BUNKER)

**AS-BUILT**

*R. Bryn Lupfer*  
3-25-19



CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
ENGLEWOOD INTERMODAL YARD - NAPL SEEP REMEDIATION

TITLE  
PROPOSED NAPL COLLECTION SYSTEM

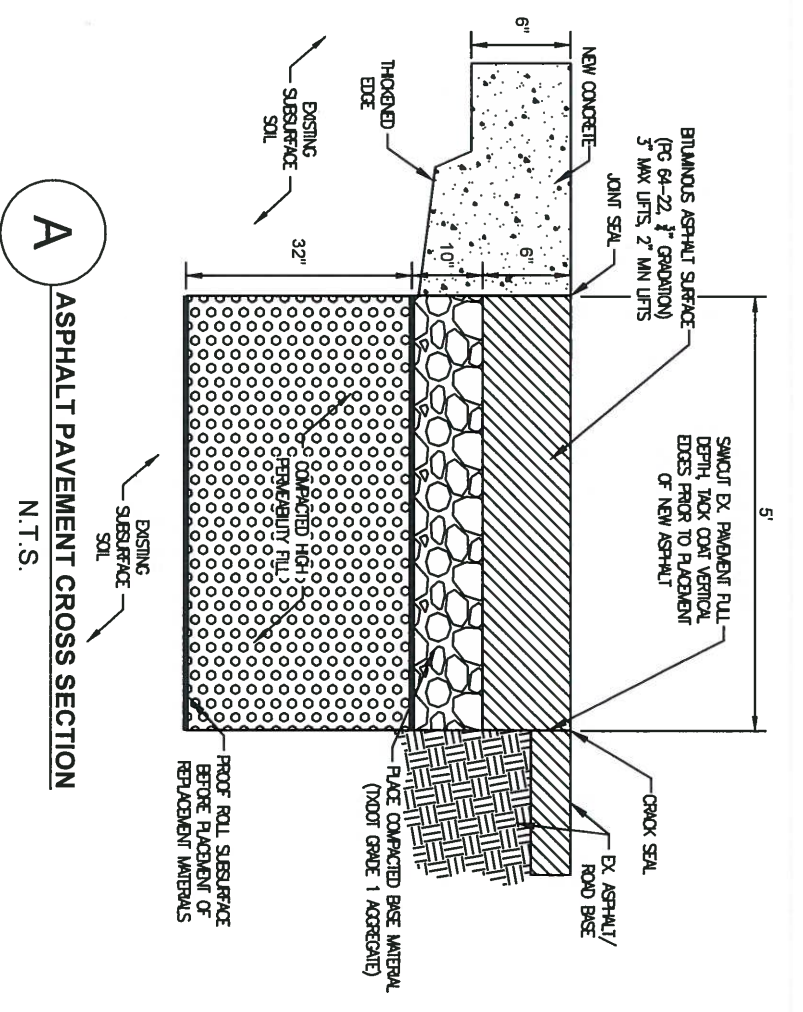
CONSULTANT  
GOLDER

DESIGNED: BZH  
PREPARED: AID  
REVIEWED: RB/ECM  
APPROVED: RB/ECM

PROJECT NO. 30401358-640

REV 0

FIGURE 3



- NOTES:
1. See joint spacing plan in Figure 2.
  2. Min. 3 day compression strength = 4,500 psi (high early strength).
  3. Dowel into existing concrete pavement per Expansion/Construction joint detail.
  4. Thickened edge to be used on all outer edges of new concrete pavement except where dowelled into existing concrete pavement (minimum 14\"/>



- NOTES:
1. Use DOW Corning 890-SL Silicone Sealant or equal.
  2. Round closed cell polyethylene backer rod. Use backer rod sized 1/4\"/>
  - 3. Sawcut and clean out existing joints before applying joint seal.

*RB Bryan Luper*  
3-25-19

**AS-BUILT**

STATE OF TEXAS  
R. BRYAN LUPER  
83963  
REGISTERED PROFESSIONAL ENGINEER

CLIENT	UNION PACIFIC RAILROAD CO.
PROJECT	ENGLEWOOD INTERMODAL YARD - NAPL SEEP REMEDIATION
TITLE	PAVEMENT DETAILS
CONSULTANT	YVYY-MM-DD 2019-03-25
DESIGNED	BZH
PREPARED	AJD
REVIEWED	RBL/CM
APPROVED	RBL/CM
PROJECT NO.	30401358-640
REV	0
FIGURE	4



**SCOPE OF WORK:**

1. THE CONTRACTOR SHALL REMOVE AT LEAST THE TOP 4" OF THE EXISTING REINFORCED CONCRETE PAVEMENT ASHALLT, ROAD BASE AND SUBGRADE MATERIAL UNDER THE AREAS OF EXCAVATION SHOWN IN FIGURE 2. THE OWNER OR HIS ON-SITE REPRESENTATIVE SHALL BE GIVEN ADEQUATE NOTICE BEFORE THE CONTRACTOR REACHES THE EXITS OF THE REQUIRED EXCAVATION TO ALLOW FOR ADEQUATE INSPECTION BY THE OWNER. THE EXCAVATION SHALL BE OPENED TO THE OWNER. THE EXCAVATION SHALL BE OPENED TO THE OWNER. THE EXCAVATION SHALL BE OPENED TO THE OWNER. THE EXCAVATION SHALL BE OPENED TO THE OWNER.
2. EXCAVATED REINFORCED CONCRETE AND ASPHALT PAVEMENT MATERIAL SHALL BE ASSUMED TO BE CLEAN AND APPROPRIATE FOR OFF-SITE RECYCLING OR DISPOSAL BEFORE OFF-SITE DISPOSAL. THE CONTRACTOR SHALL ALLOW THE OWNER TO INSPECT THE MATERIAL TO CONFIRM THIS ASSUMPTION.
3. EXCAVATED ROAD BASE AND SUBGRADE MATERIAL SHALL BE ASSUMED TO BE NON-HAZARDOUS CLASS INDUSTRIAL MATERIAL AND SHALL BE TRANSPORTED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
4. AS EXCAVATION ACTIVITIES ARE ON-GOING, THERE IS A SIGNIFICANT POSSIBILITY THAT POOLS OR SEEPS OF LNAPL AND/OR LNAPL IMPACTED WATER WILL BE ENCOUNTERED. THE LIQUIDS ENTERING THE EXCAVATIONS MUST BE CAPTURED AND COLLECTED BY THE CONTRACTOR. THE COLLECTED LIQUIDS SHALL BE PLACED INTO APPROPRIATE CONTAINERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANALYZING, CHARACTERIZING AND PROFILING THE MATERIAL FOR PROPER OFF-SITE TRANSPORTATION AND DISPOSAL.
5. AFTER THE COMPLETION OF EXCAVATION OPERATIONS, THE CONTRACTOR SHALL INSTALL THE SUBSIDIARY NAPL COLLECTION SYSTEM DESCRIBED IN FIGURE 3 AND THEN REPLACE THE PAVEMENT AND MARKING SYSTEM IN ACCORDANCE WITH THE DETAILS SHOWN IN FIGURE 2 AND FIGURE 4.
6. THE CONTRACTOR SHALL CAREFULLY READ ALL OF THESE NOTES AND SPECIFICATIONS. THE CONTRACTOR SHALL BE SATISFIED AS TO THEIR MEANING AND INTENT AND SHALL BE RESPONSIBLE FOR COMPLYING WITH EACH.
7. THE CONTRACTOR SHALL INSPECT THE SITE OF THE WORK PRIOR TO BIDDING TO SATISFY THEMSELVES BY PERSONAL EXAMINATION OR BY SUCH OTHER MEANS AS THEY MAY PREFER, OF THE LOCATION OF THE PROPOSED WORK, AND OF THE ACTUAL CONDITIONS OF THE PROJECT SITE. IF, DURING THE COURSE OF THEIR EXAMINATION, A BIDDER FINDS CONDITIONS WHICH APPEAR TO BE IN CONFLICT WITH THE PROJECT PLANS AND SPECIFICATIONS, THEY SHALL CONTACT THE ENGINEER AND/OR OWNER FOR ADDITIONAL INFORMATION AND EXPLANATION BEFORE SUBMITTING THEIR BID. AN OBSERVABLE CONDITIONS IN CONFLICT WITH PLANS AND SPECIFICATIONS THAT ARE NOT REPORTED IN BID WILL NOT RESULT IN A CHANGE ORDER.
8. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY THE ENGINEER AND FACILITY MANAGER WITH AT LEAST 2 WEEKS NOTICE PRIOR TO MOBILIZATION. CONTRACTOR IS OBLIGATED TO FACILITATE FACILITY SCHEDULES AND BUSINESS OPERATIONS.
9. CONTRACTOR SHALL COORDINATE ALL WORK SCHEDULES AND CONSTRUCTION LIMITS WITH THE FACILITY OPERATIONS MANAGER AND ENGINEER PRIOR TO COMMENCING ANY WORK.
10. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY AND CITY LAWS AND ORDINANCES AND ALL REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION AND THE TEXAS DEPARTMENT OF TRANSPORTATION SPECIFICATIONS UNLESS OTHERWISE NOTED.
11. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS, BONDS, INSURANCE, ETC. AND PAYING ALL FEES AND FOR OTHERWISE COMPLYING WITH ALL REGULATIONS GOVERNING THE WORK.
12. CONTRACTOR SHALL COORDINATE WORK HOURS TO THE TIMES PERMITTED BY FIELD MANAGER. TWENTY-FOUR HOUR WORK IS PERMISSIBLE. CONTINGENT UPON APPROVAL BY THE FACILITY MANAGER.
13. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, BARRICADES, SIGNS, FLAGMEN OR OTHER DEVICES NECESSARY FOR PUBLIC SAFETY AND AS REQUIRED BY UPRR. CONTRACTOR SHALL COORDINATE WITH UPRR FOR SCHEDULING FLAGMENS. CONTRACTOR SHALL COMPLY WITH THE ACCOMPANYING REQUIREMENTS FOR FLAGGING, INSURANCE, AND SAFETY.
14. THESE PLANS DO NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF SITE. THE CONTRACTOR SHALL VERIFY ALL UTILITIES VIA POT-HOLING OR OTHER MEANS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY UPRR FIBER OPTICS HOTLINE 1-800-338-9193, 24 HOURS PRIOR TO ANY EXCAVATION.
15. THE CONTRACTOR SHALL BE SKILLED AND REGULARLY ENGAGED IN THE GENERAL CLASS AND TYPE OF WORK CALLED FOR IN THE PROJECT PLANS AND SPECIFICATIONS. THEREFORE, THE OWNER IS RELYING UPON THE EXPERIENCE AND EXPERTISE OF THE CONTRACTOR. IT SHALL BE EXPECTED THAT PRICES PROVIDED WITHIN THE CONTRACT DOCUMENTS SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR THE WORK TO BE COMPLETED IN ACCORDANCE WITH PROJECT PLANS AND SPECIFICATIONS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND LICENSES REQUIRED FOR THE CONSTRUCTION AND COMPLETION OF THE PROJECT AND SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE SAID PERMITS AND LICENSES. THE CONTRACTOR SHALL ENSURE THAT THE NECESSARY RIGHTS-OF-WAY, EASEMENTS AND/OR PERMITS ARE SECURED PRIOR TO CONSTRUCTION WHERE NECESSARY.
17. THE CONTRACTOR SHALL BE LICENSED IN THE STATE WHERE THIS PROJECT IS LOCATED AND SHALL BE BONDED FOR AN AMOUNT EQUAL TO OR GREATER THAN THE BID AMOUNT.
18. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL WATER, POWER, SANITARY FACILITIES AND TELEPHONE SERVICES AS REQUIRED FOR THE CONTRACTOR'S USE DURING CONSTRUCTION.
19. THE CONTRACTOR SHALL PROVIDE AND PAY FOR AND/OR OBTAIN ALL ELECTRIC POWER NECESSARY TO ACCOMPLISH THE WORK.
20. THE CONTRACTOR SHALL PROVIDE AND PAY FOR AN ADEQUATE SUPPLY OF WATER AS REQUIRED TO PROPERLY CARRY OUT THE WORK AND AN ADEQUATE SUPPLY OF UNCONTAMINATED WATER AS REQUIRED FOR DOMESTIC CONSUMPTION AND SHALL INSTALL AND MAINTAIN NECESSARY SUPPLY CONNECTIONS AND PIPING FOR SUCH WATER SUPPLY, BUT ONLY AT SUCH LOCATIONS AND IN SUCH MANNER AS MAY BE APPROVED BY THE UPRR REPRESENTATIVE.
21. NO FIELD CHANGES WILL BE PERMITTED WITHOUT DIRECT WRITTEN AUTHORIZATION FROM THE OWNER, ENGINEER, AND UPRR ENGINEER OR HIS REPRESENTATIVE.
22. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.
23. ANY EXISTING CONDITIONS FOUND TO BE A VARIANCE WITH THESE DRAWINGS MUST BE IMMEDIATELY REPORTED TO THE ENGINEER.
24. THE CONTRACTOR SHALL GUARANTEE ALL WORK UNDER THIS AGREEMENT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE RAILROAD, UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL LEAVE THE WORK IN PERFECT ORDER AT COMPLETION, AND THE FINAL CERTIFICATE OF PAYMENT SHALL NOT RELIEVE HIM OF THE RESPONSIBILITY FOR NEGLIGENCE, FAULTY MATERIALS, OR WORKMANSHIP. UPON WRITTEN NOTICE, HE SHALL REMEDY ANY DEFECTS OR WORKMANSHIP THAT MAY APPEAR DURING THE TIME HEREBEFORE MENTIONED AND PAY ALL EXPENSES DUE THERE FROM TO THE ENTIRE SATISFACTION OF THE UPRR REPRESENTATIVE.
25. THE CONTRACTOR SHALL GUARANTEE ALL WORK UNDER THIS AGREEMENT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE RAILROAD, UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL LEAVE THE WORK IN PERFECT ORDER AT COMPLETION, AND THE FINAL CERTIFICATE OF PAYMENT SHALL NOT RELIEVE HIM OF THE RESPONSIBILITY FOR NEGLIGENCE, FAULTY MATERIALS, OR WORKMANSHIP. UPON WRITTEN NOTICE, HE SHALL REMEDY ANY DEFECTS OR WORKMANSHIP THAT MAY APPEAR DURING THE TIME HEREBEFORE MENTIONED AND PAY ALL EXPENSES DUE THERE FROM TO THE ENTIRE SATISFACTION OF THE UPRR REPRESENTATIVE.
26. ANY UNDERGROUND STRUCTURES SUCH AS CESSPOOLS, CISTERNS, MINING SHAFTS, TUNNELS, SEPTIC TANKS, WELLS AND PIPELINES NOT LOCATED PRIOR TO CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DETERMINATION OF APPROPRIATE ACTIONS SUCH AS REMOVAL OR TREATMENT IN A MANNER JUDGED SUITABLE TO THE ENGINEER.
27. IF ANY EXISTING STRUCTURES OR UTILITIES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE OR UTILITIES AS NECESSARY TO RETURN THEM TO EXISTING CONDITIONS OR BETTER, AS APPROVED BY THE OWNER.
28. CONTRACTOR SHALL CHECK THE LEAD TIMES OF ALL MATERIAL AND ENSURE THAT ALL MATERIALS ARE ON HAND IN SUFFICIENT TIME SO AS TO NOT DELAY CONSTRUCTION ACTIVITIES OR CAUSE DELAY TO PROJECT SCHEDULE.
29. THE CONTRACTOR IS TO OBEY FACILITY SPEED LIMITS AND ALL OTHER FACILITY SAFETY REGULATIONS.
30. THE CONTRACTOR SHALL PROVIDE ERECT AND MAINTAIN ADEQUATE TEMPORARY FENCES AND BARRICADES TO PREVENT DAMAGE AND/OR THESSASSING UPON THE RIGHT-OF-WAY, DAMAGE OF ADJOINING PROPERTY, AND REASONS OF SAFETY.
31. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY MARKINGS THAT ARE IN CONFLICT WITH THE PROPOSED WORK.
32. THE CONTRACTOR SHALL ENSURE ALL ROADS, WHETHER PAVED OR GRAVEL, USED DURING CONSTRUCTION ARE MAINTAINED AND LEFT IN PRE-CONSTRUCTION CONDITION WHEN PROJECT IS COMPLETE. THE CONTRACTOR IS RESPONSIBLE FOR ALL BONDS REQUIRED BY LOCAL OR STATE AGENCIES TO ENSURE PUBLIC ROADS ARE MAINTAINED OR REPAIRED. ANY TEMPORARY BARRICADES OR TRAFFIC CONTROL, IF NOT INCLUDED AS A BID ITEM, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IDENTICAL.
33. IF UNSUITABLE SUBGRADE MATERIALS ARE ENCOUNTERED, THEY MUST BE REMOVED AND REPLACED WITH SUITABLE MATERIALS TO COMPLY WITH UPRR SPECIFICATIONS.
34. THE CONTRACTOR IS TO STAGE CONSTRUCTION ACTIVITIES SO THAT UPRR IS STILL 100% OPERATIONAL. A PLAN PRIOR TO COMMENCING WORK SHALL BE PRESENTED TO AND APPROVED BY UPRR TO ASSURE CONTINUED OPERATION OF THE FACILITY DURING CONSTRUCTION.
35. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE DOCUMENTATION ESTABLISHING THAT ALL ON-SITE EMPLOYEES ARE OSHA HAZWOPER TRAINED TO HANDLE HAZARDOUS MATERIALS. ONLY CONTRACTORS WITH PROPER OSHA HAZWOPER TRAINING SHALL BE CONSIDERED.
36. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
37. DUST CONTROL SHALL BE PROVIDED AT ALL TIMES. AT THE CONTRACTOR'S EXPENSE, TO MINIMIZE ANY DUST IRRITANCE, SPILLAGE OF EARTH, DUSTY MATERIALS, BOULDERS AND MUD ON ROADS LOCATED ON THE RAILROAD'S PROPERTY WILL NOT BE PERMITTED. IF SPILLAGE CANNOT BE PREVENTED, THE CONTRACTOR SHALL PROVIDE AN HOURLY PATROL, OR MORE FREQUENTLY IF NEEDED, TO POLICE AND SWEEP SUCH AREAS THROUGHOUT THE WORK DAY, AND AT THE CONCLUSION OF EACH WORK DAY. ANY PAVEMENT LOCATED ON THE RAILROAD'S PROPERTY WHICH HAVE BEEN USED BY THE CONTRACTOR SHALL BE BROOM CLEANED AND LEFT TO THE SATISFACTION OF THE UPRR REPRESENTATIVE. ANY EXPENSE INCURRED IN THE USE OF RAILROAD ACCESS ROADS SHALL BE BORNE BY THE CONTRACTOR.
38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY SCHEDULING REQUIRED INSPECTION AND TESTING OF ALL FACILITIES CONSTRUCTED UNDER THIS CONTRACT.
39. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING FEATURES FROM DAMAGE. THERE WILL BE NO EXTRA PAYMENT TO THE CONTRACTOR FOR REPAIRING EXISTING FEATURES NOT SPECIFICALLY STATED ON THE PLANS.
40. IF ANY EXISTING STRUCTURES OR UTILITIES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE OR UTILITIES AS NECESSARY TO RETURN THEM TO EXISTING CONDITIONS OR BETTER, AS APPROVED BY THE OWNER.
41. CONTRACTOR SHALL CHECK THE LEAD TIMES OF ALL MATERIAL AND ENSURE THAT ALL MATERIALS ARE ON HAND IN SUFFICIENT TIME SO AS TO NOT DELAY CONSTRUCTION ACTIVITIES OR CAUSE DELAY TO PROJECT SCHEDULE.
42. THE CONTRACTOR IS TO OBEY FACILITY SPEED LIMITS AND ALL OTHER FACILITY SAFETY REGULATIONS.
43. ANY UNDERGROUND STRUCTURES SUCH AS CESSPOOLS, CISTERNS, MINING SHAFTS, TUNNELS, SEPTIC TANKS, WELLS AND PIPELINES NOT LOCATED PRIOR TO CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DETERMINATION OF APPROPRIATE ACTIONS SUCH AS REMOVAL OR TREATMENT IN A MANNER JUDGED SUITABLE TO THE ENGINEER.
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**GENERAL NOTES:**

**DESIGN CRITERIA:**

1. THE CONTRACTOR SHALL CAREFULLY READ ALL OF THESE NOTES AND SPECIFICATIONS. THE CONTRACTOR SHALL BE SATISFIED AS TO THEIR MEANING AND INTENT AND SHALL BE RESPONSIBLE FOR COMPLYING WITH EACH.
2. THE CONTRACTOR SHALL INSPECT THE SITE OF THE WORK PRIOR TO BIDDING TO SATISFY THEMSELVES BY PERSONAL EXAMINATION OR BY SUCH OTHER MEANS AS THEY MAY PREFER, OF THE LOCATION OF THE PROPOSED WORK, AND OF THE ACTUAL CONDITIONS OF THE PROJECT SITE. IF, DURING THE COURSE OF THEIR EXAMINATION, A BIDDER FINDS CONDITIONS WHICH APPEAR TO BE IN CONFLICT WITH THE PROJECT PLANS AND SPECIFICATIONS, THEY SHALL CONTACT THE ENGINEER AND/OR OWNER FOR ADDITIONAL INFORMATION AND EXPLANATION BEFORE SUBMITTING THEIR BID. AN OBSERVABLE CONDITIONS IN CONFLICT WITH PLANS AND SPECIFICATIONS THAT ARE NOT REPORTED IN BID WILL NOT RESULT IN A CHANGE ORDER.
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5. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY AND CITY LAWS AND ORDINANCES AND ALL REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION AND THE TEXAS DEPARTMENT OF TRANSPORTATION SPECIFICATIONS UNLESS OTHERWISE NOTED.
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9. THESE PLANS DO NOT GUARANTEE THE EXISTENCE OR NON-EXISTENCE OF SITE. THE CONTRACTOR SHALL VERIFY ALL UTILITIES VIA POT-HOLING OR OTHER MEANS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY UPRR FIBER OPTICS HOTLINE 1-800-338-9193, 24 HOURS PRIOR TO ANY EXCAVATION.
10. THE CONTRACTOR SHALL BE SKILLED AND REGULARLY ENGAGED IN THE GENERAL CLASS AND TYPE OF WORK CALLED FOR IN THE PROJECT PLANS AND SPECIFICATIONS. THEREFORE, THE OWNER IS RELYING UPON THE EXPERIENCE AND EXPERTISE OF THE CONTRACTOR. IT SHALL BE EXPECTED THAT PRICES PROVIDED WITHIN THE CONTRACT DOCUMENTS SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR THE WORK TO BE COMPLETED IN ACCORDANCE WITH PROJECT PLANS AND SPECIFICATIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS AND LICENSES REQUIRED FOR THE CONSTRUCTION AND COMPLETION OF THE PROJECT AND SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE SAID PERMITS AND LICENSES. THE CONTRACTOR SHALL ENSURE THAT THE NECESSARY RIGHTS-OF-WAY, EASEMENTS AND/OR PERMITS ARE SECURED PRIOR TO CONSTRUCTION WHERE NECESSARY.
12. THE CONTRACTOR SHALL BE LICENSED IN THE STATE WHERE THIS PROJECT IS LOCATED AND SHALL BE BONDED FOR AN AMOUNT EQUAL TO OR GREATER THAN THE BID AMOUNT.
13. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL WATER, POWER, SANITARY FACILITIES AND TELEPHONE SERVICES AS REQUIRED FOR THE CONTRACTOR'S USE DURING CONSTRUCTION.
14. THE CONTRACTOR SHALL PROVIDE AND PAY FOR AND/OR OBTAIN ALL ELECTRIC POWER NECESSARY TO ACCOMPLISH THE WORK.
15. THE CONTRACTOR SHALL PROVIDE AND PAY FOR AN ADEQUATE SUPPLY OF WATER AS REQUIRED TO PROPERLY CARRY OUT THE WORK AND AN ADEQUATE SUPPLY OF UNCONTAMINATED WATER AS REQUIRED FOR DOMESTIC CONSUMPTION AND SHALL INSTALL AND MAINTAIN NECESSARY SUPPLY CONNECTIONS AND PIPING FOR SUCH WATER SUPPLY, BUT ONLY AT SUCH LOCATIONS AND IN SUCH MANNER AS MAY BE APPROVED BY THE UPRR REPRESENTATIVE.
16. NO FIELD CHANGES WILL BE PERMITTED WITHOUT DIRECT WRITTEN AUTHORIZATION FROM THE OWNER, ENGINEER, AND UPRR ENGINEER OR HIS REPRESENTATIVE.
17. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY FIELD CHANGES MADE WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.
18. ANY EXISTING CONDITIONS FOUND TO BE A VARIANCE WITH THESE DRAWINGS MUST BE IMMEDIATELY REPORTED TO THE ENGINEER.
19. THE CONTRACTOR SHALL GUARANTEE ALL WORK UNDER THIS AGREEMENT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE RAILROAD, UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL LEAVE THE WORK IN PERFECT ORDER AT COMPLETION, AND THE FINAL CERTIFICATE OF PAYMENT SHALL NOT RELIEVE HIM OF THE RESPONSIBILITY FOR NEGLIGENCE, FAULTY MATERIALS, OR WORKMANSHIP. UPON WRITTEN NOTICE, HE SHALL REMEDY ANY DEFECTS OR WORKMANSHIP THAT MAY APPEAR DURING THE TIME HEREBEFORE MENTIONED AND PAY ALL EXPENSES DUE THERE FROM TO THE ENTIRE SATISFACTION OF THE UPRR REPRESENTATIVE.
20. THE CONTRACTOR SHALL GUARANTEE ALL WORK UNDER THIS AGREEMENT FOR A PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE RAILROAD, UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL LEAVE THE WORK IN PERFECT ORDER AT COMPLETION, AND THE FINAL CERTIFICATE OF PAYMENT SHALL NOT RELIEVE HIM OF THE RESPONSIBILITY FOR NEGLIGENCE, FAULTY MATERIALS, OR WORKMANSHIP. UPON WRITTEN NOTICE, HE SHALL REMEDY ANY DEFECTS OR WORKMANSHIP THAT MAY APPEAR DURING THE TIME HEREBEFORE MENTIONED AND PAY ALL EXPENSES DUE THERE FROM TO THE ENTIRE SATISFACTION OF THE UPRR REPRESENTATIVE.
21. IF ANY EXISTING STRUCTURES OR UTILITIES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE OR UTILITIES AS NECESSARY TO RETURN THEM TO EXISTING CONDITIONS OR BETTER, AS APPROVED BY THE OWNER.
22. CONTRACTOR SHALL CHECK THE LEAD TIMES OF ALL MATERIAL AND ENSURE THAT ALL MATERIALS ARE ON HAND IN SUFFICIENT TIME SO AS TO NOT DELAY CONSTRUCTION ACTIVITIES OR CAUSE DELAY TO PROJECT SCHEDULE.
23. THE CONTRACTOR IS TO OBEY FACILITY SPEED LIMITS AND ALL OTHER FACILITY SAFETY REGULATIONS.
24. ANY UNDERGROUND STRUCTURES SUCH AS CESSPOOLS, CISTERNS, MINING SHAFTS, TUNNELS, SEPTIC TANKS, WELLS AND PIPELINES NOT LOCATED PRIOR TO CONSTRUCTION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DETERMINATION OF APPROPRIATE ACTIONS SUCH AS REMOVAL OR TREATMENT IN A MANNER JUDGED SUITABLE TO THE ENGINEER.
25. THE CONTRACTOR SHALL PROVIDE ERECT AND MAINTAIN ADEQUATE TEMPORARY FENCES AND BARRICADES TO PREVENT DAMAGE AND/OR THESSASSING UPON THE RIGHT-OF-WAY, DAMAGE OF ADJOINING PROPERTY, AND REASONS OF SAFETY.
26. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY MARKINGS THAT ARE IN CONFLICT WITH THE PROPOSED WORK.
27. THE CONTRACTOR SHALL ENSURE ALL ROADS, WHETHER PAVED OR GRAVEL, USED DURING CONSTRUCTION ARE MAINTAINED AND LEFT IN PRE-CONSTRUCTION CONDITION WHEN PROJECT IS COMPLETE. THE CONTRACTOR IS RESPONSIBLE FOR ALL BONDS REQUIRED BY LOCAL OR STATE AGENCIES TO ENSURE PUBLIC ROADS ARE MAINTAINED OR REPAIRED. ANY TEMPORARY BARRICADES OR TRAFFIC CONTROL, IF NOT INCLUDED AS A BID ITEM, ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IDENTICAL.
28. IF UNSUITABLE SUBGRADE MATERIALS ARE ENCOUNTERED, THEY MUST BE REMOVED AND REPLACED WITH SUITABLE MATERIALS TO COMPLY WITH UPRR SPECIFICATIONS.
29. THE CONTRACTOR IS TO STAGE CONSTRUCTION ACTIVITIES SO THAT UPRR IS STILL 100% OPERATIONAL. A PLAN PRIOR TO COMMENCING WORK SHALL BE PRESENTED TO AND APPROVED BY UPRR TO ASSURE CONTINUED OPERATION OF THE FACILITY DURING CONSTRUCTION.
30. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE DOCUMENTATION ESTABLISHING THAT ALL ON-SITE EMPLOYEES ARE OSHA HAZWOPER TRAINED TO HANDLE HAZARDOUS MATERIALS. ONLY CONTRACTORS WITH PROPER OSHA HAZWOPER TRAINING SHALL BE CONSIDERED.

**WASTE MANAGEMENT:**

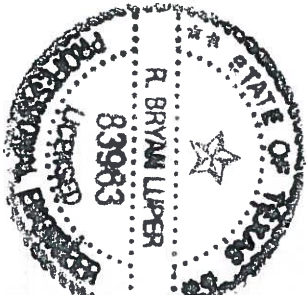
1. THE ANALYTICAL RESULTS FOR THE IMPACTED SOILS TO BE EXCAVATED ARE INCLUDED WITH THESE BID DOCUMENTS AS ATTACHMENT B. EXCAVATED SOILS WILL BE RESTRICTED TO DISPOSAL AT AN AUTHORIZED PERMITTED LANDFILL OFF-SITE REUSE OF THESE SOILS IS NOT PERMITTED. IT IS ANTICIPATED THAT APPROXIMATELY 117 CY (IN-PLACE) WILL BE EXCAVATED.
2. THE LANDFILL SELECTED FOR DISPOSAL SHALL BE APPROVED BY UPRR PRIOR TO CONSTRUCTION. LANDFILLS IN THE AREA INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
  - a. REPUBLIC SERVICES/MCCARTY ROAD LANDFILL, HOUSTON, TEXAS
  - b. WASTE MANAGEMENT-COASTAL PLAINS SECURITY LANDFILL, ALVIN, TEXAS.
3. CONTRACTOR SHALL COMPLY WITH OFF-SITE WASTE SHIPMENT REQUIREMENTS INCLUDING, U.S. DEPARTMENT OF TRANSPORTATION (DOT) REGULATIONS CONTAINED IN 49 C.F.R. 173, AND 179 AND PLACARDED REGULATIONS IN 49 C.F.R. 173 AND SHALL USE ONLY PERMITTED WASTE HAULERS, AS APPLICABLE. IF CONTRACTOR IS NOT TCEA APPROVED, THE BELOW COMPANIES ARE UPRR APPROVED REMEDIATION CONTRACTORS THAT CAN ASSIST IN HANDLING THE SOILS:
  - a. STENOIC ENVIRONMENTAL SOLUTIONS (713) 672-8100
  - b. UNITED PROFESSIONAL SERVICE (817) 306-7882
  - c. OIL MOB (281) 470-2016

**PROJECT CONTACTS:**

KEVIN PETERBURN	(402) 544-9901	K.PETER@UPR.COM
R. BRYAN LUPPER	(832) 390-9995	BRYANLUPPER@PBWILLCO.COM
	(919) 665-8162	
DAN RIALS	(713) 678-5297	DTRIALS@UPR.COM
SCOTT GREEN	(214) 821-8841	SGREEN@UPR.COM
UPRR FIBER OPTICS	(800) 338-9193	
UPRR RMCC	(889) 877-7267	
(800) DIG-TESS	(800) 344-8377	
TEXAS ONE CALL	(800) 245-5545	
LSNC	(800) 669-8344	
JEREMY LEVINE	(281) 763-4802	

**OWNERS REPRESENTATIVE**

UPRR	4423 N 119th ST.	CIVIL ENGINEER
	HOUSTON, TX 77062	PASTOR BETHUNE & WHEELER
		11231 ROCKHOLLOW, SUITE D104
		HOUSTON, TX 77062
		MTLVA@UPRR.COM
		53225



CLIENT: UNION PACIFIC RAILROAD CO. PROJECT: ENGLEWOOD INTERMODAL YARD - NAPL SEEP REMEDIATION

TITLE: PROJECT NOTES

CONSULTANT	YYYY-MM-DD	2019-03-25
DESIGNED	BZH	
PREPARED	AJD	
REVIEWED	RUBJECM	
APPROVED	RUBJECM	

PROJECT NO: 30401358-640 REV: 0 FIGURE: 5

**ATTACHMENT 2B**

**PROPOSED WELL DESIGN**

## **Introduction**

As detailed in RAP Worksheet 2.1, the following wells are proposed (designated with a “P”) to be installed:

1. A-TZ: PMW-76A, PMW-84A, PMW-91A, PMW-93A, PMW-94A, PMW-97A, and PMW-99A.
2. B-TZ/B-CZ: PMW-54B, PMW-61B, PMW-76B, PMW-92B, PMW-95B, and PMW-96B.
3. C-TZ: PMW-70C and PMW-98C.

The proposed new wells and replacement wells are shown on Attachment 2B-1. 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 34 feet to 44 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.

### **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.



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 Date: 2019-07-09 Time: 11:53:07 AM | Printed by: adiamond | Date: 2019-07-09 Time: 5:07:18 PM



**LEGEND**

- 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
- PROPOSED MONITORING WELL

**REFERENCE(S)**  
 PARCEL BOUNDARIES: CITY OF HOUSTON GEOGRAPHIC INFORMATION & MANAGEMENT SYSTEMS (GIMS).  
 AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.



CLIENT  
 UNION PACIFIC RAILROAD CO.

PROJECT  
 HOUSTON WOOD PRESERVING WORKS

TITLE  
 PROPOSED MONITORING WELL LOCATION MAP

CONSULTANT	YYYY-MM-DD	2019-07-09
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM



PROJECT NO.  
 19119232

REV.  
 0

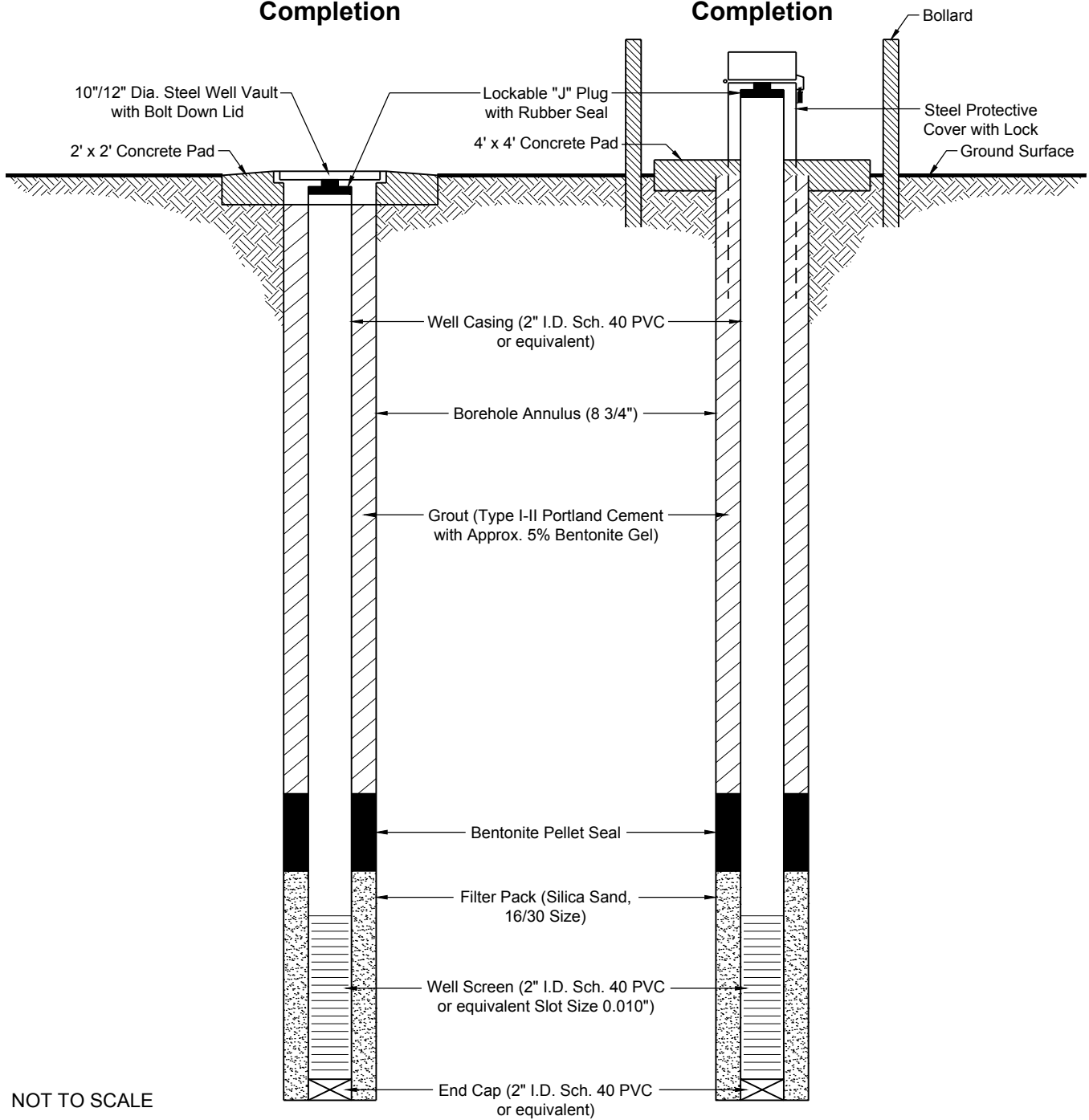
ATTACHMENT  
 2B-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/24"



### Flush-Grade Completion

### Above-Grade Completion



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.

CLIENT  
 UNION PACIFIC RAILROAD CO.

PROJECT  
 HOUSTON WOOD PRESERVING WORKS

TITLE  
**TYPICAL MONITORING WELL CONSTRUCTION**

CONSULTANT	YYYY-MM-DD	2019-07-10
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	ECM
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      ATTACHMENT 2B-2



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 Path: \\usarhama\data\Projects - Round Rock\19119232 - HMP\VP\2019-6 RAP Revision - I File Name: ATT 2B-2 - Typical Monitoring Well Construction.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A  
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<b>Plume Management Zone</b>	<b>RAP Worksheet 2.1</b> Page 1 of 6	
	Associated Information: Attachments 2D, 2E	<b>ID No.: 31547</b> <b>Report Date: July 9, 2019</b> <b>– Rev 4</b>

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, B-CZ//B-TZ, C-TZ**

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

Groundwater classification	<b>X</b> 2	<b>X</b> 3
	<u>(A-TZ, B-TZ, C-TZ)</u>	<u>(B-CZ)</u>

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

**As discussed on Worksheet 2.0, UPRR will conduct the pre-design additional Groundwater Assessment investigation to assess COC concentrations in the A-TZ, B-CZ/B-TZ, and C-TZ. Data collected from the additional Groundwater Assessment will be used to update the boundaries of the proposed final PMZ and evaluate possible response actions to address the groundwater PCLE Zone outside the proposed final PMZs. The proposed PMZs discussed on this worksheet are considered preliminary and will be revised as necessary following the assessment activities.**

The preliminary on-site and off-site PMZs proposed as a response action for the A-TZ, B-CZ/B-TZ, and C-TZ PCLE Zones (Attachments 2D-1, 2D-2, and 2D-3, respectively) ensures that COCs will not pose a potential unacceptable risk to human health or the environment as long as COC concentrations are less than cPCLs at the proposed Alternate POE wells or at the edge of the proposed preliminary PMZs. The groundwater PCLE Zones outside of the PMZs will be addressed under Remedy Standard A. PMZs are appropriate for this PCLE zone based on a relatively low groundwater velocity, the proposed institutional controls (deed recordation (on-site PMZs) and restrictive covenants/deed notices (off-site PMZs)) 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 affecting 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 preliminary on-site and off-site 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/deed notices (contiguous block of off-site properties, City of Houston ROW) prohibiting the use of groundwater within the PMZs; and 2) performance of ongoing groundwater monitoring. The proposed deed recordation and restrictive covenants that have been signed by the landowners, and will be filed in the Harris County deed records once executed by the TCEQ, are included in Appendix 5.

Groundwater PCLE Zones based on the January 2019 groundwater data (Appendix 2) collected from the Site with the properties with signed institutional controls were used to establish the preliminary PMZs for the GWBUs. Data collected from the additional Groundwater Assessment (Worksheet 2.0) will be used to adjust the boundaries of the proposed final PMZ and evaluate possible response actions to address the groundwater PCLE Zone outside the proposed final PMZs. The proposed final PMZs for the A-TZ, B-

<b>Plume Management Zone</b> Associated Information: Attachments 2D, 2E	<b>RAP Worksheet 2.1</b> Page 2 of 6	
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CZ/B-TZ, and C-TZ will be provided in the Revised RAP following completion of the additional assessment activities.

Is the alternate POE proposed to be beyond the current limits of the PCLE zone?    \*    Yes    \_\_\_ No  
 If yes, how far?    \*    \_\_\_\_\_ (§350.37(l) or (m) as applicable)  
 Is it to be off-site?    \*    Yes    \_\_\_ No

On an off-site property that currently does not contain a residential-based groundwater PCLE zone?  
 \*    Yes    \_\_\_ No -

**\*Alternate POEs for the GWBUs will be established following the additional assessment activities discussed on Worksheet 2.0.**

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)).

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 GWBUs (A-TZ, B-CZ/B-TZ, C-TZ and D-TZ) do not have a reasonably anticipated future beneficial use in the area.

For the B-CZ (Attachment 2D-2), the residential-based PCLE zone (Class 2 and 3 groundwater PCLs) extends onto the off-site properties (to the north and to the east in the residential area), and on to the City of Houston ROW. For the Off-Site PMZ, the B-TZ (Class 2 groundwater) is only present on the west portion of the Off-Site PMZ with the B-CZ present across the rest of the Off-Site PMZ. As detailed in previously submitted RAP (PBW, 2017), wells completed in the B-CZ unit have an average hydraulic conductivity of  $2 \times 10^{-7}$  cm/sec, which is considerably less than the  $1 \times 10^{-5}$  cm/sec threshold for saturated soils. This finding, which is supported by the well yield test results, indicates B-CZ should be classified as saturated soils rather than a GWBU. The TCEQ agreed that the B-CZ groundwater classification can be considered a Class 3 groundwater per the TCEQ April 10, 2017 TNOD letter. With the low yield found in the B-CZ, groundwater in this unit would not have a reasonably anticipated future beneficial use.

Is NAPL present?     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:*

<b>Plume Management Zone</b>	<b>RAP Worksheet 2.1</b> Page 3 of 6	
	Associated Information: Attachments 2D, 2E	<b>ID No.: 31547</b> <b>Report Date: July 9, 2019</b> <b>– Rev 4</b>

- (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.*

The NAPL response action objective using TCEQ Guidance TRRP-32 (Risk-Based NAPL Management) will include two approaches:

1. For the PMZ area, the NAPL response action objective will be to “ensure compliance of NAPL zone in the PMZ” to address the NAPL within the PMZs for each GWBU. Methods to meet the response action objective for the creosote DNAPL will include recovery (recover readily recoverable creosote DNAPL from wells with DNAPL present) at the NAPL source zone so that the dissolved-phase groundwater PCLE zone is stable (or shrinking) and the PCLE performance objectives for the PMZ can be met, including no cPCL exceedances at the alternate POE wells; and
2. For areas outside the PMZ, the NAPL response action will be to recover the soluble NAPL fraction that acts as the source of a dissolved-phase groundwater PCLE zone to the extent that the groundwater PCLE zone is restored.

As discussed on Worksheet 2.0, UPRR plans to conduct a pre-design NAPL Assessment to further evaluate the extent of NAPL occurrences in the vadose zone and GWBUs at the Site. Following that additional assessment, NAPL response actions will be developed in order to achieve the performance criteria in §350.33(f)(4)(E). UPRR will evaluate feasible alternatives and develop remedial approaches with the goal of achieving the specific response objectives and performance criteria in §350.33(f)(4)(E) for the different Remedy Standard areas at the Site. The feasibility study and potential design of any system components for NAPL recovery will be generally described within the Revised RAP. This may include recommendations for pilot studies or treatability studies to evaluate the feasibility of a selected response action or actions.

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) (Appendix 2), 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. The current CSM assumes that 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. In addition, with the proposed PMZ for the A-TZ Unit on-Site, groundwater monitoring as part of the PMZ will be used to confirm that any potential leachate in the surface and subsurface soils will not cause an increase in COC concentrations in groundwater at the A-TZ POE (once established following the additional assessment activities) in excess

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	Associated Information: Attachments 2D, 2E	<b>ID No.: 31547</b> <b>Report Date: July 9, 2019</b> <b>– Rev 4</b>

of the groundwater PCL. However, to confirm the CSM, pre-design assessment activities (including the Englewood Intermodal Yard area where NAPL has been confirmed in the vadose zone) are proposed (see Worksheet 2.0). Data collected from the pre-design assessment activities will be evaluated to address the potential for leachate from the surface and subsurface PCLE zones to increase concentrations of COCs in the A-TZ.

As part of the response action for the surface and subsurface soils in the former HWPW area, the response included the construction of a capped area over the surface soil PCLE Zone. Even though the cap is not designed for hydraulic control, the cap was constructed with compacted clay and vegetation and sloped to drain storm water. The design of the cap (sloped and vegetated) minimizes infiltration across the surface soil PCLE Zone and potentially reduces 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.

As requested by the TCEQ in the 4<sup>th</sup> TNOD dated April 11, 2019, UPRR will conduct the pre-design Additional Groundwater Assessment (see Worksheet 2.0) to confirm the boundaries of the groundwater PCLE Zones. Following the pre-design Additional Groundwater Assessment activities, the preliminary PMZ presented in this document will be revised accordingly. The proposed final PMZs will be submitted to the TCEQ for review in the Revised RAP.

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 and did not indicate any potential vertical 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. 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, both fiber lines return to approximately 4 to 6 feet below grade and 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. Given the depth of the fiber optic line is below the A-TZ and likely below the B-TZ (or carbonate seams within the B-CZ), monitoring well MW-19C will continue to be monitored to evaluate if the directional bored fiber optic lines may be creating a preferential pathway for COCs to migrate to the C-TZ GWBU.

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

<b>Plume Management Zone</b> Associated Information: Attachments 2D, 2E	<b>RAP Worksheet 2.1</b> Page 5 of 6	
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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' (RAP, PBW, 2014). 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).

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 $AirGW_{Inh-v}$ or existing COC concentration? Y/N
Benzene	TBD	TBD	TBD
2,4-Dimethylphenol	TBD	TBD	TBD
2 Methyl naphthalene	TBD	TBD	TBD
Dibenzofuran	TBD	TBD	TBD
Naphthalene	TBD	TBD	TBD
Other COCs TBD			

Note: TBD – to be determined following the Additional Groundwater Assessment activities (Worksheet 2.0).

**ATTACHMENT 2D**

**PLUME MANAGEMENT ZONE MAPS**

Attachment 2D-1 – Preliminary PMZ Boundary Map – A-TZ

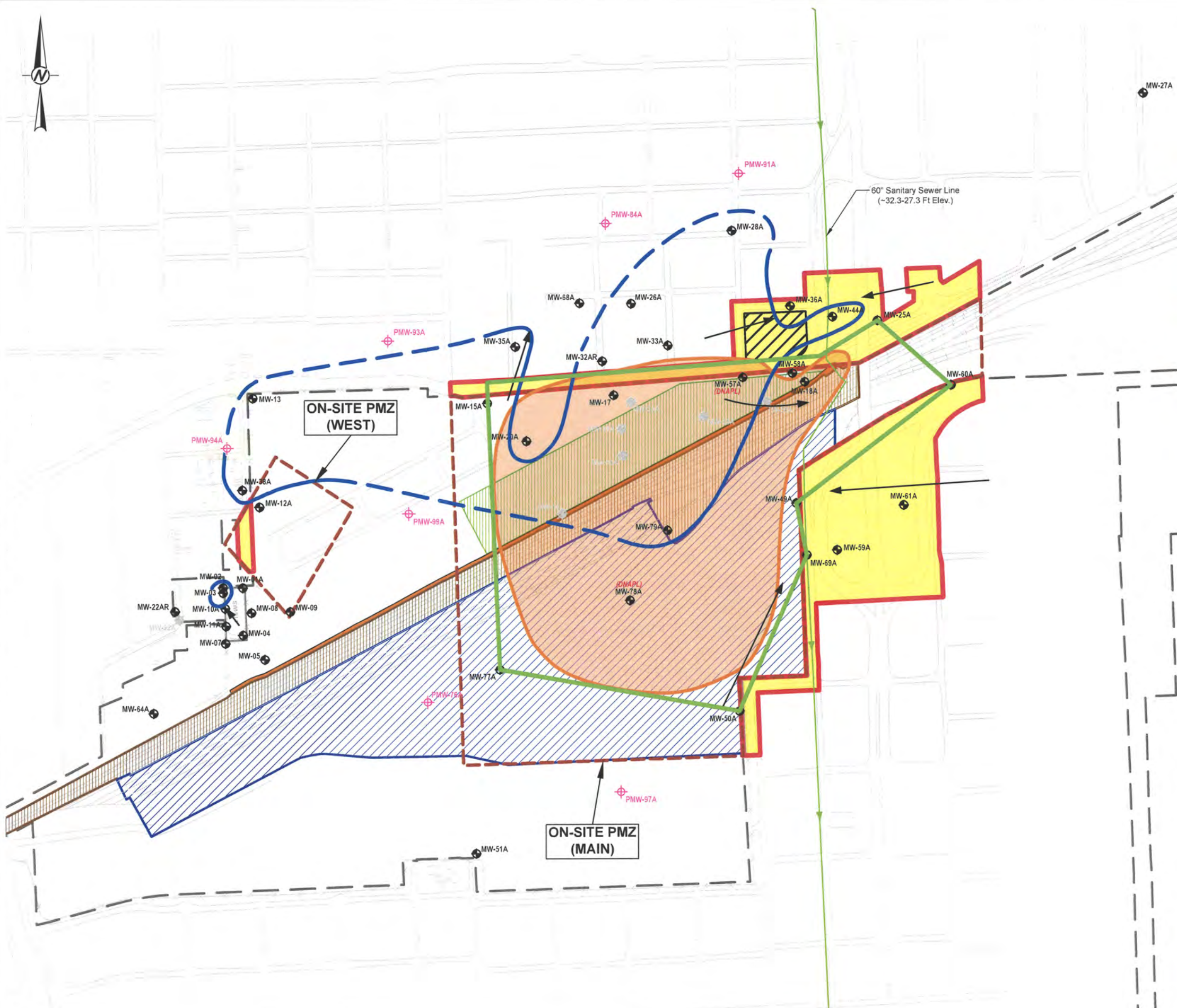
Attachment 2D-2 – Preliminary PMZ Boundary Map – B-CZ/B-TZ

Attachment 2D-3 – Preliminary PMZ Boundary Map – C-TZ





Path: \\rs\work\matt\Products - Round Road\19119232 - HWPW\2019-07-09\A-Z\PMZ Boundary Map.dwg | User: Eric Matzner | Date: 2019-07-09 10:11 PM



**LEGEND**

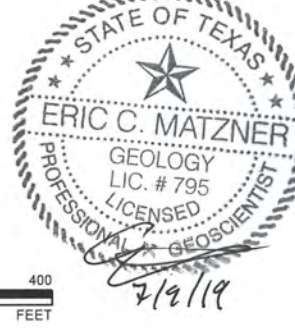
- UPRR PROPERTY BOUNDARY
- ROAD, PARLING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- PCLE ZONE
- ARSENIC PCLE ZONE
- INFERRED GROUNDWATER FLOW DIRECTION
- PRELIMINARY A-TZ PMZ BOUNDARY
- PRELIMINARY ON-SITE PMZ (PENDING ADDITIONAL GROUNDWATER ASSESSMENT)
- PRELIMINARY OFF-SITE PMZ
- PRELIMINARY OFF-SITE PMZ - PRIVATE PROPERTY (SIGNED RESTRICTIVE COVENANT/DEED)
- PRELIMINARY OFF-SITE PMZ - CITY OF HOUSTON ROW
- PROPOSED MONITORING WELL
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

**NOTE(S)**

1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
2. PCLE ZONE ESTABLISHED BASED ON JANUARY 2019 DATA.

**REFERENCE(S)**

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1. DATED JUNE 2004.



**CLIENT**

UNION PACIFIC RAILROAD CO.

**PROJECT**

HOUSTON WOOD PRESERVING WORKS

**TITLE**

PMZ BOUNDARY MAP - A-TZ

CONSULTANT	YYYY-MM-DD	2019-07-09
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      ATTACHMENT 2D-1

IF THE MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET DATE HAS BEEN UPDATED FROM ANSIBL









<b>Institutional Control</b>  Associated Information: Appendices 4, 5	<b>RAP Worksheet 2.4</b> Page 1 of 1	
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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 6 properties (plus the City of Houston right of way) (Restrictive Covenants) falling within the proposed PMZs**

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 <sup>1</sup>				Property Ownership		Anticipated Filing Date <sup>2</sup>
	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 120 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)(l))	X	X*			X	X*	Within 120 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
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							

<sup>1</sup> Check the appropriate box(es) to indicate the type of institutional control required for the proposed response action.

<sup>2</sup> Specify date or amount of time after RAP approval.

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 <sup>1</sup>	Other parameter (specify)	Sampling Method <sup>2</sup>	Sampling points or locations <sup>3</sup>	Depth/Height <sup>4</sup> (ft.)	Analytical or Field Screening Method	Sampling or Monitoring Frequency <sup>5</sup>
Surface Soil	TPH Pentachlorophenol		Bulk sampling	TPH – see Attachment 2A-1a PCP – see Attachment 2A-1b	See Worksheet 2.0	TX1005, TX1006 US EPA 8270	One time
Subsurface Soil	TPH		Bulk sampling	TPH – see Attachment 2A-1a	See Worksheet 2.0	TX1005, TX1006	One time
Groundwater	Site-Specific VOCs		Same as APAR (low-flow sampling)	See Attachment 2B-1 for well locations	Middle of screened interval of monitoring well	US EPA 8260	Semi-Annual
	Site-Specific SVOCs		Same as APAR (low-flow sampling)	See Attachment 2B-1 for well locations	Middle of screened interval of monitoring well	US EPA 8270	Semi-Annual
	Arsenic		Same as APAR (low-flow sampling)	See Attachment 2B-1 for well locations	Middle of screened interval of monitoring well	US EPA 6010/6020	Semi-Annual.

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

Pending completion of the Revised RAP, UPRR will conduct semi-annual monitoring of the site-wide groundwater monitoring wells. The long-term monitoring plan will be developed after the additional assessments and potential response actions have been selected.

<sup>1</sup> 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.  
<sup>2</sup> 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.  
<sup>3</sup> Specify the sampling or monitoring point, such as the specific monitor well or general sampling or monitoring location.  
<sup>4</sup> Specify the depth or height of the sampling or monitoring points.  
<sup>5</sup> Specify the frequency at which this monitoring or sampling will occur.

<b>Post-Response Action Care</b> Associated Information: Attachments 5A-5C	<b>RAP Worksheet 5.0</b> Page 1 of 5	
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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), asphalt roadway (HWPW), concrete sidewalk (off-site City of Houston ROW), 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, or groundwater COC trends confirm stable or decreasing concentrations, 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 four soil response areas within the Site:

(1) the former HWPW area is inactive and UPRR restricts access to the HWPW soil capped area to those performing inspections, monitoring or maintenance. Access to the HWPW area is limited by fencing. The asphalt roadway is intended to only be used by UPRR employees and contractors for the servicing of rail and signal communications in the area. Signs are posted stating that digging is prohibited on the capped area and asphalt roadway.

(2) 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). UPRR recently constructed the NAPL Collection System in the areas where the tar-like material was seeping. UPRR will continue to monitor the conditions at the Englewood Intermodal Yard as part of the operation and maintenance of the concrete cap and NAPL Collection System.

(3) 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.

<b>Post-Response Action Care</b> Associated Information: Attachments 5A-5C	<b>RAP Worksheet 5.0</b> Page 2 of 5	
	<b>ID No.: 31547</b>	<b>Report date: July 9, 2019 – Rev 4</b>

(4) For the proposed concrete sidewalk within the City of Houston ROW to address the surface soil PCL zone, the concrete cap will protect the occasional trespasser that may walk along the sidewalk. The addition of the sidewalk in the area provides additional benefit of allowing all access to mass-transportation bus stop. Signs will be posted stating that digging is prohibited within the concrete capped area.

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:

***I. Soil Cap Area - HWPW***

**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. Vegetation will target pollinator seed mixes to attract pollinator species. Mowing will be performed as needed but less frequently than a grass covered cap and only 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.

**II. Asphalt Roadway Area – HWPW**VISUAL INSPECTIONS

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

- 1) Erosion of the asphalt roadway (potholes, exposed soils)
- 2) Settling/subsidence
- 3) Cracks in asphalt roadway

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

MAINTAINING THE ASPHALT ROADWAY

The asphalt cover will be maintained by:

- 1) Crack repair/sealing;
- 2) Pothole patching; and
- 3) Controlling vegetation.

**III. Concrete Sidewalk – City Of Houston ROW along Liberty Road (Off-Site)**VISUAL INSPECTIONS

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

- 1) Step separation in the concrete;
- 2) Settling/subsidence;
- 3) Cracks in the concrete; and
- 4) Openings in the sidewalk.

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

MAINTAINING THE CONCRETE SIDEWALK/PAVEMENT

The concrete sidewalk will be maintained by:

- 1) Crack repair/sealing;
- 2) Replacing panels as needed; and
- 3) Controlling vegetation growing through cracks/along edges of sidewalk.

**IV. Concrete Pavement – Englewood Intermodal Yard (On-Site)**VISUAL INSPECTIONS

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

- 1) Step separation in the concrete;
- 2) Settling/subsidence;
- 3) Cracks in the concrete; and
- 4) Seeps in the concrete/asphalt pavement.

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

<b>Post-Response Action Care</b> Associated Information: Attachments 5A-5C	<b>RAP Worksheet 5.0</b> Page 4 of 5	
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MAINTAINING THE CONCRETE PAVEMENT

The concrete pavement will be maintained by:

- 1) Crack repair/sealing when underlying soils are exposed;
- 2) Replacing broken concrete as needed; and
- 3) Controlling vegetation growing through cracks/along edges of pavement.

The following inspections and maintenance will be conducted for the NAPL Collection System constructed within the Englewood Intermodal Yard:

OPERATION/MAINTENANCE OF THE NAPL COLLECTION SYSTEM

1. Inspections will be conducted weekly to monitor the performance of the NAPL Collection System. The inspections will focus on the following major issues:
  - Tar-like material seeps in the vicinity of the NAPL Collection System;
  - Inspecting the NAPL collection sumps for NAPL accumulation;
  - Settling/subsidence;
  - Cracks in the concrete;
  - Locations where deficiencies are found shall be marked and repaired as soon as practicable.
2. If NAPL or fluids accumulate in the sumps, the NAPL and fluids will be recovered and disposed of at a permitted facility.

**V.      *Railroad Ballast Area – (HWPW/Englewood Intermodal Yard)***

VISUAL INSPECTIONS

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

- 1) Ballast removed with exposed soil.

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

MAINTAINING THE RAILROAD BALLAST

The railroad ballast will be maintained by:

- 1) Adding railroad ballast where areas of soil are exposed;
- 2) Controlling vegetation.

The ballast areas will be maintained in accordance with UPRR Engineering Standards for Roadbase Section for Wood Tie Track Construction (UPRR, 2006).

GROUNDWATER MONITORING

Groundwater monitoring will be conducted per the Groundwater Monitoring Plan following the additional Groundwater Investigation and NAPL Assessment activities (discussed in Worksheet 2.0) have been completed

Will PRAC sampling procedures be the same as those as previously documented for monitoring and/ or confirmation sampling?

  X   Yes         No



<b>Post-Response Action Care</b> Associated Information: Attachments 5A-5C	<b>RAP Worksheet 5.0</b> Page 5 of 5	
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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, Asphalt Roadway, City of Houston ROW Sidewalk, 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?      *To be determined following additional assessment activities*

---

What is the total estimated cost for a third party to perform PRAC activities?      *To be determined following additional assessment activities*

---

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 the Revised RAP approval.

Does the person meet the criteria and definition of a small business? (see §350.33(n))     Yes     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.

<b>Implementation Schedule</b>	<b>RAP Worksheet 6.0</b> Page 1 of 3	
	ID No.: SWR ID 31547	Report Date: July 9, 2019 – Rev 4

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.

<b>Implementation of Response Action</b> (specify component or action)	<b>Start</b>	<b>Finish</b>	<b>Duration</b>
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.	Upon Revised RAP approval	Within 120 days from RAP approval	120 days
Filing of restrictive covenants prohibiting groundwater use for off-site PMZ. . Filing of deed recordation for City of Houston ROW for prohibiting groundwater use and restriction of excavation where concrete sidewalk will be installed.	Upon Revised RAP approval	Within 120 days from RAP approval	120 days
Plugging of monitoring wells within the capped area, installation of additional monitoring wells at the POEs	Completed	Completed	Completed
Excavation of Surface Soil PCLE Zone, relocation under the AOC Policy, and construction of the soil cap, asphalt roadway, and concrete sidewalk	Completed	Completed	Completed
Semi-Annual groundwater monitoring (submitted to TCEQ under the Annual Groundwater Monitoring Report)	Ongoing	Uncertain-subject to monitoring results	Uncertain – subject to monitoring results
DNAPL Recovery Activities (with annual evaluation of effectiveness), quarterly status reports to be submitted to the TCEQ.	Ongoing	Uncertain – to be evaluated annually	Uncertain – to be evaluated annually
Physical Barrier (Cap/Sidewalk/Pavement/Ballast) Inspection and Maintenance	Ongoing	30 years	30 yr O&M
Annual Groundwater Corrective Action Monitoring Report, documenting all remediation and post-response action activities at the Site including the Post-Response Action Care Reports (PRACR)	See the following Submittal table	See the following Submittal table	See the following Submittal table
<b>Pre-Design Assessments/Schedule</b>			
Pre-Design Assessment: Conduct NAPL Assessment (CPT-TarGOST) (proposed locations discussed on Worksheet 2.0), schedule may be impacted pending contractor availability and city permits.	Within 60 days of Conceptual RAP Approval	Within 90 days of Conceptual RAP Approval	30 Days
Pre-Design Assessment: Review NAPL Assessment field results and evaluate feasible alternatives and response actions to improve effectiveness and efficiency of the DNAPL recovery activities at the Site.	Within 5 days of completing NAPL Assessment	Within 65 days of completing NAPL Assessment	60 Days
Pre-Design Assessment: Conduct Additional Groundwater Assessment (proposed locations discussed on Worksheet 2.0) to evaluate nature and extent of the COCs in the three GWBUs, schedule may be impacted pending contractor availability and city permits.	Within 90 days of Conceptual RAP Approval	Within 135 days of Conceptual RAP Approval	45 Days

<b>Implementation Schedule</b>	<b>RAP Worksheet 6.0</b> Page 2 of 3	
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Pre-Design Assessment: Conduct TPH-NAPL Assessment in the Englewood Intermodal Yard (proposed locations discussed on Worksheet 2.0).	Within 60 days of Conceptual RAP Approval	Within 90 days of Conceptual RAP Approval	30 Days
Pre-Design Assessment: Conduct PCP Soil Assessment in the HWPW Yard (proposed locations discussed on Worksheet 2.0).	Within 60 days of Conceptual RAP Approval	Within 90 days of Conceptual RAP Approval	30 Days
Prepare the Revised RAP to develop remedial alternatives based on the pre-design assessment results from the NAPL Assessment and Additional Groundwater Assessment Results.	Within 30 days of completion of all Pre-Design Assessment Activities	Within 120 days of completion of all Pre-Design Assessment Activities	90 Days

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)	<b>60 days following soil Response Action</b>
Post-Response Action Care Report (PRACR) (to be submitted with the Annual Groundwater Monitoring Report as an attachment:	
PRACR submittal number 1	March 31, 2017
PRACR submittal number 2	March 31, 2018
PRACR submittal number 3	March 31, 2019
PRACR submittal number 4	March 31, 2020
PRACR submittal number 5	March 31, 2021
PRACR submittal number 6	March 31, 2022
PRACR submittal number 7	March 31, 2023
PRACR submittal number 8	March 31, 2024
PRACR submittal number 9	March 31, 2025
PRACR submittal number 10	March 31, 2026
PRACR submittal number 11	March 31, 2027
PRACR submittal number 12	March 31, 2028
PRACR submittal number 13	March 31, 2029
PRACR submittal number 14	March 31, 2030
PRACR submittal number 15	March 31, 2031
PRACR submittal number 16	March 31, 2032
PRACR submittal number 17	March 31, 2033
PRACR submittal number 18	March 31, 2034
PRACR submittal number 19	March 31, 2035
PRACR submittal number 20	March 31, 2036
PRACR submittal number 21	March 31, 2037
PRACR submittal number 22	March 31, 2038

<b>Implementation Schedule</b>	<b>RAP Worksheet 6.0</b> Page 3 of 3	
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PRACR submittal number 23	March 31, 2039
PRACR submittal number 24	March 31, 2040
PRACR submittal number 25	March 31, 2041
PRACR submittal number 26	March 31, 2042
PRACR submittal number 27	March 31, 2043
PRACR submittal number 28	March 31, 2044
PRACR submittal number 29	March 31, 2045
PRACR submittal number 30	March 31, 2046

**\*This schedule assumes RAP approval by March 31, 2016 and PMZ implementation (i.e., filing of required restrictive covenants) by September 30, 2016.**

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**APPENDIX 1**  
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**APPENDIX 2**

**DATA TABLES AND BORING LOGS**

***JANUARY 2019 GROUNDWATER MONITORING REPORT***



# January 2019 Groundwater Monitoring Report

*Former Houston Wood Preserving Works Facility*

*Post-Closure Care Permit No HW-50343*

*Industrial SWR No. 31547*

Prepared for:

**Mr. Kevin Peterburs**

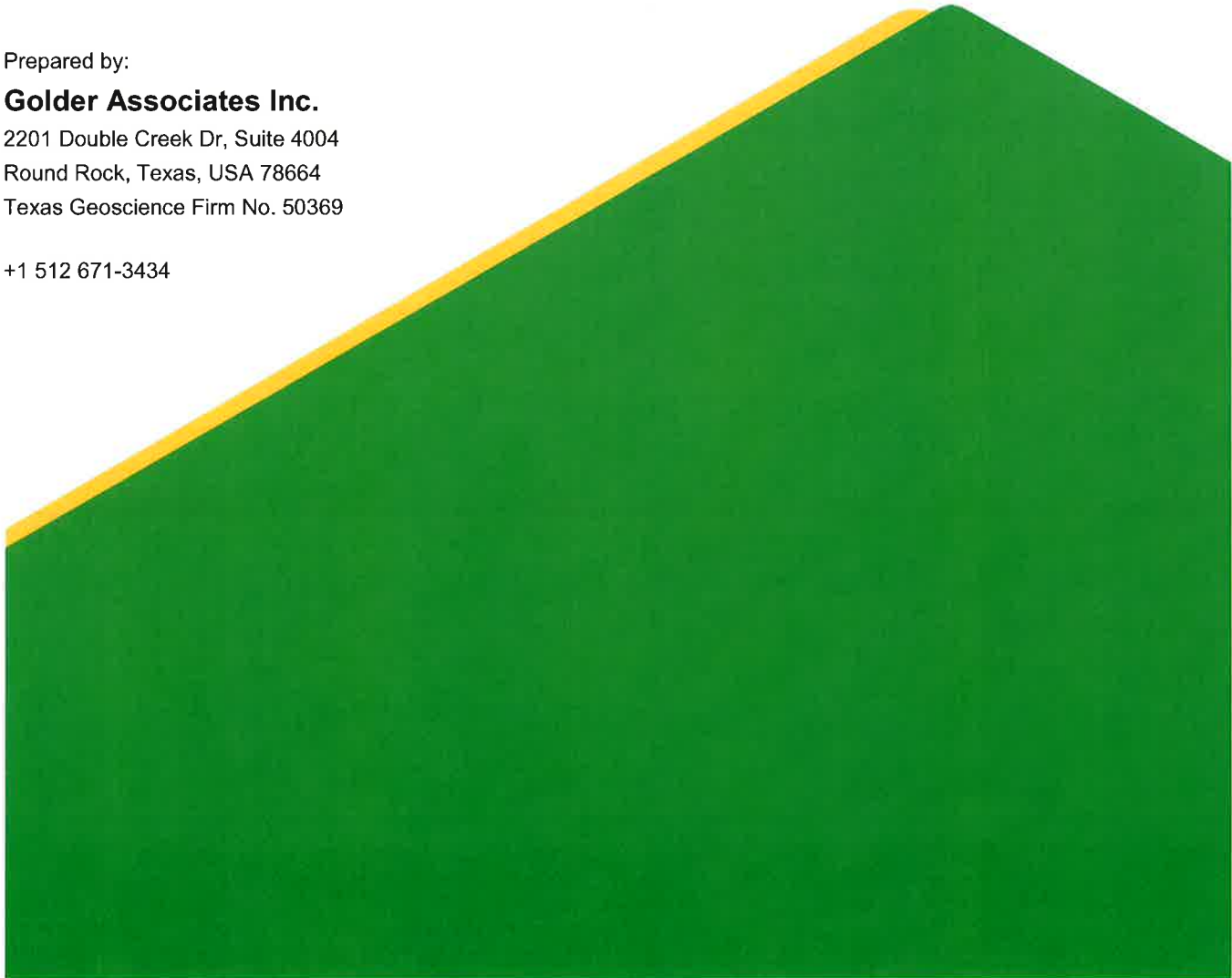
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Attachment B – COC Concentration Graphs

## 1.0 INTRODUCTION

This groundwater monitoring report documents sampling activities conducted between January 8 and January 24, 2019 at the Union Pacific Railroad (UPRR) Houston Wood Preserving Works Facility (the Site). Golder Associates Inc. (Golder) conducted the sampling event on behalf of UPRR. Sampling activities included gauging water levels and collecting samples from groundwater monitoring wells at and near the Site. Monitoring well locations are presented on Figure 1.

Groundwater analytical data collected from the Site collected in January 2019 were compared to the Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) Residential Groundwater Protective Concentration Levels (PCLs) dated April 2018, assuming the source area is greater than 0.5 acres (30-acre size), to evaluate target COCs that exceeded the groundwater residential assessment levels (RALs). RALs were established as the lesser value of the Residential <sup>GW</sup>GW<sub>Ing</sub> and <sup>Air</sup>GW<sub>Inh-V</sub> PCLs. Even though most of the monitoring wells are within the boundaries of the Site, and the assumed land use for the Site is commercial/industrial land use, RALs were conservatively used to evaluate the COCs detected at the Site.

Groundwater flow direction and concentrations of the primary chemicals of concern (COCs) that exceed the appropriate RAL in each groundwater-bearing zone (A-TZ, B-TZ/B-CZ, C-TZ, and D-TZ) during the January 2019 groundwater monitoring event are described in Section 3.0 and Section 4.0 of this report.

This report serves as a supporting document to the responses to the Texas Commission on Environmental Quality (TCEQ) 4<sup>th</sup> Technical Notice of Deficiency (TNOD) dated April 11, 2019.

## 2.0 GROUNDWATER MONITORING ACTIVITIES

Golder conducted groundwater monitoring activities following the Sampling & Analysis Plan provided in the Response Action Plan (RAP) (Rev. 3) dated June 24, 2017.

During the sampling event, 84 groundwater monitoring wells were sampled from the following groundwater bearing units (GWBUs):

- Thirty-one (31) A-Transmissive Zone (A-TZ) monitoring wells;
- Twenty-seven (27) B-Cohesive Zone/ B-Transmissive Zone (B-TZ/B-CZ) monitoring wells;
- Twenty-two (22) C-Transmissive Zone (C-TZ) monitoring wells; and
- Four (4) D-Transmissive Zone (D-TZ) monitoring wells.

Monitoring wells MW-27A, MW-49B, and MW-57B were not sampled in January 2019 due to: (1) MW-27A was blocked by a vehicle on concrete blocks and (2) dense non-aqueous phase liquid (DNAPL) was observed during purging of MW-49B and MW-57B. Other monitoring wells with DNAPL detected were not sampled during this monitoring event.

Groundwater samples were submitted to ALS Environmental in Houston, Texas. Analytical laboratory reports and data validation documentation for the sampling event are provided in Attachment A.

## 3.0 GROUNDWATER ELEVATION DATA

Prior to purging and sampling, static depth to groundwater in wells was measured from the designated surveyed measuring point with an interface probe to the nearest one hundredth of one foot (0.01 ft). Groundwater elevations for the monitoring wells measured in January 2019 are summarized on Table 5D<sup>1</sup>. Potentiometric surface maps for each groundwater-bearing unit (GWBU) are included as Figures 5A-1 through 5A-4. Groundwater flow directions are described below.

### 3.1 A-TZ Wells

The A-TZ is a continuous silty sand and sand layer beneath the Site, and is considered a Class 2 groundwater resource. Groundwater generally flows to the northwest, north and northeast in the western and center portion of the Site. On the east side of the Site, groundwater generally flows toward the east or west relative to the 60" sanitary sewer line as shown on Figure 5A-1.

### 3.2 B-CZ/B-TZ Wells

The B-CZ is a layer of cohesive soils of mostly clays, silty clays, sandy clays, and clayey silts containing thin seams of silty sand and carbonate nodules, and is classified as a Class 3 groundwater resource through aquifer testing. The B-TZ is a discontinuous sand layer in the western portion of the Site and western portion of the off-site area (north of the Site), and is considered a Class 2 groundwater resource. Groundwater generally flows to the northeast in the western and center portion of the Site and off-site area to the north where the B-TZ is present. On the east side of the divide between the B-TZ and B-CZ, groundwater flow in the B-CZ is variable with the flow gradient to the northwest in the eastern portion of the off-site area north of the Site and to the east-northeast on the east side of the Site within the Englewood Intermodal Yard (Figure 5A-2).

### 3.3 C-TZ Wells

The C-TZ is a silt and silty sand layer, and is a Class 2 groundwater resource. Groundwater in the C-TZ generally flows to the southwest across the Site. Groundwater elevations in wells where current DNAPL recovery efforts are being conducted (i.e., monthly recovery events) were lower than in surrounding wells (Figure 5A-3).

### 3.4 D-TZ Wells

The D-TZ is a series of silty sand layers with minor amounts of thin clay intervals. Groundwater in the D-TZ is considered a Class 2 groundwater resource and generally flows to the northeast (Figure 5A-4).

## 4.0 ANALYTICAL RESULTS

Groundwater samples were collected from monitoring wells installed in the four units of the uppermost GWBUs at the Site. Laboratory data packages for the data collected in January 2019 are provided in Attachment A. A complete summary of groundwater analytical data for the Site from 2009 through 2019 is presented on the following tables:

- Table 5B-1 (A-TZ wells)
- Table 5B-2a (B-CZ wells)
- Table 5B-2b (B-TZ wells)

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<sup>1</sup> The table numbers follow the same labeling format used for submittal in the Response Action Plan (RAP) Revision 3.

- Table 5B-3 (C-TZ wells)
- Table 5B-4 (D-TZ wells)
- Table 5B-5 (Arsenic and Lead data – A-TZ wells)
- Table 5B-6 (Arsenic and Lead data – B-CZ/B-TZ wells)
- Table 5B-7 (Arsenic and Lead data – C-TZ wells); and
- Table 5B-8 (Arsenic and Lead data – D-TZ wells).

## 4.1 2019 COC Concentrations

COC concentration isopleth maps of the January 2019 data were prepared for the primary COCs at the Site (Figure 5B-1 through 5B-19) as shown below:

COC	A-TZ	B-CZ/B-TZ	C-TZ
Benzene	Figure 5B-5	Figure 5B-10	Figure 5B-15
2,4 – Dimethylphenol	Figure 5B-6	Figure 5B-11	Figure 5B-16
2-Methylnaphthalene	Figure 5B-7	Figure 5B-12	Figure 5B-17
Dibenzofuran	Figure 5B-8	Figure 5B-13	Figure 5B-18
Naphthalene	Figure 5B-9	Figure 5B-14	Figure 5B-19

Monitoring wells in the four GWBUs were also sampled and analyzed for arsenic and lead as required under the RAP (PBW, November 21, 2014). Arsenic concentrations from the January 2019 sampling event were detected above the TCEQ TRRP Tier 1 PCLs in the A-TZ and B-CZ/B-CZ zones (Table 5B-5 and 5B-6). Arsenic isopleth maps were generated for the A-TZ, B-CZ/B-TZ, and C-TZ based on the 2019 data (Figure 5B-20 through Figure 5B-22). No lead concentrations were detected above the RAL during the January 2019 sampling event.

### 4.1.1 A-TZ Wells

#### **Primary COCs**

As shown on Figure 5B-5 through 5B-9, benzene, 2,4-dimethylphenol, 2-methynaphthalene, and naphthalene concentrations from the January 2019 sampling event were detected above RALs in A-TZ monitoring wells in the eastern portion of the Site extending into the Englewood Intermodal Yard. Concentrations of the primary COCs in A-TZ wells located off-site were all below RALs. Dibenzofuran concentrations were not detected above the RAL in A-TZ wells in January 2019.

#### **Other COCs**

Most concentrations of other COCs were either detected below RALs or below the sample detection limit (SDL) in the A-TZ wells from the January 2019 sampling event. One exception was pentachlorophenol that had a concentration detected in MW-18A (0.014 mg/L) above its RAL (0.001 mg/L). Pentachlorophenol had not been detected above the SDL over the past 10 years. The detection will be verified as part of the next sampling event planned for July 2019. Vinyl chloride concentrations in MW-18A had been detected above the RAL during previous sampling events but was below the RAL and was below the detection limit in the January 2019 sampling results.

## **Arsenic**

Arsenic concentrations have generally fluctuated in A-TZ wells between sampling events (Table 5B-5). Of the A-TZ wells sampled, arsenic concentrations in six wells exceeded the RAL during all four sampling events in 2018 and 2019 (MW-15A, MW-17, MW-26A, MW-35A, and MW-44A). The January 2019 analytical results show arsenic concentrations in A-TZ wells exceeding the RAL in the northern and eastern portion of the Site, offsite to the north, and at one well in the western portion of the Site. Arsenic concentrations in the A-TZ wells do not appear correlate with the elevated concentrations of the primary COCs. Many wells with elevated arsenic concentrations (exceeding RAL) do not have exceedances in other COC concentrations, especially off-site to the north of the Site. For example, arsenic concentrations were highest at MW-26A and MW-13 in January 2019, but all other COC concentrations were below RALs at MW-26A and below detection limits at MW-13 in January 2019 (Table 5B-1).

### **4.1.2 B-CZ/B-TZ Wells**

#### **Primary COCs**

Since groundwater in the B-CZ is classified as Class 3 and groundwater in the B-TZ is classified as Class 2, the groundwater COC concentrations detected were compared to the applicable RAL. In January 2019, benzene, 2-methylnaphthalene, and naphthalene concentrations were detected above RALs in the eastern portion of the Site and off-site north of the Site. Benzene and naphthalene concentrations were detected above their RALs on the west side of the Site in MW-40B. Dibenzofuran was detected above RALs in one monitoring well (MW-68B (B-TZ)) in January 2019. The concentration of 2,4-dimethylphenol at MW-74B (eastern side of the Englewood Intermodal Yard (B-CZ)) was above its RAL; concentrations of 2,4-dimethylphenol at all other B-CZ/B-TZ wells were below corresponding Class 2 and Class 3 RALs during the January 2019 sampling event.

#### **Other COCs**

Except for arsenic (discussed below) no other COCs were detected above the applicable RALs in the B-CZ or B-TZ wells during the January 2019 sampling event.

## **Arsenic**

Similar to the A-TZ, arsenic concentrations have also fluctuated in B-CZ/B-TZ wells. Groundwater samples from six wells exceeded the arsenic RAL during the 2018 and 2019 sampling events (MW-22BR, MW-40B, MW-68B, MW-83B, P-11, and TW-41B). As with the A-TZ monitoring wells, arsenic levels in B-CZ/B-TZ wells do not appear correlate with the elevated concentrations of the primary COCs. Concentrations of primary COCs were above RALs in January 2019 in the eastern portion of the Site, where arsenic concentrations were below the arsenic RAL in that same area.

### **4.1.3 C-TZ Wells**

#### **Primary COCs**

Benzene, 2-methylnaphthalene, dibenzofuran, and naphthalene concentrations were above RALs in C-TZ wells in the eastern portion of the Site and offsite to the northeast where DNAPL has been observed in the C-TZ. Concentrations of 2,4-dimethylphenol were below RALs for all C-TZ wells.

#### **Other COCs**

Benzo(a)pyrene was detected above the RAL at well MW-25C in January 2019. Benzo(a)pyrene concentrations at MW-25C have varied during previous sampling events (below detection limit or above RAL). Monitoring well



MW-25C is located between wells MW-44C and MW-46C; DNAPL has been detected in MW-44C and MW-46C since 2013.

### **Arsenic**

Arsenic concentrations were detected in the C-TZ above the RAL in only one well, MW-18C at 0.0257 mg/L (Table 5B-7). This is the first RAL exceedance for arsenic in MW-18C. The detection will be verified as part of the next sampling event planned for July 2019. Arsenic concentrations in all other wells in the C-TZ were below the RAL (Table 5B-7).

#### **4.1.4 D-TZ Wells**

In January 2019, no COCs were detected above RALs in D-TZ wells. COC concentrations were below detection limits or J-flagged estimates except for 2-methylnaphthalene concentrations in MW-65D that were detected at 0.00016 mg/L, which is below the RAL (0.098 mg/L). 2-Mehtylnaphthalene results during previous events were below detection limit or estimates (J-flagged).

Benzo(a)pyrene at MW-36D was detected above its RAL (0.0002 mg/L) in March (0.0003 mg/L) and June 2018 (0.00024 mg/L). However, benzo(a)pyrene concentrations in MW-38D (0.000027J mg/L) from the January 2019 sampling event were below the RAL.

Groundwater samples from the four D-TZ wells were also analyzed for arsenic and lead. Arsenic and lead concentrations detected in D-TZ wells were all below RALs.

## **4.2 COC Concentration Graphs**

Graphs of primary COC concentrations over time at each well are provided in Attachment B.

**TABLES**

**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	MW-03				MW-04			
			mg/L	mg/L	1/24/2018	3/27/2018	5/1/2018	1/9/2019	1/24/2018	3/23/2018	5/25/2018	1/9/2019
<b>Volatile Organic Compounds</b>												
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>												
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<2.1E-05	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.00021	<0.00021	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00004	<0.00004	0.000051J	<0.00004	4.1E-05	<0.00004	<0.00011	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<5.8E-05	<0.000058	<0.000058	<0.000058	<5.9E-05	<0.000058	<0.000059	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<4.2E-05	<0.000042	<0.000042	<0.000042	<4.3E-05	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<2.1E-05	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.00021	<0.00021	<0.00021
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<1.9E-05	<0.00019	<0.00019	<0.00019	0.00008 J	<0.00019	<0.00019	<0.00019
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<4.7E-05	<0.00047	<0.00047	<0.00047	4.8E-05	<0.00047	<0.00047	<0.00047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<2.7E-05	<0.00027	0.00021	<0.00027	0.00013	<0.00027	0.00031	<0.00027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<1.5E-05	<0.00015	<0.00015	<0.00015	<1.5E-05	<0.00015	<0.00015	<0.00015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<1.4E-05	<0.00014	<0.00014	<0.00014	<1.4E-05	<0.00014	0.000054 J	0.000079 J
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.00005	<0.00005	<0.00005	<5.1E-05	<0.00005	<0.000051	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00003	<0.00003	<0.00003	<0.00003	<3.1E-05	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	8.3E-05 J	<0.000037	<0.000037	<0.000037	0.00008 J	<0.000037	<0.000037	<0.000037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<2.1E-05	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.00021	<0.00021	<0.00021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00002	<0.00002	<0.00002	<0.00002	7.2E-05 J	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00002	<0.00002	<0.00002	<0.00002	0.00003 J	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00003	<0.00003	<0.00003	<0.00003	7.5E-05 J	<0.00003	0.000059 J	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.00002	<0.00002	<0.00002	<0.00002	0.0013	0.00055	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<2.4E-05	<0.00024	<0.00024	<0.00024	<2.4E-05	<0.00024	<0.00024	<0.00024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<2.5E-05	<0.00025	<0.00025	<0.00025	<2.6E-05	<0.00025	<0.00025	<0.00025
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<7.9E-05	<0.00079	<0.00079	<0.00079	<8.1E-05	<0.00079	<0.00008	<0.00079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<2.1E-05	<0.00021	<0.00021	<0.00021	<2.1E-05	0.000099J	<0.000021	<0.000021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<3.5E-05	<0.00035	<0.00035	<0.00035	<3.6E-05	<0.00035	<0.00035	<0.00035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<1.9E-05	<0.00019	<0.00019	<0.00019	0.00003 J	<0.00019	0.00011	<0.00019

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold type**.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-05										
			mg/L	mg/L	7/27/2011	2/2/2012	7/25/2012	2/5/2013	8/1/2013	1/15/2014	07/29/2014	1/24/2018	3/20/2018	5/24/2018	1/9/2019
<b>Volatile Organic Compounds</b>															
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	0.0013J	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>															
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.00021	<0.00021	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.0005	<0.0005	<0.0005	<0.00031	<0.00031	<0.00029	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.0005	<0.0005	<0.0005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<0.00058	<0.00058	<0.00058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.0006	<0.0006	<0.0006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.00042	<0.00042	<0.00042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.00021	<0.00021	<0.00021
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<0.0005	0.00085J	<0.0005	0.000468J	<0.00007	0.000187J	<0.00007	<1.9E-05	<0.00019	<0.00019	<0.00019
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.0008	<0.0008	<0.0008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<0.0005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.00047	<0.00047	<0.00047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0053	0.00034	<0.0005	<0.00008	0.000521	0.000194J	<0.00008	<2.7E-05	<0.00027	<0.00027	<0.00027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.00015	<0.00015	<0.00015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.0005	0.0005J	<0.0005	0.000621	0.000427J	0.000411J	0.000153J	3.7E-05 J	<0.00014	0.00045 J	<0.00014
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	<5.1E-05	<0.00051	<0.00051	<0.00051
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.0005	<0.0005	<0.0005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
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	0.00011 J	<0.00037	<0.00013	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.00021	<0.00021	<0.00021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.0022	0.00011J	<0.0005	<0.00008	8.28E-05J	0.000162J	<0.00008	<0.00002	<0.00002	0.00024 J	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.0005	<0.0005	0.00065J	<0.00011	<0.00011	<0.00011	<0.00011	3.3E-05 J	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00011J	<0.0005	<0.0005	<0.00007	7.61E-05J	<0.00007	<0.00007	5.1E-05 J	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0012	0.00012J	<0.0005	<0.00007	0.000166J	0.000176J	<0.00007	<0.00003	<0.00003	0.00039 J	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.0005	0.00087	<0.0005	0.00133	0.000573J	0.000969J	<0.00013	0.0001	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<0.0005	0.00011J	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.00024	<0.00024	<0.00024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.00025	<0.00025	<0.00025
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.0005	<0.0005	<0.0005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00008	<0.00008	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00013J	<0.0005	<0.0005	0.000143J	<0.00006	0.00051	<0.00006	5.4E-05 J	<0.00021	<0.00021	<0.00021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.0005	<0.0005	<0.0005	0.000193J	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.00035	<0.00035	<0.00035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00014J	<0.0005	<0.0005	<0.00011	0.000154J	<0.00011	<0.00011	4.7E-05 J	<0.00019	0.00019	<0.00019

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-09							
			mg/L	mg/L	7/27/2011	2/2/2012	7/25/2012	4/1/2013	1/24/2018	3/23/2018	5/24/2018	1/9/2019
<b>Volatile Organic Compounds</b>												
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0005	<0.00008	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0005	<0.00012	<0.0003	<0.0003	<0.0003	0.0041
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	<0.0011	<0.0005	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.0013	<0.001	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.001	<0.0005	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>												
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00005	<0.00005	<0.00005	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00005	<0.00005	<0.00005	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.00005	<0.00005	<0.00013	<5.9E-05	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.00006	<0.00006	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.00005	<0.00005	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<0.00005	<0.00005	<0.00005	0.000115J	<1.9E-05	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.00005	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00005	<0.00005	0.00005J	0.000188J	<2.7E-05	<0.000027	<0.000027	<0.000027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00005	<0.00005	<0.00005	<0.00006	<1.5E-05	<0.000015	<0.000015	<0.000015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00036	<0.00005	<0.00005	0.000471J	<1.4E-05	0.00013	0.0001	0.000093 J
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.00005	<0.00005	<0.00008	<5.1E-05	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00005	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.00005	<0.00005	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00018J	0.00032	0.00022	<0.00037	8.2E-05 J	<0.000037	<0.00011	<0.000037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00005	<0.00005	<0.00005	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00005	<0.00005	<0.00005	0.000126J	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.00005	0.000074J	0.000123J	<0.00002	<0.00002	<0.000031	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00005	<0.00005	<0.00005	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00005	<0.00005	<0.00005	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.00005	<0.00005	<0.00005	0.00431J	<0.00002	0.00039	<0.00008	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.00005	<0.00011	<2.4E-05	<0.000024	<0.000024	<0.000024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.00005	<0.00005	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00005	<0.00061	<0.00008	<0.000079	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00005	<0.00005	<0.00005	<0.00006	<2.1E-05	<0.000021	<0.000021	<0.000021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00005	0.000098J	<0.00005	<0.00004	<3.5E-05	<0.000035	<0.000035	<0.000035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00005	<0.00005	<0.00005	<0.00011	<1.9E-05	<0.000019	0.00004 J	<0.000019

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
Constituent	CAS	Method	mg/L	mg/L	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	1/23/2018	3/19/2018	5/16/2018	1/9/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0025	<0.00014	<0.00014	<0.00014	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00073J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0025	0.000237J	9.57E-05J	0.00048J	0.000122J	<0.0002	<0.0002	<0.0002	<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	<0.0025	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0059	0.0029J	0.00056J	0.0014J	0.0015J	0.0042J	<0.0025	0.000521J	0.000774J	0.000257J	0.000403J	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<b>0.0087J</b>	<0.00015	<0.00015	<0.00015	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.00079J	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0025	<0.00015	0.00017J	<0.00015	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0031	0.0048J	<0.0075	0.00197J	0.00217J	0.00145J	0.00165J	0.0023	0.00076J	0.00076J	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<b>&lt;0.00529</b>	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	0.0001J	<0.00005	<0.00005	0.000056J	<0.00031	<0.0149	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.0004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.00625</b>	<0.00013	<5.8E-05	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<b>&lt;0.00385</b>	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00385	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<b>0.22</b>	<b>0.15</b>	<b>0.15</b>	0.03300	0.014	0.061	<b>0.17</b>	0.0477	<b>0.306</b>	0.0386	<b>0.121</b>	0.067	0.008	0.005	<0.000019
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<b>&lt;0.0399</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.0369	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.25	0.19	0.21	0.19	0.038	0.13	0.2	0.253	0.428	0.342	0.292	0.26	0.23	0.17	<0.000027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00360	0.00260	0.00190	0.00160	<0.00005	0.00150	0.00150	<0.00006	<0.00006	<0.00288	0.00225	<1.5E-05	0.0017	0.0015	<0.000015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00990	0.00930	0.01100	0.01200	0.00170	0.02800	0.02300	0.01790	0.02220	0.03250	0.0179	0.016	0.019	0.014	<0.000014
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	0.00082	<0.00005	<0.00005	0.00011J	0.000221J	0.000226J	<0.00385	0.000268J	0.00016	0.00026	0.00011	<0.000005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<b>&lt;0.0003</b>	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<b>&lt;0.00385</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.00625</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.00031	<0.0006	<0.0002	0.00036	0.00017J	0.00027	0.0001J	<0.00037	<0.00037	<b>&lt;0.0178</b>	0.000679	<0.00011	0.0002J	<0.00013	<0.000037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	0.00074	<0.00005	<0.00005	0.00013J	0.000186J	0.000231J	<0.00385	0.000241J	0.00015	0.00022	0.00011	<0.000021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.18</b>	<b>0.14</b>	<b>0.18</b>	<b>0.15</b>	0.025	<b>0.13</b>	<b>0.16</b>	<b>0.17</b>	<b>0.317</b>	<b>0.22</b>	<b>0.193</b>	<b>0.2</b>	<b>0.15</b>	<b>0.11</b>	0.000031J
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00024J	<0.00529	0.000797	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.0061	<0.0059	0.0064	0.0086	0.0017	0.0031	0.007	0.0111	0.0181	0.018J	0.0132	0.013	0.0097	0.0084	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.15	<0.13	0.16	0.14	0.025	0.067	0.15	0.17	0.316	0.245	0.202	0.21	0.17	0.13	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>2.6</b>	<b>1.7</b>	<b>0.6</b>	0.22	0.05	<b>1.5</b>	0.36	0.0828J	<b>0.661</b>	0.0338J	0.075	0.012	0.0014	<0.0021	<0.00026
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00529	<0.00011	<2.4E-05	<0.000024	<0.000024	<0.000024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00481	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025
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	<b>&lt;0.0293</b>	<0.00061	<7.9E-05	<0.000079	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.10000	0.08700	0.09100	0.06100	0.01500	0.07800	0.12000	0.13	0.23400	0.19200	0.162	0.13	0.13	0.093	<0.000021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000101J	<0.00004	<0.00192	<0.00004	<3.5E-05	<0.000035	<0.000035	<0.000035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0025	0.0029	0.0025	0.0044	0.00068	0.0026	0.0036	0.00515	0.00818	0.00759J	0.00649	0.0064	0.0049	0.0042	<0.000019

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/23/2018	3/18/2018	5/15/2018	1/9/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	0.000401J	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00021	<0.00011	<2.1E-05	<0.00021	<0.00021	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.0006	<0.00031	<0.0004	<0.0004	<0.0004	<0.0004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00025	<0.00013	<5.8E-05	<0.00058	<0.00058	<0.00058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	0.00066	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00015	<0.00008	<4.2E-05	<0.00042	<0.00042	<0.00042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00015	<0.00008	<2.1E-05	<0.00021	<0.00021	<0.00021
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<0.00007	0.00076	<0.00007	0.000075J	0.00026	<0.00005	0.000063J	<0.00007	<0.00007	0.000141J	0.00007	<1.9E-05	<0.00019	<0.00019	<0.00019
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.0016	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00108	<0.00056	<4.7E-05	<0.00047	<0.00047	<0.00047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.00011J	<0.00009	<0.00009	0.00033	<0.00005	<0.00005	<0.00008	<0.00008	<0.00015	0.00008J	<2.7E-05	<0.00027	<0.00027	<0.00027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	7.15E-05J	<0.00012	<0.00006	0.00003 J	<0.00015	<0.00015	<0.00015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.0002	0.00043	<0.00007	<0.00007	0.00037	0.000068J	0.00011J	0.0011	0.000878	9.62E-05J	0.00005	0.00047	0.000039J	0.000085 J	0.00039
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00014J	0.00005	<0.00008	<0.00008	<0.00154	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005
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	<0.00015	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00025	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00035	0.0016	0.00044	<0.0002	0.00027	0.00043	<0.0001	<0.00037	<0.00037	<0.00071	<0.00037	<0.00011	0.000078J	<0.00011	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00017J	<0.00005	<0.00008	<0.00008	<0.00015	<0.00008	<2.1E-05	<0.00021	<0.00021	<0.00021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	0.00019J	<0.00008	<0.00008	<0.00034	0.000063J	0.00019J	<0.00008	<0.00008	<0.00015	0.00008J	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	0.0001J	<0.00007	<0.00005	<0.00005	<0.00011	<0.00021	<0.00021	0.000122J	<0.00002	<0.00002	0.000029 J	<0.000029 J	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.000067J	0.00015J	0.00013J	<0.00007	<0.00007	<0.00014	<0.00007	<0.00001	<0.00001	0.000015 J	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	0.000072J	0.00035	<0.00005	0.00012J	<0.00007	<0.00007	<0.00014	0.00007J	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.0001	0.007	<0.0001	0.0005	0.00087	<0.00005	<0.00023	<0.00008	<0.00023	<0.00126	0.0039	0.00014	<0.000083	<0.00002	<0.00022
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00021	<0.00011	<2.4E-05	<0.00024	<0.00024	<0.00024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00019	<0.0001	<2.5E-05	<0.00025	<0.00025	<0.00025
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	<7.9E-05	<0.00079	<0.00079	<0.00079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00014J	0.00020	<0.00007	0.00029	0.00015J	0.00049	<0.00006	<0.00006	<0.00012	0.00006J	<2.1E-05	<0.00021	<0.00021	<0.00021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<7.7E-05	<0.00004	<3.5E-05	<0.00035	<0.00035	<0.00035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.00011J	0.0002J	0.000089J	<0.00011	<0.00011	<0.00021	<0.00011	<1.9E-05	<0.00019	0.00002 J	<0.00019

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-15A															
			mg/L	mg/L	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	1/23/2018	3/18/2018	5/15/2018	1/8/2019	
<b>Volatiles Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0002	0.00051J	0.0006 J	<0.0002	
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	<0.0002	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0015	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.001	0.0038J	0.0073J	0.0097J	0.00417	0.00527	0.00337	0.00854	0.0018	<0.0003	<0.0003	0.0008 J	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<b>&lt;0.00529</b>	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00059	0.00056	0.00200	<0.00031	<0.0149	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.00625</b>	<0.00013	<5.8E-05	<0.000058	<0.000058	<0.000058	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<b>&lt;0.00385</b>	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0012	<0.0011	<0.0011	<0.0011	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00385	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021	
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	0.04400	0.03300	0.04200	0.03800	<b>0.14</b>	0.001	0.046	0.00997	<b>0.124</b>	0.0475	0.059	0.0076	0.0016	0.0034	0.0098	
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<b>&lt;0.0399</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.269	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.17000	0.17	0.16	0.27	0.2	0.13	0.13	0.141	0.332	0.3	0.205	0.13	0.099	0.1	0.1	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00170	0.00150	0.00097	0.00110	0.00097	0.00071	0.00120	<0.00006	<0.00006	<0.00288	<0.00006	0.002	0.0007	0.0069	<0.000015	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00300	0.00360	0.00490	0.00630	0.00530	0.00280	0.00460	0.00313	0.00850	0.0111J	0.00642	0.0026	0.0024	0.0032	0.0025	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00385	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	
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	<b>&lt;0.00385</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.00625</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.0026	0.00073	0.00084	0.0016	0.0001J	<0.0001	<0.0001	<0.00037	<0.00037	<b>&lt;0.0178</b>	<0.00037	<3.7E-05	<0.000037	<b>0.0093</b>	<0.000037	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00007	0.00007	0.00007	0.00007	0.00005	0.00005	0.00005	0.00008	0.00008	<0.00385	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.047	0.043	0.048	0.05	0.078	0.028	0.046	0.0416	<b>0.104</b>	0.0693	0.0572	0.029	0.024	0.018	0.023	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00029	0.00011J	0.00007	<0.00007	<0.00005	<0.00005	<0.00011	0.000187J	<0.00529	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0011	0.0015	0.002	0.0023	0.0021	0.00094	0.0015	0.000885	0.00361	<0.00337	0.00257	0.002	0.0012	0.0016	0.0012	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.059	0.06	0.062	0.076	0.092	0.043	0.063	0.05600	0.13900	0.11400	0.0822	0.041	0.036	0.029	0.038	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.048	0.00180	0.036	0.023	0.087	0.008	0.27	0.0501J	<b>0.526</b>	0.326	0.248	0.0005	<0.00034	<0.00037	<0.00032	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00529	<0.00011	<2.4E-05	<0.000024	<0.000024	<0.000025	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00481	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025	
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	<b>&lt;0.0293</b>	<0.00061	<7.9E-05	<0.000079	<0.000079	<0.000079	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00950	0.00740	0.01200	0.01900	0.03600	0.00560	0.01400	0.00792	0.05200	0.03750	0.0203	0.0046	0.0054	0.0074	0.009	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	0.0002	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00192	<0.00004	<3.5E-05	<0.000035	<0.000035	<0.000035	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00042	0.00062	0.00076	0.00095	0.00089	0.00053	0.00084	0.000496	0.00154	<0.00529	0.00101	0.0009	0.00063	0.00078	0.00051	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well





**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															
Constituent	CAS	Method			mg/L	mg/L	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	1/25/2018	3/19/2018	5/16/2018
<b>Volatile Organic Compounds</b>																				
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0025	<0.0005	<0.0005	<0.0025	<0.001	<0.005	<0.005	<0.007	0.00405J	<0.014	0.00482J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.48</b>	<b>0.51</b>	<b>0.47</b>	<b>0.55</b>	<b>0.59</b>	<b>0.28</b>	<b>0.68</b>	<b>0.636</b>	<b>0.491</b>	<b>0.239</b>	<b>0.483</b>	<b>0.19</b>	<b>0.22</b>	<b>0.17</b>	<b>1.2</b>	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.017J	<0.0005	<0.0005	<0.0025	<0.001	<0.005	<0.005	<0.006	<0.0012	<0.012	<0.0024	0.0062	0.006	0.0066	<0.0003	
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	0.36	0.36	0.43	0.34	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0025	<0.0005	<0.00035	<0.0025	<0.0013	<0.0065	<0.01	<0.0075	<b>0.00976J</b>	<0.015	<b>0.0138J</b>	<0.001	<0.001	<0.001	<0.001	
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	0.074	0.068	0.042	0.92	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		<b>0.059</b>		<b>0.07</b>	<b>0.028</b>	<b>0.047</b>	<0.005	<b>0.0181J</b>	<b>0.029</b>	<0.011	<b>0.02J</b>	<b>0.0023</b>	0.002	<b>0.0021</b>	<0.0002	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.98000	1.20000	1.20000	1.00000	0.73000	1.10000	0.51	0.51900	0.99100	1.27000	1.3	0.97	0.79	0.91	1	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0005	<0.0001	<0.00005	<0.00005	<0.00005	<0.0011	<b>&lt;0.0214</b>	<b>&lt;0.0106</b>	<b>&lt;0.00519</b>	<0.00021	<0.00021	<0.00021	<0.00021	<0.000021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>1.9</b>	<b>4.50</b>	<b>7.90</b>	<b>9.6J</b>	<b>11.00</b>	<b>5.80</b>	<b>9.4J</b>	<b>11.80</b>	<b>6.29</b>	<b>2.95</b>	<b>8.01</b>	0.023	0.12	<b>0.5</b>	0.0054	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.0004	<0.00009	<0.00005	<0.00005	<0.00005	<0.0013	<b>&lt;0.0252</b>	<b>&lt;0.0125</b>	<b>&lt;0.00613</b>	<0.00058	<0.00058	<0.00058	<0.000058	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00035	<0.00007	<0.00006	<0.00006	<0.00006	<0.0008	<b>&lt;0.0155</b>	<b>&lt;0.00769</b>	<b>&lt;0.00377</b>	<0.00042	<0.00042	<0.00042	<0.000042	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0012	<0.0001	<0.00035	<0.0001	<0.00005	<0.00005	<0.00005	<0.0008	<0.0155	<0.00769	<0.00377	<0.00021	<0.00021	<0.00021	<0.000021	
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<b>0.42</b>	<b>0.36</b>	<b>0.4</b>	<b>0.44</b>	<b>0.7</b>	<b>0.23</b>	<b>0.64J</b>	<b>0.745</b>	<b>0.819</b>	<b>0.996</b>	<b>0.589</b>	<b>0.33</b>	<b>0.34</b>	<b>0.22</b>	<b>0.1</b>	
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00035	<0.00008	<0.00008	<0.00008	<0.00008	<0.0008	<b>&lt;0.0083</b>	<b>&lt;0.161</b>	<b>&lt;0.0798</b>	<b>&lt;0.0392</b>	<0.0002	<0.0002	<0.0002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.00005	<0.00005	0.00560	<b>&lt;0.109</b>	<b>&lt;0.0538</b>	<0.0264	<0.00047	<0.00047	<0.00047	<0.000047	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.19	0.23	0.25	0.24	0.36	0.15	0.3J	0.464	0.493	0.553	0.352	0.25	0.23	0.24	0.048	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00920	0.00620	0.00950	0.00720	0.01500	0.007	0.00670	0.0151	<0.0117	<0.00577	0.0155J	0.0074	0.0092	0.009	0.0016	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00900	0.00690	0.00750	0.00730	0.01300	0.00460	0.00900	0.02040	0.0204J	0.0226J	0.0192J	0.0061	0.0079	0.0077	0.0064	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.0025	<0.00007	<0.00005	<0.00005	<0.00005	<0.0008	<b>&lt;0.0155</b>	<b>&lt;0.00769</b>	<0.00377	<0.00005	<0.00005	<0.00005	<0.000005	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<b>&lt;0.0004</b>	<0.00008	<0.00005	<0.00005	<0.00005	<b>&lt;0.0008</b>	<b>&lt;0.0155</b>	<b>&lt;0.00769</b>	<b>&lt;0.00377</b>	<0.0002	<0.0002	<0.0002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.0013</b>	<b>&lt;0.0252</b>	<b>&lt;0.0125</b>	<b>&lt;0.00613</b>	<0.0003	<0.0003	<0.0003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00033	<0.0002	<0.001	<0.0002	<0.0001	0.0011J	<0.0001	<0.0037	<b>&lt;0.0718</b>	<b>&lt;0.0356</b>	<b>&lt;0.0175</b>	<0.00037	<0.00037	<0.00037	<0.000037	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.0025	<0.00007	<0.00005	<0.00005	<0.00005	<0.0008	<0.0155	<0.00769	<0.00377	<0.00021	<0.00021	<0.00021	<0.000021	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.12000</b>	<b>0.15000</b>	<b>0.16000</b>	<b>0.15000</b>	<b>0.230</b>	0.07500	<b>0.21J</b>	<b>0.188</b>	<b>0.279</b>	<b>0.326</b>	<b>0.204</b>	<b>0.16</b>	<b>0.15</b>	<b>0.14</b>	0.047	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.00005	<0.00005	<0.0011	<0.0214	<0.0106	<0.00519	<0.0002	<0.0002	<0.0002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0026	0.0013	0.0013	0.0014	0.0018	0.0013J	0.0016J	<0.0007	<0.0136	<0.00673	<0.0033	0.0021	0.0023	0.0017	0.002	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.08900	0.09600	0.11000	0.09400	0.18000	0.05700	0.14J	0.13600	0.21400	0.26800	0.163	0.087	0.12	0.098	0.021	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>3.3</b>	<b>4.3</b>	<b>6.1</b>	<b>5.9</b>	<b>7.3</b>	<b>3.6</b>	<b>7.8J</b>	<b>9.29</b>	<b>11.8</b>	<b>11.4</b>	<b>5.27</b>	<b>4.4</b>	<b>4.9</b>	<b>6.1</b>	<b>3.2</b>	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.00005	<0.00005	<0.0011	<0.0214	<0.0106	<0.00519	<0.00024	<0.00024	<0.00024	<0.000024	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.0025	<0.00009	<0.00005	<0.00005	<0.00005	<0.001	<0.0194	<0.00962	<0.00472	<0.00025	<0.00025	<0.00025	<0.000025	
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<b>&lt;0.0025</b>	<0.00008	<0.00005	<0.00005	<0.00005	<b>0.00610</b>	<b>&lt;0.118</b>	<b>&lt;0.0587</b>	<b>&lt;0.0288</b>	<0.00079	<0.00079	<0.00079	<b>0.014</b>	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.07800	0.06700	0.08200	0.06300	0.09800	0.04200	0.083J	0.101	0.14400	0.19	0.114	0.066	0.08	0.082	0.024	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00500	0.04300	0.00540	0.02000	0.06100	0.01100	0.12J	<0.0004	<0.00777	<0.00385	<0.00189	0.0019 J	<0.00035	<0.00035	0.0032	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0013	0.00075	0.00063J	0.00085	0.0011	0.00077J	0.00081J	<0.0011	<0.0214	<0.0106	<0.00519	0.0011	0.0012	0.0008 J	0.0012	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	MW-20A								MW-22A								
					7/14/2011	2/1/2012	7/16/2012	1/30/2013	1/23/2018	3/19/2018	5/18/1/8	1/8/2019	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
					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	mg/L
<b>Volatile Organic Compounds</b>																					
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.005	<0.0005	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.0002	<0.0014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.098</b>	<b>0.057</b>	<b>0.089</b>	<b>0.0746</b>	<b>0.053</b>	<b>0.05</b>	<b>0.062</b>	<b>0.024</b>	<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	<0.005	<0.0005	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<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	0.05	0.027	0.045	0.024	<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	0.0013	<b>0.0065</b>	0.001	0.00015	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00022	<0.00015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.005	<0.022	<0.0028	0.0038	<0.0002	0.0055	0.00077 J	<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	0.05	0.033	0.048	0.022	<0.001	<0.001	<0.001	0.001J	<0.0031	<0.0031	<0.0015	0.000834J	0.0569
<b>Semi-Volatile Organic Compounds</b>																					
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.0005	<0.0005	<b>&lt;0.00519</b>	<0.00021	<0.00021	<0.00021	<0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.30000	0.07600	0.10000	0.119	0.049	0.072	0.06	0.0076	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00001	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.0005	<0.00005	<b>&lt;0.00613</b>	<0.00058	<0.00059	<0.00058	<0.00058	<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	1.30E-03	3.00E-03	<0.00006	<0.0006	<0.00006	<b>&lt;0.00377</b>	<0.00042	<0.00042	<0.00042	<0.00042	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0005	<0.0005	<0.0005	<0.00377	<0.00021	<0.00021	<0.00021	<0.00021	<0.00012	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<b>0.42</b>	0.064	<b>0.36</b>	<b>0.191</b>	<b>0.15</b>	<b>0.15</b>	<b>0.17</b>	0.069	<0.00007	<0.00007	<0.00007	0.00072	0.00005	<0.00005	0.00059	<0.00007	0.0603
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00008	<0.0008	<0.00008	<b>&lt;0.0392</b>	<0.0002	<0.0002	<0.0002	<0.0002	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.0005	<0.00005	<0.0264	<0.00047	<0.00047	<0.00047	<0.00047	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.2	0.15	0.19	0.12	0.14	0.18	0.15	0.1	<0.00009	<0.00009	<0.00009	0.00015J	<0.00005	0.00009J	0.00031	0.00557	0.0783
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00170	0.0015J	0.00150	<0.00283	0.0014	<0.0015	0.0013	0.00057	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000742	0.000943
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00580	0.00440	0.00420	0.00589J	0.021	0.022	0.0081	0.0058	0.0002	<0.00007	<0.00007	0.00011J	<0.00005	0.000058J	0.00040	0.000939	0.00265
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.0005	<0.00005	<0.00377	<0.0005	<0.00051	<0.00005	<0.00005	0.00015J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<b>&lt;0.0005</b>	<0.00005	<b>&lt;0.00377</b>	<0.0002	<0.0002	<0.0002	<0.0002	<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	1.90E-03	<0.00005	<0.0005	<0.00005	<b>&lt;0.00613</b>	<0.0003	<0.0003	<0.0003	<0.0003	<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	0.00033	<0.001	<0.0001	<b>&lt;0.0175</b>	<0.00037	<0.00037	<0.00037	<0.00037	0.00033	0.0013	0.0012	<0.0002	0.0015	0.0011	0.00011J	<0.00037	0.000703
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00005	<0.0005	<0.00005	<0.00377	<0.00021	<0.00021	<0.00021	<0.00021	0.00014J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.0001J	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.14</b>	0.073	<b>0.15</b>	0.0799	0.097	<b>0.13</b>	0.081	0.067	<0.00008	<0.00008	<0.00008	0.00015J	<0.00005	0.000074J	0.00048	0.001	0.0224
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.0005	<0.00005	<0.00519	<0.0002	<0.0002	<0.0002	<0.0002	0.00017J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000866J	<0.00011
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0007	0.00082J	0.00061	<0.0033	0.00078 J	0.00095J	0.00074	0.00041	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000086J	0.00041	0.000362J	0.00247
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.11000	0.06000	0.11000	0.06610	0.16	0.16	0.076	0.062	<0.00007	<0.00007	<0.00007	0.0001J	<0.00005	0.00008J	0.00029	0.000468J	0.0175
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>7.7</b>	<b>0.96</b>	<b>6.1</b>	<b>43.9</b>	<b>2.7</b>	<b>2.9</b>	<b>2.8</b>	<b>1.4</b>	<0.0001	<0.0001	<0.0001	0.0035	0.001J	0.00024	0.018	0.0034J	<b>0.792</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.0005	<0.00005	<0.00519	<0.00024	<0.00024	<0.00024	<0.00024	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.0005	<0.00005	<0.00472	<0.00025	<0.00025	<0.00025	<0.00025	<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	<0.0005	<0.00005	<b>&lt;0.0288</b>	<0.00079	<0.0008	<0.00079	<0.00079	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.03900	0.03000	0.04300	0.0217J	0.032	0.037	0.034	0.025	<0.00007	<0.00007	<0.00007	0.00028	<0.00005	0.0002J	0.00150	0.000478J	0.000604
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00005	<0.0005	<0.00005	<0.00189	<0.00035	<0.00035	<0.00035	<0.00035	<0.00007	<0.00007	<0.00007	0.00017J	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0004	0.00056J	0.0003	0.00519	<0.00019	0.0005J	0.00048	0.00025	0.00013J	<0.00007	<0.00007	<0.00007	<0.00005	0.000055J	0.00033	<0.00011	0.00106

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential	C/I	MW-22AR				MW-24AR									
			Assessment Level	Assessment Level	2/8/2018	3/25/2018	5/31/2018	1/22/2019	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
			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	
<b>Volatle Organic Compounds</b>																		
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0003	<0.0003	<0.0003	<0.0003	<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	<0.0003	<0.0003	<0.0003	<0.0003	<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	<0.001	<0.001	<0.001	<0.001	<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	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0003	<0.0003	<0.0003	<0.0003	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	0.00058J
<b>Semi-Volatile Organic Compounds</b>																		
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<2.1E-05	<0.000021	<2.1E-05	<0.000021	<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	4.90E-01	1.50E+00	<0.00004	<0.000041	<0.00004	<0.00004	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00013J	<0.00005	<0.00031	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<5.9E-05	<0.000059	<5.9E-05	<0.000058	<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	1.30E-03	3.00E-03	<4.2E-05	<0.000043	<4.2E-05	<0.000042	<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	2.00E+00	5.80E+00	<2.1E-05	<0.000021	<2.1E-05	<0.000021	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	91-57-6	8270	9.80E-02	2.90E-01	<1.9E-05	<0.000019	<1.9E-05	<0.000019	<0.00007	0.00023	<0.00007	0.00018J	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	9.24E-05J
4,6-Dinitro-2-methylphenol	534-52-1	8270	2.40E-03	7.30E-03	<0.00002	<0.00002	<0.00002	<0.00002	<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	4.90E-02	1.50E-01	<4.7E-05	<0.000048	<4.7E-05	<0.000047	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	0.00056J
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<2.7E-05	<0.000028	<2.7E-05	0.00071	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000146J
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<1.5E-05	<0.000015	<1.5E-05	<0.000015	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<1.4E-05	<0.000014	0.00017	0.000028 J	<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	9.10E-03	2.00E-02	<0.00005	<0.000051	<0.00005	<0.00005	<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	<0.00002	<0.00002	<0.00002	<0.00002	<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	1.90E-03	<0.00003	<0.000031	<0.00003	<0.00003	<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	0.0033	<0.000038	<0.0001	0.000065 J	0.00031	0.00029	0.0024	<0.0002	0.00089	0.00048	<0.0001	<0.00037	<0.00037	0.000767J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<2.1E-05	<0.000021	<2.1E-05	<0.000021	<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	9.80E-02	2.90E-01	<0.00002	<0.00002	<0.00002	0.000029 J	<0.00008	0.000084J	0.00011J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000164J
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00002	<0.00002	<0.00002	0.00051	<0.00019	0.0001J	<0.00007	<0.00007	<0.00005	0.00017J	0.000071J	<0.00011	0.000168J	0.00011J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00001	<0.00001	<0.00001	0.000079 J	<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	9.80E-01	2.90E+00	<0.00003	<0.000031	<0.00003	0.00014	<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	4.90E-01	1.50E+00	<0.00017	0.00012	<0.00002	<0.00002	<0.0001	0.0023	0.0036	0.00081	<0.00005	<0.00005	<0.00005	0.000139J	<0.00008	0.00008J
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<2.4E-05	<0.000024	<2.4E-05	<0.000024	<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	1.90E-01	4.20E-01	<2.5E-05	<0.000026	<2.5E-05	<0.000025	<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	<0.000081	<7.9E-05	<0.000079	<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	7.30E-01	2.20E+00	<2.1E-05	0.00012	<2.1E-05	0.000068 J	<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	7.30E+00	2.20E+01	<3.5E-05	<0.000036	<3.5E-05	<0.000035	<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	7.30E-01	2.20E+00	<1.9E-05	<0.000019	<1.9E-05	0.000084 J	<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 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential	C/I	MW-25A															
			Assessment Level	Assessment Level	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	1/31/2018	3/26/2018	5/31/2018	1/15/2019	
			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	mg/L	
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	0.0005J	0.00012J	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0002	<0.0002	<0.0002	<0.0002	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0047J	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	
<b>mi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<4.1E-05	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	0.00066	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.3E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.02400	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<6.1E-05	<0.00007	<0.00007	<0.00007	<0.00007	0.00014	<1.9E-05	5.2E-05 J	<5.1E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	0.00026	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.8E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.034	0.0014	0.0012	0.00054	0.0042	0.00053	<0.00005	0.00017J	0.00035J	0.00356	9.1E-05J	0.062	0.054	<2.7E-05	3.6E-05 J	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00040	<0.00007	0.00034	<0.00007	5.3E-05J	<0.00005	<0.00005	<0.00006	<0.00006	0.00054	<0.00006	0.00044	0.00053	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00050	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00057	0.00068	<1.4E-05	1.5E-05 J	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	0.00012J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<3.1E-05	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00033	<0.0002	0.00056	<0.0002	0.00023	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	<0.00008	<3.8E-05	<0.0001	<7.8E-05	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.018	<0.00008	0.00034	<0.00008	0.0013	0.0005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.00017	0.00011	3.3E-05 J	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<0.00002	0.00002 J	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00057	8.4E-05J	9.2E-05J	<0.00007	0.00014J	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.00106	<0.00007	0.0062	<0.00001	1.5E-05 J	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0049	<0.00007	<0.00007	<0.00007	0.00016J	0.00011J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	0.026	0.022	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.45	<0.0001	0.00024	0.00027	<0.00005	0.00017J	<0.00038	<0.0007	<0.00008	0.00008J	0.000817	<0.00029	0.0002	0.0006	<0.00029	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.6E-05	<2.5E-05	<2.5E-05	
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	0.00033	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05	<8.1E-05	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00340	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00015	0.00015	<2.1E-05	2.9E-05 J
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.6E-05	<3.5E-05	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00036	0.00047	0.00015J	<0.00007	0.0009	<0.00005	<0.00005	<0.00011	0.00012J	0.000585	0.00018J	0.0033	0.0049	<1.9E-05	2.7E-05 J	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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																		
Constituent	CAS	Method	mg/L	mg/L	2/3/2009	1/13/2010	6/25/2010	1/24/2011	7/19/2011	8/25/2011	#####	2/15/2012	7/17/2012	2/6/2013	8/7/2013	#####	1/22/2014	07/24/2014	1/28/2018	3/21/2018	6/5/2018	1/15/2019	
			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	mg/L	mg/L	mg/L	mg/L	
<b>Volatile Organic Compounds</b>																							
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0005	0.00118	0.0097	0.00391	0.00043J	0.00019J	<0.0002	<0.0002	<0.0002	<0.0002	<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	0.00018J	0.0003J		<0.00018	0.00021J	<0.0003	<0.0003	<0.0003	0.00056J	
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	0.00082J		<0.00019	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	0.00029J		<0.00017	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	
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	0.0045J			<0.0031	<0.0015	<0.00026	0.00239J		<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	
<b>mi-Volatile Organic Compounds</b>																							
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005			<0.00005	<0.00005	<0.00529	<0.00011		<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00054	<0.00008	<0.00008	<0.00008	<0.00005			<0.00005	<0.00005	<0.0149	<0.00031		<0.00031	<0.00031	5.6E-05J	<0.000041	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005			<0.00005	0.0001J	<0.00025	<0.00013		<0.00013	<0.00013	<5.8E-05	<0.000059	<0.000058	<0.000058	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006			<0.00006	<0.00006	<0.00385	<0.00008		<0.00008	<0.00008	<4.2E-05	<0.000043	<0.000042	<0.000042	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005			<0.00005	<0.00005	<0.00385	<0.00008		<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00240	<0.00007	<0.00007	0.00031	0.00039			<0.00005	5.6E-05J	<0.00337	0.00041J		<0.00007	<0.00007	5.3E-05J	<0.000019	<0.000019	<0.000019	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	0.00008J	<0.00008	<0.00008	<0.00008	<0.00008			<0.00008	<0.00008	<0.0399	<0.000083		<0.000083	<0.000083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005			<0.00005	<0.00005	<0.0269	0.00056		<0.00056	<0.00056	<4.7E-05	<0.000048	<0.000047	<0.000047	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.015	0.0097	0.005	0.0039	0.12			0.0095	0.0087	0.0481	0.141		0.0699	0.0663	0.0073	<0.000028	0.019	0.042	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.00014J	<0.00007	<0.00007	0.00047			0.00013J	<0.00005	<0.00288	<0.00006		<0.00006	0.000486	0.00007J	<0.000015	0.000082J	0.00027	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00079	<0.00007	0.00020	9.9E-05J	0.00260			0.00025	0.00027	<0.0024	0.00228		0.00136	0.00141	0.00012	0.00015	0.00025	0.00087	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00016J	<0.00007	<0.00007	<0.00007	<0.00005			<0.00005	<0.00005	<0.00385	<0.00008		<0.00008	<0.00008	<0.00005	<0.000051	<0.00005	<0.00005	
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	<0.00385	<0.00008		<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005			<0.00005	<0.00005	<0.00625	<0.00013		<0.00013	<0.00013	<0.00003	<0.000031	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00042	0.00026	0.00045	0.00043	0.00031			<0.0001	0.0002J	<0.0178	<0.00037		<0.00037	<0.00037	7.6E-05J	<0.000038	<0.000037	<0.000037	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00018J	<0.00007	0.0003	<0.00007	<0.00005			<0.00005	<0.00005	<0.00385	<0.00008		<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.0026	0.00078	0.00033	0.00038	0.021			0.0014	0.00084	0.00416J	0.0151		<0.00008	0.00154	<0.00016	0.000086J	0.0001	0.0005	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005			<0.00005	<0.00005	<0.00529	<0.00011		<0.00011	<0.00011	<0.00002	0.000052J	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00091	0.0003	0.0004	0.00036	0.0048			0.00049	0.00092	<0.00337	0.0062		0.00306	0.00465	0.00084	0.0011	0.0014	0.0044	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0016	0.00028	0.00034	0.00017J	0.00570			0.0006	0.00041	<0.00337	0.00611		0.0031	0.00245	0.00044	0.00051	0.00084	0.0039	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0074	<0.00051	<0.0001	0.0043	0.0019			0.0001J	0.00027	<0.00385	0.0066		0.00008J	0.00042J	<0.00014	<0.00002	<0.00002	<0.00049	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005			<0.00005	<0.00005	<0.00529	<0.00011		<0.00011	0.00394	<2.4E-05	<0.000024	<0.000024	<0.000024	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	0.00023			<0.00005	<0.00005	<0.00481	<0.0001		<0.0001	<0.0001	<2.5E-05	<0.000026	<0.000025	<0.000025	
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	<0.0293	<0.00061		<0.00061	<0.00061	<7.9E-05	<0.000081	<0.000079	<0.000079	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00300	0.00021	0.00017J	0.00011J	0.00029			<0.00005	<0.00005	<0.00288	<0.00006		0.00015J	0.00016J	<3.8E-05	<0.000021	<0.000021	0.00012	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005			<0.00005	<0.00005	<0.00192	<0.00004		<0.00004	<0.00004	<3.5E-05	<0.000036	<0.000035	<0.000035	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00069	9.2E-05J	0.0002J	0.00013J	0.0031			0.00024	0.00051	<0.00529	0.00322		0.00159	0.0022	0.00043	0.00042	0.00094	0.0025	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well





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

Constituent	CAS	Method	Residential	C/I	MW-30A				MW-31A				MW-32A				
			Assessment Level	Assessment Level	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
			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	
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.0025	<0.0028	<0.001	<b>&lt;0.025</b>	<0.0005	<0.0014	<0.0005	<0.0005	<0.0005	<0.0025	<b>0.03000</b>
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.14</b>	<b>0.13</b>	<b>0.14</b>	<b>0.117</b>	<b>0.14</b>	<b>0.14</b>	<b>0.11</b>	<b>0.135</b>	<b>0.69</b>	<b>0.34</b>	<b>1.5</b>	<b>0.61</b>	<b>1.4</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.001	<0.0025	<0.0024	<0.001	<0.025	<0.0005	<0.0012	<0.0005	<0.0005	<0.0005	<0.0025	<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	<0.0013	<b>&lt;0.013</b>	<0.005	<b>0.02110</b>	<0.0013	<b>&lt;0.032</b>	<b>&lt;0.01</b>	<b>0.00971J</b>	<0.0005	<0.0005	0.0032J	<0.0025	<0.0013
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	<b>1.5</b>	<b>1</b>	<b>1.2</b>
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
<b>mi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00005	<0.0005	<0.00005	<b>&lt;0.0524</b>	<0.00005	<0.0005	<0.00005	<b>&lt;0.055</b>	<0.0001	<0.0001	<0.0001	<0.001	<0.00005
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>2.90000</b>	<b>3.00000</b>	<b>2.70000</b>	<b>2.94</b>	<b>5.30000</b>	<b>5.10000</b>	<b>3.40000</b>	<b>4.45</b>	<b>2.2</b>	<b>2.1</b>	<b>15.0</b>	<b>2.3</b>	<b>31.0</b>
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.0005	<0.00005	<b>&lt;0.0619</b>	<0.00005	<0.0005	<0.00005	<b>&lt;0.065</b>	<0.00009	<0.00009	<0.00009	<0.0009	<0.00005
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.0006	<0.00006	<b>&lt;0.0381</b>	<0.00006	<0.0006	<0.00006	<b>&lt;0.04</b>	<0.00007	<0.00007	<0.00007	<0.0007	<0.00006
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.0005	<0.00005	<0.0381	<0.00005	<0.0005	<0.00005	<0.04	<0.00012	<0.0001	<0.0001	<0.001	<0.00005
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.85</b>	<b>0.42</b>	<b>0.67</b>	<b>1.01</b>	<b>1</b>	<b>0.65</b>	<b>0.83</b>	<b>1.17</b>	<b>1.20</b>	<b>0.30</b>	<b>0.48</b>	<b>6.90</b>	<b>0.95</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.0008	<0.00008	<b>&lt;0.395</b>	<0.00008	<0.0008	<0.00008	<b>&lt;0.415</b>	<0.00008	<0.00008	<0.00008	<0.0008	<0.00008
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.0005	<0.00005	<b>0.26700</b>	<0.00005	<0.0005	<0.00005	<b>0.28000</b>	<0.00007	<0.00007	<0.00007	<0.0007	<0.00005
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.31	0.23	0.24000	0.436	0.37	0.3	0.28	0.488	0.34	0.13	0.19	<b>3.1</b>	0.25
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00750	0.00640	0.00740	<0.0286	0.00760	0.00440	0.00320	<0.03	0.00600	0.00190	0.00790	0.02700	0.00500
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.01800	0.01300	0.01800	0.0391J	0.03200	0.02600	0.02600	<0.056	0.07700	0.05100	0.09300	0.91000	0.09000
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.0005	<0.00005	<b>&lt;0.0381</b>	0.00380	<0.0005	0.00023	<b>&lt;0.04</b>	<b>0.0096</b>	0.0067	<b>0.0100</b>	<b>0.3000</b>	<b>0.0380</b>
Benzo(a)pyrene	50-32-8	8270	2.10E-04	2.00E-04	<0.00005	<b>&lt;0.0005</b>	<0.00005	<b>&lt;0.0381</b>	<b>0.00089</b>	<b>&lt;0.0005</b>	<0.00005	<b>&lt;0.04</b>	<b>0.003</b>	<b>0.0023</b>	<b>0.0067</b>	<b>0.078</b>	<b>0.019</b>
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.0005	<0.00005	<b>&lt;0.0619</b>	<0.00005	<0.0005	<0.00005	<b>&lt;0.065</b>	<0.00009	<0.00009	<0.00009	<b>&lt;0.0009</b>	<0.00005
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.001	<0.0001	<b>&lt;0.176</b>	<0.0001	<0.001	<0.0001	<b>&lt;0.185</b>	0.00042	0.0018	0.0041	0.0046	0.0013J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00005	<0.0005	<0.00005	<0.0381	0.00310	<0.0005	0.00017J	<0.04	0.00870	0.00640	0.00990	0.28000	0.03300
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.25000</b>	<b>0.21000</b>	<b>0.20000</b>	<b>0.308</b>	<b>0.33000</b>	<b>0.26000</b>	<b>0.26000</b>	<b>0.36700</b>	<b>0.32000</b>	<b>0.14000</b>	<b>0.21000</b>	<b>3.20000</b>	<b>0.27000</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.0005	0.0002	<0.0524	<0.00005	<0.0005	<0.00005	<0.055	<0.00007	<0.00007	<0.00007	<0.0007	<0.00005
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0041	0.0031	0.0038	<0.0333	0.031	0.0029	0.0052	<0.035	0.098	0.07	0.09	<b>2.5</b>	0.11000
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.18000	0.13000	0.14000	0.24700	0.24000	0.17000	0.17000	0.27300	0.22000	0.08700	0.13000	<b>2.50000</b>	0.18000
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>15</b>	<b>7.8</b>	<b>12</b>	<b>16.8J</b>	<b>21</b>	<b>18</b>	<b>17</b>	<b>19.3J</b>	<b>16</b>	<b>3.5</b>	<b>11</b>	<b>31</b>	<b>21</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.0005	<0.00005	<b>0.05240</b>	<0.00005	<0.0005	<0.00005	<b>&lt;0.055</b>	<0.00009	<0.00009	<0.00009	<0.0009	<0.00005
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.0005	<0.00005	0.04760	<0.00005	<0.0005	<0.00005	<0.05	<0.00009	<0.00009	0.014J	<0.0009	<0.00005
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00033	<0.0005	<0.00005	<b>&lt;0.29</b>	<b>0.07600</b>	<b>0.11000</b>	<b>0.09400</b>	<b>&lt;0.305</b>	<0.00008	<0.00008	<0.00008	<0.0008	<0.00005
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.12000	0.06400	0.10000	0.162J	0.24000	0.14000	0.13000	0.26800	0.45000	0.25000	0.19000	<b>8.90000</b>	0.35000
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.14000	0.01500	0.02000	0.0781J	0.60000	0.76000	0.29000	0.57900	1.40000	1.30000	<b>14.00000</b>	1.20000	<b>21</b>
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0022	0.0021	0.0018	<0.0524	0.018	0.0025	0.002	<0.055	0.062	0.043	0.047	<b>1.5</b>	0.072

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	MW-32AR									
					2/9/2012	7/16/2012	2/6/2013	8/7/2013	1/21/2014	07/24/2014	1/28/2018	3/27/2018	6/4/2018	1/23/2019
<b>Volatile Organic Compounds</b>														
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	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<b>0.023</b>	0.00048J	<0.0002	<b>0.0404</b>	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0011	<0.0005	0.0082	0.0003J	<0.00019	0.0208	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.001	<0.0005	0.00338	0.00023J	<0.00017	0.000849J	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0031	<0.0015	0.0176	0.00087J	<0.00058	0.0336	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.0005	<b>&lt;0.00529</b>	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.00021	<0.00021	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00120	6.1E-05J	0.0172J	<0.00031	<0.00031	0.0722	<0.00004	<0.00004	<0.00004	0.00013 J
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.00005	<b>&lt;0.00625</b>	<0.00013	<0.00013	<0.00013	<5.8E-05	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.00006	<b>&lt;0.00385</b>	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.00005	<0.00385	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	8.8E-05J	0.00019J	0.011J	<0.00007	0.00021J	<b>0.206</b>	7.9E-05J	0.0068	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<b>&lt;0.0399</b>	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.0269	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0046	0.0029	0.0232J	0.00625	0.0105	0.111	0.0013	0.0043	0.002	0.0001
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00032	<0.00005	<0.00288	0.00026J	0.00006J	0.00226	5.4E-05J	0.000054J	<0.000015	<0.000015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00041	0.00026	<0.0024	0.00022J	0.00044J	0.00332	8.2E-05J	0.00021	0.000064 J	0.00002 J
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00012J	0.00015J	<0.00385	<0.00008	<0.00008	0.000218J	0.00006J	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<b>&lt;0.00385</b>	<0.00008	<0.00008	<0.00008	2.7E-05J	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.00005	<b>&lt;0.00625</b>	<0.00013	<0.00013	0.000452J	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00054	0.00014J	<b>&lt;0.0178</b>	<0.00037	<0.00037	0.000621	0.00011J	<0.000037	<0.00004	<0.000044
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	9.3E-05J	0.00023	<0.00385	<0.00008	7.7E-05J	0.00016J	5.8E-05J	<0.000021	0.000037 J	<0.000021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00096	0.00170	0.00936J	0.000515	0.000664	0.05	<5.3E-05	0.0024	0.00007 J	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	5.6E-05J	<0.00529	0.00012J	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	0.00002 J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.002	0.003	0.00508J	0.00102	0.00124	0.00656	0.00048	0.00023	0.00031	0.000051 J
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0017	0.0016	0.00932J	0.00105	0.00317	0.0516	0.00012	0.00093	0.000058 J	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00044	0.0036	0.406	<0.00297	0.0087	<b>3.83</b>	<0.00058	0.026	0.000043 J	0.000067 J
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.00529	<0.00011	<0.00011	<0.00011	0.00035	<0.000024	<0.000024	<0.000024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.00005	<0.00481	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<b>&lt;0.0293</b>	<0.00061	<0.00061	<0.00061	<7.9E-05	<0.000079	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00033	5.5E-05J	0.00768J	0.00011J	0.0001J	0.0111	0.00022	0.0013	<0.000021	0.000034 J
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00012J	0.00029	<0.00192	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<0.000035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0041	0.0046	<0.00529	0.000617	0.000625	0.00474	0.00031	0.00018	0.00049	0.000036 J

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential	C/I	MW-33A															
			Assessment Level	Assessment Level	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	1/30/2018	3/27/2018	6/5/2018	1/22/2019	
			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	mg/L	
<b>Volatile Organic Compounds</b>																				
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	0.00020	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00071J	0.0025J	0.0018J	<b>0.0056</b>	<b>0.009</b>	<b>0.054</b>	0.0023J	<b>0.00782</b>	<b>0.165</b>	<b>0.223</b>	0.00236	<0.0002	<0.0002	<0.0002	<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	<0.00012	0.00019J	0.00021J	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<0.00011				<0.0002			
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.001	<0.001	<0.001	0.0016J	<0.0031	<0.11	<0.0015	0.00223J	0.17200	0.188	0.00063J	<0.0003	<0.0003	<0.0003	<0.0003	
<b>mi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<b>&lt;0.00519</b>	<b>&lt;0.104</b>	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	0.00270	0.00340	0.02900	<0.00005	0.00623	<b>0.888</b>	<b>1.44</b>	0.0212	<0.0002	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<b>&lt;0.00613</b>	<b>&lt;0.123</b>	<0.00013	<5.8E-05	<0.000058	<0.000058	<0.000058	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	0.00006J	<0.00008	<b>&lt;0.00377</b>	<b>&lt;0.0755</b>	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00377	<0.0755	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00066	0.00090	0.00092	0.00670	0.02200	0.03000	0.015	0.00345	<b>0.195</b>	<b>0.263J</b>	0.0216	<1.9E-05	<0.000019	<0.000019	<0.000019	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<b>&lt;0.0392</b>	<b>&lt;0.783</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.0264	<b>&lt;0.528</b>	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.013	0.028	0.012	0.014	0.037	0.048	0.019	0.0279	0.157	0.288J	0.046	0.0005	<0.000027	0.00097 J	<0.000027	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.00015J	<0.00007	0.00014J	0.00018J	0.00030	<0.00005	<0.00006	<0.00283	0.0566J	0.00041J	2.2E-05J	<0.000015	<0.000015	<0.000015	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.0002J	0.00028	0.00021	0.00072	0.00130	0.00082	0.00260	<0.00075	0.0049J	<0.0472	0.00132	<1.4E-05	<0.000014	0.000021 J	<0.000014	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.0002J	0.00017J	0.00014J	0.00025	0.00019J	0.0001J	0.00043	0.00017J	<0.00377	<b>&lt;0.0755</b>	0.00029J	7.7E-05J	<0.00005	0.000077 J	<0.00005	
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	<b>&lt;0.00377</b>	<b>&lt;0.0755</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<b>&lt;0.00613</b>	<b>&lt;0.123</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00033	0.0003	0.00035	0.00031	0.00056	0.0013	0.00014J	<0.00037	<b>&lt;0.0175</b>	<b>&lt;0.349</b>	<0.00037	<3.7E-05	<0.000037	<0.000078	<0.000037	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00012J	0.00012J	0.00009J	0.00016J	0.0001J	6.1E-05J	0.00033	0.00011J	<0.00377	<0.0755	0.00017J	<2.1E-05	0.000047 J	0.00005 J	0.000025 J	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00078	0.0019	0.0014	0.0027	0.0088	0.019	0.0049	0.00262	0.0728	<b>0.148J</b>	0.0164	4.2E-05J	<0.00002	0.00002 J	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00519	<0.104	<0.00011	<0.00002	<0.00002	0.000039 J	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0022	0.0013	0.0012	0.003	0.0021	0.0012	0.0036	0.00212	0.00385J	0.0703J	0.00395	0.0006	0.00052	0.0006 J	0.00033	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00067J	0.0015J	0.0012J	0.00270	0.00880	0.01500	0.0056J	0.00641	0.06680	0.145J	0.0146	<0.00003	<0.00003	0.00017 J	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0028	0.02	0.0082	0.095	0.31	<b>0.96</b>	0.017	0.112	<b>4.98</b>	<b>5.82</b>	0.489	<0.00033	0.00013	<0.00019	<0.00002	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00519	<b>&lt;0.104</b>	<0.00011	<2.4E-05	<0.000024	<0.000024	<0.000024	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.00472	<0.0943	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025	
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	<b>&lt;0.0288</b>	<b>&lt;0.575</b>	<0.00061	<7.9E-05	<0.000079	<0.000079	<0.000079	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00037	0.00032	0.00065	0.00480	0.00460	0.00380	0.00580	0.00049	0.0232J	0.18J	0.00427	<2.1E-05	<0.000021	0.000085 J	<0.000021	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00189	0.203J	<0.00004	<0.0002	<0.000035	<0.000035	<0.000035	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0024	0.0019	0.0016	0.0035	0.0025	0.0021	0.0035	0.00283	<0.00519	<0.104	0.0043	0.00028	0.00057	0.00073	0.00015	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential	C/I	MW-35A														
			Assessment Level	Assessment Level	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	1/25/2018	3/22/2018	6/5/2018	1/15/2019
			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	mg/L
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	0.00037J	0.00021J	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	0.00015J	<0.0003	0.00042J	<0.0003	<0.0003
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	0.00047J	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.0015	<0.00015	<0.00015	0.00022J	<0.00015	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	0.00031J	0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	0.0003	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	0.0021
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	0.00061	<0.00007	<0.00007	<0.00005	<0.00005	0.0063	0.00024J	<0.00007	0.00035J	0.00015J	0.0019	0.000092J	0.00032	0.016
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<0.000047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0035	0.017	0.0077	0.00069	0.00091	0.00041	0.0072	0.0196	0.0181	0.0551	0.0294	0.0076	0.0064	0.006	0.0039
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.00011J	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00006	<0.00006	0.00075	<0.00006	<1.5E-05	0.000088J	0.000066J	0.000068J
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	0.00043	0.00035	<0.00007	<0.00005	<0.00005	0.00130	0.00039J	<0.00005	0.00111	0.000601	0.00038	0.00028	0.00022	0.00044
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005	0.00030	<0.00008	<0.00008	<0.00008	<0.00008	5.4E-05J	<0.00005	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00024	0.00045	0.00048	0.0004	0.00099	0.00013J	0.00014J	<0.00037	<0.00037	<0.00037	<0.00037	0.00011J	<0.000037	<0.00018	<0.000037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	<0.00008	<0.00008	<0.00008	<0.00008	0.00005J	<0.000021	<0.000021	<0.000021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.0014	0.005	0.0026	0.00011J	0.00013J	0.00008J	0.0043	0.00043J	0.00014J	0.00177	0.00115	0.0047	0.0011	0.00072	0.0041
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	9.2E-05J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00034	0.0011	0.00048	0.00021	0.00053	0.00007J	0.0027	0.00011J	0.00037J	0.000484	0.000782	0.00065	0.00039	0.00024	0.00015
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00062	0.0028	0.0014	9.5E-05J	0.00012J	<0.00005	0.0029	<0.00007	0.002	0.0149	0.0071	0.0024	0.00061	0.00086	0.0022
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.0001	0.19	0.0017	0.00028	<0.00005	0.00027	0.05	0.00286J	0.00056J	0.00968	0.00293	0.13	0.013	0.0075	0.22
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	0.00009J	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<0.000024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<0.000025
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	<7.9E-05	<0.000079	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00039	<0.00007	<0.00007	<0.00005	<0.00005	0.00680	0.0001J	<0.00006	0.00006	0.00045J	0.0016	0.00028	<0.000021	0.0025
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<0.000035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00025	0.00092	0.00031	<0.00007	0.00029	<0.00005	0.0016	0.00031J	0.00025J	0.00038J	0.000548	0.00055	0.00026	0.00027	0.00007

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
Constituent	CAS	Method	mg/L	mg/L	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	1/25/2018	3/21/2018	5/31/2018	1/14/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<4.1E-05	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.3E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	0.00030	0.00023	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000177J	<1.9E-05	0.000022J	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.8E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.00036	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00008J	<0.00008	<2.8E-05	0.00059	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<1.4E-05	0.000066J	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00005	0.00008J	<0.00008	<0.00008	<0.00008	<5.1E-05	<0.00005	<0.00005	<0.00005
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	<0.00002	0.000064J	0.00003 J	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<3.1E-05	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00045	0.00033	0.00061	0.00048	0.0004	0.0025	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.000089J	0.00015J	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	2.7E-05 J	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	0.0003	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	0.00061	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.000391J	<0.00011	<0.00011	<0.00002	<0.00002	2.8E-05 J	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	0.00012	3.3E-05 J	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	0.00024	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<3.1E-05	0.00034	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0006	0.0013	0.0023	<0.0001	<0.00005	<0.00005	0.0003	0.000211J	<0.00008	<0.00008	0.00101	<0.00002	<0.00002	<0.00002	<6.2E-05
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.6E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<8.1E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00039	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	8.61E-05J	0.00006J	<0.00006	<2.1E-05	0.00011	2.6E-05 J	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.6E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00015J	0.00021	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.000155J	<0.00011	<1.9E-05	0.000076J	3.2E-05 J	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-38A														
			mg/L	mg/L	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	1/26/2018	3/25/2018	6/5/2018
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>ni-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00044	<0.00007	0.00016J	0.000085J	<0.00005	<0.00005	0.00031	<0.00007	0.000115J	<0.00007	<1.9E-05	0.00014	<1.9E-05	5.5E-05 J	5.5E-05 J
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.00024	<0.00009	<0.00009	0.00043	<0.00005	0.00025	<0.00008	0.00064	<0.00008	<0.00008	<2.7E-05	0.0039	0.00061	0.014
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	0.000053J	<1.5E-05	0.0002
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	0.00023	0.0001J	<0.00005	0.00013J	7.12E-05J	<0.00005	0.000103J	8.16E-05J	<1.4E-05	0.00026	0.00015	0.00017
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	0.00025	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00042	0.00049	0.00044	0.00064	0.00094	0.00160	0.00023	<0.00037	<0.00037	<0.00037	<0.00037	<3.7E-05	<3.7E-05	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	0.00022	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	0.000083J	<0.00008	<0.00005	0.000055J	<0.00005	0.00014J	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	0.00006 J	0.00014
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	0.00017 J	6.8E-05 J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	0.00012J	<0.00007	0.00034	0.00014J	<0.00005	0.00017J	<0.00007	0.000164J	<0.00007	<0.00007	<0.00001	0.00023	3.2E-05 J	0.0013
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00015J	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	0.0003	0.00016	0.0024
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00600	<0.0001	<0.0001	0.00059	0.00026	<0.00005	0.00100	<0.00008	0.00192J	0.00008J	<0.00008	<0.00002	<0.00002	0.00071	0.00015
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	0.0001J	<0.00005	0.00011J	0.00032	<0.00006	<0.00006	<0.00006	<0.00006	<2.1E-05	0.00033	<2.1E-05	0.00058
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.0001J	<0.00007	0.00021	0.00018J	<0.00005	0.00016J	<0.00011	0.000176J	<0.00011	<0.00011	<1.9E-05	0.00021	5.6E-05 J	0.0011

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
Constituent	CAS	Method	mg/L	mg/L	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	1/31/2018	3/26/2018	6/1/2018	1/22/2019
			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	mg/L
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<b>0.00849</b>	<b>0.00727</b>	0.0042	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	0.000705J	0.000418J	0.000329J	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	0.00081	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<4.1E-05	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	0.00017J	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.3E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00097	0.00012J	0.00400	<0.0007	0.00230	0.00480	0.00950	<0.0007	<b>0.10900</b>	0.01060	0.00902	<9.3E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<b>&lt;0.0083</b>	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.8E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.12000	0.13000	0.20000	0.23000	0.23000	0.21000	0.22000	0.07000	0.54600	0.39400	0.197	0.062	0.064	0.09	0.037
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00120	0.00079	0.00096	0.00140	0.00130	0.00100	0.00130	0.00276J	<0.0006	<0.0006	0.0014	0.00078	0.0006	<1.5E-05	0.00036
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00460	0.00770	0.00670	0.00055	0.00580	0.00680	0.00400	<0.0005	0.01700	0.01700	0.00868	0.00066	0.0024	0.0022	0.00044
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<b>&lt;0.0008</b>	<b>&lt;0.0008</b>	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.0013</b>	<b>&lt;0.0013</b>	<0.00013	0.00014J	<0.00003	<3.1E-05	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00043	0.00031	0.00028	0.00048	0.00075	0.00011J	<0.0001	<0.0037	<0.0037	<0.00037	<0.00037	<0.0001	<3.8E-05	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.0008	<0.0008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	2.6E-05 J
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.05400	0.00870	0.00430	0.00072	0.00140	0.00100	0.00310	<0.0008	<b>0.13500</b>	<b>0.10700</b>	0.0159	0.00019	0.00029	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.0011	<0.0011	<0.0011	<0.0011	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00320	0.00560	0.00600	0.00140	0.00950	0.00940	0.00650	0.00257J	0.01370	0.01540	0.00749	0.0067	0.0095	0.012	0.0058
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.05600	0.06900	0.09700	0.00027	0.09400	0.11000	0.09100	0.00495	0.17200	0.17800	0.0987	0.024	0.03	0.039	0.0097
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.02100	0.00110	0.16000	0.00035	0.04200	0.32000	0.39000	0.00094J	<b>1.72000</b>	0.235J	0.0163	<0.00028	0.00036	0.00038	0.00011
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0011	<0.0011	<0.00011	0.0012	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00065	<0.00005	<0.001	<0.001	<0.0001	<0.0001	<2.5E-05	<2.6E-05	<2.5E-05	<2.5E-05
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	<b>&lt;0.0061</b>	<b>&lt;0.0061</b>	<0.00061	<0.00061	<7.9E-05	<8.1E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.02000	0.00550	0.00250	<0.0007	0.00470	0.00730	0.00640	<0.0006	0.04160	0.04380	0.0217	0.00012	0.00018	0.0002	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00062J	<0.0004	<0.0004	<0.0004	<0.00004	<3.5E-05	<3.6E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00160	0.00320	0.00300	0.00100	0.00460	0.00540	0.00380	0.00139J	0.00732	0.00830	0.0041	0.0037	0.0069	0.0073	0.0033

- Notes:  
1. Sampling locations shown on Figure 1  
2. Concentrations > RAL and non-detects are bold type.  
3. Concentrations > cPCL and non-detects are highlighted.  
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.  
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial  
6. J = Estimated value, < = Compound not detected at the specified detection limit.  
\* indicates DNAPL is or has been observed in monitoring well



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

Constituent	CAS	Method	Residential	C/I	MW-49A														
			Assessment Level	Assessment Level	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	1/29/2018	4/1/2018	5/31/2018	1/23/2019
			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	
<b>Volatile Organic Compounds</b>																			
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.05	<0.0005	<0.00014	<0.0014	<0.0002	<0.00014	<0.0002	<0.001	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.24000</b>	<b>0.20000</b>	<b>0.29000</b>	<b>0.05700</b>	<b>0.20000</b>	<0.05	<b>0.04200</b>	<b>0.11400</b>	<b>0.09400</b>	<b>0.05650</b>	<b>0.108</b>	<b>0.013</b>	<b>0.016</b>	<b>0.01</b>	0.004
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.00530	0.0024J	<0.0005	0.0084J	<0.001	<0.05	0.0037J	<b>0.29900</b>	<b>0.47600</b>	<b>0.30400</b>	<b>0.211</b>	<0.0003	<0.0015	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.08400	0.08500	0.14000	0.04J	0.09400	<0.055	0.03700	0.03210	0.04990	0.03310	0.0701	0.01	0.01	0.0067	0.0031
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.005	<0.0013	<b>&lt;0.065</b>	<0.001	<0.00015	<0.0015	<0.00022	<b>0.0212</b>	<0.001	<0.005	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.07700	0.08300	0.13000	0.021J	0.11000	<0.05	0.03100	0.03430	0.03470	0.02960	0.0593	0.003	0.0075	0.0065	0.0023
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<b>&lt;0.005</b>	<0.001	<b>&lt;0.05</b>	<0.0005	<0.00011	<0.0011	<0.00018	<b>&lt;0.0022</b>	<0.0002		<0.0002	<0.0002
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.20000	0.21000	0.34000	0.079J	0.20000	<0.16	0.08200	0.07770	0.10600	0.06990	0.157	0.023	0.023	0.015	0.0087
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<b>&lt;0.00524</b>	<b>&lt;0.0105</b>	<b>&lt;0.00519</b>	<b>&lt;0.011</b>	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>6.80</b>	<b>0.86</b>	<b>3.70</b>	0.18	<b>3.00</b>	<0.00005	0.03700	<b>1.420</b>	<b>0.903</b>	<b>2.100</b>	<b>1.23</b>	0.097	0.033	0.097	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.00619</b>	<b>&lt;0.0124</b>	<b>&lt;0.00613</b>	<b>&lt;0.013</b>	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<b>&lt;0.00381</b>	<b>&lt;0.00762</b>	<b>&lt;0.00377</b>	<b>&lt;0.008</b>	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00381	<0.00762	<0.00377	<0.008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E+01	<b>0.60000</b>	<b>0.35000</b>	<b>0.44000</b>	<b>0.13000</b>	<b>0.27000</b>	<0.00005	<0.00005	<b>0.21800</b>	<b>0.21600</b>	<b>0.26700</b>	<b>0.293</b>	0.000078J	0.000067J	0.0079	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<b>&lt;0.0395</b>	<b>&lt;0.079</b>	<b>&lt;0.0392</b>	<b>&lt;0.083</b>	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.0267	<b>&lt;0.0533</b>	<0.0264	<b>&lt;0.056</b>	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.32000	0.20000	0.21000	0.13000	0.13000	<0.00005	0.03300	0.13400	0.12600	0.18000	0.126	0.0036	0.0049	0.007	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00390	0.00320	0.00520	0.00180	0.00290	<0.00005	0.00062	<0.00286	<0.00571	0.00528J	<0.006	0.00012	0.00012	0.00015	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.01000	0.00710	0.00990	0.00960	0.01100	<0.00005	0.00076	0.00824J	0.0119J	0.0132J	<0.005	0.00028	0.00035	0.00062	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00066	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00381	<0.00762	<0.00377	<0.008	<0.00005	<5.1E-05	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>0.00024</b>	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<b>&lt;0.00381</b>	<b>&lt;0.00762</b>	<b>&lt;0.00377</b>	<b>&lt;0.008</b>	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.00691</b>	<b>&lt;0.0124</b>	<b>&lt;0.00613</b>	<b>&lt;0.013</b>	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00090	0.00150	<0.0002	0.00029	<0.0001	<0.0001	0.0001J	<b>&lt;0.0176</b>	<b>&lt;0.0352</b>	<b>&lt;0.0175</b>	<b>&lt;0.037</b>	0.00013J	0.00014J	<0.0002	<5.5E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00060	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00381	<0.00762	<0.00377	<0.008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.210</b>	<b>0.140</b>	<b>0.160</b>	0.07500	0.09000	<0.00005	0.00990	0.08510	0.08120	0.09020	0.0941	0.0021	0.0029	0.0049	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00524	<0.0105	<0.00519	<0.011	0.000069J	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00580	0.00250	0.00340	0.00380	0.00330	<0.00005	0.00180	<0.00333	<0.00667	0.00521J	<0.007	0.00035	0.00039	0.00049	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.15000	0.11000	0.13000	0.07300	0.09200	<0.00005	0.01500	0.07170	0.06620	0.08640	0.0651	0.0025	0.0027	0.0039	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>9.00000</b>	<b>5.10000</b>	<b>10.00000</b>	<b>1.80000</b>	<b>7.40000</b>	<0.00005	<0.00005	<b>2.88000</b>	<b>3.30000</b>	<b>5.86000</b>	<b>5.13</b>	<0.00016	0.0002	0.046	8.9E-05 J
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00524	<0.0105	<0.00519	<0.011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00476	<0.00952	<0.00472	<0.01	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<b>&lt;0.029</b>	<b>&lt;0.0581</b>	<b>&lt;0.0288</b>	<b>&lt;0.061</b>	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.09600	0.07200	0.08600	0.06200	0.07000	<0.00005	0.00200	0.04550	0.06840	0.05640	0.0519	0.00066	0.00055	0.0034	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	0.00077	0.00110	0.00580	0.00950	<0.00005	0.00005	<0.00019	<0.00381	<0.00189	<0.004	<3.5E-05	<3.5E-05	0.0001 J	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00460	0.00170	0.00180	0.00200	0.00160	<0.00005	0.00095	<0.00524	<0.0105	<0.00519	<0.011	0.00018	0.00029	0.00034	<1.9E-05

- Notes:  
1. Sampling locations shown on Figure 1  
2. Concentrations > RAL and non-detects are bold type.  
3. Concentrations > cPCL and non-detects are highlighted.  
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.  
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial  
6. J = Estimated value, < = Compound not detected at the specified detection limit.  
\* indicates DNAPL is or has been observed in monitoring well

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

Constituent	CAS	Method	Residential	C/I	MW-50A														
			Assessment Level	Assessment Level	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	1/30/2018	3/28/2018	5/24/2018	1/10/2019
			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	mg/L
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.000083J	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	0.00019J	<0.00005	<0.00005	0.000390	0.000107J	<0.00007	0.000264J	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	0.00290	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00060	<0.00005	<0.00005	<0.00005	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	9.72E-05J	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.00015J	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00350	<0.0002	0.00030	0.0029	0.00077	0.00032	0.00012J	0.00051	0.000409J	<0.00037	<0.00037	<3.7E-05	<3.7E-05	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000157J	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00025	<0.00008	<0.00008	0.00011J	<0.00005	<0.00005	0.00240	<0.00008	<0.00008	0.000134J	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00061	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00220	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00030	<0.0001	0.00040	0.00260	<0.00005	<0.00005	0.02000	<0.00008	0.000265J	0.00129	0.00071	<4.6E-05	<0.00002	0.00018	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00031	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00450	0.000164J	<0.00006	7.03E-05J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00038	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00031	0.000138J	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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															
Constituent	CAS	Method	mg/L	mg/L	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	1/30/2018	3/28/2018	5/24/2018	1/10/2019	
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>mi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<b>0.00292</b>	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	0.00013J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000069J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	<0.00009	0.00013J	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	0.00017J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005	
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	<0.00002	<0.00002	2.2E-05 J	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00034	0.00190	0.00035	0.00029	0.00180	<0.0001	0.00033	<0.00037	<0.00037	0.00121	0.000804	<3.7E-05	0.000069J	<6.9E-05	7.8E-05 J	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	0.00013J	<0.00007	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	0.00012J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<2.5E-05	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00072	<0.00007	<0.00005	<0.00005	0.00012J	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00011J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00029	<0.0001	0.00087	0.0001J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000118J	0.000162J	<0.00018	<0.00023	<8.7E-05	0.00012	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	
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	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00068	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	6.99E-05J	<0.00006	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00037	<0.00007	<0.00005	<0.00005	0.000088J	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-52A				
			mg/L	mg/L	1/18/2010	7/14/2011	2/3/2012	7/12/2012	2/1/2013
<b>Volatile Organic Compounds</b>									
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	<b>0.00530</b>	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
<b>mi-Volatile Organic Compounds</b>									
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.00005	<0.00005	<0.00005	<b>&lt;0.00524</b>
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00460	0.00450	0.00340	0.02900	0.04790
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00005	<0.00005	<0.00005	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00006	<0.00006	<0.00006	<b>&lt;0.00381</b>
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00381
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.54000</b>	<b>0.33000</b>	0.09600	<b>0.16000</b>	<b>0.16500</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<b>&lt;0.0395</b>
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.0267
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.36000	0.26000	0.19000	0.15000	0.27100
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00450	0.00400	0.00240	0.00250	<0.00286
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.02200	0.04100	0.03600	0.02100	0.0231J
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00047	0.00063	0.00031	0.00022	<0.00381
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	0.00017J	0.000066J	<0.00005	<b>&lt;0.00381</b>
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.00619</b>
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00032	0.00042	0.00043	<0.0001	<b>&lt;0.0176</b>
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00041	0.00060	0.00033	0.00028	<0.00381
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.28000</b>	<b>0.20000</b>	<b>0.14000</b>	<b>0.13000</b>	<b>0.17800</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00524
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.01500	0.02400	0.01300	0.01700	0.02450
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.23000	0.18000	0.12000	0.11000	0.16700
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>3.90</b>	<b>1.90</b>	<b>0.77</b>	<b>0.83</b>	<b>0.88</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00524
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00476
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00005	<0.00005	<0.00005	<b>&lt;0.029</b>
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.24000	0.22000	0.08100	0.12000	0.22600
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	0.000066J	0.000052J	0.00015J	<0.0019
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00660	0.01100	0.00540	0.00710	0.0124J

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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								
Constituent	CAS	Method	mg/L	mg/L	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
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
<b>Volatile Organic Compounds</b>													
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.001	<0.01	<0.05	<0.0028	<0.014	<0.007	<0.0028
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.19000</b>	<b>0.07200</b>	<b>0.07000</b>	<b>0.15000</b>	<b>0.17000</b>	<b>0.13300</b>	<b>0.14500</b>	<b>0.07150</b>	<b>0.0881</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.001	<0.01	<0.005	<0.0024	<0.012	<0.006	<0.0024
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	<b>&lt;0.013</b>	<b>&lt;0.01</b>	<0.003	<b>0.0894J</b>	<b>&lt;0.0075</b>	<b>0.0179J</b>
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							<b>&lt;0.011</b>		
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
<b>mi-Volatile Organic Compounds</b>													
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.00005	<0.0005	<0.00005	<0.00011	<b>&lt;0.00534</b>	<b>&lt;0.0529</b>	<b>&lt;0.00519</b>
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>1.20000</b>	0.28000	0.48000	<b>1.80000</b>	<b>0.96000</b>	<0.00031	<b>0.95600</b>	<b>0.51900</b>	0.463
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00005	<0.0005	<0.00005	<0.00013	<b>&lt;0.00631</b>	<b>&lt;0.0625</b>	<b>&lt;0.00613</b>
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00006	<0.0006	<0.00006	<0.00008	<b>&lt;0.00388</b>	<b>&lt;0.0385</b>	<b>&lt;0.00377</b>
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.00005	<0.0005	<0.00005	<0.00008	<0.00388	<0.0385	<0.00377
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.63000</b>	<b>0.39000</b>	<b>0.33000</b>	<b>0.25000</b>	<b>0.31000</b>	<0.00007	<b>0.46800</b>	<b>0.46300</b>	<b>0.486</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.0008	<0.00008	<0.00083	<b>&lt;0.0403</b>	<b>&lt;0.399</b>	<b>&lt;0.0392</b>
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00005	<0.0005	<0.00005	<0.00056	<0.0272	<b>&lt;0.269</b>	<0.0264
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.28000	0.19000	0.16000	0.14000	0.11000	0.05730	0.20700	0.25100	0.219
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00370	0.00280	0.00300	0.0019J	0.00170	0.00210	<0.00291	<0.0288	<0.00283
Anthracene	120-12-7	8270	7.30E+00	2.20E+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	9.10E-03	2.00E-02	<b>0.01000</b>	0.00180	0.00140	<0.0005	0.00034	<0.00008	<0.00388	<b>&lt;0.0385</b>	<0.00377
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>0.00690</b>	<b>0.00081</b>	<b>0.00062</b>	<b>&lt;0.0005</b>	0.000081J	<0.00008	<b>&lt;0.00388</b>	<b>&lt;0.0385</b>	<b>&lt;0.00377</b>
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00005	<0.0005	<0.00005	<0.00013	<b>&lt;0.00631</b>	<b>&lt;0.0625</b>	<b>&lt;0.00613</b>
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00073	0.00310	<0.0001	<0.001	<0.0001	<0.00037	<b>&lt;0.018</b>	<b>&lt;0.178</b>	<b>&lt;0.0175</b>
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00990	0.00170	0.00140	<0.0005	0.00025	<0.00008	<0.00388	<0.0385	<0.00377
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.20000</b>	<b>0.13000</b>	<b>0.12000</b>	0.08400	0.07800	0.02650	<0.00388	<b>0.15J</b>	<b>0.14</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.0005	<0.00005	<0.00011	<0.00534	<0.0529	<0.00519
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.05200	0.00810	0.00900	0.00440	0.00420	0.000459J	0.0148J	0.0595J	0.0175J
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.16000	0.08300	0.08000	0.05700	0.04800	0.00213	0.09960	0.172J	0.1
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>17.00</b>	<b>11.00</b>	<b>8.60</b>	<b>9.90</b>	<b>9.70</b>	0.00227J	<b>13.8</b>	<b>11.7</b>	<b>11.6</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00005	<0.0005	<0.00005	<0.00011	<0.00534	<b>&lt;0.0529</b>	<0.00519
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00005	<0.0005	<0.00005	<0.0001	<0.00485	<0.0481	<0.00472
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	0.00053	<0.00008	<0.00005	<0.0005	<0.00005	<0.00061	<b>&lt;0.0296</b>	<b>&lt;0.293</b>	<b>&lt;0.0288</b>
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.20000	0.08400	0.08300	0.04700	0.04500	<0.00006	0.07800	0.174J	0.0893
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.15000	0.02500	0.00380	0.07900	0.04600	<0.00004	<0.00194	<0.0192	<0.00189
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.03200	0.00520	0.00610	0.00410	0.00210	0.000223J	0.00729J	<0.0529	0.0101J

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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*										
Constituent	CAS	Method	mg/L	mg/L	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
<b>Volatile Organic Compounds</b>															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.01	<0.0005	<0.0014	<0.007	<0.0002	<0.00014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.26000</b>	<b>0.17000</b>	<b>0.47000</b>	<b>0.23000</b>	<b>0.08400</b>	<b>0.14000</b>	<b>0.06400</b>	<b>0.13800</b>	<b>0.13700</b>	<b>0.10900</b>	<b>0.0412</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.01	<0.0005	<0.0012	<0.006	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	<b>0.014J</b>	<0.005	<0.0013	<0.013	<0.001	0.00367J	<0.0075	<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	<0.0005	<0.0005	<0.001	<0.01	0.0016J	<0.0011	<0.0055	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
<b>mi-Volatile Organic Compounds</b>															
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.005	<0.0001	<0.00005	<0.0005	<0.0005	<0.075	<0.0267	<0.0259	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>1.80000</b>	<b>3.00000</b>	<b>2.7J</b>	<b>2.00000</b>	<b>1.00000</b>	<b>1.70000</b>	0.20000	<b>1.62000</b>	<b>0.99400</b>	<b>7.91000</b>	0.0443J
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.00005	<0.0005	<0.0005	<0.0886	<0.0316	<0.0307
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00035	<0.00007	<0.00006	<0.0006	<0.0006	<0.0545	<0.194	<0.0189	<0.00008
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.005	<0.0001	<0.00005	<0.0005	<0.0005	<0.0545	<0.0194	<0.0189	<0.00008
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.73</b>	<b>0.89</b>	<b>3.5J</b>	<b>3.50</b>	<b>13.00</b>	<b>1.90</b>	<b>3.10</b>	<b>13.90</b>	<b>1.50</b>	<b>8.24</b>	<b>0.616</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.0004	<0.00008	<0.00008	<0.0008	<0.0008	<0.566	<0.201	<0.196	<0.00083
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.00005	<0.0005	<0.382	<0.136	<0.132	<0.00056
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.24000	0.31000	<b>2J</b>	<b>1.90000</b>	<b>8.60000</b>	1.20000	<b>1.80000</b>	<b>8.56000</b>	0.99700	<b>5.69000</b>	0.335
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00560	0.00610	0.02J	0.02200	0.09100	0.01400	0.02400	<0.0409	<0.0146	<0.0142	0.00779
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.04400	0.02200	0.9J	0.62000	<b>8.40000</b>	0.34000	0.55000	3.09000	0.33700	2.02000	0.0557
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<b>0.01100</b>	0.00051	<b>0.15J</b>	<b>0.120</b>	<b>0.450</b>	<b>0.047</b>	<b>0.074</b>	<b>0.60500</b>	<b>0.0521J</b>	<b>0.36100</b>	0.0072
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>0.00450</b>	0.00012J	<b>0.037J</b>	<b>0.028</b>	<b>0.160</b>	<b>0.014</b>	<b>0.024</b>	<b>0.165J</b>	<0.0194	<b>0.0962J</b>	<b>0.00385</b>
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.0005	<0.0005	<0.0886	<0.0316	<0.0307	<b>0.0021</b>
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00200	0.00040	<0.0004	<0.0002	<0.0001	0.0016J	<0.001	<0.252	<0.0898	<0.0873	0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00940	0.00034	0.14J	0.11000	0.53000	0.04600	0.08900	0.60200	0.0482J	0.360	0.00625
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.21</b>	<b>0.17</b>	<b>1.9J</b>	<b>1.70</b>	<b>8.60</b>	<b>0.86</b>	<b>1.70</b>	<b>7.28</b>	<b>0.80</b>	<b>4.69</b>	<b>0.257</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00045	<0.00007	<0.00005	<0.00005	<0.0005	<0.075	<0.0267	<0.0259	<0.00011
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0540	0.0063	<b>1.4J</b>	<b>1.0</b>	<b>6.0</b>	0.48	0.74	<b>4.98</b>	0.4120	<b>3.190</b>	0.0561
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0830	0.1100	<b>1.6J</b>	<b>1.4</b>	<b>7.9</b>	<b>0.72</b>	<b>1.40</b>	<b>6.54</b>	0.7130	<b>4.160</b>	0.21
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>16.0</b>	<b>7.4</b>	<b>20J</b>	<b>18.0</b>	<b>71.0</b>	<b>9.2</b>	<b>22.0</b>	<b>60.7</b>	<b>13.5</b>	<b>56.900</b>	<b>7.27</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.0005	<0.0005	<0.075	<0.0267	<0.0259	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.001	<0.00009	<0.00005	<0.0005	<0.0005	<0.0682	<0.0243	<0.0236	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00045	<0.00008	<0.00005	<0.0005	<0.0005	<0.416	<0.148	<0.144	<0.00061
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.22000	0.08800	<b>4J</b>	<b>3.50000</b>	<b>13.00000</b>	<b>2.00000</b>	<b>3.00000</b>	<b>17.00000</b>	<b>1.61000</b>	<b>13.10000</b>	0.271
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.05200	0.00990	0.042J	0.02000	<0.00005	0.00890	<0.0005	<0.0273	<0.00971	<0.00943	<0.00004
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.03800	0.00370	<b>0.84J</b>	0.67000	<b>3.30000</b>	0.34000	0.42000	<b>3.12000</b>	0.26400	<b>2.29000</b>	0.0308J

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
Constituent	CAS	Method	mg/L	mg/L	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	1/31/2018	3/19/2018	5/16/2018	1/23/2019
<b>Volatile Organic Compounds</b>																			
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0025	<0.0005	<0.0025	<0.0025	<0.001	<0.01	<0.0005	<0.00014	<0.00014	<0.00014	<0.00014	<0.0002	<0.0002	<0.001	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.05200</b>	<b>0.03800</b>	<b>0.07500</b>	<b>0.03400</b>	<0.001	<b>0.12000</b>	<b>0.16000</b>	<b>0.09430</b>	8.07E-05J	<0.00008	<b>0.259</b>	0.0048	<b>0.012</b>	<b>0.012</b>	0.0011
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0025	0.0093J	0.01J	0.0029J	<0.001	<0.01	0.0018J	0.00295	<0.00012	<0.00012	<0.0012	<0.0003	0.00054J	<0.0015	0.00046J
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	0.0066	0.038	0.035	0.0032
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0025	<0.0005	0.005J	<0.0025	<0.0013	<0.013	<0.001	<0.00015	<0.00015	<0.00015	<0.0015	<0.001	<0.001	<0.005	<0.001
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	0.00091J	0.00063J	0.0027 J	0.0014
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03		<0.0005		<b>0.0025</b>	<0.001		<b>0.01100</b>	<b>0.00281</b>	<0.00011	<0.00011	<b>0.0101J</b>	<0.0002	<0.0002	<0.001	<0.0002
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	0.012	0.068	0.015	0.005
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.01	<0.00011	<0.00011	<b>&lt;0.00539</b>	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.047	0.097	<b>0.610</b>	<b>0.680</b>	<0.0005	<b>1.10</b>	<b>2.40</b>	<b>0.95</b>	<0.00031	<0.00031	<b>9.19</b>	0.0015J	0.00053	<0.00004	0.0001 J
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.0118</b>	<0.00013	<0.00013	<b>&lt;0.00637</b>	<0.00058	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<b>&lt;0.00727</b>	<0.00008	<0.00008	<b>&lt;0.00392</b>	<0.00042	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00727	<0.00008	<0.00008	<b>&lt;0.00392</b>	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.220</b>	<b>0.100</b>	<b>0.210</b>	0.057	<0.0005	0.08200	0.00760	<b>0.24300</b>	<0.00007	<0.00007	<b>0.373</b>	0.038	0.045	<b>0.14</b>	7.2E-05 J
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<b>&lt;0.0755</b>	<0.00083	<0.00083	<b>&lt;0.0407</b>	<0.0002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<b>0.0509</b>	<0.00056	<0.00056	<0.0275	<0.00047	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.31000	0.18000	0.28000	0.12000	<0.00005	0.16000	0.05700	0.20500	<0.00008	<0.00008	0.221	0.1	0.17	0.19	0.023
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00120	0.00130	0.00150	0.00072	<0.00005	0.00110	0.00110	<0.00545	<0.00006	<0.00006	0.00996J	0.0012	0.001	0.0017	0.00038
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00450	0.00980	0.01700	0.00510	0.00039	0.00550	0.00690	0.0245J	<0.00005	<0.00005	0.0126J	0.0055	0.008	0.011	0.002
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00072	<0.00727	<0.00008	<0.00008	<0.00392	<0.0005	0.000083J	8.3E-05 J	<0.00005
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	<b>0.00027</b>	<b>&lt;0.00727</b>	<0.00008	<0.00008	<b>&lt;0.00392</b>	<0.0002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>0.0321J</b>	<0.00013	<0.00013	<b>&lt;0.00637</b>	<0.0003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00030	<0.0002	0.00046	0.00035	0.00071	<0.0001	0.00010	<b>&lt;0.0336</b>	<0.00037	<0.00037	<b>&lt;0.0181</b>	<0.00037	<3.7E-05	<9.8E-05	<0.00007
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00110	<0.00727	<0.00008	<0.00008	<0.00392	<0.00021	0.000083J	8.2E-05 J	0.00003 J
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.23000</b>	<b>0.14000</b>	<b>0.23000</b>	0.07900	0.00170	<b>0.13000</b>	0.00880	<b>0.12800</b>	<0.00008	<0.00008	<b>0.136</b>	0.036	0.008	0.091	0.013
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00120	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.01	<0.00011	<0.00011	<0.00539	<0.0002	<0.00002	<0.00002	3.2E-05 J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00250	0.00580	0.00900	0.00490	0.00100	0.00360	0.00990	0.0102J	<0.00007	<0.00007	<0.00343	0.0065	0.0074	0.0067	0.002
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.15000	0.12000	0.16000	0.06500	<0.00005	0.08000	0.02700	0.12000	<0.00007	<0.00007	0.109	0.084	0.096	0.12	0.015
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>2.40000</b>	<b>0.67000</b>	<b>1.50000</b>	0.45000	<0.00005	<b>2.20000</b>	0.06800	<b>2.96J</b>	0.00036J	<0.00008	<b>4.05</b>	0.0037	<b>0.95</b>	0.32	0.00042
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.01	<0.00011	<0.00011	<0.00539	<0.00024	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00909	<0.0001	<0.0001	<0.0049	<0.00025	<2.5E-05	<2.5E-05	<2.5E-05
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	<b>&lt;0.0555</b>	<0.00061	<0.00061	<b>&lt;0.0299</b>	<0.00079	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.04100	0.04900	0.06100	0.03700	<0.00005	0.03900	0.03600	0.05630	<0.00006	<0.00006	0.0702	0.024	0.042	0.038	0.0038
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00029	0.00740	0.00650	0.00037	0.000077J	0.00380	0.00074	<0.00364	<0.00004	<0.00004	<0.00196	0.00054J	<3.5E-05	<3.5E-05	7.4E-05 J
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00120	0.00340	0.00420	0.00220	0.00073	0.00220	0.00690	<0.01	<0.00011	<0.00011	<0.00539	0.0031	0.0039	0.0036	0.00088

- Notes:  
1. Sampling locations shown on Figure 1  
2. Concentrations > RAL and non-detects are bold type.  
3. Concentrations > cPCL and non-detects are highlighted.  
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.  
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial  
6. J = Estimated value, < = Compound not detected at the specified detection limit.  
\* indicates DNAPL is or has been observed in monitoring well



**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														
Constituent	CAS	Method	mg/L	mg/L	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	1/29/2018	3/20/2018	5/24/2018	1/23/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	0.000066J	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<4.1E-05	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.3E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	0.00020	0.00180	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.00007J	<0.00007	0.00011	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.8E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	<0.00009	0.00030	0.00079	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00008J	<0.00008	0.0001	<2.8E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	0.00026	0.00040	<0.00005	<0.00005	<0.00005	<0.00005	5.19E-05J	0.000119J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	0.00015J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<3.1E-05	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00060	0.00065	0.00023	0.00031	0.00054	0.00015J	<0.0001	<0.00037	<0.00037	<0.00037	0.000094J	<3.8E-05	<3.7E-05	<3.7E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	0.00014J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	0.00070	0.00099	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00008J	<0.00008	0.00017	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00077	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000075J	<0.00011	0.000169J	0.000178J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00050	0.00120	0.00012J	<0.00005	<0.00005	<0.00007	<0.00007	0.000199J	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00045	0.00084	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000176J	<0.00007	0.00011	<3.1E-05	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<0.0001	<0.0001	0.00047	0.00660	<0.00005	<0.00005	0.000051J	<0.00008	<0.00008	0.00008J	0.000219J	0.00068	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.6E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<8.1E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00170	0.00240	0.00018J	<0.00005	<0.00005	<0.00006	0.000075J	0.00006	<0.00006	0.00018	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000065J	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.6E-05	8.9E-05 J	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00029	0.00059	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00012J	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-60A															
			mg/L	mg/L	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	2/8/2018	3/20/2018	5/25/2018	1/11/2019
<b>Volatiles Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>ni-Volatiles Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-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	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+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	<0.00004	<4.1E-05	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-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	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-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	<4.2E-05	<4.3E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+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	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00028	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00210	0.000146J	<0.00007	<0.00007	0.000143J	0.000516	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4-Nitrophenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00016	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+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	<2.7E-05	<2.8E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+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	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00034	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	<0.00044	<0.00005	8.83E-05J	0.000158J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00025	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-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	<0.00003	<3.1E-05	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00200	0.00250	<0.0002	0.00310	0.00017J	0.00023	0.0001J	<0.00059	<0.00037	<0.00037	<0.00037	<0.00037	<3.7E-05	<3.8E-05	<3.7E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00024	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-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	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00230	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000076J	<0.00187	<0.00011	<0.00011	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	6.4E-05 J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00039	<0.00007	0.00030	0.00029	<0.00005	0.00028	0.00030	<0.00031	<0.00007	<0.00007	8.94E-05J	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+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	<0.00003	0.000054J	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+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	<0.00002	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-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	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-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	<2.5E-05	<2.6E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<8.1E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+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	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+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	<3.5E-05	<3.6E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+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	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
Constituent	CAS	Method	mg/L	mg/L	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	2/8/2018	3/20/2018	5/25/2018	1/23/2019
			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	mg/L
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00041	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00017J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00170	0.00200	0.00210	<0.0002	0.00023	0.00038	0.00027	<0.00037	<0.00037	0.00163J	0.000536	<3.7E-05	<3.7E-05	<5.4E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	8.06E-05J	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00660	<0.0001	0.00018J	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	0.00012J	0.00008J	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	0.00015 J	<2.5E-05
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	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00021	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00016J	<0.00006	5.86E-05J	0.00006J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:  
1. Sampling locations shown on Figure 1  
2. Concentrations > RAL and non-detects are bold type.  
3. Concentrations > cPCL and non-detects are highlighted.  
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.  
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial  
6. J = Estimated value, < = Compound not detected at the specified detection limit.  
\* indicates DNAPL is or has been observed in monitoring well

**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	MW-64A															MW-68A
			mg/L	mg/L	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	1/31/2018	3/25/2018	5/31/2018	1/23/2019	5/29/2019
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<0.0002	<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	0.000154J	<0.00008	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
<b>ni-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00014J	<0.00007	<0.00007	<0.00007	<0.00005	0.000053J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	0.000026J
4-Nitrophenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00029	<0.00009	<0.00009	<0.00009	<0.00005	0.00960	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	0.035	<2.7E-05	<2.7E-05	0.0012
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	0.00050	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	0.0086	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00016J	<0.00007	<0.00007	<0.00007	0.00036	<0.00005	<0.00005	0.000158J	<0.00005	<0.00005	0.000127J	<1.4E-05	0.00056	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<5.1E-05
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	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00040	0.00160	0.00200	0.00049	0.00076	0.00013J	0.00021	<0.00037	<0.00037	<0.00037	<0.00037	<0.0001	<3.7E-05	0.00023	<3.7E-05	0.00015J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00012J	<0.00008	<0.00008	<0.00008	0.00130	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.00003J	0.00038	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<0.00002	<0.00002	0.00087
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00076	<0.00007	<0.00007	<0.00007	0.00057	0.00021	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	0.00095	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00018J	<0.00007	<0.00007	<0.00007	<0.00005	0.00012J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	0.0013	<0.00003	<0.00003	0.000044J
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00092	<0.0001	<0.0001	<0.0001	<0.00005	0.00063	<0.00005	<0.00008	<0.00008	<0.00008	0.000317J	<9.4E-05	0.00058	<0.00002	<0.00002	0.00025
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00055	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	0.000032J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	0.000077J	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	0.00051	<3.5E-05	0.00041J
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00063	<0.00007	<0.00007	<0.00007	0.00042	0.00013J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	0.00059	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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	MW-69A												
			mg/L	mg/L	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	1/28/2018	3/20/2018	5/24/2018	1/10/2019
<b>Volatile Organic Compounds</b>																	
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.001	<0.001	<0.0005	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>mi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00360	<0.00008	<0.00005	<0.00005	0.000078J	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00380	0.000074J	<0.00005	<0.00005	0.00090	<0.00007	<0.00007	<0.00007	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00370	0.00025	<0.00005	<0.00005	0.00082	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00039	0.00024	<0.00005	<0.00005	0.00047	<0.00005	<0.00005	0.00050	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00049	<0.00007	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	<0.00008	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00590	0.00081	0.00086	0.00018J	0.00030	<0.00037	<0.00037	<0.00037	<0.00037	0.00028	0.00038	0.00025	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00032	0.00011J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00300	0.00022	<0.00005	<0.00005	0.00071	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	0.000069J	<0.00005	<0.00005	<0.00011	<0.00011	0.00011J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00250	0.00057	0.000059J	<0.00005	0.00045	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00330	0.00036	<0.00005	<0.00005	0.00085	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.02600	0.00011J	<0.00005	0.00029	0.00400	0.000142J	<0.00008	0.00008J	0.000155J	<0.00019	<0.00002	<0.00008	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00830	0.00120	<0.00005	<0.00005	0.00220	<0.00006	<0.00006	0.00066J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00690	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00220	0.00037	<0.00005	<0.00005	0.00033	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	0.000055J	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



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

Constituent	CAS	Method	Residential	C/I	MW-77A					MW-78A*	MW-79A					TW-56A					
			Assessment	Assessment	07/24/2014	1/30/2018	3/28/2018	5/24/2018	2/1/2019	07/24/2014	08/28/2014	1/30/2018	3/28/2018	5/25/2018	1/23/2019	1/20/2010	7/14/2011	2/2/2012	7/11/2012	1/31/2013	
			Level	Level	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	mg/L
<b>Volatiles Organic Compounds</b>																					
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.0007	<0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.023J</b>	<0.001	<0.01	<0.0025	<0.0014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.00008	<b>0.054</b>	<b>0.063</b>	<b>0.053</b>	<0.0002	<b>0.0571</b>	<b>0.0485</b>	<b>1</b>	<b>0.3</b>	<b>0.36</b>	<b>0.45</b>	<b>0.26000</b>	<b>0.27000</b>	<b>0.15000</b>	<b>0.26000</b>	<b>0.23800</b>	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.0006	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0005	<0.001	<0.01	<0.0025	0.00412J	
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011	0.059	0.063	0.044	<0.0003	0.0637	0.0215	0.18	0.12	0.14	0.19	0.36000	0.16000	0.06800	0.14000	0.20200	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.00075	0.00075	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0013	<b>&lt;0.013</b>	<0.005	<0.0015	
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.00015	0.011	0.011	0.006	<0.0002	0.1	0.076	0.99	0.44	0.48	0.55	0.32000	0.14000	0.028J	0.06900	0.03140	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.00011					<0.00055						<0.0005	<b>0.0069J</b>	<b>0.01J</b>	<b>0.01600</b>	<b>0.0126J</b>	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.00026	0.1	0.11	0.058	<0.0003	0.158	0.0763	0.48	0.31	0.41	0.54	0.98000	0.61000	0.53000	0.43000	0.50000	
<b>Non-Volatile Organic Compounds</b>																					
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<b>&lt;0.00519</b>	<0.00021	<0.00021	<0.00021	<2.1E-05	<b>&lt;0.0259</b>	<b>&lt;0.00539</b>	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.0001	<0.00005	<0.0005	<0.00005	<0.0055	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.0146	0.014	0.015	0.007	<0.00004	<b>6.66</b>	<b>6.11</b>	<b>11</b>	<b>11</b>	<b>20</b>	<b>2.5</b>	<b>2.9</b>	<b>6.8</b>	<b>4.2</b>	<b>3.8</b>	<b>4.8</b>	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<b>&lt;0.00613</b>	<0.00058	<0.00058	<0.00058	<5.8E-05	<b>&lt;0.0307</b>	<b>&lt;0.00637</b>	<0.00058	<0.00058	<0.00058	<5.8E-05	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.065</b>	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<b>&lt;0.00377</b>	<0.00042	<0.00042	<0.00042	<4.2E-05	<b>&lt;0.0189</b>	<b>&lt;0.00392</b>	<0.00042	<0.00042	<0.00042	<4.2E-05	<0.00007	<0.00006	<0.0006	<0.00006	<b>&lt;0.04</b>	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00377	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.0189	<0.00392	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.0001	<0.00005	<0.0005	<0.00005	<0.04	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.0571	<b>0.2</b>	0.085	0.085	<1.9E-05	<b>0.879</b>	<b>0.654</b>	<b>0.17</b>	<b>0.42</b>	<b>0.44</b>	<b>0.1</b>	<b>0.15</b>	<b>0.16</b>	<b>0.11</b>	0.05	<b>0.123J</b>	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<b>&lt;0.0392</b>	<0.0002	<0.0002	<0.0002	<0.00002	<b>&lt;0.196</b>	<b>&lt;0.0407</b>	<0.0002	<0.0002	<0.0002	<0.00002	<0.00008	<0.00008	<0.0008	<0.00008	<b>&lt;0.415</b>	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0264	0.0044J	<0.00047	<0.00047	<4.7E-05	<b>&lt;0.132</b>	<0.0275	<0.00047	<0.00047	0.016 J	<4.7E-05	<0.00007	<0.00005	<0.0005	<0.00005	<b>&lt;0.28</b>	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0456	0.2	0.23	0.079	<2.7E-05	0.497	0.427	0.13	0.17	0.16	0.039	0.07700	0.18000	0.19000	0.09500	0.25000	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00283	0.0032	0.0035	0.0012	<1.5E-05	<0.0142	0.0112J	0.0045	<0.00015	0.0056	0.0015	0.00240	0.00400	0.00380	0.00280	<0.03	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00236	0.0034	0.0052	0.0025	<1.4E-05	0.105J	0.0673	0.0057	0.0092	0.0084	0.0021	0.00350	0.02100	0.02000	0.00830	0.0338J	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00377	<0.0005	<0.0005	<0.0005	<0.00005	<b>0.0336J</b>	<b>0.00985J</b>	<0.0005	<0.0005	<0.0005	<0.00005	0.00099	0.00140	0.0016J	0.00240	<0.04	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>&lt;0.00377</b>	<0.0002	<0.0002	<0.0002	<0.00002	<b>&lt;0.0189</b>	<b>&lt;0.00392</b>	<0.0002	<0.0002	<0.0002	<0.00002	<b>0.00031</b>	<b>0.00047</b>	<b>0.00051J</b>	<b>0.00080</b>	<b>&lt;0.04</b>	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<b>&lt;0.00613</b>	<0.0003	<0.0003	<0.0003	<0.00003	<b>&lt;0.0307</b>	<b>&lt;0.00637</b>	<0.0003	<0.0003	<0.0003	<0.00003	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.065</b>	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<b>&lt;0.0175</b>	<0.00037	<0.00037	<0.00037	0.0001 J	<b>&lt;0.0873</b>	<b>&lt;0.0181</b>	<0.00037	<0.00037	<0.00037	<3.7E-05	0.00020	0.00010	<0.001	<0.0001	<b>&lt;0.185</b>	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00377	<0.00021	<0.00021	<0.00021	<2.1E-05	0.0248J	0.00948J	<0.00021	<0.00021	<0.00021	<2.1E-05	0.00084	0.00140	0.0018J	0.00220	<0.04	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.0229J	0.086	0.09	0.04	<0.00002	<b>0.411</b>	<b>0.342</b>	0.097	<b>0.14</b>	0.092	0.037	0.04300	0.09000	0.04900	0.03800	<b>0.108J</b>	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00519	<0.0002	<0.0002	<0.0002	8.1E-05 J	<0.0259	<0.00539	<0.0002	<0.0002	<0.0002	<0.00002	0.00045	<0.00005	<0.0005	<0.00005	<0.055	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.0033	0.0014	0.0013	0.00067 J	<0.00001	0.165	0.0713	0.0036	0.0051	0.0023	0.001	0.01000	0.02100	0.02000	0.02700	<0.035	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.024	0.076	0.083	0.037	<0.00003	0.382	0.291	0.063	0.081	0.056	0.022	0.03300	0.09000	0.05800	0.04700	0.12J	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>0.884</b>	<b>7.8</b>	<b>6</b>	<b>1.5</b>	<0.00002	<b>7.18</b>	<b>6.89</b>	<b>7.9</b>	<b>8.5</b>	<b>15</b>	<b>1.9</b>	<b>2.50</b>	<b>2.30</b>	<b>2.20</b>	<b>0.81</b>	<b>1.75</b>	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00519	<0.00024	<0.00024	<0.00024	<2.4E-05	<0.0259	<0.00539	<0.00024	<0.00024	<0.00024	<2.4E-05	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.055</b>	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00472	<0.00025	<0.00025	<0.00025	<2.5E-05	<0.0236	<0.0049	<0.00025	<0.00025	<0.00025	<2.5E-05	<0.00009	<0.00005	<0.0005	<0.00005	<0.05	
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<b>&lt;0.0288</b>	<0.00079	<0.00079	<0.00079	<7.9E-05	<b>&lt;0.144</b>	<b>&lt;0.0299</b>	<0.00079	<0.00079	<0.00079	<7.9E-05	0.00013J	0.00076	<0.0005	0.00091	<b>&lt;0.305</b>	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.0262	0.026	0.035	0.019	<2.1E-05	0.604	0.355	0.038	0.049	0.039	0.012	0.06000	0.17000	0.20000	0.07300	0.217J	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00189	<0.00035	<0.00035	<0.00035	<3.5E-05	0.192	1.13	2.6	4	4.2	0.51	0.01400	<0.00005	0.00630	<0.00005	<0.02	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00519	0.00068J	0.001	0.00037 J	<1.9E-05	0.0967J	0.0434	0.0022	0.0038	0.0022	0.00063 J	0.00670	0.01200	0.01500	0.01800	<0.055	

Notes:  
1. Sampling locations shown on Figure 1  
2. Concentrations > RAL and non-detects are bold type.  
3. Concentrations > cPCL and non-detects are highlighted.  
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.  
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial  
6. J = Estimated value, < = Compound not detected at the specified detection limit.  
\* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-32B*				MW-33B				
			Assessment Level	Assessment Level	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
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
<b>Volatile Organic Compounds</b>													
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.025	<0.0005	<0.00014	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<b>2.6</b>	<0.0005	0.00428	0.23900	<b>2.4</b>	<b>1.2</b>	<b>2</b>	<b>1</b>	<b>1.6</b>
Chlorobenzene	108-90-7	8260	1.00E+01	1.00E+01	<0.025	<0.0005	0.000343J	<0.00018	<0.0005	<0.0005	<0.0005	<0.0005	<0.001
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
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.032	<0.001	<0.00015	<0.00022	0.0096J	<0.0005	<0.0005	<0.0005	<0.0013
Toluene	108-88-3	8260	1.00E+02	1.00E+02	2.20000	<0.0005	0.00261	0.54100	0.08400	0.019J	0.016J	0.0067J	<0.001
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01									<0.001
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	1.50000	<0.0015	0.02030	0.74900	1.40000	1.20000	1.50000	0.85000	1.20000
<b>Semi-Volatile Organic Compounds</b>													
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0005	<0.00005	<0.00011	<0.0011	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	46.00000	0.00140	<0.00031	0.17800	<0.00008	0.00350	<0.00008	0.00290	0.00340
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.0005	<0.00005	<0.00013	<0.0013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.0006	<0.00006	<0.00008	<0.0008	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0005	<0.00005	<0.00008	<0.0008	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.53000	0.00019J	<0.00007	0.13700	1.90	0.71	0.51	0.52	1.60
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.0008	<0.00008	<0.00083	<0.0083	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.0005	<0.00005	<0.00056	<0.0056	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.28000	0.01400	0.0416J	0.04270	0.41000	0.17000	0.09600	0.15000	0.41000
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.00590	0.00085	<0.00006	<0.0006	0.00370	0.00160	0.00110	0.00150	0.00330
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.05900	0.00480	<0.00005	0.14400	0.14000	0.01500	0.01100	0.02700	0.16000
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	0.00330	0.00330	<0.00008	0.01950	0.02200	0.00019J	0.000073J	0.00190	0.03200
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.0005	0.00089	<0.00008	0.00649	0.00450	<0.00008	<0.00008	0.00073	0.00770
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.0005	<0.00005	<0.00013	<0.0013	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	<0.001	0.00079	<0.00037	<0.0037	0.00031	0.00800	0.00054	0.00091	0.00046
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	0.00420	0.00230	<0.00008	0.01800	0.02000	0.00018J	0.000092J	0.00180	0.02600
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.28000	0.00120	<0.00008	0.04280	0.46000	0.18000	0.13000	0.17000	0.53000
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.0005	<0.00005	<0.00011	<0.0011	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.03000	0.03100	<0.00007	0.12100	0.20000	0.00330	0.00180	0.03300	0.28000
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.15000	0.00210	<0.00007	0.02820	0.26000	0.06800	0.04800	0.06900	0.31000
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	26	0.00057	<0.00008	2.2	20.0	10.0	2.2	7.0	13.0
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.0005	<0.00005	<0.00011	<0.0011	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.0005	<0.00005	<0.0001	<0.001	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.0005	<0.00005	<0.00061	<0.0061	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.25000	0.00120	<0.00006	0.05480	0.72000	0.06600	0.04100	0.09000	0.79000
Phenol	108-95-2	8270	7.30E+02	2.20E+03	38.00000	0.000066J	<0.00004	0.03570	0.00300	<0.00007	0.00320	<0.00007	0.00100
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.02000	0.04000	<0.00011	0.08410	0.13000	0.00160	0.00092	0.00700	0.17000

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-33BR									
chemical_name	CAS	Method	mg/L	mg/L	2/15/2012	7/17/2012	2/6/2013	8/7/2013	1/21/2014	07/28/2014	1/28/2018	3/29/2018	5/31/2018	1/22/2019
<b>Volatile Organic Compounds</b>														
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.001	<0.0005	<0.007	<0.0007	<0.0002	<0.0007	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<b>2</b>	0.3	<b>1.61</b>	<b>1.62</b>	<b>0.837</b>	<b>1.41</b>	<0.0002	<0.0002	0.12	0.0025
Chlorobenzene	108-90-7	8260	1.00E+01	1.00E+01	<0.001	<0.0005	<0.006	<0.0006	0.000349J	<0.0006	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E+01	7.00E+01	0.46000	0.07000	0.47100	0.38900	0.12800	0.348	<0.0003	<0.0003	0.0058	0.013
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0013	<0.001	0.011J	<0.00075	<0.00022	<0.00075	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+02	1.00E+02	0.12000	0.02300	0.15700	0.06450	0.00942	0.00638	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01	<0.001	<0.0005	<0.0055	<0.00055	<0.00018	<0.00055	<0.0002	<0.0002	<0.0002	<0.0002
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.82000	0.15000	0.92400	0.18200	0.12800	0.0649	<0.0003	<0.0003	0.0058	<0.0003
<b>semi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.00005	<0.00005	<b>&lt;0.529</b>	<0.00519	<0.00053	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	<0.00005	0.00740	<1.49	<0.0146	<0.00149	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E+01	<0.00005	<0.00005	<b>&lt;0.625</b>	<0.00613	<0.00063	<0.00013	<5.8E-05	<0.000058	<0.000058	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00006	<0.00006	<b>&lt;0.385</b>	<0.00377	<0.00039	<0.00008	<4.2E-05	<0.000042	<0.000042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.00005	<0.00005	<0.385	<0.00377	<0.00039	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.81000	0.55000	0.993J	0.19800	0.05580	0.277	<1.9E-05	<0.000019	0.0029	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<b>&lt;3.99</b>	<0.0392	<0.00399	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00005	<0.00005	<2.69	<0.0264	<0.00269	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.23000	0.09900	<0.385	0.04550	0.06250	0.0711	<2.7E-05	<0.000027	0.0019	0.0013
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	<0.00005	0.0014J	<0.288	<0.00283	0.000288J	0.00087	<1.5E-05	<0.000015	0.000068J	<1.5E-05
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.05400	0.01100	<0.24	<0.00236	0.00450	0.00564	<1.4E-05	<0.000014	0.00018	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	0.000074J	<0.00005	<0.385	<0.00377	<0.00039	0.000119J	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00005	<0.00005	<b>&lt;0.385</b>	<0.00377	<0.00039	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00005	<0.00005	<b>&lt;0.625</b>	<0.00613	<0.00063	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.0001J	<0.0001	<b>&lt;1.78</b>	<0.0175	<0.00178	0.000722	0.000062J	<0.000037	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	0.000073J	<0.00005	<0.385	<0.00377	<0.00039	0.000132J	<2.1E-05	<0.000021	<0.000021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.38000	0.15000	<0.385	0.04980	0.07690	0.0868	<2.1E-05	<0.00002	0.0019	7.9E-05J
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.00005	<0.00005	<0.529	<0.00519	<0.00053	0.000384J	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.00490	0.01000	<0.337	<0.0033	0.00107J	0.00265	0.000049J	<0.00001	0.0003	5.3E-05J
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.12000	0.05100	<0.337	0.0181J	0.02870	0.035J	<0.00003	<0.00003	0.00058	<0.00003
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	21.0	7.3	14.9J	6.54000	1.68J	6.59	<0.00018	<0.00002	0.069	0.00004J
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00005	<0.00005	<0.529	<0.00519	<0.00053	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	0.00081	<0.00005	<0.481	<0.00472	<0.00048	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00005	<0.00005	<b>&lt;2.93</b>	<0.0288	<0.00293	<0.00061	<7.9E-05	<0.000079	<0.000079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.17000	0.09100	<0.288	0.0141J	0.02380	0.0313J	<4.7E-05	<0.000021	0.0008	<2.1E-05
Phenol	108-95-2	8270	7.30E+02	2.20E+03	0.00430	0.0014J	<0.192	<0.00189	<0.00019	<0.00004	<3.5E-05	<0.000035	<0.000035	<3.5E-05
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.00250	0.00540	<0.529	<0.00519	0.000734J	0.00126	<1.9E-05	<0.000019	0.00019	0.00003J

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level	C/I Assessment Level	MW-36B												
			mg/L	mg/L	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	1/25/2018	3/21/2018	5/31/2018	1/14/2019
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<0.0005	0.0018J	0.0014J	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	
Toluene	108-88-3	8260	1.00E+02	1.00E+02	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01			<0.001		<0.0005	<0.00011	<0.00011	<0.00018	<0.00011	<0.0002	<0.0002	<0.0002	
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<0.000058	<0.000058	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	0.0073	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.00076	<0.00007	0.00007J	<0.00007	<1.9E-05	<0.000019	<0.000019	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	<0.00009	0.00023	0.00014J	0.00023	0.00016J	<0.00008	<0.00008	0.000463J	<0.00008	0.00014	<0.000027	0.00014	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.000015	<0.000015	<1.5E-05
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00035J	<0.00005	<1.4E-05	<0.000014	<0.000014	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.00012J	<0.00008	<5.1E-05	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.010	0.00048	0.00068	0.00033	0.00021	<0.00037	<0.00037	0.00044J	<0.00037	0.00015J	<0.000037	<0.00017	0.00022
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000146J	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	<0.00008	<0.00008	<0.00005	<0.00005	0.00011J	0.000118J	<0.00008	0.00008J	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.00076	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00007	<0.00007	0.000434J	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	<0.0001	<0.0001	<0.00005	0.00024	<0.00005	0.00094	8.95E-05J	0.000825J	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00008	<0.000079	<0.000079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	<0.00005	0.00027	<0.00006	<0.00006	0.00183	<0.00006	<2.1E-05	<0.000021	<0.000021	<2.1E-05
Phenol	108-95-2	8270	7.30E+02	2.20E+03	<0.00007	0.000089J	<0.00005	0.00026	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<3.5E-05
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.00046J	<0.00011	<1.9E-05	<0.000019	<0.000019	<1.9E-05

- Notes:
- Sampling locations shown on Figure 1
  - Concentrations > RAL and non-detects are **bold** type.
  - Concentrations > cPCL and non-detects are highlighted.
  - TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  - RAL = Residential Assessment Level, C/I = Commercial/Industrial
  - J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/29/2018	3/21/2018	5/25/2018
<b>Volatile Organic Compounds</b>																		
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.0028	<0.0002	<0.0028	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-01	5.00E-01	0.00950	0.01300	0.10000	0.00570	0.05600	0.00560	0.11000	0.06310	0.46900	0.06910	0.346	0.0073	0.026	0.26
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	<0.0024	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	0.048
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.003	<0.00022	0.0212	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+02	1.00E+02	0.01600	0.04500	0.07100	0.00720	0.03800	0.00570	0.08900	0.06330	0.34500	0.09100	0.31	0.0058	0.014	0.23
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01					<0.001	<0.001	<0.0005	<0.00011	<0.0022	<0.00018	<0.0022	<0.0002	<0.0002	<0.0002
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.02400	0.07000	0.04700	0.0066J	0.02000	0.008J	0.06000	0.05270	0.22200	0.11200	0.249	0.0095	0.012	0.14
<b>Semi-Volatile Organic Compounds</b>																		
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0001	<0.0001	<0.00045	<0.0001	<0.00005	<0.00005	<0.00005	<0.00524	<0.011	<0.0259	<0.00208	<2.1E-05	<0.00021	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	0.03100	0.01300	1.20000	0.18000	0.59000	0.19000	6.30	1.09	21.40	4.96	13.6	0.2	0.34	3.4
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.00005	<0.00005	<0.00619	<0.013	<0.0307	<0.00245	<5.8E-05	<0.00058	<0.00058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00007	<0.00007	<0.0005	<0.00007	<0.00006	<0.00006	<0.00006	<0.00381	<0.008	<0.0189	<0.00151	0.002	<0.00042	<0.00042
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.00012	<0.0001	<0.00035	<0.0001	<0.00005	<0.00005	<0.00005	<0.00381	<0.008	<0.0189	<0.00151	<2.1E-05	<0.00021	<0.00021
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.14000	<0.00007	0.00160	<0.00007	0.00290	0.00950	0.18000	0.29700	0.22300	0.69100	0.276	0.00011	0.00084J	0.072
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<0.0004	<0.00008	<0.00008	<0.00008	<0.00008	<0.0395	<0.083	<0.196	<0.0157	<0.00002	<0.0002	<0.0002
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.00005	<0.00005	<0.0267	<0.056	<0.132	<0.0106	<4.7E-05	<0.00047	<0.00047
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.09400	0.01700	0.01400	0.00067	0.00510	0.03400	0.14000	0.24800	0.09640	0.62200	0.117	0.071	0.066	0.071
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.00160	0.00070	0.00063J	<0.00007	0.00019J	0.00070	0.00130	<0.00286	<0.006	<0.0142	0.00432J	0.0017	0.003	0.026
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.01900	0.00015J	<0.00045	0.00031	0.00093	0.00290	0.05600	0.08760	<0.005	0.22100	0.013	0.003	0.0038	0.0073
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	0.00035	<0.00007	<0.00035	<0.00007	0.00018J	<0.00005	0.01300	0.0228J	<0.008	0.0671J	<0.00151	0.000088J	<0.0005	<0.0005
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00008	<0.00008	<0.00035	<0.00008	0.000057J	<0.00005	0.00380	<0.00381	<0.008	<0.0189	<0.00151	<0.00002	<0.0002	<0.0002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.00005	<0.00005	<0.00619	<0.013	<0.0307	<0.00245	<0.00003	<0.0003	<0.0003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.00029	0.00053	<0.0004	0.00055	0.00024	0.00069	0.00055	<0.0176	<0.037	<0.0873	<0.00698	0.00011J	<0.00037	<0.00037
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	0.00038	<0.00007	<0.00045	<0.00007	0.00016J	<0.00005	0.01500	0.0207J	<0.008	0.0737J	<0.00151	0.00012	<0.00021	<0.00021
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.07100	0.00240	0.00260	0.00018J	0.00180	0.01900	0.12000	0.20000	<0.008	0.48400	0.08	0.028	0.009	0.03
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	0.00130	0.000083J	<0.001	<0.00007	<0.00005	<0.00005	<0.00005	<0.00524	<0.011	<0.0259	<0.00208	<0.00002	<0.0002	<0.0002
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.01400	0.00023	<0.00035	0.00019J	0.00110	0.00150	0.09300	0.16700	<0.007	0.41500	0.00456J	0.0027	0.0038	0.0036
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.07100	0.00360	0.00160	0.00018J	0.00140	0.01900	0.13000	0.21700	0.04900	0.46400	0.0633	0.0087	0.018	0.031
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	1.40000	0.00044	0.23000	0.00010	0.13000	0.04700	2.30	2.88	9.38	6.75	5.57	0.00042	0.0075	2.5
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00005	<0.00005	<0.00005	<0.00524	<0.011	<0.0259	<0.00208	<2.4E-05	<0.00024	<0.00024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.00009	<0.00009	<0.0004	<0.00009	<0.00005	<0.00005	<0.00005	<0.00476	<0.01	<0.0236	<0.00189	<2.5E-05	<0.00025	<0.00025
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00008	<0.00008	<0.00035	<0.00008	<0.00005	<0.00005	<0.00005	<0.029	<0.061	<0.144	<0.0115	<7.9E-05	<0.00079	<0.00079
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.11000	0.00017J	<0.00035	0.00007	0.00250	0.00980	0.35000	0.46600	0.039J	1.29000	0.0458	0.0073	0.011	0.028
Phenol	108-95-2	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	0.00530	0.00044	0.00021	<0.00005	0.00630	<0.0019	<0.004	0.0445J	0.0145	<3.5E-05	<0.00035	<0.00035
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.00740	0.00020	<0.00045	0.00024	0.00066	0.00083	0.06200	0.10100	<0.011	0.26200	<0.00208	0.0014	0.002	0.0021

- Notes:
- Sampling locations shown on Figure 1
  - Concentrations > RAL and non-detects are **bold** type.
  - Concentrations > cPCL and non-detects are highlighted.
  - TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  - RAL = Residential Assessment Level, C/I = Commercial/Industrial
  - J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-57B*									
			Assessment Level	Assessment Level	2/15/2012	7/24/2012	1/31/2013	7/31/2013	1/15/2014	07/29/2014	1/31/2018	4/1/2018	5/25/2018	
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
<b>Volatile Organic Compounds</b>														
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.01	<0.005	<0.0035	<0.014	<0.0002	<0.0007	<0.0002	<0.001	<0.0002	
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<b>1.40000</b>	<b>1.50000</b>	<b>0.73300</b>	<b>1.49000</b>	<b>0.71600</b>	<b>1.25</b>	0.012	0.01	<b>0.82</b>	
Chlorobenzene	108-90-7	8260	1.00E+01	1.00E+01	<0.01	<0.005	<0.003	<0.012	<0.00018	<0.0006	<0.0003	<0.0015	<0.0003	
Ethylbenzene	100-41-4	8260	7.00E+01	7.00E+01	0.39000	0.42000	0.19300	0.50100	0.17400	0.371	0.026	0.032	0.3	
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.013	0.017J	<0.00375	0.0405J	<0.00022	<0.00075	<0.001	<0.005	<0.001	
Toluene	108-88-3	8260	1.00E+02	1.00E+02	1.30000	1.40000	0.69200	1.62000	0.63000	1.33	0.0043	0.0019J	0.84	
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01						0.00299J				
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	1.20000	1.10000	0.58900	1.40000	0.57400	1.16	0.057	0.055	0.84	
<b>Semi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0005	<0.0005	<0.055	<0.0267	<0.0519	<0.011	<0.00021	<0.000021	<0.00021	
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	6.30000	16.00000	13.80000	9.67000	19.80000	15	0.01	<0.00004	3.7	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.0005	<0.0005	<0.065	<0.0316	<0.0613	<0.013	<0.00058	<0.000058	<0.00058	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.0006	<0.0006	<0.04	<0.0194	<0.0377	<0.008	<0.00042	<0.000042	<0.00042	
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0005	<0.0005	<0.04	<0.0194	<0.0377	<0.008	<0.00021	<0.000021	<0.00021	
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.92000	1.60000	1.75000	1.07000	0.89200	0.945	0.17	0.029	0.61	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.0008	<0.0008	<b>&lt;0.415</b>	<0.201	<b>&lt;0.392</b>	<0.083	<0.0002	<0.00002	<0.0002	
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.0005	<0.0005	<0.28	<0.136	<0.264	<0.056	<0.00047	<0.000047	<0.00047	
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.35000	0.44000	0.93000	0.42300	0.52400	0.267	0.13	0.13	0.3	
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.00600	0.00870	<0.03	<0.0146	<0.0283	<0.006	0.0029	0.0011	0.0063	
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.02300	0.05000	0.29200	0.0493J	0.0844J	0.0355J	0.014	0.005	0.44	
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	0.0011J	0.0012J	0.0543J	<0.0194	<0.0377	<0.008	0.001	<0.00005	0.03	
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.0005	<0.0005	<b>&lt;0.04</b>	<0.0194	<b>&lt;0.0377</b>	<0.008	0.00058J	<0.00002	0.0094	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.0005	<0.0005	<0.065	<0.0316	<0.0613	<0.013	<0.0003	<0.00003	<0.0003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.0019J	<0.001	<0.185	<0.0898	<0.175	<0.037	0.00043J	0.000095J	<0.00037	
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	0.00099J	0.0016J	0.0561J	<0.0194	<0.0377	<0.008	0.00091J	<0.000021	0.024	
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.28000	0.38000	0.81400	0.32200	0.39200	0.226	0.11	0.081	0.29	
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.0005	<0.0005	<0.055	<0.0267	<0.0519	<0.011	<0.0002	<0.00002	<0.0002	
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.00810	0.01600	0.38700	0.0301J	0.0752J	0.0109J	0.012	0.0044	0.19	
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.09500	0.23000	0.65000	0.20800	0.29800	0.138	0.081	0.096	0.27	
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	24	27	19	18	11	17	1.8	0.39	12	
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.0005	<0.0005	<0.055	<0.0267	<0.0519	<0.011	<0.00024	<0.000024	<0.00024	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.0005	<0.0005	<0.05	<0.0243	<0.0472	<0.01	<0.00025	<0.000025	<0.00025	
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.0005	<0.0005	<b>&lt;0.305</b>	<b>&lt;0.148</b>	<b>&lt;0.288</b>	<0.061	<0.00079	<0.000079	<0.00079	
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.16000	0.24000	1.39000	0.24200	0.45600	0.127	0.094	0.033	0.63	
Phenol	108-95-2	8270	7.30E+02	2.20E+03	0.45000	1.00000	1.00000	0.64500	1.00000	0.495	<0.00035	<0.000035	0.22	
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.00750	0.01100	0.245J	<0.0267	<0.0519	<0.011	0.0068	0.003	0.13	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-59B													
			Assessment Level	Assessment Level	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	1/29/2018	3/20/2018	5/25/2018	1/23/2019	
			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	
<b>Volatile Organic Compounds</b>																		
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	9.81E-05J	<0.0002	<0.00008	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001	
Toluene	108-88-3	8260	1.00E+02	1.00E+02	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00018	<0.00011	<0.0002	<0.0002	<0.0002	<0.0002	
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																		
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	<0.00008	<0.00008	<0.00005	0.25000	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<0.000059	<0.000059	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	<0.000042	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<1.9E-05	<0.000019	<0.000019	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	<0.00009	<0.00009	<0.00005	0.00170	<0.00005	<0.00008	<0.00008	<0.00008	0.000621	<2.7E-05	<0.000027	<0.000027	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.000015	<0.000015	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	<0.00005	0.000054J	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<1.4E-05	<0.000014	<0.000014	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.000051	<0.000051	<0.00005	
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	3.3E-05 J	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.00200	0.00021	0.00031	0.00068	0.00018J	<0.00037	<0.00037	<0.00037	<0.00037	0.000058J	<0.000037	<0.000037	<5.6E-05	
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	3.6E-05 J	
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	0.000201J	<0.00002	<0.00002	<0.00002	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.000115J	0.000105J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	5.1E-05 J	
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000189J	<0.00003	<0.00003	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	0.00014J	0.0001J	<0.00005	0.00012J	0.00006J	0.000269J	0.000166J	7.55E-05J	0.000627	<0.00002	<0.00002	<0.00002	7.2E-05 J	
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05	
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00008	<0.00008	<0.00005	0.00011J	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05	<0.000079	<0.000079	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	0.00025	<0.00005	<0.00006	<0.00006	5.66E-05J	<0.00006	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
Phenol	108-95-2	8270	7.30E+02	2.20E+03	0.00020	<0.00007	<0.00005	0.00033	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<3.5E-05	
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	0.000062J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<0.000019	<0.000019	5.3E-05 J	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-63B															
chemical_name	CAS	Method			mg/L	mg/L	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	1/28/2018	3/26/2018	6/6/2018	1/14/2019
<b>Volatile Organic Compounds</b>																				
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-01	5.00E-01	0.21000	0.01500	0.01900	0.01900	<0.001	0.0015J	0.00952	0.08690	0.07620	0.108	0.0033	0.0026	0.048	0.048	0.35	
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	<0.0003	<0.0003	<0.0003	<0.0003	0.00073 J	
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	0.012	0.0059	0.048	0.048	0.48	
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.001	
Toluene	108-88-3	8260	1.00E+02	1.00E+02	0.01500	0.0016J	0.0018J	0.0017J	<0.001	0.0038J	0.00241	0.000434J	0.000399J	0.00257	<0.0002	<0.0002	0.00093 J	0.0071		
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01										<0.00011						
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.08200	0.02000	0.01600	0.013J	<0.0031	<0.0015	0.00629	0.01130	0.01560	0.0535	0.0048	0.0016	0.011	0.011	0.11	
<b>emi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00524	<0.00011	<0.0011	<0.0011	<2.1E-05	<2.1E-05	<0.00021	<2.1E-05		
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	<0.00008	<0.00008	<0.00008	0.000056J	<0.00005	<0.00005	<0.0148	<0.00031	<0.0031	<0.0031	<0.00004	<0.00004	<0.0004	<0.0004	<0.0004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00619	<0.00013	<0.0013	<0.0013	<5.8E-05	<5.8E-05	<0.00058	<5.8E-05		
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00381	<0.00008	<0.0008	<0.0008	<4.2E-05	<4.2E-05	<0.00042	<4.2E-05		
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00381	<0.00008	<0.0008	<0.0008	<2.1E-05	<2.1E-05	<0.00021	<2.1E-05		
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.11000	0.03100	0.02500	0.01400	0.00290	0.00340	0.0104J	0.00242	0.00756	0.0302	0.000059J	<1.9E-05	0.0016	0.042		
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00395	<0.00083	<0.0083	<0.0083	<0.00002	<0.00002	<0.0002	<0.0002	<0.0002	
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.0267	<0.00056	<0.0056	<0.0056	<4.7E-05	<4.7E-05	<0.00047	<4.7E-05		
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.02800	0.01300	0.01700	0.00530	0.00200	0.00230	0.00952J	0.00083	0.00274J	0.00754	0.00066	<2.7E-05	0.0027	<2.7E-05		
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.00051	0.00018J	<0.00007	0.000066J	0.00012J	<0.00005	<0.00286	<0.00006	<0.0006	<0.0006	<1.5E-05	<1.5E-05	<0.00015	0.0029		
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.00068	0.00039	0.00110	0.00011J	0.00015J	0.00005J	<0.00238	<0.00005	<0.0005	<0.0005	0.00011	0.00022	<0.00014	0.00017 J		
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	0.00087	<0.00005	<0.00005	<0.00005	<0.00381	<0.00008	<0.0008	<0.0008	<0.00005	<0.00005	<0.0005	<0.00005		
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00008	<0.00008	0.00027	<0.00005	<0.00005	<0.00005	<0.00381	<0.00008	<0.0008	<0.0008	<0.00002	<0.00002	<0.0002	<0.00002		
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00619	<0.00013	<0.0013	<0.0013	<0.00003	<0.00003	<0.0003	<0.0003		
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.00036	0.00036	0.00060	0.00051	0.00096	0.00096	<0.0176	0.000381J	<0.0037	<0.0037	<3.7E-05	<3.7E-05	<0.00037	<3.7E-05		
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	<0.00007	<0.00007	0.00079	<0.00005	<0.00005	<0.00005	<0.00381	<0.00008	<0.0008	<0.0008	<2.1E-05	<2.1E-05	<0.00021	<2.1E-05		
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.02200	0.00800	0.01300	0.00410	0.00240	0.00260	0.00576J	0.00104	0.002J	0.00663	0.00065	<0.00002	0.002	0.0087		
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	0.00019J	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00524	0.000104J	<0.0011	<0.0011	<0.00002	<0.00002	<0.0002	<0.0002		
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	0.00420	<0.00005	0.000091J	0.00013J	<0.00333	<0.00007	<0.0007	<0.0007	0.0001	<0.00001	<0.0001	<0.00001		
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.00780	0.00410	0.00540	0.00190	0.00093	0.00110	<0.00333	0.000349J	0.00102J	0.00248J	0.00033	<0.00003	0.00099 J	0.0029		
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	3.10000	0.67000	0.76000	0.36000	0.02700	0.04400	0.25100	0.14600	0.37400	1.69	<0.00066	<0.00002	0.29	2.1		
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00524	<0.00011	<0.0011	<0.0011	<2.4E-05	<2.4E-05	<0.00024	<2.4E-05		
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00476	<0.0001	<0.001	<0.001	<2.5E-05	<2.5E-05	<0.00025	<2.5E-05		
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00008	<0.00008	<0.00008	<0.00005	0.00018J	<0.00005	<0.029	<0.00061	<0.0061	<0.0061	<7.9E-05	<7.9E-05	<0.00079	<7.9E-05		
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.00340	0.00076	0.00440	0.00075	0.00072	0.00100	<0.00286	<0.00006	0.00133J	<0.0006	<7.5E-05	<2.1E-05	<0.00021	0.00094 J		
Phenol	108-95-2	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	<0.00007	<0.00005	0.00057	<0.00005	<0.0019	<0.00004	0.000889J	<0.0004	<3.5E-05	<3.5E-05	<0.00035	<3.5E-05		
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	0.00290	<0.00005	0.000063J	<0.00005	<0.00524	<0.00011	<0.0011	<0.0011	<1.9E-05	<1.9E-05	<0.00019	<1.9E-05		

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-67B													
			Assessment Level	Assessment Level	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	1/31/2018	3/27/2018	6/6/2018	1/24/2019	
			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	
<b>Volatile Organic Compounds</b>																		
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00008	<0.00008	<0.0002	<0.00008	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.0005	<0.0005	<0.0013	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001	
Toluene	108-88-3	8260	1.00E+02	1.00E+02	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01							<0.00011		<0.00011					
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.0012J	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026	<0.00058	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																		
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	<0.00008	<0.00008	<0.00005	0.00050	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.00007	<0.00007	<0.00006	<0.00006	0.00220	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	<0.00007	<0.00007	<0.00005	0.00023	0.000062J	<0.00007	<0.00007	<0.00007	<0.00007	<3.1E-05	<1.9E-05	6.1E-05 J	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.00011J	<0.00009	<0.00005	0.00012J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.00160	0.00220	0.00094	0.00042	0.00012J	<0.00037	<0.00037	<0.00037	0.00184	<5.6E-05	<3.7E-05	<0.00056	5.1E-05 J	
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	<0.00008	<0.00008	<0.00005	0.00013J	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	6.9E-05 J	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.00007	0.000083J	<0.00005	<0.00005	<0.00005	<0.00011	0.000119J	0.00011J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001	
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	<0.00007	<0.00007	<0.00005	0.0001J	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	<0.0001	0.00062	<0.00005	0.00190	0.00049	<0.00008	0.000433J	0.00008J	0.000275J	<0.00045	0.00013	0.00047 J	<0.00002	
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00006	<0.00006	0.00006J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Phenol	108-95-2	8270	7.30E+02	2.20E+03	<0.00007	<0.00007	<0.00005	0.000089J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	0.00018J	<3.5E-05	<3.5E-05	<3.5E-05	
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a  
Summary of Groundwater Sampling Results - B-CZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	MW-70B*				MW-71B									
					7/17/2012	2/7/2013	1/22/2014	07/28/2014	2/8/2012	7/18/2012	2/7/2013	8/7/2013	1/24/2014	07/28/2014	1/25/2018	3/26/2018	6/6/2018	1/10/2019
<b>Volatile Organic Compounds</b>																		
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.0025	<0.007	<0.0002	<0.0014	<0.001	<0.0005	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-01	5.00E-01	0.21	<b>2.01</b>	<b>2.39</b>	<b>2.55</b>	0.01200	0.0014J	0.01240	0.10300	0.03900	0.00155	<0.0002	0.0042	0.027	0.0024
Chlorobenzene	108-90-7	8260	1.00E+01	1.00E+01	<0.0025	0.0317J	0.00072	<0.0012	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E+01	7.00E+01	0.058	0.524	0.621	0.742	0.0045J	0.00750	0.00541	0.03540	0.00793	<0.00011	<0.0003	0.00065J	0.0055	0.00093 J
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.005	<0.0075	<0.00022	<0.0015	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+02	1.00E+02	0.22	1.65	2.31	2.76	0.00770	0.00780	0.01040	0.03550	0.00918	0.00423	<0.0002	0.00094J	0.0033	<0.0002
Vinyl chloride	75-01-4	8260	2.00E+01	2.00E+01								<0.00011						
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.19	1.51	1.68	2.11	0.01600	0.03300	0.01430	0.06150	0.02020	0.0126	<0.0003	0.0044	0.013	0.00084 J
<b>emi-Volatile Organic Compounds</b>																		
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0005	<0.075	<0.0157	<0.011	<0.00005	<0.00005	<0.00011	<0.00519	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	2.60000	<2.11	<b>72</b>	<b>50.8</b>	0.00340	<0.00005	<0.00031	<0.0146	0.02250	<0.00031	<4.1E-05	<4.1E-05	0.00044	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.0005	<0.0886	<0.0186	<0.013	<0.00005	<0.00005	<0.00013	<0.00613	<0.00013	<0.00013	<5.9E-05	<5.9E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.0006	<0.0545	<0.0114	<0.008	<0.00006	<0.00006	<0.00008	<0.00377	<0.00008	<0.00008	<4.3E-05	<4.3E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0005	<0.0545	<0.0114	<0.008	<0.00005	<0.00005	<0.00008	<0.00377	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.94000	1.21000	1.40000	1.31	0.00760	0.00400	0.000377J	0.11400	0.04760	<0.00007	<1.9E-05	0.0017	0.00031	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.0008	<0.566	<0.119	<0.083	<0.00008	<0.00008	<0.00083	<0.0392	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.0005	<0.382	<0.08	<0.056	<0.00005	<0.00005	<0.00056	<0.0264	<0.00056	<0.00056	<4.8E-05	<4.8E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.91000	0.51500	0.45400	0.374	0.00390	0.00017J	0.00440	0.03460	0.02120	0.000785	<2.8E-05	0.0043	0.0023	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.01100	0.0424J	<0.00857	0.0114J	0.00019J	<0.00005	0.000135J	<0.00283	0.00122	<0.00006	<1.5E-05	0.000066J	0.00011	<1.5E-05
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.09600	0.051J	0.0423J	0.0387J	0.00056	0.00005J	0.000452J	0.00383J	0.00198	<0.00005	0.000064J	0.0022	0.00041	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	0.01600	<0.0545	<0.0114	<0.008	0.000081J	0.00011J	<0.00008	<0.00377	<0.00008	<0.00008	0.00015	0.00067	0.00013	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	0.00410	<0.0545	<0.0114	<0.008	0.00012J	0.00014J	<0.00008	<0.00377	<0.00008	<0.00008	0.0002	0.00029	0.00018	2.1E-05 J
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.0005	<0.0886	<0.0186	<0.013	<0.00005	<0.00005	<0.00013	<0.00613	<0.00013	<0.00013	<3.1E-05	<3.1E-05	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	0.00680	<0.252	<0.0529	<0.037	0.00130	0.00012J	<0.00037	<0.0175	<0.00037	<0.00037	0.00018J	0.000081J	<0.00056	<3.7E-05
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	0.01300	<0.0545	<0.0114	<0.008	0.000089J	0.00015J	<0.00008	<0.00377	<0.00008	<0.00008	0.00023	0.00077	0.00025	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.69000	0.34500	0.35500	0.278	0.00310	0.00016J	0.00244	0.02920	0.01750	<0.00008	<0.00002	0.004	0.0019	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.0005	<0.075	<0.0157	<0.011	<0.00005	<0.00005	<0.00011	<0.00519	0.00011J	<0.00011	<0.00002	<0.00002	<0.00002	2.2E-05 J
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.28000	<0.0477	0.0105J	0.013J	0.00053	0.00026	0.000387J	<0.0033	0.00071	0.000149J	0.00033	0.0045	0.0005	3.9E-05 J
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.66000	0.211J	0.21700	0.186	0.00200	0.00023	0.00168	0.0127J	0.01040	<0.00007	<3.1E-05	0.0032	0.0013	<0.00003
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	5.30	17.30	30.1	18.1	0.05100	0.00190	9.37E-05J	2.07000	0.50400	0.000471J	<0.00002	0.00048	0.00011	<0.00002
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.0005	<0.075	<0.0157	<0.011	<0.00005	<0.00005	<0.00011	<0.00519	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.0005	<0.0682	<0.0143	<0.01	<0.00005	<0.00005	<0.0001	<0.00472	<0.0001	<0.0001	<2.6E-05	<2.6E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.0005	<0.416	<0.0871	<0.061	0.00022	<0.00005	<0.00061	<0.0288	<0.00061	<0.00061	<8.1E-05	<8.1E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.93000	0.227J	0.17500	0.162	0.00250	0.00034	0.00127	0.0124J	0.00677	<0.00006	0.00012	0.012	0.0016	<2.1E-05
Phenol	108-95-2	8270	7.30E+02	2.20E+03	0.07700	2.87000	3.86000	1.69	0.00037	<0.00005	<0.00004	<0.00189	<0.00004	<0.00004	<3.6E-05	<3.6E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.09400	<0.075	<0.0157	<0.011	0.00057	0.00026	0.000253J	<0.00519	0.000353J	<0.00011	0.00031	0.0028	0.00064	3.7E-05 J

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, <= Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2a**  
**Summary of Groundwater Sampling Results - B-CZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-72B							
			Assessment Level	Assessment Level	7/12/2012	2/1/2013	7/29/2013	1/15/2014	2/8/2018	3/19/2018	5/16/2018	1/24/2019
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
<b>Volatile Organic Compounds</b>												
1,2-Dichloroethane	107-06-2	8260	5.00E-01	5.00E-01	<0.005	<0.007	<0.014	<0.0002	0.018	<0.0002	<0.001	0.011
Benzene	71-43-2	8260	5.00E-01	5.00E-01	<b>1.40</b>	<b>1.45</b>	<b>1.23</b>	<b>0.93</b>	<b>0.8</b>	<b>1.1</b>	<b>1.2</b>	<b>0.63</b>
Chlorobenzene	108-90-7	8260	1.00E+01	1.00E+01	<0.005	<0.006	<0.012	0.00029J	0.00033J	<0.0003	<0.0015	<0.0003
Ethylbenzene	100-41-4	8260	7.00E+01	7.00E+01	0.31000	0.32100	0.33200	0.22400	0.26	0.31	0.34	0.2
Methylene chloride	75-09-2	8260	5.00E-01	5.00E-01	<0.01	<0.0075	0.291	<0.00022	<0.001	<0.001	<0.005	<0.001
Toluene	108-88-3	8260	1.00E+02	1.00E+02	1.10	1.18	1.12	0.72400	0.72	0.99	0.95	0.58
Vinyl chloride	75-01-4	8260	2.00E-01	2.00E-01								
Xylenes (total)	1330-20-7	8260	1.00E+03	1.00E+03	0.88000	0.96000	0.92800	0.66100	0.87	0.94	1.1	0.63
<b>Semi-Volatile Organic Compounds</b>												
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-01	2.60E-01	<0.0005	<0.0524	<0.0267	<b>&lt;0.156</b>	<0.00021	<0.00021	<0.00021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E+01	1.50E+02	20.0	<b>98.1</b>	29.9	<b>182.0</b>	10	16	14	2
2,4-Dinitrotoluene	121-14-2	8270	1.30E-01	3.00E-01	<0.0005	<0.0619	<0.0316	<b>&lt;0.184</b>	<0.00058	<0.00058	<0.00058	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-01	3.00E-01	<0.0006	<0.0381	<0.0194	<0.113	<0.00042	<0.00042	<0.00042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+02	5.80E+02	<0.0005	<0.0381	<0.0194	<0.113	<0.00021	<0.00021	<0.00021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E+00	2.90E+01	0.74	1.39	1.19	3.37	0.33	0.42	0.23	0.071
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-01	7.30E-01	<0.0008	<b>&lt;0.395</b>	<0.201	<b>&lt;1.17</b>	<0.0002	<0.0002	<0.0002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E+00	1.50E+01	<0.0005	<0.267	<0.136	<0.792	<0.00047	<0.00047	<0.00047	0.0073 J
Acenaphthene	83-32-9	8270	1.50E+02	4.40E+02	0.23000	0.58400	0.47600	1.60000	0.07	0.15	0.12	0.019
Acenaphthylene	208-96-8	8270	1.50E+02	4.40E+02	0.00730	<0.0286	<0.0146	<0.0849	0.0021	<0.00015	0.003	0.00069 J
Anthracene	120-12-7	8270	7.30E+02	2.20E+03	0.01700	0.0646J	0.033J	0.179J	0.0085	0.02	<0.00014	0.0015
Benzo(a)anthracene	56-55-3	8270	9.10E-01	2.00E+00	<0.0005	<0.0381	<0.0194	<0.113	<0.0005	<0.0005	<0.0005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-02	2.00E-02	<0.0005	<b>&lt;0.0381</b>	<0.0194	<b>&lt;0.113</b>	<0.0002	<0.0002	<0.0002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-02	1.90E-01	<0.0005	<0.0619	<0.0316	<b>&lt;0.184</b>	<0.0003	<0.0003	<0.0003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-01	6.00E-01	<0.001	<0.176	<0.0898	<0.524	<0.00037	<0.00037	<0.00037	<3.7E-05
Chrysene	218-01-9	8270	9.10E+01	2.00E+02	<0.0005	<0.0381	<0.0194	<0.113	<0.00021	<0.00021	<0.00021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E+00	2.90E+01	0.18	0.36	0.35	1.21	0.06	0.13	0.082	0.017
Di-n-butylphthalate	84-74-2	8270	2.40E+02	7.30E+02	<0.0005	<0.0524	<0.0267	<0.156	<0.0002	<0.0002	<0.0002	<0.00002
Fluoranthene	206-44-0	8270	9.80E+01	2.90E+02	0.00340	<0.0333	<0.017	<0.0991	<0.0001	0.0015	0.00095 J	<0.00001
Fluorene	86-73-7	8270	9.80E+01	2.90E+02	0.11000	0.25300	0.22400	0.7J	0.032	0.069	0.051	0.0091
Naphthalene	91-20-3	8270	4.90E+01	1.50E+02	16.0	<b>88.5</b>	25.0	<b>82.8</b>	7.5	13	12	1.2
Nitrobenzene	98-95-3	8270	4.90E+00	1.50E+01	<0.0005	<0.0524	<0.0267	<0.156	<0.00024	<0.00024	<0.00024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E+01	4.20E+01	<0.0005	<0.0476	<0.0243	<0.142	<0.00025	<0.00025	<0.00025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-01	1.00E-01	<0.0005	<b>&lt;0.29</b>	<b>&lt;0.148</b>	<b>&lt;0.863</b>	<0.00079	<0.00079	<0.00079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E+01	2.20E+02	0.079	0.264	0.182	0.760	0.02	0.084	0.045	0.0042
Phenol	108-95-2	8270	7.30E+02	2.20E+03	3.400	7.510	6.310	31.4	4.2	4.2	2.3	0.58
Pyrene	129-00-0	8270	7.30E+01	2.20E+02	0.0019J	<0.0524	<0.0267	<0.156	<0.00019	0.0012	0.00074 J	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Table 3), Class 3, last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b**  
**Summary of Groundwater Sampling Results - B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-14															
chemical_name	CAS	Method			mg/L	mg/L	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	1/23/2018	3/18/2018	5/15/2018
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	0.00012J	<0.00011	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<0.000058	<0.000058	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<b>0.0788</b>	<4.2E-05	<0.000042	<0.000042	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00075	0.00064	0.00049	0.00039	0.00034	6.4E-05J	0.00030	0.0004J	0.0003J	0.00032J	0.00034J	0.00019	<0.00014	<0.000019	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00047	0.00043	0.00041	0.00033	0.00032	<0.00005	0.00030	0.00060	0.00055	0.00094	0.000619	0.00019	0.00027	<0.000027	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.000015	<0.000015	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	6.9E-05J	0.00028J	0.0002J	0.00005J	0.00014J	6.7E-05J	0.000052J	<0.000014	5.2E-05 J	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	
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	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00081	0.00540	0.00077	0.00029	0.00047	<0.0001	0.00011J	<0.00037	<0.00037	<0.00037	0.000615	<9.1E-05	<0.000037	<0.00014	<3.7E-05	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00045	0.00040	0.00037	0.00030	0.00031	0.00012J	0.00032	0.00047J	0.00037J	0.00044J	0.00044J	0.00024	<0.00025	<0.00002	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00018J	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	2.2E-05 J	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00024	5.5E-05J	7.9E-05J	0.00027J	7.4E-05J	<0.00007	2.8E-05J	0.000025J	<0.00001	<0.00001	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	0.00013J	<0.00007	7.9E-05J	<0.00005	<0.00005	7.6E-05J	<0.00007	<0.00007	0.00008J	9E-05J	<0.00003	0.000094J	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00320	0.00300	0.00220	0.00240	0.00140	0.00035	0.00150	0.00211	0.00216J	0.00008J	0.00143	0.00067	<0.000057	<0.00002	<0.00002	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05	
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	<7.9E-05	<0.000079	<0.000079	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00035	0.00041	0.00044	0.00030	0.00033	0.00011J	0.00038	0.00048	0.00066	0.00066	0.000506	0.00035	0.00032	<0.000021	<2.1E-05	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	0.0004J	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00029	<0.00005	<0.00011	0.00016J	<0.00011	<0.00011	<1.9E-05	<0.000019	<0.000019	<1.9E-05	

**Notes:**

1. Sampling locations shown on Figure 1
2. Concentrations > RAL and non-detects are bold type.
3. Concentrations > cPCL and non-detects are highlighted.
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
6. J = Estimated value, < = Compound not detected at the specified detection limit.

\* indicates DNAPL is or has been observed in monitoring well



**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	MW-15B									
					2/2/2012	7/19/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014	1/23/2018	3/18/2018	5/15/2018	1/8/2019
<b>Volatile Organic Compounds</b>														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.005	<0.0025	<0.00014	<0.00014	<0.00014	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.005	<b>0.0053J</b>	0.00220	0.00484	0.00101	0.00292	<0.0002	<0.0002	0.00071 J	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.005	<0.0025	<0.00012	0.00012J	<0.00012	0.00014J	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.02J	0.014J	0.00159	0.00399	0.00019J	0.00903	<0.0003	<0.0003	0.001	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<b>&lt;0.0065</b>	<0.005	<0.00015	<0.00015	<0.00015	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.005	<0.0025	<0.00015	0.00016J	<0.00015	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03										
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.016	<0.0075	0.00036J	0.00876	0.00088J	0.00464	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00005	<0.00005	<0.00011	<0.00011	<0.0011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00043	<0.00005	<0.00031	<0.00031	<0.0031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.00005	<0.00013	<0.00013	<0.0013	<0.00013	<5.9E-05	<0.000058	<0.000059	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.00006	<0.00008	<0.00008	<0.0008	<0.00008	<4.2E-05	<0.000042	<0.000042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.00005	<0.00008	<0.00008	<0.0008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.290</b>	0.023	0.00074	0.00327	0.00325J	0.00622	<1.9E-05	<0.000019	0.00015	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00083	<0.00083	<b>&lt;0.0083</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.00056	<0.00056	<0.0056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.17000	0.07500	0.04130	0.11400	0.13400	0.0653	<2.7E-05	<0.000027	0.012	0.0026
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00110	0.00080	0.00099	<0.00006	0.00148J	<0.00006	5.9E-05J	<0.000015	0.00027	0.00015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.03900	0.00710	0.00179	0.00581	0.00665	0.00517	0.00034	0.00016	0.00058	0.00023
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00016J	0.00017J	<0.00008	0.00022J	0.00087J	0.00031J	0.00017	<0.00005	0.00011	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00005	<0.00008	<0.00008	<b>&lt;0.0008</b>	<0.00008	0.00007J	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.0013</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	0.00018J	<0.00037	<0.00037	<0.0037	0.000548	<0.00007	<0.000037	0.0001 J	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00019J	0.00013J	<0.00008	0.00017J	<0.0008	0.00023J	0.00014	<0.000021	0.000098 J	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.15000</b>	0.05200	0.01270	0.05890	0.05090	0.0272	0.0005	<0.00002	0.0025	0.00014
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.00005	<0.00011	0.00019J	<0.0011	<0.00011	<0.00002	<0.00002	0.000042 J	2.2E-05 J
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.01200	0.00620	0.00101	0.00615	0.01310	0.00736	0.0027	<0.00001	0.0031	0.00045
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.08400	0.03600	0.01100	0.04590	0.04430	0.0231	0.00017	<0.00003	0.0028	5.5E-05 J
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>2.50</b>	<b>0.82</b>	0.0569J	<b>0.94300</b>	0.24800	0.452	<0.00002	<0.00002	0.02	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.00005	<0.00011	<0.00011	<0.0011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.00005	<0.0001	<0.0001	<0.001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00005	<0.00061	<0.00061	<b>&lt;0.0061</b>	<0.00061	<0.00008	<0.000079	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.08000	0.05200	0.00199	0.03760	0.02570	0.0204	0.00033	<0.000021	0.00016	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00012J	<0.00005	<0.00004	<0.00004	0.00141J	0.00112	<3.5E-05	<0.000035	<0.000035	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00500	0.00310	0.00051	0.00291	0.00569	0.00406	0.0016	<0.000019	0.0017	0.00027

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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
<b>Volatile Organic Compounds</b>														
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	0.0003J	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
<b>Semi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-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	4.90E-01	1.50E+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	1.30E-03	3.00E-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	1.30E-03	3.00E-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	2.00E+00	5.80E+00	<0.00012	<0.00011	<0.00011	<0.00011	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00044	0.00063	0.00041J	0.00721	0.00663
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<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	4.90E-02	1.50E-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	1.50E+00	4.40E+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	1.50E+00	4.40E+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	7.30E+00	2.20E+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	9.10E-03	2.00E-02	<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	1.90E-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	0.00061	<0.0002	0.00041	0.00051	<0.0001	<0.00037	0.000672	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<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	9.80E-02	2.90E-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	2.40E+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	9.80E-01	2.90E+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	9.80E-01	2.90E+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	4.90E-01	1.50E+00	0.00017J	0.00012J	0.00036	<0.00011	<0.00005	0.00320	0.03200	0.13J	<b>0.832</b>	<b>0.977</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-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	1.90E-01	4.20E-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	7.30E-01	2.20E+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	7.30E+00	2.20E+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	7.30E-01	2.20E+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 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-22BR				MW-24B								
chemical_name	CAS	Method	mg/L	mg/L	2/8/2018	3/25/2018	5/31/2018	1/22/2019	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
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0003	<0.0003	<0.0003	<0.0003	<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	0.00034J	<0.0003	<0.0003	<0.0003	<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	<0.001	<0.001	<0.001	<0.001	<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	<0.0002	<0.0002	<0.0002	<0.0002	<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	0.00082J	<0.0003	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0031	<0.0031	<0.0015	<0.00026	<0.00026
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<2.1E-05	<0.000021	<0.000021	<2.1E-05	<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	4.90E-01	1.50E+00	<0.00004	<0.000041	<0.00004	<0.00004	<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	1.30E-03	3.00E-03	<5.9E-05	<0.000059	<0.000058	<5.8E-05	<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	1.30E-03	3.00E-03	<4.2E-05	<0.000043	<0.000042	<4.2E-05	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<2.1E-05	<0.000021	<0.000021	<2.1E-05	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00056	0.00067J	0.00071 J	<1.9E-05	<0.00007	<0.00007	9.9E-05J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00002	<0.00002	<0.00002	<0.00002	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<4.7E-05	<0.000048	<0.000047	<4.7E-05	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.034	0.044	0.047	0.022	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<1.5E-05	0.00096	0.00041	<1.5E-05	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00039	0.00062	0.0013	0.00048	<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	9.10E-03	2.00E-02	<5.1E-05	<0.000051	<0.00005	<0.00005	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	<0.00002	<0.00002	<0.00002	<0.00002	<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	1.90E-03	<0.00003	<0.000031	<0.00003	<0.00003	<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	<3.7E-05	<0.000038	<0.000037	<3.7E-05	0.00046	0.00210	0.00074	<0.00002	0.00014J	0.00011J	0.00015J	<0.00037	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<2.1E-05	<0.000021	<0.000021	<2.1E-05	0.00015J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00066	0.00049	0.0011	0.00029	<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	2.40E+00	7.30E+00	<0.00002	<0.00002	<0.00002	<0.00002	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00013J	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00098	0.0011	0.0028	0.0011	0.00011J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.002	0.0017	0.0046	0.0025	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0038	0.0008	0.00044	0.00017	<0.0001	<0.0001	0.00083	<0.0001	<0.00005	<0.00005	0.00015J	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<2.4E-05	<0.000024	<0.000024	<2.4E-05	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<2.5E-05	<0.000026	<0.000025	<2.5E-05	<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	<0.000081	<0.000079	<7.9E-05	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00081	0.00018	0.00039	<2.1E-05	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<3.5E-05	<0.000036	<0.000035	<3.5E-05	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00062	0.00077	0.0015	0.00046	<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 1
2. Concentrations > RAL and non-detects are **bold** type.
3. Concentrations > cPCL and non-detects are highlighted.
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
6. J = Estimated value, < = Compound not detected at the specified detection limit.

\* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/25/2018	3/22/2015	6/5/2018	1/15/2019
<b>Volatile Organic Compounds</b>																			
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.005	<0.0007	<0.0028	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.06200</b>	<b>0.06400</b>	<b>0.06800</b>	<b>0.06400</b>	<b>0.05600</b>	<b>0.07700</b>	<b>0.06400</b>	<b>0.06620</b>	<b>0.08550</b>	<b>0.06640</b>	<b>0.0539</b>	<b>0.078</b>	<b>0.088</b>	<b>0.044</b>	0.0033
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.005	<0.0006	<0.0024	0.00024J	0.00023J	0.0009J	<0.0003	<0.0003	<0.0003
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	0.15	0.15	0.12	0.0094
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0013	<b>0.02J</b>	<0.00075	<b>0.02340</b>	<0.00022	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0057J	<0.0005	0.00500	0.0045J	<0.001	0.0042J	<0.005	0.00437J	0.00584J	0.00429	0.00377	0.0057	0.0041	0.0031	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03									<b>&lt;0.0022</b>		<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	0.064	0.066	0.056	0.004
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<b>0.00120</b>	<0.0001	<0.00005	<0.00005	<0.00005	<b>&lt;0.105</b>	<b>&lt;0.00539</b>	<b>&lt;0.106</b>	<0.0011	<0.00021	<0.00021	<0.00021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.295	<0.0152	<0.298	<0.0031	<0.0004	<0.0004	<0.0004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.124</b>	<b>&lt;0.00637</b>	<b>&lt;0.125</b>	<0.0013	<0.00059	<0.00058	<0.00058	<0.00005
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<b>&lt;0.0762</b>	<b>&lt;0.00392</b>	<b>&lt;0.0769</b>	<0.0008	<0.00042	<0.00042	<0.00042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.0762	<0.00392	<0.0769	<0.0008	<0.00021	<0.00021	<0.00021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.40</b>	<b>0.47</b>	<b>0.36</b>	<b>0.41</b>	<b>0.48</b>	<b>0.18</b>	<b>0.26</b>	<b>0.295J</b>	<b>0.43100</b>	<b>0.53400</b>	<b>0.376</b>	<b>0.13</b>	<b>0.22</b>	<b>0.25</b>	0.011
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<b>&lt;0.798</b>	<b>&lt;0.0407</b>	<b>&lt;0.798</b>	<b>&lt;0.0083</b>	<0.0002	0.00078J	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<b>&lt;0.533</b>	<b>&lt;0.0275</b>	<b>&lt;0.538</b>	<0.0056	<0.00047	<0.00047	<0.00047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.17000	0.22000	0.20000	0.19000	0.20000	0.08000	0.15000	0.173J	0.25800	0.305J	0.139	0.094	0.18	0.17	0.013
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00088	0.00130	0.00110	0.00120	0.00097	0.00063	0.00078	<0.0571	<0.00294	<0.0577	0.0015J	<0.00015	0.0014	0.00076	0.00018
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00560	0.00800	0.01500	0.01400	0.01600	0.00480	0.00640	<0.0476	0.0202J	<0.0481	0.0111	0.011	0.014	0.072	0.0011
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00017J	0.00032	0.00022	0.00031	0.00021	0.00011J	0.00020	<b>&lt;0.0762</b>	<b>&lt;0.00392</b>	<b>&lt;0.0769</b>	<0.0008	<0.00051	<0.0005	0.000075 J	7.7E-05 J
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	0.00014J	0.00012J	0.00014J	6.9E-05J	<0.00005	<0.00005	<b>&lt;0.0762</b>	<b>&lt;0.00392</b>	<b>&lt;0.0769</b>	<b>&lt;0.0008</b>	<0.0002	<0.0002	<0.00002	5.8E-05 J
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.124</b>	<b>&lt;0.00637</b>	<b>&lt;0.125</b>	<b>&lt;0.0013</b>	<0.0003	<0.0003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00052	0.00029	0.00097	0.00041	0.00056	0.00088	0.00018J	<b>&lt;0.352</b>	<b>&lt;0.0181</b>	<b>&lt;0.356</b>	<0.0037	<0.00037	<0.00037	<0.00037	<0.00014
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00015J	0.00028	0.00017J	0.00037	0.00025	0.0001J	0.00023	<0.0762	<0.00392	<0.0769	<0.0008	0.00051J	<0.00021	0.000086 J	9.8E-05 J
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.160</b>	<b>0.230</b>	<b>0.220</b>	<b>0.200</b>	<b>0.210</b>	0.097	<b>0.14000</b>	<b>0.161J</b>	<b>0.25200</b>	<b>0.256J</b>	<b>0.138</b>	<b>0.13</b>	<b>0.22</b>	<b>0.18</b>	0.015
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.105	<0.00539	<0.106	<0.0011	<0.0002	<0.0002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00310	0.00530	0.00600	0.00650	0.00560	0.00260	0.00390	<0.0667	0.00756J	0.0698J	0.00692	0.0081	0.0098	0.0031	0.0013
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.06300	0.09200	0.11000	0.09000	0.09700	0.04800	0.06900	<0.0667	0.13800	0.167J	0.076	0.057	0.092	0.095	0.0066
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>12.00</b>	<b>14.00</b>	<b>11.00</b>	<b>4.80</b>	<b>12.00</b>	<b>7.40</b>	<b>7.60</b>	<b>8.83</b>	<b>14.10</b>	<b>13.10</b>	<b>9.36</b>	<b>5</b>	<b>13</b>	<b>15</b>	0.079
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.105</b>	<0.00539	<b>&lt;0.106</b>	<0.0011	<0.00024	<0.00024	<0.00024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0952	<0.0049	<0.0962	<0.001	<0.00025	<0.00025	<0.00025	<2.5E-05
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	<b>&lt;0.581</b>	<b>&lt;0.0299</b>	<b>&lt;0.587</b>	<b>&lt;0.0061</b>	<0.0008	<0.00079	<0.00079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.06100	0.08600	0.12000	0.07800	0.12000	0.05200	0.06600	0.0936J	0.14200	0.27J	0.0891	0.088	0.18	0.11	0.0086
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00014J	<0.0381	<0.00196	0.129J	<0.0004	<0.00035	<0.00035	<0.00035	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00170	0.00270	0.00250	0.00320	0.00270	0.00160	0.00190	<0.105	<0.00539	<0.106	0.00327J	0.0057	0.0053	0.0018	0.00075

Notes:

- Sampling locations shown on Figure 1
- Concentrations > RAL and non-detects are **bold** type.
- Concentrations > cPCL and non-detects are highlighted.
- TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
- RAL = Residential Assessment Level, C/I = Commercial/Industrial
- J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/26/2018	3/25/2018	6/5/2018	1/22/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.00018	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<4.1E-05	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<0.000059	<0.000058	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.3E-05	<0.000042	<0.000042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00037	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00030	<0.00007	<0.00007	0.00014J	9.9E-05J	9.6E-05J	<0.000019	<0.000019	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.8E-05	<0.000047	<0.000047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0001J	<0.00009	0.00047	<0.00009	<0.00005	0.0001J	0.00096	0.00023J	<0.00008	7.9E-05J	0.00034J	<2.8E-05	0.000095J	0.048	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.000015	0.00036	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00013J	<0.00007	<0.00007	0.00011J	0.00013J	0.00021	0.00023	0.00031J	<0.00005	0.00014J	0.0004J	4.7E-05J	<0.000014	0.018	0.001
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<5.1E-05	<0.000051	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	7.2E-05J	<0.00013	<0.00013	<0.00013	<0.00013	<3.1E-05	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00041	0.00039	0.00074	<0.0002	0.00100	<0.0001	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	6.1E-05J	0.00012J	<0.000037	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00028	<0.00008	<0.00008	9.2E-05J	0.00041J	5.3E-05J	<0.00002	0.008	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	0.000027J	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00017J	<0.00007	<0.00005	<0.00005	0.00032	<0.00007	<0.00007	0.0001J	0.00058	<0.00001	0.000022J	0.014	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00015J	<0.00007	<0.00005	<0.00005	0.00027	<0.00007	<0.00007	7.8E-05J	0.00022J	4.6E-05J	<0.00003	0.019	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00450	0.00014J	<0.0001	0.00031	<0.00005	0.00037	0.00150	<0.00008	<0.00008	0.00047J	0.0016	0.00084	0.00016	0.00099	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.6E-05	<0.000025	<0.000025	<2.5E-05
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	<8.1E-05	<0.00008	<0.000079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00037	<0.00006	<0.00006	0.0003J	0.00016J	6.1E-05J	0.000052J	<0.000021	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.6E-05	<0.000035	<0.000035	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00027	<0.00007	<0.00005	<0.00005	0.00037	<0.00011	<0.00011	<0.00011	0.00047J	<1.9E-05	0.000035J	0.00086	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b**  
**Summary of Groundwater Sampling Results - B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/23/2018	3/19/2018	5/16/2018	1/8/2019	
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.0011	<0.0011	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.0031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.0013	<0.00013	<5.8E-05	<0.000059	<0.000059	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.0008	<0.0008	<4.2E-05	<0.000042	<0.000042	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.0008	<0.0008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	8.6E-05J	<0.00005	<0.00005	6.9E-05J	<0.00007	<0.00007	<0.0007	0.00007J	8.1E-05J	<0.000019	<0.00008	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<b>&lt;0.0083</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.0056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00022	0.00014J	0.00340	0.00039	0.00028	0.00110	0.00040	0.00076	0.00070	0.00115J	0.0012	0.00093	0.001	0.00054	0.00062	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	5.3E-05J	<0.00005	<0.00005	0.00011J	6.8E-05J	<0.0006	6.2E-05J	<1.5E-05	<0.000015	<0.000015	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00028	<0.00007	<0.00007	<0.00007	0.00040	<0.00005	0.0001J	0.00090	0.00077	0.00048J	0.000615	5.3E-05J	<0.000014	0.0002	0.00016	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00008	<0.00008	<0.0008	<0.0008	<0.00005	<0.000051	<0.000051	<0.00005	
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	<b>&lt;0.0008</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<b>&lt;0.0013</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00046	0.00070	<0.0002	0.00024	0.00092	0.00015J	0.00015J	<0.00037	<0.00037	<0.0037	<0.00037	0.0018	<0.00013J	<0.00011	<3.7E-05	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.0008	<0.0008	5.7E-05J	<0.000021	<0.000021	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.00040	6.7E-05J	<0.00008	<0.00008	<0.0008	0.00008J	0.0001	<0.00002	<0.000054	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.00012J	<0.0011	<0.0011	8.2E-05J	<0.00002	<0.000035	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00140	<0.00007	0.00190	0.00013J	7.9E-05J	0.00110	0.00036	0.00011J	0.00042J	<0.0007	6.05E-05	0.00015	0.000075J	0.000053J	6.7E-05J	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00025	0.00021	0.00048	0.00013J	0.00011J	0.00032	0.00019J	<0.00007	0.00022J	<0.0007	0.00031J	0.00011	<0.00003	0.000061J	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00052	0.00018J	0.00015J	0.00076	<0.00005	0.00034	0.00018J	0.00043J	<0.00008	<0.0008	<0.00008	0.00082	<0.00002	<0.0013	<9.2E-05	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.0011	0.000853	<2.4E-05	<0.000024	<0.000024	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	5.4E-05J	<0.00005	<0.00005	<0.0001	0.00016J	<0.001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05	
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	<b>&lt;0.0061</b>	<0.00061	<7.9E-05	<0.00008	<0.00008	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00025	<0.00007	0.00018J	<0.00005	<0.00005	0.00016J	<0.00006	9.1E-05J	<0.0006	0.0001J	<2.1E-05	<0.000021	0.000056J	3.9E-05J	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.0004	<0.0004	<3.5E-05	<0.000035	<0.000035	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00130	0.00018J	0.00200	<0.00007	0.00017J	0.00130	0.00052	0.00013J	0.00066	<0.0011	0.000818	0.00015	0.000074J	0.000064J	5.2E-05J	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/24/2018	3/19/2018	5/16/2018	1/8/2019	
					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
<b>Volatile Organic Compounds</b>																				
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.01	<0.005	<0.00014	<0.0014	<0.0007	<0.00014	<0.0002	<0.0002	<0.001	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.02600</b>	<b>0.02800</b>	<b>0.02600</b>	<b>0.01900</b>	<b>0.016J</b>	<b>0.013J</b>	<b>0.013J</b>	<b>0.01080</b>	<b>0.01150</b>	<b>0.01090</b>	<b>0.0103</b>	<b>0.0091</b>	<b>0.0066</b>	<b>0.014</b>	<b>0.0063</b>	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.001J	<0.0005	<0.0005	<0.0005	<0.001	<0.01	<0.005	<0.00012	<0.0012	<0.0006	<0.00012	<0.0003	<0.0003	<0.0015	<0.0003	
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	0.049	0.039	0.08	0.041	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.013	<0.01	<0.00015	<0.0015	<0.00075	<0.00015	<0.001	<0.001	<0.005	<0.001	
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	0.0081	0.0049	0.019	0.0048	
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	0.066	0.044	0.11	0.052	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.011	<0.00524	<0.0212	<0.0011	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.01100	0.01400	0.00440	0.00033	0.00340	0.00400	0.00390	<0.031	<0.0148	<0.0596	<0.0031	<0.00004	0.00034	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.013	<0.00619	<0.025	<0.0013	<5.9E-05	<0.000058	<0.000058	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.008	<0.00381	<0.0154	<0.0008	<4.2E-05	<0.000042	<0.000042	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.008	<0.00381	<0.0154	<0.0008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.58</b>	<b>0.49</b>	<b>0.41</b>	<b>0.27</b>	<b>0.24</b>	<b>0.20</b>	<b>0.28</b>	<b>0.30</b>	<b>0.31</b>	<b>0.35</b>	<b>0.263</b>	<b>0.13</b>	0.056	0.091	0.077	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.083	<0.0395	<0.16	<0.0083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.056	<0.0267	<0.108	<0.0056	<4.7E-05	<0.000047	0.015	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.35000	0.33000	0.27000	0.25000	0.17000	0.20000	0.23000	0.31500	0.35000	0.40200	0.236	0.26	0.16	0.14	0.12	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00270	0.00250	0.00310	0.00250	0.00190	0.00220	0.00210	<0.006	<0.00286	<0.0115	0.00335J	<1.5E-05	<0.000015	0.014	0.00083	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.01600	0.00950	0.01700	0.01700	0.00970	0.01900	0.00700	0.0183J	0.019J	0.0247J	0.0142	0.016	0.0082	0.0087	0.007	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00028	0.0001J	<0.00007	0.00016J	<0.00005	9.5E-05J	<0.00005	<0.008	<0.00381	<0.0154	<0.0008	<5.1E-05	<0.00005	<0.00005	<0.00005	
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	<0.008	<0.00381	<0.0154	<0.0008	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.013	<0.00619	<0.025	<0.0013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00047	0.00350	<0.0002	0.00075	0.00053	0.00033	0.00016J	<0.037	<0.0176	<0.0712	<0.0037	0.00038	<0.000037	<0.00012	7.9E-05 J	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00023	0.00011J	<0.00007	0.00013J	<0.00005	0.00011J	<0.00005	<0.008	<0.00381	<0.0154	<0.0008	<2.1E-05	<0.000021	<0.000021	4.5E-05 J	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.250</b>	<b>0.170</b>	<b>0.220</b>	0.092	<b>0.130</b>	<b>0.150</b>	<b>0.170</b>	<b>0.206</b>	<b>0.242</b>	<b>0.252</b>	<b>0.178</b>	<b>0.166</b>	0.085	0.086	0.069	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.011	<0.00524	<0.0212	<0.0011	<0.00002	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00820	0.00670	0.00640	0.00680	0.00490	0.00420	0.00310	<0.007	0.0104J	<0.0135	0.00562	0.0081	0.0037	0.0034	0.0041	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.20000	0.15000	0.17000	0.09300	0.13000	0.13000	0.15000	0.17500	0.21200	0.21700	0.183	0.18	0.096	0.1	0.087	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>9.70</b>	<b>8.00</b>	<b>6.80</b>	<b>6.10</b>	<b>4.00</b>	<b>4.20</b>	<b>6.00</b>	<b>6.78</b>	<b>7.73</b>	<b>6.07</b>	<b>4.24</b>	<b>1.5</b>	<b>0.97</b>	<b>1.8</b>	<b>1.3</b>	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.011	<0.00524	<0.0212	<0.0011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.01	<0.00476	<0.0192	<0.001	<2.5E-05	<0.000025	<0.000025	<2.5E-05	
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	<0.061	<0.029	<0.117	<0.0061	<0.00008	<0.000079	<0.000079	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.16000	0.12000	0.15000	0.08300	0.11000	0.08000	0.10000	0.13700	0.15800	0.19700	0.111	0.14	0.078	0.1	0.068	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.004	<0.0019	<0.00769	<0.0004	<3.5E-05	<0.000035	0.00065	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00430	0.00330	0.00350	0.00390	0.00210	0.00330	0.00190	<0.011	<0.00524	<0.0212	0.00242J	0.0036	0.0019	0.0016	0.002	

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-42B												
chemical_name	CAS	Method	mg/L	mg/L	1/19/2010	7/14/2011	2/3/2012	7/19/2012	2/5/2013	8/1/2013	1/15/2014	07/18/2014	1/24/2018	3/19/2018	5/16/2018	1/8/2019	
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0025	<0.00014	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.001	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<0.001	<0.001	<0.0025	<0.00008	<0.00008	<0.0002	<0.00008	<0.0002	<0.0002	<0.001	<0.0002	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005	<0.001	<0.001	<0.0025	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0015	<0.0003	
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0005	<0.0011	<0.0011	<0.0025	0.00011J	<0.00011	<0.00019	0.00021J	<0.0003	<0.0003	<0.0015	<0.0003	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0013	<0.0013	<b>0.0097J</b>	<0.00015	<0.00015	<0.00022	<0.00015	<0.001	<0.001	<0.005	<0.001	
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	<0.001	<0.001	<0.0025	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002	<0.0002	<0.001	<0.0002	
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	<0.0075	<0.00026	<0.00026	<0.00058	0.00035J	<0.0003	<0.0003	<0.0015	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	0.00013J	<0.00005	<0.00005	<0.00031	<0.00031	0.00092	0.000577	<0.00004	<0.00004	<0.00041	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<0.000058	<0.000059	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	<b>0.012</b>	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00005	8.9E-05J	0.00015J	0.0002J	0.00014J	0.00032J	<0.00007	<1.9E-05	<0.000019	<0.000019	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00021	0.00024	0.00170	0.00081	0.00036J	<0.00008	0.00036J	<0.00008	<2.7E-05	<0.000027	<0.000067	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<0.000015	<0.000015	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	0.00036	<0.00005	<0.00005	0.00019J	0.00012J	0.00047J	<0.00005	2.5E-05J	<0.000014	0.000019 J	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<5.1E-05	<0.000051	<0.000051	<0.00005	
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	<0.00002	<0.00002	<0.00002	<0.00002	
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00028	0.00080	<0.0001	0.00022	<0.00037	<0.00037	<0.00037	0.000513	0.00025	0.00015J	0.00021	6.1E-05 J	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	3.8E-05J	<0.000021	<0.000021	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00037	0.00005J	0.00016J	6.6E-05J	0.00022J	0.00013J	0.00021J	<0.00008	<0.00002	<0.00002	<0.000039	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00005	<0.00005	6.2E-05J	<0.00011	0.00011J	<0.00011	<0.00011	0.00006J	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00059	0.00024	0.00085	0.00041	0.00064	0.00029J	0.00034J	<0.00007	0.00024	0.00014	0.000016 J	0.00011	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00016J	0.00026	0.00050	0.00016J	<0.00007	0.00013J	0.0002J	<0.00007	<0.00003	<0.00003	<0.000047	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00035	0.00048	0.00063	0.00190	0.00048	0.00288J	0.00242J	0.00043J	<0.00002	0.00049	<0.00061	<0.00002	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05	
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	<0.00008	<0.000079	<0.00008	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00016J	0.00012J	<0.00005	0.00036J	0.00012J	0.00050	<0.00006	7.7E-05J	<0.000021	0.000039 J	<2.1E-05	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	0.000801	<3.5E-05	<0.000035	<0.000035	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00035	0.00014J	0.00044	0.00023	0.00037J	0.00013J	0.00023J	<0.00011	0.00023	0.00014	<0.000019	0.0001	

Notes:

1. Sampling locations shown on Figure 1
2. Concentrations > RAL and non-detects are **bold** type.
3. Concentrations > cPCL and non-detects are highlighted.
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
6. J = Estimated value, < = Compound not detected at the specified detection limit.

\* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-55B					
chemical_name	CAS	Method	mg/L	mg/L	2/2/2012	7/12/2012	1/30/2013	7/30/2013	1/14/2014	07/17/2014
<b>Volatile Organic Compounds</b>										
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.01	<0.005	<0.007	<0.014	<0.007	<0.0028
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.78000</b>	<b>0.89000</b>	<b>0.88100</b>	<b>0.80900</b>	<b>0.64800</b>	<b>0.846</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.01	<0.005	<0.006	<0.012	<0.006	<0.0024
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.13000	0.21000	0.16200	0.17300	0.13400	0.126
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<b>&lt;0.013</b>	<b>&lt;0.01</b>	<b>0.0213J</b>	<b>0.0517J</b>	<b>&lt;0.0075</b>	<b>0.0155J</b>
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.65000	0.90000	0.76000	0.78200	0.59700	0.591
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<b>&lt;0.011</b>		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.39000	0.68000	0.62300	0.62400	0.48100	0.443
<b>Semi-Volatile Organic Compounds</b>										
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.0005	<b>&lt;0.0208</b>	<b>&lt;0.0534</b>	<b>&lt;0.529</b>	<b>&lt;0.013</b>
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<b>35.00000</b>	<b>30.00000</b>	<b>2.06000</b>	<b>25.20000</b>	<b>44.20000</b>	<b>35.6</b>
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.0005	<0.0005	<b>&lt;0.0245</b>	<b>&lt;0.0631</b>	<b>&lt;0.625</b>	<b>&lt;0.0153</b>
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.0006	<0.0006	<b>&lt;0.0151</b>	<b>&lt;0.0388</b>	<b>&lt;0.385</b>	<b>&lt;0.00943</b>
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0005	<0.0005	<0.0151	<0.0388	<0.385	<0.00943
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.28000</b>	<b>0.64000</b>	<b>0.75700</b>	<b>0.86800</b>	<b>0.901J</b>	<b>0.512</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.0008	<0.0008	<b>&lt;0.157</b>	<b>&lt;0.403</b>	<b>&lt;3.99</b>	<b>&lt;0.0979</b>
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<b>&lt;0.106</b>	<b>&lt;0.272</b>	<b>&lt;2.69</b>	<b>&lt;0.066</b>
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.19000	0.26000	0.34700	<0.0388	<0.385	0.19
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00570	0.01000	<0.0113	<0.0291	<0.288	<0.00708
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.01600	0.03000	0.0492J	0.0437J	<0.24	0.027J
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.0011J	0.0012J	<b>&lt;0.0151</b>	<b>&lt;0.0388</b>	<b>&lt;0.385</b>	<b>&lt;0.00943</b>
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>&lt;0.0005</b>	<b>&lt;0.0005</b>	<b>&lt;0.0151</b>	<b>&lt;0.0388</b>	<b>&lt;0.385</b>	<b>&lt;0.00943</b>
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.0005	<0.0005	<b>&lt;0.0245</b>	<b>&lt;0.0631</b>	<b>&lt;0.625</b>	<b>&lt;0.0153</b>
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.001	<0.001	<b>&lt;0.0698</b>	<b>&lt;0.18</b>	<b>&lt;1.78</b>	<b>&lt;0.0436</b>
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.0005	0.0009J	<0.0151	<0.012	<0.385	<0.00943
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.15000</b>	<b>0.23000</b>	<0.0151	<b>0.30900</b>	<b>&lt;0.385</b>	<b>0.138</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.0005	<0.0005	<0.0208	<0.0534	<0.529	<0.013
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00470	0.01400	0.0153J	<0.034	<0.337	0.0119J
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.09000	0.15000	0.16600	0.195J	<0.337	0.0816
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>21.00000</b>	<b>24.00000</b>	<b>2.30000</b>	<b>21.90000</b>	<b>24.30000</b>	<b>13.5</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<0.0208	<b>&lt;0.0534</b>	<b>&lt;0.529</b>	<0.013
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0005	<0.0005	<0.0189	<0.0485	<b>&lt;0.481</b>	<0.0118
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.0005	0.00069J	<b>&lt;0.115</b>	<b>&lt;0.296</b>	<b>&lt;2.93</b>	<b>&lt;0.0719</b>
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.05700	0.13000	0.13000	0.228J	<0.288	0.1
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<b>150</b>	<b>130</b>	0.09990	<b>103</b>	<b>454</b>	<b>127</b>
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00420	0.00760	<0.0208	<0.0534	<0.529	<0.013

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b**  
**Summary of Groundwater Sampling Results - B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-62B																	
chemical_name	CAS	Method	mg/L	mg/L	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	1/24/2018	3/20/2018	5/24/2018	1/23/2019		
<b>Volatile Organic Compounds</b>																						
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	<0.0002	<0.0002	<0.0002	<0.0002		
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	<0.0002	<0.0002	0.0021	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003		
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	<0.0003	<0.0003	0.013	<0.0003		
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	<0.001	<0.001	<0.001	<0.001		
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	<0.0002	<0.0002	0.003	<0.0002		
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	<0.0003	<0.0003	0.014	<0.0003		
<b>Semi-Volatile Organic Compounds</b>																						
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<0.000021	<0.000021	<2.1E-05		
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005		<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004		
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<0.000058	<0.000058	<5.8E-05		
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006		<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<0.000042	<0.000042	<4.2E-05		
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05		
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00012J	0.00160	0.00064	<0.00007	<0.00005		<0.00005	0.00006J	0.00017J	<0.00007	<0.00007	<0.00007	<1.9E-05	<0.000019	0.00011	<1.9E-05		
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008		<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002		
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<0.000047	<0.000047	<4.7E-05		
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00780	0.03900	0.00041	<0.00009	0.21000		0.02600	0.08500	0.00024J	<0.00008	<0.00008	0.00024J	0.00006J	0.023	0.11	<2.7E-05		
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.00066	<0.00007	<0.00007	0.00260		0.00130	0.00084	0.00011J	<0.00006	<0.00006	<0.00006	6.1E-05J	0.00063	0.0013	<1.5E-05		
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00024	0.00110	<0.00007	<0.00007	0.01300		<0.00005	0.00320	0.00072	<0.00005	<0.00005	7E-05J	0.00036	0.00051	0.0044	<1.4E-05		
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005		
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	<0.00002	<0.00002	<0.00002	<0.00002		
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003		
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00041	0.00098	0.00160	0.00022	0.00042		0.00029	0.00013J	<0.00037	<0.00037	<0.00037	0.00026	0.00018J	<0.00013	<3.7E-05	<3.7E-05		
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<0.000021	<0.000021	<2.1E-05		
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00240	0.01300	0.00034	<0.00008	<b>0.15</b>	<b>0.23</b>	0.00012J	0.03800	0.00017J	<0.00008	<0.00008	9.2E-05J	<0.00002	0.0031	0.048	<0.00002		
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00065	<0.00007	<0.00007	<0.00007	<0.00005		<0.00005	7.8E-05J	<0.00011J	<0.00011J	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002		
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00012J	0.00110	<0.00007	0.00014J	0.00790		0.00053	0.00400	0.00033J	<0.00007	<0.00007	<0.00007	0.00052	0.0015	0.0041	<0.00001		
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00120	0.01500	0.00016J	<0.00007	0.05800		0.00020	0.00870	<0.00007	<0.00007	<0.00007	0.00013J	0.00015	0.0047	0.034	<0.00003		
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00270	0.00028	0.00960	<0.0001	0.03500		0.00021	0.00560	0.00129J	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	0.038	<0.00002		
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<0.000024	<0.000024	<2.4E-05		
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005		<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<0.000025	<0.000025	<2.5E-05		
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	<7.9E-05	0.00033	<0.000079	<7.9E-05		
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00087	0.00250	0.00025	<0.00007	0.03500		0.00014J	0.00260	0.00047	<0.00006	<0.00006	0.00014J	<2.1E-05	0.00023	0.0083	<2.1E-05		
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005		5.3E-05J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<0.000035	<0.000035	<3.5E-05		
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.00047	<0.00007	7.7E-05J	0.00330		0.00037	0.00210	0.00039J	<0.00011	<0.00011	<0.00011	0.00039	0.00077	0.002	<1.9E-05		

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-68B									
chemical_name	CAS	Method	mg/L	mg/L	2/16/2012	7/16/2012	2/6/2013	8/8/2013	1/22/2014	07/24/2014	1/29/2018	3/21/2018	6/6/2018	1/15/2019
<b>Volatile Organic Compounds</b>														
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.005	<0.0005	<0.014	<0.014	<0.0002	<0.0028	<0.001	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>2.70000</b>	<b>2.40000</b>	<b>2.35000</b>	<b>2.88000</b>	<b>1.50000</b>	<b>2.18</b>	<b>2.1</b>	<b>1.4</b>	<b>1.9</b>	<b>2</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.005	<0.0005	0.0273J	<0.012	0.00045J	<0.0024	<0.0015	<0.0003	<0.0003	0.00056 J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.45000	0.49000	0.44900	0.55000	0.36400	0.403	0.61	0.29	0.5	0.5
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0065	<0.001	<0.015	<b>0.10100</b>	<0.00022	<0.003	<0.005	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.91000	0.93000	0.70100	0.62500	0.32900	0.538	0.45	0.2	0.45	0.086
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<0.011		<b>0.007J</b>				
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	1.20000	1.30000	1.04000	1.28000	0.85700	1.08	1.6	0.83	1.4	1.2
<b>Semi-Volatile Organic Compounds</b>														
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00005	<0.00025	<0.00524	<0.00519	<0.011	<0.0055	<0.00021	<0.00021	<0.00021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.19000	0.27000	0.27300	<0.0146	<b>0.53600</b>	0.445	0.051J	0.07	0.23 J	0.05
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.00025	<0.00619	<0.00613	<0.013	<0.0065	<0.00058	<0.00059	<0.00058	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.0003	<0.00381	<0.00377	<0.008	<0.004	<0.00042	<0.00042	<0.00042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.00025	<0.00381	<0.00377	<0.008	<0.004	<0.00021	<0.00021	<0.00021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.66000</b>	<b>1.30000</b>	<b>0.95200</b>	<b>1.41000</b>	<b>1.10000</b>	<b>0.852</b>	<b>0.6</b>	<b>0.67</b>	<b>1.4</b>	<b>0.33</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.0004	<0.0395	<0.0392	<0.083	<0.0415	<0.0002	<0.0002	<0.0002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.00025	<0.0267	<0.0264	<0.056	<0.028	<0.00047	<0.00047	<0.00047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.15000	0.23000	0.26100	0.30400	0.26300	0.178	0.13	0.21	0.34	0.1
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00230	0.00300	<0.00286	<0.00283	<0.006	<0.003	0.002	0.0021	0.0022	0.0012
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.04600	0.03400	0.0194J	0.023J	0.0428J	0.0169J	0.014	0.014	0.015	0.008
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00600	0.00540	<0.00381	<0.00377	<b>0.0123J</b>	<0.004	<0.0005	<0.00051	<0.0005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>0.00170</b>	<b>0.00160</b>	<b>0.00381</b>	<b>0.00377</b>	<b>&lt;0.008</b>	<b>&lt;0.004</b>	<0.0002	<0.0002	<0.0002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.00025	<0.00619	<0.00613	<0.013	<0.0065	<0.0003	<0.0003	<0.0003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.0001	<0.0005	<0.0176	<0.0175	<0.037	<0.0185	<0.00037	<0.00037	<0.00037	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00520	0.00500	<0.00381	<0.00377	0.00806J	<0.0024	<0.00021	<0.00021	<0.00021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.190</b>	<b>0.300</b>	<b>0.260</b>	<b>0.325</b>	<b>0.284</b>	<b>0.198</b>	<b>0.16</b>	<b>0.24</b>	<b>0.38</b>	<b>0.1</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.00025	<0.00524	<0.00519	<0.011	<0.0055	<0.0002	<0.0002	<0.0002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.05000	0.04400	<0.00333	0.00764J	0.05200	0.00825J	0.0052	0.006	0.0063	0.0031
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.09600	0.13000	0.11800	0.15400	0.14900	0.0966	0.082	0.092	0.18 J	0.057
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>14</b>	<b>26</b>	<b>12</b>	<b>31</b>	<b>17</b>	<b>10.5</b>	<b>9.2</b>	<b>12</b>	<b>23</b>	<b>5</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.00025	<0.00524	<0.00519	<0.011	<0.0055	<0.00024	<0.00024	<0.00024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	0.00110	<0.00025	<0.00476	<0.00472	<0.01	<0.005	<0.00025	<0.00025	<0.00025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00025	<0.029	<0.0288	<0.061	<0.0305	<0.00079	<0.0008	<0.00079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.19000	0.24000	0.12000	0.13600	0.26300	0.106	0.099	0.15	0.22 J	0.065
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.03500	0.05800	0.04210	0.07950	0.08620	0.00988J	<0.00035	<0.00035	<0.00035	0.0019 J
Pyrene	129-00-0	8270	7.30E-01	2.20E+01	0.03100	0.02400	<0.00524	<0.00519	0.0341J	<0.0055	0.0025	0.0032	0.0058 J	0.0015

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	1/30/2018	3/28/2018	6/7/2018	1/23/2019
					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
<b>Volatile Organic Compounds</b>																			
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.0005	<0.00014	0.00068J	<0.0002	<0.00014	<0.01	<0.005	<0.0028	<0.0007	<0.0028	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00970	<0.0005	0.00022J	0.00016J	<0.0002	0.00309	0.35000	0.71000	0.55200	0.79500	0.652	0.47	0.58	0.71	0.83
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.0005	<0.00012	<0.00012	<0.00018	<0.00012	<0.01	<0.005	<0.0024	<0.0006	<0.0025	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.00590	<0.0005	<0.00011	<0.00011	0.00044J	<0.00011	0.08600	0.14000	0.14700	0.20300	0.2	0.25	0.12	0.17 J	0.22
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.001	<0.00015	<0.00015	<0.00022	<0.00015	<0.013	<0.01	<0.003	<0.00075	0.003	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.01500	<0.0005	0.00034J	<0.00015	0.00058	<0.00015	0.32000	0.56000	0.53300	0.77400	0.741	0.75	0.56	0.74	0.69
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	0.53	0.33	0.51 J	0.63
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.0005	<0.0005	<0.106	<0.208	<0.216	<0.0021	<0.00021	<0.0021	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00700	0.00280	<0.00031	<0.00031	0.00095	<0.00031	55	41.0	56.9	525	70.6	59	30	57	9
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.0005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.0005	<0.0005	<0.125	<0.254	<0.255	<0.0058	<0.00058	<0.0058	<5.8E-05
2,6-Dinitrotoluene	608-20-2	8270	1.30E-03	3.00E-03	<0.0006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.0006	<0.0006	<0.0769	<0.151	<0.157	<0.0042	<0.00042	<0.0042	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.0005	<0.0005	<0.0769	<0.151	<0.157	<0.0021	<0.00021	<0.0021	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00055J	0.00011J	<0.00007	8.8E-05J	0.01610	<0.00007	0.39000	0.43000	0.67300	5.52	0.95J	0.3	2.4	0.99	0.22
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.0008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.0008	<0.0008	<0.798	<1.57	<1.63	<0.002	<0.0002	<0.002	<0.0002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.0005	<0.0005	<0.538	<1.06	<1.1	0.033J	<0.00047	<0.0047	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.01200	0.00016J	0.00019J	0.00012J	0.01120	<0.00008	0.29000	0.21000	0.31J	2.40	0.413J	0.31	1.4	0.33	0.098
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.0013J	<0.00005	7E-05J	<0.00006	<0.00006	<0.00006	0.00580	0.00620	<0.0577	<0.113	<0.118	0.012	0.019	0.0098 J	0.0032
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.0005	0.00012J	0.00019J	0.00025J	0.00462	0.00015J	0.03700	0.02400	<0.0481	0.282J	<0.098	0.027	0.58	0.034	0.0074
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.0005	5.7E-05J	<0.00008	<0.00008	0.00131	<0.00008	<0.0005	0.00220	<0.0769	<0.151	<0.157	<0.005	0.22	<0.005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.0005	<0.00005	<0.00008	<0.00008	0.00039J	<0.00008	<0.0005	0.00085J	<0.0769	<0.151	<0.157	<0.002	0.064	<0.002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.0005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.0005	<0.0005	<0.125	<0.245	<0.255	<0.003	<0.0003	<0.003	<0.0003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.001	0.00012J	<0.00037	<0.00037	0.0015J	0.000603	<0.001	<0.001	<0.356	<0.698	<0.725	<0.0037	<0.00037	<0.0037	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.0005	9.6E-05J	<0.00008	<0.00008	0.00119	<0.00008	<0.0005	0.0018J	<0.0769	<0.151	<0.157	<0.0021	0.23	<0.0021	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00078J	6.7E-05J	<0.00008	<0.00008	0.01020	<0.00008	0.25000	0.19000	0.252J	1.84	<0.157	0.24	1.4	0.24	0.079
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.0005	<0.00005	<0.00011	0.00013J	0.00017J	<0.00011	<0.0005	<0.0005	<0.106	<0.208	<0.216	<0.002	<0.0002	<0.002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.01000	5.9E-05J	0.00014J	<0.00007	0.00937	<0.00007	0.00440	0.01800	<0.0673	<0.132	<0.137	0.015	1.4	0.017	0.0038
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00410	0.00021	<0.00007	8.1E-05J	0.00951	<0.00007	0.17000	0.14000	0.196J	1.34	0.263J	0.19	1.4	0.19	0.056
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0014J	0.00064	0.00044J	0.00067J	0.09060	<0.00008	16.00	10.00	13.90	139.00	17.90	18	21	19	4
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.0005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.0005	<0.0005	<0.106	<0.208	<0.216	<0.0024	<0.00024	<0.0024	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0962	<0.189	<0.196	<0.0025	<0.00025	<0.0025	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.0005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.0005	<0.0005	<0.587	<0.189	<1.2	<0.0079	<0.00079	<0.0079	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00087J	8.9E-05J	<0.00006	0.00023J	0.03480	<0.00006	0.15000	0.15000	0.169J	1.28	0.307J	0.16	3.7	0.17	0.046
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00530	0.00015J	<0.00004	<0.00004	0.00052	<0.00004	43.0	38.0	63.2	420.0	53.3	56	25	39	5
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00770	<0.00005	<0.00011	<0.00011	0.00725	<0.00011	0.00500	0.01000	<0.106	<0.208	<0.216	0.0079J	0.83	0.0077 J	0.002

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



**Table 5B-2b  
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				
chemical_name	CAS	Method	mg/L	mg/L	2/8/2012	7/26/2012	4/2/2013	1/29/2014	07/24/2014	08/28/2014	1/30/2018	3/28/2018	5/24/2018	1/10/2019	07/24/2014	1/29/2018	3/28/2018	5/25/2018	1/10/2019
<b>Volatile Organic Compounds</b>																			
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.01	<0.0025	<0.0028	<0.0007	<0.00014	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.61000</b>	<b>0.85000</b>	<b>0.36900</b>	<b>0.50200</b>	<b>0.298</b>	9E-05J	<0.0002	<0.0002	<0.0002	<0.0002	<0.00008	<0.0002	<0.0002	<0.0002	0.00021 J
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.01	<0.0025	<0.0024	<0.0008	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.00012	<0.0003	<0.0003	<0.0003	0.00036 J
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.13000	0.10000	0.06900	0.07730	0.0737	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<b>&lt;0.013</b>	<0.005	<0.003	<0.00075	<0.00015	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.00015	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.51000	0.50000	0.28200	0.32800	0.273	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0005	<0.0005	<b>&lt;0.00212</b>	<b>&lt;0.0519</b>	<b>&lt;0.00214</b>	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.18000	<b>0.64000</b>	0.06950	<b>6.35000</b>	<b>0.00602</b>	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.0005	<0.0005	<b>&lt;0.0025</b>	<b>&lt;0.0613</b>	<b>&lt;0.00252</b>	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<0.00013	<5.8E-05	<5.9E-05	0.00079	<5.8E-05
2,6-Dinitrotoluene	608-20-2	8270	1.30E-03	3.00E-03	<0.0006	<0.0006	<b>&lt;0.00154</b>	<b>&lt;0.0377</b>	<b>&lt;0.00155</b>	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<0.00008	<4.2E-05	<4.2E-05	0.001	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0005	<0.0005	<0.00154	<0.0377	<0.00155	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00008	<2.1E-05	<2.1E-05	0.0018	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.62</b>	<b>0.60</b>	<b>0.10</b>	<b>3.18</b>	<b>0.546</b>	0.00016J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.0008	<0.0008	<b>&lt;0.016</b>	<b>&lt;0.392</b>	<b>&lt;0.0161</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<0.0108	<b>&lt;0.264</b>	<0.0109	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.34000	0.26000	0.06970	<b>2.57000</b>	0.429	8.4E-05J	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.01300	0.00580	<0.00115	0.0672J	0.0121	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.03500	0.04500	0.00948J	0.60500	0.0626	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00064J	0.00470	<0.00154	<b>0.0667J</b>	0.00748J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00008	<0.00005	<5.1E-05	<5.1E-05	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>&lt;0.0005</b>	<b>0.0013J</b>	<b>&lt;0.00154</b>	<b>&lt;0.0377</b>	<b>&lt;0.00155</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.0005	<0.0005	<b>&lt;0.0025</b>	<b>&lt;0.0613</b>	<b>&lt;0.00252</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	<0.001	<0.001	<b>&lt;0.00712</b>	<b>&lt;0.175</b>	<b>&lt;0.00718</b>	0.00106	<6.9E-05	<3.7E-05	<0.00012	<3.7E-05	<0.00037	<3.7E-05	<3.7E-05	<0.00006	5.8E-05 J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00062J	0.00420	<0.00154	0.0704J	0.00677J	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.29000</b>	<b>0.23000</b>	0.05330	<b>1.56000</b>	<b>0.214</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.0005	<0.0005	<0.00212	<0.0519	<0.00214	<0.00011	<0.00002	<0.00002	<4.7E-05	<0.00002	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.01600	0.04000	0.01030	0.70800	0.0914	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.19000	0.17000	0.04250	<b>1.59</b>	0.218	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>8.90</b>	<b>9.30</b>	0.21100	<b>27.10</b>	<b>5.7</b>	0.00157	<0.00002	<0.00002	<0.00002	6.8E-05 J	<0.00008	<0.00002	<0.00002	<0.00002	0.00016
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.0005	<0.0005	<0.00212	<b>&lt;0.0519</b>	<0.00214	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0005	<0.0005	<0.00192	<0.0472	<0.00194	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.0005	<0.0005	<b>&lt;0.0117</b>	<b>&lt;0.288</b>	<b>&lt;0.0118</b>	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<0.00061	<7.9E-05	<0.00008	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.24000	0.27000	0.06060	<b>2.13000</b>	0.238	7.9E-05J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	9.4E-05J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00660	0.00270	0.0069J	0.108J	<0.00078	0.00018J	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00980	0.02600	0.00617J	0.41600	0.0537	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b  
Summary of Groundwater Sampling Results - B-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	MW-82B				MW-83B					MW-84B					MW-89B		MW-90B	
chemical_name	CAS	Method	mg/L	mg/L	2/1/2018	3/22/2018	6/6/2018	1/22/2019	2/8/2018	3/22/2018	6/7/2018	7/19/2018	1/15/2019	2/8/2018	3/27/2018	6/7/2018	7/19/2018	1/24/2019	7/19/2018	1/22/2019	7/19/2018	1/22/2019
<b>Volatile Organic Compounds</b>																						
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.018</b>	<b>0.019</b>	<b>0.02</b>	<b>0.03</b>	<b>0.032</b>	<b>0.0097</b>	<b>0.0086</b>	0.0017	0.002	0.0024	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	0.08	0.1	0.085	0.068	0.091	0.039	0.037	0.0036	0.0029	0.0051	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0002	<0.0002	<0.0002	<0.0002	0.0055	0.0046	0.0049	0.007	0.0082	0.0025	0.00099J	<0.0002	<0.0002	0.00056 J	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03																		
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0003	0.00065J	<0.0003	<0.0003	0.1	0.11	0.091	0.066	0.1	0.035	0.031	0.003	0.0019	0.0033	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																						
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	<b>0.0014J</b>	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.00021	<2.1E-05	<2.1E-05	<0.00021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00004	<0.00004	<0.00004	<0.00004	<0.0004	<0.0004	<0.00004	<0.00004	<0.00004	<0.0004	<0.0004	0.0017 J	0.00048 J	<0.00016	<0.0004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<0.00058	<0.00059	<5.8E-05	<5.8E-05	<5.8E-05	<0.00058	<0.00058	<0.00058	<0.00058	<5.8E-05	<0.00058	<5.8E-05	<5.8E-05	<0.00058
2,6-Dinitrotoluene	608-20-2	8270	1.30E-03	3.00E-03	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<0.00042	<0.00042	<4.2E-05	<4.2E-05	<4.2E-05	<0.00042	<0.00042	<0.00042	<0.00042	<4.2E-05	<0.00042	<4.2E-05	<4.2E-05	<0.00042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021	<0.00021	<0.00021	<0.00021	<2.1E-05	<0.00021	<2.1E-05	<2.1E-05	<0.00021
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<b>0.15</b>	<b>0.75</b>	<b>0.23</b>	0.076	0.086	<b>0.55</b>	<b>0.58</b>	0.025	<b>0.2J</b>	<1.9E-05	5.4E-05J	<1.9E-05	<1.9E-05	<0.00019
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00002	<0.00002	<0.00002	<0.00002	<0.0002	<0.0002	<0.00002	<0.00002	<0.00002	<0.0002	<0.0002	<b>0.0038</b>	<0.00002	<0.00002	<0.0002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<0.00047	<0.00047	<4.7E-05	<4.7E-05	<4.7E-05	<0.00047	<0.00047	<0.00047	<4.7E-05	<4.7E-05	<0.00047	<4.7E-05	<4.7E-05	<0.00047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	0.098	0.33	0.11	0.027	0.026	0.22	0.27	0.031	0.14J	3.2E-05 J	<2.7E-05	<2.7E-05	<2.7E-05	<0.00027
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	0.00086J	0.0016	0.00064	<1.5E-05	0.00034	0.003	0.0032	0.00061 J	0.00062 J	4.3E-05 J	<1.5E-05	<1.5E-05	<1.5E-05	<0.00015
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<1.4E-05	6.8E-05J	9.1E-05 J	4.2E-05 J	0.01	0.011	0.007	0.0014	0.0012	0.02	0.0092	0.0022	0.0042J	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<0.00014
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.00005	<0.00005	<0.00005	<0.0005	<0.00051	5.8E-05 J	<0.0005	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00002	<0.00002	<0.00002	<0.00002	<0.0002	<0.0002	<0.00002	<0.0002	<0.00002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00003	<0.00003	<0.00003	<0.00003	<0.0003	<0.0003	<0.00003	<0.0003	<0.00003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00011J	<3.7E-05	<0.00056	<3.7E-05	<0.00037	<0.00037	<0.00012	<0.00037	<3.7E-05	0.00056J	<0.00037	<0.00037	<3.7E-05	6.5E-05J	<3.7E-05	9.7E-05J	<3.7E-05	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021	<0.00021	0.00009 J	<0.00021	<2.1E-05	<0.00021	<0.00021	<0.00021	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00002	<0.00002	<0.00002	<0.00002	0.043	<b>0.17</b>	0.061	0.023	0.02	<b>0.13</b>	<b>0.22</b>	0.019	0.077J	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00002	<0.00002	<0.00002	<0.00002	<0.0002	<0.0002	<9.4E-05	0.00021	0.00015 J	<0.0002	<0.0002	<0.0002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00001	<0.00001	<0.00001	<0.00001	0.0035	0.0043	0.0046	0.00057	0.00051	0.0039	0.0029	0.00069 J	0.0016 J	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00003	<0.00003	<0.00003	<0.00003	0.046	0.072	0.039	0.0083	0.0099	0.074	0.076	0.011	0.039J	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00019	<0.00015	<0.00002	<0.00002	<b>2.6</b>	<b>14</b>	<b>2</b>	<b>1.5</b>	<b>1.6</b>	<b>2.4</b>	<b>2.2</b>	0.066	<b>0.95J</b>	<0.00002	0.0009	<0.00002	<0.00002	0.000045 J
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<0.00024	<0.00024	<2.4E-05	<2.4E-05	<2.4E-05	<0.00024	<0.00024	<0.00024	<0.00024	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<0.00024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<0.00025	<0.00025	<2.5E-05	<2.5E-05	<2.5E-05	<0.00025	<0.00025	<0.00025	<0.00025	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<0.00025
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<0.00079	<0.0008	<7.9E-05	<7.9E-05	<7.9E-05	<0.00079	<0.00079	<0.00079	<b>0.005J</b>	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<0.00079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	0.04	0.071	0.045	0.0086	0.0074	0.088	0.072	0.013	0.043J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00021
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<0.00035	<0.00035	<3.5E-05	<3.5E-05	<3.5E-05	<0.00035	<0.00035	0.00062 J	<0.00035	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<0.00035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	0.0029	0.0023	0.0026	0.00037	0.0003	0.0025	0.0018	0.00036 J	0.00097 J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<0.00019

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b**  
**Summary of Groundwater Sampling Results - B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	P-11														
			Assessment Level	Assessment Level	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	1/24/2018	3/23/2018	5/24/2018	1/9/2019
			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	mg/L
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	0.00021J	<0.00008	<0.0002	<0.0002	0.00021 J	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	0.00025J	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	0.00032 J	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.9E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00023	0.00005J	0.00013J	<0.00007	0.00026J	<0.00007	<1.9E-05	<1.9E-05	0.00015	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00570	<0.00009	0.00370	<0.00009	0.00075	0.03000	0.01800	<0.00008	<0.00008	0.00951	0.000653	<2.7E-05	0.00021	0.081	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	0.00020	0.0001J	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00015J	<0.00007	0.00012J	<0.00007	0.00012J	0.00160	0.00039	0.00025J	1E-04J	0.00050	0.00012J	<1.4E-05	<1.4E-05	0.0037	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<5.1E-05	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00022	0.00051	0.00020	0.00160	0.00018J	0.00013J	0.00021	0.00036J	0.00059J	0.00403	0.000711	0.00018J	<3.7E-05	<6.3E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00024	<0.00008	9.3E-05J	<0.00008	0.00013J	0.00350	0.00059	0.00014J	<0.00008	0.00103	0.00018J	<0.00002	<0.00002	0.0016	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00002	<0.00002	<2.4E-05	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00042	<0.00007	8.1E-05J	0.00220	0.00048	<0.00007	<0.00007	0.00029J	7.7E-05J	3.8E-05J	<0.00001	0.0056	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00180	<0.00007	0.00160	<0.00007	8.2E-05J	0.01100	0.00440	7.7E-05J	<0.00007	0.00264	0.00034J	4.5E-05J	<0.00003	0.037	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00270	<0.0001	0.00270	<0.0001	0.00013J	0.00170	0.00026	0.00066	<0.00008	0.05540	<0.00008	<0.00002	<0.00002	0.0024	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05	<7.9E-05	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00048	<0.00007	0.00053	<0.00007	8.6E-05J	0.00450	0.00055	8.5E-05J	<0.00006	0.00189	0.00032J	<2.1E-05	<2.1E-05	0.04	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00005J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00015J	<0.00007	<0.00005	0.00130	0.00023	<0.00011	<0.00011	0.00027J	<0.00011	3.9E-05J	<1.9E-05	0.0032	<1.9E-05

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-2b**  
**Summary of Groundwater Sampling Results - B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

			Residential Assessment Level	C/I Assessment Level	TW-41B											
chemical_name	CAS	Method	mg/L	mg/L	1/19/2010	7/27/2011	2/1/2012	7/26/2012	2/5/2013	7/31/2013	1/16/2014	07/25/2014	1/24/2018	3/20/2018	5/16/2018	1/9/2019
<b>Volatile Organic Compounds</b>																
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	<0.0002	<0.0002	<0.0002	<0.0002
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	0.00065J	0.001J	0.0013	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	0.0036	0.0029	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	0.00068J	0.0012	<0.0002
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	0.0079	0.013	0.015	<0.0003
<b>Semi-Volatile Organic Compounds</b>																
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00005	<0.00005	0.00140	<0.00031	<0.00031	<0.00031	<0.00031	<0.000041	<0.000041	<0.000041	<0.000041
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.000059	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.000043	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	0.01500	<0.00005	0.0001J	<0.00007	0.000256J	<0.0000846	0.0125	0.0003	0.011	0.026	0.0098
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.000048	<0.000047	<0.000047	<0.000047
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.04100	<0.00005	0.03900	<0.00008	0.02520	<0.00008	0.142	0.087	0.072	0.08	0.058
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00007	0.00053	<0.00005	0.00041	0.0000751J	0.000409J	0.0000926J	0.00185	0.0019	0.0017	0.0016	0.00091
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	0.00220	0.00016J	0.00110	0.00098	0.00161	0.00093	0.00697	0.0016	0.0034	0.0039	0.0023
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	0.0000879J	<0.00008	<0.00008	<0.000051	<0.00005	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	0.000097 J
Bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.000031	<0.00003	<0.00003	<0.00003
Bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.00110	0.00022	0.00023	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.000058J	<0.000037	<0.000037	<0.000037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.000021	<0.000021	<0.000021	<0.000021
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	0.02900	<0.00005	0.01600	<0.00008	0.01040	<0.00008	0.0845	0.022	0.026	0.034	0.026
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00005	<0.00005	0.0001J	<0.00011	0.000138J	0.000116J	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	0.00220	<0.00005	0.00150	<0.00007	0.00153	0.000206J	0.00475	0.0019	0.0026	0.0022	0.0014
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00015J	0.02800	<0.00005	0.0054J	0.0000917J	0.00386	<0.00007	0.02800	0.0007	0.035	0.037	0.045
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00014J	0.04900	<0.00051	<0.0013	0.000156J	0.00309J	<0.00259	0.149	0.027	0.12	0.28	0.061
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.000024	<0.000024	<0.000024	<0.000024
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.000026	<0.000025	<0.000025	<0.000025
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	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.01900	<0.00005	<0.00005	<0.00006	0.00066	<0.000176	0.0573	0.00048	0.0089	0.013	0.0035
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00005	0.000057J	0.00160	<0.00004	<0.00004	<0.00004	<0.00004	<0.000036	<0.000035	<0.000035	<0.000035
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.00095	<0.00005	0.00066	<0.00011	0.00070	0.000223J	0.00209	0.00083	0.0011	0.001	0.00056

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
chemical_name	CAS	Method	mg/L	mg/L	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	1/23/2018	3/19/2018	5/16/2018	1/9/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00012	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	0.000145J	<0.00011	<0.00011	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<b>0.209</b>	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.000079J	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00045	0.00024	0.00011J	0.00012J	0.000099J	<0.00005	0.000086J	0.000146J	0.000129J	0.000164J	0.000091J	0.000092J	<7.8E-05	<7.8E-05	0.00039
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00052	0.00019J	<0.00009	0.00012J	<0.00005	<0.00005	0.00011J	<0.00008	<0.00008	<0.00008	0.000114J	0.0002	0.0001	<2.7E-05	0.093
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	0.00064	<1.5E-05	0.00082
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	7.45E-05J	<0.00005	<0.00005	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	0.0084
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.00014
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	<0.00002	<0.00002	<0.00002	4.1E-05 J
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0003	0.00077	0.00099	<0.0002	0.0004	<0.0001	0.00011J	<0.00037	<0.00037	<0.00037	<0.00037	<0.00009	0.00013J	<3.7E-05	0.00011 J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	0.00013
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.0004	0.00014J	<0.00008	0.00011J	<0.00005	<0.00005	0.000054J	8.65E-05J	8.57E-05J	9.79E-05J	0.000091J	0.0001	<0.00002	<5.2E-05	0.067
Di-n-butylphthalate	84-74-2	8270	2.40E+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	0.000034J	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	0.0071
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00037	0.00014J	<0.00007	0.000099J	0.000071J	0.0001J	0.000082J	0.000149J	0.000102J	<0.00007	<0.00007	<0.00003	<0.00003	8.7E-05 J	0.085
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.003	0.0017	0.00046	0.00099	0.00048	0.00054	0.00052	0.000729	0.000585J	0.00008J	0.000598	0.00046	0.0003	<0.00061	<0.00017
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00048	0.00015J	<0.00007	0.00011J	<0.00005	<0.00005	0.000059J	<0.00006	<0.00006	0.00006J	0.000081J	0.000069J	<2.1E-05	4.8E-05 J	0.052
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	0.0031

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
chemical_name	CAS	Method	mg/L	mg/L	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	1/23/2018	3/18/2018	5/15/2018	1/8/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	0.00063J	0.00053J	0.00052 J	0.00058 J
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	0.000323J	0.000263J	0.000305J	0.00019J	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<b>&lt;0.011</b>	<0.00011	<0.0011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<b>113</b>	<0.00031	<0.0031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.013</b>	<0.00013	<0.0013	<0.00013	<5.8E-05	<5.8E-05	<5.9E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<b>&lt;0.008</b>	<0.00008	<0.0008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.008	<0.00008	<0.0008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.000084J	<0.00007	<0.00007	<0.00007	<0.00005	0.000099J	0.00022	<b>0.35</b>	<0.00007	<0.0007	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<b>&lt;0.083</b>	<0.00083	<b>&lt;0.0083</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<b>&lt;0.056</b>	<0.00056	<0.0056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.034	0.0097	0.013	0.032	0.016	0.041	0.042	0.13	0.0574	0.0912	0.0455	0.027	0.021	0.02	0.02
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00052	0.00041	0.00062	0.0011	0.0012	0.0013	0.002	<0.006	0.00268	<0.006	0.00342	0.0027	0.002	0.0022	0.0014
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00078	0.00031	<0.00007	<0.00007	<0.00005	0.00021	0.00045	0.0191J	9.45E-05J	<0.0005	0.000315J	0.00047	0.000095J	6.7E-05 J	0.00031
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.008	<0.00008	<0.0008	<0.00008	<0.00005	<0.00005	<5.1E-05	<0.00005
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	<b>&lt;0.008</b>	<0.00008	<b>&lt;0.0008</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<b>&lt;0.013</b>	<0.00013	<b>&lt;0.0013</b>	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.00065	0.00059	0.00044	0.00057	<0.0001	0.00012J	<b>&lt;0.037</b>	<0.00037	<0.0037	0.000526	<6.7E-05	<3.7E-05	7.2E-05 J	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.008	<0.00008	<0.0008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.034	0.0075	0.005	0.018	0.0046	0.027	0.021	<b>0.116</b>	0.0141	0.0317	0.0102	0.0081	0.0029	0.0046	0.0053
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000059J	<0.011	<0.00011	<0.0011	<0.00011	<0.00002	<0.00002	3.7E-05 J	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0006	0.00029	0.0002J	0.0003	0.00031	0.0016	0.00079	<0.007	0.000634	0.00158J	0.000763	0.00094	0.00054	0.00074	0.00075
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.0027	0.0011	0.00071	0.0017	0.00074	0.0025	0.0014	0.0769	0.00159	0.00224J	0.00135	0.001	0.00045	0.00064	0.00056
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0016	0.00057	0.00094	0.00091	0.00046	0.0011	0.0018	<b>89.7</b>	0.00122J	0.000769J	0.000748	0.00042	<0.00031	<0.00039	<0.00032
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.011	<0.00011	<0.0011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.01	<0.0001	<0.001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<b>&lt;0.061</b>	<0.00061	<b>&lt;0.0061</b>	<0.00061	<7.9E-05	<7.9E-05	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00014J	<0.00007	<0.00007	0.00019J	0.0015	0.00038	0.0868	0.000354J	<0.0006	<0.00006	<2.1E-05	0.00019	0.00041	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<b>61.8</b>	<0.00004	<0.0004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00027	0.00012J	0.00011J	0.00015J	0.00018J	0.00093	0.00046	<0.011	0.00037J	<0.0011	0.00043J	0.00049	0.00035	0.00043	0.00041

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



**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															
chemical_name	CAS	Method	mg/L	mg/L	2/4/2009	1/18/2010	6/23/2010	1/17/2011	7/13/2011	2/1/2012	7/12/2012	4/1/2013	7/30/2013	1/13/2014	07/17/2014	1/31/2018	3/18/2018	5/16/2018	1/10/2019	
<b>Volatile Organic Compounds</b>																				
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.005	<0.0005	<0.00014	<0.0014	<0.0007	<0.00014	<0.0002	<0.0002	<0.001	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.03</b>	<b>0.0083</b>	<b>0.024</b>	<b>0.023</b>	<b>0.01</b>	<b>0.016J</b>	<b>0.013</b>	<b>0.0114</b>	<b>0.0162</b>	<b>0.00939</b>	<b>0.0132</b>	<b>0.014</b>	<b>0.0067</b>	<b>0.0099</b>	<b>0.012</b>	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0005		<0.0005	<0.0005	<0.001	<0.005	<0.0005	<0.00012	<0.0012	<0.0006	<0.00012	<0.0003	<0.0003	<0.0015	<0.0003	
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	0.042	0.16	0.12	0.027	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<b>&lt;0.0065</b>	<0.001	0.00368J	<b>0.00786J</b>	<0.00075	<0.00015	<0.001	<0.001	<0.005	<0.001	
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	0.0097	0.0038	0.0069	0.0087	
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	0.071	0.1	0.094	0.05	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<b>&lt;0.011</b>	<b>&lt;0.011</b>	<b>&lt;0.00519</b>	<0.00021	<0.00021	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.0028	0.044	0.0018	0.0035	<b>1.5</b>	<0.00005	0.039	<0.00031	<0.031	<0.031	<b>7.09</b>	<b>0.59</b>	0.03	0.08	0.47	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<b>&lt;0.013</b>	<b>&lt;0.013</b>	<b>&lt;0.00613</b>	<0.00058	<0.00058	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<b>&lt;0.008</b>	<b>&lt;0.008</b>	<b>&lt;0.00377</b>	<0.00042	<0.00042	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.008	<0.008	<0.00377	<0.00021	<0.00021	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.085	0.063	<b>0.099</b>	0.075	0.0073	0.062	<b>0.1</b>	<b>0.176</b>	<b>0.151</b>	<b>0.144</b>	0.0203J	0.094	<b>0.12</b>	<b>1.1</b>	0.025	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<b>&lt;0.083</b>	<b>&lt;0.083</b>	<b>&lt;0.0392</b>	<0.0002	<0.0002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.00502	<b>&lt;0.056</b>	<b>&lt;0.056</b>	<0.0264	0.0035J	<0.00047	0.0017	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.14	0.13	0.14	0.18	0.021	0.097	0.14	0.216	0.239	0.218	0.0299	0.043	0.15	1.4	0.031	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.0012	0.0013	0.0016	0.0017	0.00028	0.0011	0.0018	<0.00006	<0.006	<0.006	<0.00283	0.00076J	0.002	0.0017	0.00047	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.0084	0.0057	0.0071	0.015	0.0016	0.0048	0.008	0.011	0.0144J	0.0156J	<0.00236	0.0017	0.01	0.0088	0.0012	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00018J	0.00013J	0.00016J	0.0012	0.00017J	0.000091J	0.00022	0.00016J	<0.008	<0.008	<0.00377	<0.0005	<0.0005	0.00011	6.2E-05 J	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<0.00008	<b>0.00027</b>	<0.00005	<0.00005	<0.00005	<0.00008	<b>&lt;0.008</b>	<b>&lt;0.008</b>	<b>&lt;0.00377</b>	<0.0002	<0.0002	<0.00002	<0.00002	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<b>&lt;0.013</b>	<b>&lt;0.013</b>	<b>&lt;0.00613</b>	<0.0003	<0.0003	<0.00003	<0.00003	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0039	0.0018	0.0015	<b>0.012</b>	0.0001	0.0048	0.00148	<b>&lt;0.037</b>	<b>0.0491J</b>	<b>&lt;0.0175</b>	0.005	0.0053	0.0018	0.00062	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00017J	0.00012J	0.00017J	0.001	<0.00005	0.00013J	0.00016J	0.000167J	<0.008	<0.008	<0.00377	<0.00021	<0.00021	0.00011	5.9E-05 J	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.13</b>	<b>0.11</b>	<b>0.13</b>	<b>0.19</b>	0.021	0.096	<b>0.14</b>	<b>0.185</b>	<b>0.199</b>	<b>0.184</b>	0.0255	0.039	<b>0.13</b>	<b>0.099</b>	0.027	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.011	<0.011	<0.00519	<0.0002	<0.0002	<5.8E-05	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.007	0.0044	0.005	0.019	0.0018	0.002	0.0048	0.00784	0.007941J	0.00707J	<0.0033	0.00073J	0.0056	0.0044	0.00078	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.062	0.055	0.069	0.083	0.009	0.054	0.066	0.0989	0.103	0.0907	0.0118J	0.019	0.066	0.06	0.012	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>3.4</b>	<b>2.2</b>	<b>3.4</b>	<b>4.1</b>	0.37	<b>3.3</b>	<b>4</b>	<b>5.9</b>	<b>4.4</b>	<b>6.24</b>	<b>0.772</b>	<b>1.8</b>	<b>4.8</b>	<b>53</b>	<b>1.1</b>	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.011	<0.011	<0.00519	<0.00024	<0.00024	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.01	<0.01	<0.00472	<0.00025	<0.00025	<2.5E-05	<2.5E-05	
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	<b>&lt;0.061</b>	<b>&lt;0.061</b>	<b>&lt;0.0288</b>	<0.00079	<0.00079	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.078	0.058	0.08	0.076	0.014	0.0081	0.076	0.12	0.12	0.11	0.0122J	0.014	0.071	0.07	0.031	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.0013	0.14	<0.00007	0.00078	0.025	0.00014J	0.0002J	<0.00004	<0.004	<0.004	<b>8.33</b>	0.0025	0.0036	0.00022	0.033	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0033	0.0028	0.0026	0.009	0.00098	0.0025	0.0028	0.00356	<0.011	<0.011	<0.00519	0.00031J	0.0031	0.0025	0.00045	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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															
chemical_name	CAS	Method	mg/L	mg/L	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	1/25/2018	3/19/2018	5/16/2018	1/10/2019	
<b>Volatile Organic Compounds</b>																				
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.005	<0.0005	<0.0025	<0.0025	<0.001	<0.005	<0.005	<b>&lt;0.007</b>	<b>&lt;0.014</b>	<b>&lt;0.007</b>	<0.0028	<0.0002	<0.0002	<0.002	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>1.4</b>	<b>1.5</b>	<b>1</b>	<b>1.3</b>	<b>1.2</b>	<b>1.3</b>	<b>1.2</b>	<b>1.51</b>	<b>1.23</b>	<b>1.51</b>	<b>1.45</b>	<b>1.4</b>	<b>1.3</b>	<b>1.4</b>	<b>0.3</b>	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.005	<0.0005	<0.0025	<0.0025	<0.001	<0.005	<0.005	<0.006	<0.012	<0.006	<0.0024	<0.0003	0.00052J	<0.003	<0.0003	
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	0.35	0.29	0.32	0.41	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.005	<0.0005	<0.0025	<0.0025	<0.0013	<b>&lt;0.0065</b>	<b>&lt;0.01</b>	<b>&lt;0.0075</b>	<b>0.0688J</b>	<b>&lt;0.0075</b>	<b>0.0161J</b>	<0.001	<0.001	<b>&lt;0.01</b>	<0.001	
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	1.1	0.96	0.9	0.03	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03				<b>&lt;0.0025</b>	<0.001	<b>&lt;0.005</b>	<b>&lt;0.005</b>	<b>&lt;0.0055</b>	<b>&lt;0.011</b>	<b>&lt;0.0055</b>	<b>&lt;0.0022</b>	0.0018	<b>0.0026</b>	<0.002	<0.0002	
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	1	0.93	1.1	0.69	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0005	<0.0001	<0.00005	<0.0005	<0.00005	<b>&lt;0.0545</b>	<b>&lt;0.00534</b>	<b>&lt;0.011</b>	<b>&lt;0.00519</b>	<0.00021	<0.00021	<0.00021	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.084	0.0081	0.0078	0.012	0.0031	0.01	0.0021	<0.153	<0.015	<0.031	0.0325	<0.0004	<0.0004	0.082	0.29	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.0644</b>	<b>&lt;0.00631</b>	<b>&lt;0.013</b>	<b>&lt;0.00613</b>	<0.00058	<0.00058	<0.00058	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00035	<0.00007	<0.00006	<0.0006	<0.00006	<b>&lt;0.0396</b>	<b>&lt;0.00388</b>	<b>&lt;0.008</b>	<b>&lt;0.00377</b>	<0.00042	<0.00042	<0.00042	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0005	<0.0001	<0.00005	<0.0005	<0.00005	<0.0396	<0.00388	<0.008	<0.00377	<0.00021	<0.00021	<0.00021	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.95</b>	<b>0.46</b>	<b>0.2</b>	<b>0.31</b>	<b>0.34</b>	<b>0.16</b>	<b>0.46</b>	<b>0.977</b>	<b>0.871</b>	<b>1.06</b>	<b>0.778</b>	<b>0.41</b>	<b>0.44</b>	<b>0.3</b>	<b>0.33</b>	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.0004	<0.00008	<0.00008	<0.0008	<0.00008	<b>&lt;0.411</b>	<b>&lt;0.0403</b>	<b>&lt;0.083</b>	<b>&lt;0.0392</b>	<0.0002	<0.0002	<0.0002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.0005	<0.00005	<b>&lt;0.277</b>	<b>&lt;0.0272</b>	<b>&lt;0.056</b>	<0.0264	<0.00047	<0.00047	<0.00047	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.18	0.17	0.082	0.14	0.12	0.062	0.13	0.32	0.265	0.317	0.246	0.15	0.16	0.15	0.21	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.0036	0.0023	0.0015	0.0019	0.0023	0.0018J	0.0019	<0.0297	<0.00291	<0.006	<0.00283	0.0025	0.0035	0.003	0.0075	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.017	0.014	0.0076	0.015	0.013	0.012	0.008	0.0401J	0.0284	0.0414J	0.028	0.017	0.02	0.019	0.007	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	0.00039	<0.00007	<0.00035	<0.00007	<0.00005	<0.0005	0.00014J	<b>&lt;0.0396</b>	<b>&lt;0.00388</b>	<0.008	<0.00377	0.0013	<0.0005	<0.0005	<0.00005	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	0.00013J	<0.00008	<b>&lt;0.0004</b>	<b>0.00035</b>	0.00015J	<b>&lt;0.0005</b>	<0.00005	<b>&lt;0.0396</b>	<b>&lt;0.00388</b>	<b>&lt;0.008</b>	<b>&lt;0.00377</b>	<0.0002	<0.0002	<0.0002	<0.00002	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.0644</b>	<b>&lt;0.00631</b>	<b>&lt;0.013</b>	<b>&lt;0.00613</b>	<0.0003	<0.0003	<0.0003	<0.00003	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00023	<0.0002	<0.001	<0.0002	<0.0001	<0.001	<0.0001	<b>&lt;0.183</b>	<b>&lt;0.018</b>	<b>&lt;0.037</b>	<b>&lt;0.0175</b>	<0.00037	<0.00037	<0.00037	<3.7E-05	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.00033	<0.00007	<0.00035	<0.00007	<0.00005	<0.0005	0.0001J	<0.0396	<0.00388	<0.008	<0.00377	0.0008J	<0.00021	0.00038 J	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>0.16</b>	0.091	0.077	<b>0.13</b>	<b>0.11</b>	0.06	<b>0.14</b>	<b>0.288</b>	<b>0.225</b>	<b>0.276</b>	<b>0.207</b>	<b>0.14</b>	<b>0.15</b>	<b>0.13</b>	<b>0.13</b>	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00035	<0.00007	<0.00005	<0.0005	<0.00005	<0.0545	<0.00534	<0.011	<0.00519	<0.0002	<0.0002	<0.0002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0047	0.0035	0.0023	0.0059	0.0042	0.0018J	0.0023	<0.0347	0.00865J	0.0191J	0.00957J	0.0096	0.0071	0.0058	0.0023	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.081	0.052	0.034	0.051	0.052	0.028	0.055	0.132J	0.114	<0.007	0.116	0.056	0.073	0.062	0.095	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>21</b>	<b>12</b>	<b>6.2</b>	<b>13</b>	<b>12</b>	<b>9.7</b>	<b>13</b>	<b>20.2</b>	<b>20.9</b>	<b>20.3</b>	<b>14.7</b>	<b>14</b>	<b>12</b>	<b>21</b>	<b>4.4</b>	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.0005	<0.00005	<b>&lt;0.0545</b>	<0.00534	<0.011	<0.00519	<0.00024	<0.00024	<0.00024	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00045	<0.00009	<0.00005	<0.0005	<0.00005	<0.0495	<0.00485	<0.01	<0.00472	<0.00025	<0.00025	<0.00025	<2.5E-05	
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<b>0.026</b>	<b>0.041</b>	<b>0.02</b>	<b>0.064</b>	<b>0.076</b>	<b>0.085</b>	<b>0.075</b>	<b>&lt;0.302</b>	<b>&lt;0.0296</b>	<b>0.188</b>	<b>0.164</b>	<b>0.024</b>	<b>0.041</b>	<b>0.037</b>	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.076	0.052	0.032	0.055	0.052	0.027	0.055	0.155J	0.127	0.177	0.122	0.072	0.086	0.078	0.084	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.031	0.059	0.026	0.043	0.048	0.027	0.075	0.0601J	0.0205J	0.0184J	0.0285	0.0042	0.0067	<0.00035	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0025	0.002	0.0012	0.0028	0.0017	0.001J	0.0011	<0.0545	<0.00534	<0.011	0.00571J	0.0055	0.0049	0.0036	0.0012	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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															
chemical_name	CAS	Method	mg/L	mg/L	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	2/9/2018	3/18/2018	5/16/2018	1/24/2019	
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.002	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0005	<b>0.0056</b>	<0.0005	<0.0005	<0.001	0.005	<0.0005	0.000558J	0.00427	0.00028J	8.01E-05J	0.0013	0.0027	0.0041 J	0.0044	
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	<0.0003	<0.0003	<0.003	<0.0003	
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	0.00091J	0.0025	<0.003	0.004	
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	<0.001	<0.001	<0.01	<b>&lt;0.01</b>	<0.001
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	<0.0002	0.0018	0.0042 J	0.0057	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<0.0002	<0.0002	<0.002	<0.0002	
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	0.00095J	0.0044	<0.003	0.0037	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	0.00024	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00021	<0.00011	<2.1E-05	0.000099J	6.1E-05 J	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	0.00016J	0.00125	<0.00031	<0.0006	<0.00031	0.0028	<0.00038	<0.00004	<0.00032	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00025	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00015	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00015	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00025	0.0017	0.000079J	0.00015J	0.0012	<0.00005	0.00005J	0.00084	0.000114J	0.00142	0.000845	0.000093J	0.00037	<1.9E-05	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.0016	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00108	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00022	0.001	0.00012J	0.00015J	0.00067	0.0012	0.00017J	0.000608	0.00279	<0.00015	0.0007	0.0012	0.001	0.00035	0.00078	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.00014J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00012	<0.00006	0.000069J	<1.5E-05	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	0.0001J	<0.00007	<0.00007	0.00015J	<0.00005	<0.00005	0.000115J	0.000269J	<9.6E-05	<0.00005	0.000057J	0.000065J	<1.4E-05	5.7E-05 J	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	0.000111J	<0.00015	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	
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	<0.00015	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00025	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.0028	0.00036	0.00026	0.00039	0.00022	0.00014J	<0.00037	0.0012J	<0.00071	0.000646	0.00019J	0.0001J	<0.00016	9.6E-05 J	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	0.000072J	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00015	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00017J	0.00051	<0.00008	0.00013J	0.0006	0.00014J	0.00011J	0.000367J	0.000631	0.00116	0.000554	0.00045	0.00081	<3.2E-05	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00015J	<0.00011	0.000164J	<0.00021	<0.00011	<0.00002	<0.00002	<3.1E-05	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00015J	0.00024	0.0021	0.0026	0.0016	<0.00005	0.0018	0.00257	0.000309J	0.00223	0.00169	0.000081J	0.00064	0.00023	<0.00001	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	0.00032	0.00028	0.00032	0.00066	<0.00005	0.00033	0.000605	<0.00007	0.000296J	0.000485	0.000099J	0.00037	<0.00009	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0077	0.09	0.0015	0.0061	0.014	0.00077	0.00048	0.0264J	0.00196J	0.0383	0.0198	0.0022	0.013	<0.00061	<0.00036	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00021	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00019	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	
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	<b>&lt;0.00117</b>	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00016J	<0.00007	<0.00007	0.00053	<0.00005	<0.00005	0.000166J	0.000201J	0.00006J	<0.00006	<2.1E-05	0.000051J	<2.1E-05	<2.1E-05	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.00024	0.00023J	0.024	0.000724J	0.00033J	0.00071	0.00072	<3.5E-05	<0.00013	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.0002	0.0012	0.0016	0.0014	<0.00005	0.0014	0.00207	0.000233J	0.00191	0.00178	0.000053J	0.00076	0.00037	<1.9E-05	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
chemical_name	CAS	Method	mg/L	mg/L	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	1/24/2018	3/20/2018	5/17/2018	1/9/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	0.000144J	<0.00011	<0.00019	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.9E-05	<5.8E-05	<5.9E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<b>0.023 J</b>	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000067J	<0.00005	0.000271J	<0.00007	0.00007J	<0.00007	<1.9E-05	<1.9E-05	0.00012J	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.00041	<0.00009	0.00034	<0.00005	<0.00005	<0.00005	0.000237J	<0.00008	0.00008J	<0.00008	<2.7E-05	<2.7E-05	0.00013	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	5.27E-05J	<0.00005	0.000243J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	0.000129J	<0.00008	<5.1E-05	<0.00005	<5.1E-05	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<0.0002	0.00072	0.00023	0.00062	0.00062	0.0001J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.000058J	<3.7E-05	4.8E-05 J	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	8.12E-05J	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.000109J	<0.00008	0.00008J	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000072J	<0.00011	<0.00011	<0.00011	0.000184J	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000528	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000291J	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00039	<0.0001	<0.0001	<0.0001	<0.00005	0.00093	<0.00005	0.000429J	0.0021J	0.000523J	<0.00008	<0.00002	<0.00002	0.0014 J	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<0.00008	<7.9E-05	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000184J	7.75E-05J	0.00128	0.000087J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	0.000355J	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-3  
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-23C*										
			Assessment Level	Assessment Level	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
			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
<b>Volatile Organic Compounds</b>															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0005	<0.0005	<0.005	<0.005	<0.001	<0.01	<0.0005	<0.00014	<0.0014	<0.0002	<0.0014
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<b>0.017</b>	<b>0.012</b>	<b>0.0095J</b>	<b>0.0072J</b>	<0.001	<0.01	<b>0.0071</b>	<b>0.0111</b>	<b>0.0138</b>	<b>0.0126</b>	<b>0.00596J</b>
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	0.001J		<0.005	<0.005	<0.001	<0.01	<0.0005	0.000279J	0.00146J	<0.00018	<0.0012
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	<b>0.0092J</b>	<0.005	<0.0013	<0.001	<0.00015	<0.0015	<0.0015	<0.00022	<0.0015
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0023J	0.0012J	<0.005	<0.005	<0.001	<0.01	0.0025J	0.00433	0.00819J	0.00728	0.00378J
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03			<b>&lt;0.005</b>	<0.001	<b>&lt;0.01</b>	<0.0005	<0.00011	<0.0011	<0.00018	<0.0011	
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
<b>Semi-Volatile Organic Compounds</b>															
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<b>&lt;0.005</b>	<0.0001	<0.00005	<0.0005	<0.001	<0.00011	<b>&lt;0.00534</b>	<b>&lt;0.0259</b>	<b>&lt;0.022</b>
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.004	<0.00008	0.0035	0.0014J	0.028	<0.00031	<0.015	<0.0731	0.202
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<b>&lt;0.0045</b>	<0.00009	<0.00005	<0.0005	<0.001	<0.00013	<b>&lt;0.00631</b>	<b>&lt;0.0307</b>	<b>&lt;0.026</b>
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<b>&lt;0.0035</b>	<0.00007	<0.00006	<0.0006	<0.0012	<0.00008	<b>&lt;0.00388</b>	<b>&lt;0.0189</b>	<b>&lt;0.016</b>
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.005	<0.0001	<0.00005	<0.0005	<0.001	<0.00008	<0.00388	<0.0189	<0.016
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>2.6</b>	<b>0.75</b>	<b>2.7</b>	<b>1.2</b>	<b>1.3</b>	<b>0.65</b>	<b>28</b>	<b>1.38</b>	<b>1.16</b>	<b>4.52</b>	<b>18.3</b>
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<b>&lt;0.004</b>	<0.00008	<0.00008	<0.0008	<0.0016	<0.00083	<b>&lt;0.0403</b>	<b>&lt;0.196</b>	<b>&lt;0.166</b>
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.0035	<0.00007	<0.00005	<0.0005	<0.001	<0.00056	<0.0272	<b>&lt;0.132</b>	<b>&lt;0.112</b>
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<b>3.4</b>	<b>1.2</b>	<b>3.4</b>	<b>1.6</b>	<b>2</b>	<b>0.89</b>	<b>39</b>	<b>1.78</b>	<b>1.58</b>	<b>7.79</b>	<b>25.9</b>
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.017	0.01	0.03	0.012	0.015	0.0068	0.45	<0.00006	<0.00291	<0.0142	0.336
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	1.2	0.36	1.2	0.4	1.7	0.25	<b>16</b>	0.641	0.31	1.49	<b>8.74</b>
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<b>0.31</b>	<b>0.12</b>	<b>0.3</b>	<b>0.12</b>	<b>0.15</b>	<b>0.046</b>	<b>4.8</b>	<b>0.104</b>	<b>0.0905</b>	<b>0.5</b>	<b>2.63</b>
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<b>0.072</b>	<b>0.029</b>	<b>0.093</b>	<b>0.04</b>	<b>0.044</b>	<b>0.016</b>	<b>1.2</b>	<b>0.0283</b>	<b>0.0235J</b>	<b>0.119</b>	<b>0.73</b>
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<b>&lt;0.0035</b>	<0.00009	<0.00005	<0.0005	<0.001	<0.00013	<b>&lt;0.00631</b>	<b>&lt;0.0307</b>	<b>&lt;0.026</b>
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.002	0.0011	<0.0035	0.0014	0.0019	<0.001	<b>0.042</b>	<0.00037	<b>&lt;0.018</b>	<b>&lt;0.0873</b>	<b>&lt;0.074</b>
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	0.28	0.093	0.27	0.099	0.21	0.044	<b>4.3</b>	0.103	0.0819	0.476	<b>2.24</b>
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<b>3.5</b>	<b>1.2</b>	<b>3.6</b>	<b>1.6</b>	<b>2.7</b>	<b>0.85</b>	<b>46</b>	<b>1.82</b>	<b>1.48</b>	<b>5.45</b>	<b>25.7</b>
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.004	<0.00007	<0.00005	<0.0005	<0.001	<0.00011	<0.00534	<0.0259	<0.022
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<b>3</b>	<b>0.77</b>	<b>3</b>	<b>0.99</b>	<b>1.8</b>	<b>0.48</b>	<b>34</b>	<b>1.09</b>	<b>0.812</b>	<b>4.42</b>	<b>20.4</b>
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<b>2.5</b>	<b>0.82</b>	<b>2.6</b>	<b>0.88</b>	<b>2</b>	<b>0.57</b>	<b>32</b>	<b>1.19</b>	<b>0.874</b>	<b>3.78</b>	<b>20.5</b>
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>9.9</b>	<b>3.9</b>	<b>8.9</b>	<b>8.5</b>	<b>7.5</b>	<b>7.8</b>	<b>83</b>	<b>12.2</b>	<b>13.2</b>	<b>43.8</b>	<b>57.9</b>
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.01	<0.00009	<0.00005	<0.0005	<0.001	<0.00011	<0.00534	<0.0259	<0.022
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.0045	<0.00009	<0.00005	<0.0005	<0.001	<0.0001	<0.00485	<0.0236	<0.02
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<b>&lt;0.0035</b>	<0.00008	<0.00005	<0.0005	<0.001	<0.00061	<b>&lt;0.0296</b>	<b>&lt;0.144</b>	<b>&lt;0.122</b>
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<b>8.8</b>	<b>2.7</b>	<b>8.2</b>	<b>3.6</b>	<b>3.8</b>	<b>1.9</b>	<b>130</b>	<b>3.48</b>	<b>2.8</b>	<b>18.2</b>	<b>59.4</b>
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.0035	<0.00007	<0.00005	0.0011J	<0.001	<0.00004	<0.00194	<0.00943	<0.008
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<b>1.6</b>	<b>0.59</b>	<b>1.9</b>	<b>0.6</b>	<b>1.1</b>	<b>0.35</b>	<b>21</b>	<b>0.754</b>	<b>0.515</b>	<b>3.04</b>	<b>13.3</b>

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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								
chemical_name	CAS	Method	mg/L	mg/L	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
<b>Volatile Organic Compounds</b>													
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	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00026	<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
<b>Semi-Volatile Organic Compounds</b>													
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.0008	<0.0008	<0.0008	<0.0008	<0.0005	<0.0005	<0.0005	<0.00031	<0.00031
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00013	<0.00013
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.0007	<0.0007	<0.0007	<0.0007	<0.0006	<0.0006	<0.0006	<0.00008	<0.00008
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0012	<0.0011	<0.0011	<0.0011	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	0.000077J	<0.00007	<0.00007
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.00083	<0.00083
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00056	<0.00056
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.0009	<0.0009	0.00022	<0.0009	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.0006	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.0008	<0.0008	<0.0008	<0.0008	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00013	<0.00013
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00055	<0.0002	0.001	<0.0002	0.00013J	0.0013	0.00013J	<0.00037	<0.00037
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.0008	<0.0008	<0.0008	<0.0008	<0.0005	<0.0005	<0.0005	<0.00008	<0.00008
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00007	<0.00007
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00013J	0.00026	<0.0001	<0.0001	0.0002	<0.0005	0.00019J	<0.00008	<0.00008
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0009	<0.0009	<0.0009	<0.0009	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.0008	<0.0008	<0.0008	<0.0008	<0.0005	<0.0005	<0.0005	<0.00061	<0.00061
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00006	<0.00006
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00004	<0.00004
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.0007	<0.0007	<0.0007	<0.0007	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well





**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														
chemical_name	CAS	Method	mg/L	mg/L	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	1/31/2018	3/26/2018	6/1/2018	1/22/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											<0.0011				
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	0.00052	<4.2E-05	0.00057	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000777	<0.00007	<0.00007	0.00041	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	0.00031J	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00026	0.00015J	0.00028	0.00019J	0.00011J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.0012	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000431J	<0.00005	0.000065J	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00038	0.0016	0.0015	0.00047	0.00095	0.00014J	0.00021	0.000652	<0.00037	<0.00037	<0.00037	0.000073J	0.000057J	0.00042	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	5.4E-05 J	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	0.00038	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	0.000055J	<0.00011	0.000143J	0.00011J	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	0.00015J	<0.00007	<0.00007	0.00011J	<0.00005	<0.00005	<0.00007	0.000114J	8.81E-05J	<0.00007	0.000085J	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00025	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	0.00085	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00037	0.00013J	0.00024	0.00015J	<0.00005	<0.00005	0.00019J	<0.00008	0.000353J	0.00008J	<0.00008	<0.00043	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	0.00014J	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	9.08E-05J	0.00006J	<0.00006	0.00027	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	5.3E-05 J	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.00011J	<0.00007	<0.00007	0.000064J	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	0.000044J	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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														
chemical_name	CAS	Method	mg/L	mg/L	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	1/25/2018	3/21/2018	5/17/2018	1/14/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03															<0.0001
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	0.002	<0.00008	0.000086J	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.9E-05	<5.9E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.000097J	0.00024	0.000077J	0.000079J	<0.00005	<0.00005	0.00011J	<0.00007	<0.00007	7.41E-05J	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.00018J	0.00033	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<5.1E-05	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0033	0.00046	0.0012	0.00063	0.00053	0.00013J	<0.0001	<0.00037	<0.00037	<0.00037	<0.00037	0.000064J	<3.7E-05	<3.7E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	0.00018J	<0.00008	<0.00008	0.00019J	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	0.000104J	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.00012J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	0.00016J	0.00033	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00057	0.0014	0.00035	0.00029	0.000091J	0.00031	0.00064	0.000163J	<0.00008	0.00008J	<0.00008	<0.00021	<0.00002	<0.00002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<0.00008	<0.00008	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00013J	0.00033	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	7.39E-05J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00063	0.0027	0.00075	0.0014	0.00054	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00007J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-3  
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level	C/I Assessment Level	MW-34C	MW-34CR					MW-44C*				
			mg/L	mg/L	2/8/2012	07/29/2014	1/29/2018	3/27/2018	6/5/2018	1/15/2019	7/20/2011	7/18/2012	2/6/2013		
<b>Volatile Organic Compounds</b>															
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.001	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.005	<0.0014		
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.0014J	0.000154J	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.005	0.000964J		
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.001	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.001	<0.005	0.00293J		
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	0.0039J	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	<0.0011	0.32	0.233		
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.0013	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.0013	<0.01	<0.0015		
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.0041J	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	0.16	0.0895		
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03											
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	0.0077J	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	<0.0031	0.84	0.688		
<b>Semi-Volatile Organic Compounds</b>															
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00005	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00005	<0.00075	<0.529		
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	0.00022	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00005	<0.00075	<1.49		
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00005	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<0.00005	<0.00075	<0.625		
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00006	<0.00008	0.0001J	<4.2E-05	<4.2E-05	<4.2E-05	<0.00006	<0.0009	<0.385		
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00005	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<0.00005	<0.00075	<0.385		
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00011J	0.000255J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<0.00005	62	1.15J		
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00008	<0.0012	<3.99		
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00005	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<0.00005	<0.00075	<2.69		
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00005	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	2.9E-05 J	0.00012J	31	0.632J		
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00005	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	0.000097J	0.29	<0.288		
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00005	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	0.00014J	19	<0.24		
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	0.00017J	3.5	<0.385		
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00005	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	0.00022	0.87	<0.385		
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00005	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00005	<0.00075	<0.625		
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00053	0.000799	<3.7E-05	<3.7E-05	<8.1E-05	<3.7E-05	0.00087	0.013	<1.78		
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00005	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	0.00032	3.3	<0.385		
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.000071J	<0.00008	<0.00002	<0.00002	<0.00002	2.7E-05 J	<0.00005	38	0.453J		
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00005	<0.00011	<0.00002	<0.00002	<0.00002	2.1E-05 J	<0.00005	<0.00075	<0.529		
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00017J	<0.00007	<0.00001	<0.00001	<0.00001	1.4E-05 J	0.00016J	28	<0.377		
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00011J	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003	<0.00005	26	<0.377		
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00043	0.00282	<0.00017	<0.00002	<0.00023	<0.00069	0.00016J	230	18J		
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00005	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<0.00005	<0.00075	<0.529		
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00005	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<0.00005	<0.00075	<0.481		
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00005	<0.00061	0.00013J	<7.9E-05	<7.9E-05	<7.9E-05	<0.00005	<0.00075	<2.93		
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.0001J	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	0.000081J	88	0.498J		
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.000072J	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<0.00005	<0.00075	<0.192		
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00021	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	0.00013J	19	<0.529		

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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-47C											
chemical_name	CAS	Method	mg/L	mg/L	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	1/23/2019
<b>Volatile Organic Compounds</b>																
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	<0.0002
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	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003
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	<0.0003
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	<0.001
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	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002
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	<0.0003
<b>Semi-Volatile Organic Compounds</b>																
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	0.00011J	<0.00008	<0.00005	<0.00005	0.00042	<0.00031	<0.00031	<0.00031	<0.00031	9.5E-05 J
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.0044	<0.00005	0.000098J	<0.00007	<0.00007	<0.00007	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.0002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	0.00017J	0.000058J	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.000074J	<0.00005	0.000107J	<0.00005	<0.00005	<0.00005	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000137J	<0.00008	<0.00008	<0.00008	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	0.000099J	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<b>0.00031J</b>	<0.00008	<0.00008	<0.00008	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.0036	0.00065	0.00021	<0.0002	0.0001J	<b>0.011</b>	<0.0001	0.000594	<0.00037	<0.00037	<0.00037	<5.6E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000127J	<0.00008	<0.00008	<0.00008	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	0.000104J	<0.00008	<0.00008	<0.00008	3.4E-05 J
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00015J	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	0.000289J	0.000186J	7.18E-05J	<0.00007	2.8E-05 J
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00025	<0.00005	0.000116J	<0.00007	<0.00007	<0.00007	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00019J	<0.0001	0.00046	0.00021	<0.00005	0.0041	0.00046	0.0004J	<0.00008	0.000297J	<0.00008	0.00083
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	0.0004	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.0003	<0.00005	0.000406J	<0.00006	0.000185J	<0.00006	5.2E-05 J
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00044	0.00056	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00015J	<0.00005	0.000388J	0.000131J	<0.00011	<0.00011	2.1E-05 J

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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																
chemical_name	CAS	Method	mg/L	mg/L	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	1/28/2018	3/20/2018	5/24/2018	1/10/2019	
<b>Volatile Organic Compounds</b>																					
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																					
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+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	<0.00004	<0.00004	<0.00004	<0.00004	0.0001
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.0004	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00045	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.00035	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<0.00007	<b>0.18</b>	<0.00007	<0.00007	<0.00005	<0.00005	0.0013	<0.00007	<0.00007	<0.00007	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	0.00038
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.0005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.0004	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+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	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	9.8E-05 J
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+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	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+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	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00035	<0.00007	<0.00007	<0.00005	<0.00005	0.000066J	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.000057J	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00008	<b>&lt;0.00035</b>	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00035	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00034	0.0018	<0.00035	0.0013	0.001	0.00043	<0.0001	0.00024	<0.00037	<0.00037	<0.00037	<0.00037	0.000079J	0.00011J	<5.4E-05	<3.7E-05	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.0004	<0.00007	<0.00007	<0.00005	<0.00005	0.000073J	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	0.000044J	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-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	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00045	<0.00007	<0.00007	<0.00005	<0.00005	0.000053J	<0.00011	<0.00011	<0.00011	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	0.00013J	0.0021	0.00019J	0.00019J	0.00013J	<0.00005	0.00095	<0.00007	0.000134J	0.000153J	<0.00007	0.000049J	0.000099J	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+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	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00052	0.0002J	<b>5</b>	<0.0001	<0.0001	<0.00005	<0.00005	0.0071	0.000495J	0.000158J	<0.00008	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	0.0085
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00035	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.001	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00008	<0.00008	<b>0.019</b>	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00061	<0.00061	<0.00061	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+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	<2.2E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+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	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	0.002
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	0.0001J	0.001	0.00015J	0.00012J	0.0001J	<0.00005	0.00052	<0.00011	<0.00011	<0.00011	<0.00011	0.000052J	0.000087J	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well



**Table 5B-3  
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level	C/I Assessment Level	MW-51C					
			mg/L	mg/L	07/24/2014	1/29/2018	3/28/2018	5/24/2018	1/10/2019	
<b>Volatile Organic Compounds</b>										
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.000104J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>										
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00111	<3.7E-05	<3.7E-05	<3.7E-05	0.00013 J	0.00013 J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.000553	<0.0002	<0.00021	0.00029	0.00017	0.00017
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00006	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.000628	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

Notes:

1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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-53C														
chemical_name	CAS	Method	mg/L	mg/L	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	1/28/2018	3/21/2018	5/31/2018	1/14/2019
<b>Volatile Organic Compounds</b>																			
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	0.000644J	<0.00014	<0.0002	<0.00014	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00052	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00148	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00062	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00038	<0.00008	<4.2E-05	<4.2E-05	<b>0.0016</b>	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00038	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	0.000071J	<0.00007	<0.00007	<0.00005	0.00008J	0.000091J	<0.00007	<0.00007	0.000358J	8.26E-05J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<b>&lt;0.00395</b>	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00267	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	0.0002	0.00032	<0.00009	0.00032	0.0002J	<0.00005	<0.00008	<0.00008	0.000856J	<0.00008	<2.7E-05	<2.7E-05	4.4E-05 J	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00029	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00024	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00038	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005
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	<b>&lt;0.00038</b>	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00062	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00072	0.00024	0.00032	0.00037	0.00014J	<0.0001	<0.0001	<0.00037	<0.00037	<0.00176	<0.00037	0.00012J	<3.7E-05	<0.0001	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00038	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00038	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00052	<0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00033	<0.00007	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000355J	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0012	0.00027	<0.0001	0.00015J	<0.00005	0.00066	0.00048	0.000183J	<0.00008	0.000381J	0.00194	<0.00002	<3.4E-05	0.00023	<0.00025
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00052	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00048	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<b>&lt;0.0029</b>	<0.00061	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.000939J	0.000067J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00004	<0.00004	<0.00019	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00052	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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															
chemical_name	CAS	Method	mg/L	mg/L	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	1/28/2018	3/20/2018	5/31/2018	1/14/2019	
<b>Volatile Organic Compounds</b>																				
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	<0.0002	<0.0002	<0.0002	<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	<0.00008	<0.0002	<0.0002	<0.0002	<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	<0.00012	0.000128J	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																				
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	0.000098J	<0.00005	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<b>0.13</b>	<0.00007	0.0096	0.0025	0.022	0.065	0.0054J	0.00392	0.0173	0.00834	0.00048	0.00075	0.00059	0.0059	0.0014	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.067	0.00016J	0.024	0.023	0.039	0.035	0.022	0.0219	0.0749	0.062	0.0367	0.023	0.03	0.04	0.014	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	0.00072	<0.00007	0.00042	<0.00007	0.00045	0.00051	0.00039	<0.00006	<0.00006	0.00105	0.000526	0.00034	0.00036	0.00054	<0.0002	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.003	<0.00007	0.005	0.0027	0.0029	0.024	0.019	0.00183	0.00389	0.00445	0.00261	0.0015	0.0027	0.0041	0.0013	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	9.93E-05J	<0.00008	<0.00005	<0.00005	6.5E-05 J	<0.00005	
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	<0.00002	<0.00002	<0.00002	3.9E-05 J	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	5.6E-05 J	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00072	0.00077	0.00037	0.0016	0.00015J	<0.0001	0.00017J	<0.00037	<0.00037	<0.00037	0.000055J	<3.7E-05	<0.00011	9.6E-05 J		
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	7.58E-05J	<0.00008	<2.1E-05	0.000059J	5.3E-05 J	3.8E-05 J	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.064	<0.00008	0.028	0.018	0.046	0.047	0.029	0.0223	0.0878	0.0695	0.0471	0.025	0.029	0.045	0.015	
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	2.9E-05 J	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.0032	<0.00007	0.0032	0.00016J	0.0034	0.0026	0.002	0.00246	0.00474	0.00575	0.00302	0.0023	0.004	0.0049	0.002	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.03	<0.00007	0.015	0.001	0.022	0.021	0.011	0.0092	0.0409	0.0321	0.0208	0.011	0.014	0.022	0.0085	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	<b>1.1</b>	<0.0001	0.21	0.0055	0.47	0.35	0.15	0.0681	0.383J	0.315J	0.18	0.022	0.029	0.068	0.019	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00014J	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.042	<0.00007	0.024	0.011	0.04	0.034	0.019	0.0128	0.04	0.042	0.0148	0.0023	0.0041	0.023	0.0052	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00011J	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.0018	<0.00007	0.0016	<0.00007	0.0017	0.0015	0.0013	0.00138	0.00248	0.00373	0.00169	0.0012	0.0018	0.0028	0.001	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**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												
chemical_name	CAS	Method	mg/L	mg/L	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	1/29/2018	3/21/2018	6/6/2018	1/15/2019
<b>Volatile Organic Compounds</b>																	
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	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.00081J	0.0021J	0.0032J	<b>0.0069</b>	<b>0.0079</b>	0.00134	0.00364	0.00225	<b>0.0073</b>	0.0028	0.0049	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0005	0.00067J	0.0011J	0.0019J	0.0023J	0.000632J	0.0016	0.00059	0.00138	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0031	<0.0031	<0.0015	0.000873J	0.000879J	<0.00058	0.000649J	<0.0003	0.00046J	<0.0003	0.0011
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	0.00012J	0.00031	0.00095	0.0014	<0.00031	<0.00031	0.000454J	<0.00031	<0.00004	0.0015	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<0.00007	0.00016J	0.00024	0.00011J	0.0025	0.00132	0.000301J	0.00031	0.000188J	<1.9E-05	0.00014	<1.9E-05	<7.7E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<0.00009	<0.00009	0.00013J	<0.00005	0.0013	0.000647	<0.00008	0.00183	0.000235J	<2.7E-05	0.00017	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00005	<0.00005	0.00089	<0.00005	<0.00005	0.00106	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00005	<0.00005	0.00018J	<0.00008	<0.00008	0.000276J	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.00098	0.006	0.001	0.0015	0.0018	0.000637	0.00157J	<0.00037	<0.00037	0.00015J	<3.7E-05	<0.00056	<4.4E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00016J	<0.00008	<0.00008	0.000301J	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00008	<0.00008	0.0002J	0.000078J	0.0018	0.000168J	<0.00008	0.00192	9.42E-05J	<0.00002	<0.00002	<0.00002	6.6E-05 J
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00011J	<0.00011	0.000104J	<0.00011	<0.00011	<0.00002	<0.00002	<0.0001	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.0016	<0.00007	<0.00007	0.00233	<0.00007	<0.00001	<0.00001	0.00021	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	0.0001J	<0.00005	0.0012	0.00034J	0.000135J	0.00167	0.000155J	<0.00003	0.00012	<0.00003	5.7E-05 J
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00083	0.0014	0.0027	0.0015	0.015	0.0129	0.00643	0.0112	0.00274	0.00088	0.0032	0.00035	<0.00079
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	0.00016J	<0.00005	0.005	0.000499	<0.00006	0.00585	<0.00006	<2.1E-05	0.0001	<2.1E-05	6.2E-05 J
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.0005	0.0039	0.0049	0.0074	0.000062J	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00005	<0.00005	0.00086	<0.00011	<0.00011	0.0014	<0.00011	<1.9E-05	<1.9E-05	0.00015	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-3  
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential	C/I	MW-76C					MW-83C				MW-85C			
			Assessment	Assessment	07/24/2014	1/30/2018	3/28/2018	5/25/2018	1/23/2019	2/8/2018	3/22/2018	6/7/2018	1/15/2019	2/1/2018	3/28/2018	5/24/2018	2/1/2019
			Level	Level	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
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.00014	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzene	71-43-2	8260	5.00E-03	5.00E-03	0.000149J	<0.0002	<0.0002	0.00021 J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.013</b>	0.0026
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.00011	<0.0003	<0.0003	<0.0003	<0.0003	0.000066J	0.00005J	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.00015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	108-88-3	8260	1.00E+00	1.00E+00	0.000156J	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011	<0.00011
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.00026	<0.0003	<0.0003	<0.0003	<0.0003	0.0014	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	8.7E-05 J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00031	0.0018	<0.0004	<0.0004	0.0041	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00013	<5.8E-05	<5.8E-05	<5.9E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.000392J	0.0001	0.0012	3.2E-05 J	0.00031	0.0015	0.0015	8.9E-05 J	<1.9E-05	0.0001J	0.000049J	6.7E-05 J	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	0.0003J	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.000696	0.00015	0.00023	7.1E-05 J	0.00011	0.00083	0.001	0.00017	<2.7E-05	0.00013	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	0.0002	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.000234J	0.00006J	0.000055J	4.8E-05 J	4.1E-05 J	0.000034J	0.000068J	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00008	<0.00005	<0.00005	<5.1E-05	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00008	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	0.000803	<0.00024	0.00015J	<9.6E-05	<9.1E-05	0.00019J	<3.7E-05	<0.00012	<6.4E-05	0.000091J	0.0002	<0.00013	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.000507	0.00012	0.00012	5.6E-05 J	0.00011	0.00061	0.00044	4.6E-05 J	<0.00002	0.000087J	<0.00002	3.6E-05 J	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	<0.00011	<0.00002	<0.00002	0.00004 J	2.7E-05 J	<0.00002	<0.00002	<9.2E-05	0.00006 J	0.00023	<0.00002	<0.00003	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.000322J	0.00019	0.00018	0.00007 J	<0.00001	0.000044J	<0.00001	1.8E-05 J	<0.00001	0.000015J	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.000778	0.00016	0.00014	7.6E-05 J	7.6E-05 J	0.00035	0.00034	6.7E-05 J	<0.00003	0.00011	<0.00003	3.4E-05 J	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00176	<0.0028	0.0019	0.00036	0.007	0.012	0.016	0.00039	<0.00036	0.00069	0.0017	0.0026	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<b>0.00272</b>	<7.9E-05	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	0.00015 J	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00183	0.00051	0.00044	0.00023	8.6E-05 J	0.00044	0.00053	3.8E-05 J	<2.1E-05	0.0001	<2.1E-05	0.0001	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	0.00284	0.0032	<3.5E-05	<3.5E-05	0.0012	<3.5E-05	<3.5E-05	<3.5E-05	3.8E-05 J	0.00011J	<3.5E-05	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.000194J	0.00016	0.00012	4.8E-05 J	<1.9E-05	0.000027J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well

**Table 5B-3  
Summary of Groundwater Sampling Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

chemical_name	CAS	Method	Residential Assessment Level	C/I Assessment Level	MW-86C				MW-87C				MW-88C				
			mg/L	mg/L	2/1/2018	3/28/2018	5/25/2018	1/11/2019	2/8/2018	3/27/2018	6/7/2018	1/22/2019	2/1/2018	3/19/2018	3/20/2018	5/24/2018	1/8/2019
<b>Volatile Organic Compounds</b>																	
1,2-Dichloroethane	107-06-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Benzene	71-43-2	8260	5.00E-03	5.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Chlorobenzene	108-90-7	8260	1.00E-01	1.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
Ethylbenzene	100-41-4	8260	7.00E-01	7.00E-01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
Methylene chloride	75-09-2	8260	5.00E-03	5.00E-03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Toluene	108-88-3	8260	1.00E+00	1.00E+00	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Xylenes (total)	1330-20-7	8260	1.00E+01	1.00E+01	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																	
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<b>0.0028</b>	0.00041 J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	0.00043	0.00014	<1.9E-05	<1.9E-05	0.000052J	0.000052J	<1.9E-05	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	0.0003J	<4.7E-05	<4.7E-05	<4.7E-05	0.00033J	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05	0.00042	0.00011	<2.7E-05	<2.7E-05	0.000053J	<2.7E-05	<2.7E-05	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	0.000081J	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	
Benzo(a)pyrene	50-32-8	8270	2.00E-04	2.00E-04	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	8270	6.00E-03	6.00E-03	<3.7E-05	<3.7E-05	<5.2E-05	<5.7E-05	0.0003	<3.7E-05	<0.00012	<3.7E-05	0.000052J	<3.7E-05	<3.7E-05	<0.00017	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	<0.00002	<0.00002	<0.00002	<0.00002	0.00032	0.000063J	<0.00002	<0.00002	0.000023J	0.000056J	0.000056J	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.000051J	<0.00002	<0.00002	7.2E-05 J	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.000025J	0.000025J	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	<0.00003	<0.00003	<0.00003	<0.00003	0.00027	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.000054J	<0.00002	<7.9E-05	7.9E-05 J	0.0014	0.00038	<0.00002	<0.00002	0.00011	0.00055	0.00011	<5.9E-05	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05	
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05	
Pentachlorophenol	87-86-5	8270	1.00E-03	1.00E-03	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05	<0.00008	
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	<2.1E-05	<2.1E-05	3.2E-05 J	<2.1E-05	0.00048	0.00015	<2.1E-05	<2.1E-05	0.00003J	<2.1E-05	<2.1E-05	3.5E-05 J	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<0.00011	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	<3.5E-05	
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are **bold** type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.
- \* indicates DNAPL is or has been observed in monitoring well





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														
Constituent	CAS	Method	mg/L	mg/L	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	2/7/2018	3/26/2018	6/1/2018	1/24/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<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	0.000135J	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.0005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00004
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00015J	<0.00007	<0.00007	0.00046	<0.00005	<0.00005	0.000071J	<0.00007	0.00016J	<0.00007	0.000334J	<1.9E-05	<1.9E-05	8.3E-05 J	<1.9E-05
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00015J	<0.00009	<0.00009	0.00095	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	0.00069	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	0.00027	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.006	0.00023	0.00031	0.0015	0.0011	0.00094	0.00014J	<0.00037	0.000805J	0.000425J	0.00306	0.000063J	<3.7E-05	0.00024	<3.7E-05
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	0.00024	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00014J	<0.00008	<0.00008	0.0011	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	0.00024 J	<0.00002
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	<0.00002	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	<0.00007	<0.00007	<0.00007	0.0018	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	7.89E-05J	0.00018J	<0.00001	<0.00001	<0.00001	<0.00001
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00013J	<0.00007	<0.00007	0.00079	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	0.00017 J	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0019	<0.0001	0.00022	0.0034	<0.00005	<0.00005	0.00036	<0.00008	0.00226J	0.00008J	0.00576	<0.00002	<0.00002	0.0002	<0.00002
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<7.9E-05	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.0002	<0.00007	<0.00007	0.0037	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	0.00006J	0.00018J	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	0.00014J	<0.00005	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	0.00063 J	<3.5E-05	<3.5E-05
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	0.0011	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	0.000131J	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

Notes:

1. Sampling locations shown on Figure 1
2. Concentrations > RAL and non-detects are bold type.
3. Concentrations > cPCL and non-detects are highlighted.
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
6. 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														
Constituent	CAS	Method	mg/L	mg/L	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	2/7/2018	3/26/2018	6/1/2018	1/24/2019
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0002	<0.0002	<0.0002	<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	<0.00012	<0.00012	<0.00018	<0.00012	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.0003	<0.0003	<0.0003	<0.0003
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	<0.001	<0.001	<0.001	<0.001
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	<0.0002	<0.0002	<0.0002	<0.0002
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00017	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002
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	<0.0003	<0.0003	<0.0003	<0.0003
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.00004	<0.00004	<0.00004	<0.00009
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<5.8E-05	<5.8E-05	<5.8E-05	<5.8E-05
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<4.2E-05	<4.2E-05	<4.2E-05	<4.2E-05
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00012J	<0.00007	0.00014J	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	8.08E-05J	<0.00007	<0.00007	<1.9E-05	<1.9E-05	8.9E-05 J	0.00016
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.00002	<0.00002	<0.00002	<0.00002
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<4.7E-05	<4.7E-05	<4.7E-05	<4.7E-05
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.00019J	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.7E-05	<2.7E-05	<2.7E-05	<2.7E-05
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<1.5E-05	<1.5E-05	<1.5E-05	<1.5E-05
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.000078J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	5.74E-05J	<0.00005	<1.4E-05	<1.4E-05	<1.4E-05	<1.4E-05
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00005	<5.1E-05	<0.00005	<0.00005
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	<0.00002	<0.00002	<0.00002	<0.00002
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00003	<0.00003	<0.00003	<0.00003
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.0019	0.0027	0.001	0.001	0.001	0.0013J	0.00025	0.000593	<0.00037	<0.00037	0.00244	<3.7E-05	<3.7E-05	<0.0002	0.00006 J
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<2.1E-05	<2.1E-05	<2.1E-05	<2.1E-05
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00016J	0.00012J	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00002	<0.00002	6.1E-05 J	3.9E-05 J
Di-n-butylphthalate	84-74-2	8270	2.40E+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	<0.00002	<0.00002	2.2E-05 J	<0.00002
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.000097J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	0.000117J	<0.00007	<0.00001	<0.00001	1.3E-05 J	2.7E-05 J
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00016J	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	<0.00007	<0.00003	<0.00003	<0.00003	<0.00003
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.00051	0.00026	0.00059	0.00019J	<0.00005	<0.00005	0.000094J	<0.00008	<0.00008	0.000529J	0.00071	<0.00002	<0.00002	0.00029	<0.0026
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<2.4E-05	<2.4E-05	<2.4E-05	<2.4E-05
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<2.5E-05	<2.5E-05	<2.5E-05	<2.5E-05
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	<7.9E-05	<0.00008	<7.9E-05	<7.9E-05
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00014J	<0.00007	<0.00007	<0.00007	0.000065J	<0.00005	<0.00005	<0.00006	0.000093J	0.000294J	<0.00006	<2.1E-05	<2.1E-05	3.5E-05 J	<2.1E-05
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	0.0015	<0.00007	<0.00007	0.000051J	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<3.5E-05	<3.5E-05	<3.5E-05	<0.00019
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	<0.00007	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<1.9E-05	<1.9E-05	<1.9E-05	<1.9E-05

Notes:

1. Sampling locations shown on Figure 1
2. Concentrations > RAL and non-detects are bold type.
3. Concentrations > cPCL and non-detects are highlighted.
4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
6. 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

Constituent	CAS	Method	Residential Assessment Level mg/L	C/I Assessment Level mg/L	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	2/7/2018	3/26/2018	5/1/2018	1/24/2019	
<b>Volatile Organic Compounds</b>																			
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.0003	<0.0003	<0.0003	<0.0003	
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	<0.001	<0.001	<0.001	<0.001	
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	<0.0002	<0.0002	<0.0002	<0.0002	
Vinyl Chloride	75-01-4	8260	2.00E-03	2.00E-03	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.0005	<0.00015	<0.00015	<0.00015	<0.00015	<0.0002	<0.0002	<0.0002	<0.0002	
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	<0.0003	<0.0003	<0.0003	<0.0003	
<b>Semi-Volatile Organic Compounds</b>																			
1,2-Diphenylhydrazine	122-66-7	8270	1.10E-03	2.60E-03	<0.0001	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00011	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	
2,4-Dimethylphenol	105-67-9	8270	4.90E-01	1.50E+00	<0.00008	<0.00008	<0.00008	<0.00005	<0.00005	<0.00005	<0.00031	<0.00031	<0.00031	<0.00031	<0.0004	<4.1E-05	<0.00004	<0.00004	
2,4-Dinitrotoluene	121-14-2	8270	1.30E-03	3.00E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00058	<5.8E-05	<5.8E-05	<5.8E-05	
2,6-Dinitrotoluene	606-20-2	8270	1.30E-03	3.00E-03	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00006	<0.00008	<0.00008	<0.00008	<0.00008	<0.00042	<4.3E-05	<4.2E-05	<4.2E-05	
2-Chloronaphthalene	91-58-7	8270	2.00E+00	5.80E+00	<0.00012	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00008	<0.00008	<0.00008	<0.00008	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	
2-Methylnaphthalene	534-52-1	8270	9.80E-02	2.90E-01	0.00062	<0.00007	<0.00007	<0.00005	<0.00005	0.000085J	<0.00007	<0.00007	<0.00007	0.00021J	<0.00019	<1.9E-05	<1.9E-05	<1.9E-05	
4,6-Dinitro-2-methylphenol	91-57-6	8270	2.40E-03	7.30E-03	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00083	<0.00083	<0.00083	<0.00083	<0.0002	<0.00002	<0.00002	<0.00002	
4-Nitrophenol	100-02-7	8270	4.90E-02	1.50E-01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00056	<0.00056	<0.00056	<0.00056	<0.00047	<4.8E-05	<4.7E-05	<4.7E-05	
Acenaphthene	83-32-9	8270	1.50E+00	4.40E+00	0.0004	<0.00009	<0.00009	<0.00005	<0.00005	0.000054J	<0.00008	<0.00008	0.000145J	0.000141J	<0.00027	<2.8E-05	<2.7E-05	<2.7E-05	
Acenaphthylene	208-96-8	8270	1.50E+00	4.40E+00	<0.00006	<0.00007	<0.00007	<0.00005	<0.00005	0.000081J	<0.00006	<0.00006	<0.00006	0.000411J	<0.00015	<1.5E-05	<1.5E-05	<1.5E-05	
Anthracene	120-12-7	8270	7.30E+00	2.20E+01	0.00015J	<0.00007	<0.00007	0.00022	0.00027	0.00059	<0.00005	<0.00005	<0.00005	0.00304	<0.00014	<1.4E-05	<1.4E-05	<1.4E-05	
Benzo(a)anthracene	56-55-3	8270	9.10E-03	2.00E-02	<0.00007	<0.00007	<0.00007	0.00011J	0.00012J	0.00036	<0.00008	<0.00008	<0.00008	0.00041J	<0.0005	<5.1E-05	<0.00005	<0.00005	
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	0.00044J	<0.0002	<0.00002	<0.00002	<0.00002	
bis(2-Chloroethoxy)methane	111-91-1	8270	8.30E-04	1.90E-03	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.0003	<3.1E-05	<0.00003	<0.00003	
bis(2-Ethylhexyl)phthalate	117-81-7	8270	6.00E-03	6.00E-03	0.0064	0.0028	0.00096	0.0019	0.0002J	0.0032	<0.00037	<0.00037	<0.00037	0.000585	<0.00037	<3.8E-05	<0.00019	0.00017 J	
Chrysene	218-01-9	8270	9.10E-01	2.00E+00	<0.00007	<0.00007	<0.00007	0.00046	0.00052	0.0018	<0.00008	<0.00008	<0.00008	0.00104	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	
Dibenzofuran	132-64-9	8270	9.80E-02	2.90E-01	0.00036	<0.00008	0.000083J	<0.00005	<0.00005	0.000066J	<0.00008	<0.00008	<0.00008	0.000133J	<0.0002	<0.00002	<0.00002	<0.00002	
Di-n-butylphthalate	84-74-2	8270	2.40E+00	7.30E+00	0.00044	0.000086J	<0.00007	0.0000956J	<0.00005	0.000078J	<0.00011	<0.00011	<0.00011	0.000121J	<0.0002	<0.00002	<0.00002	<0.00002	
Fluoranthene	206-44-0	8270	9.80E-01	2.90E+00	0.00026	<0.00007	<0.00007	0.00035	0.00057	0.0019	<0.00007	<0.00007	<0.00007	0.00116	<0.0001	<0.00001	<0.00001	<0.00001	
Fluorene	86-73-7	8270	9.80E-01	2.90E+00	0.00033	<0.00007	<0.00007	<0.00005	<0.00005	<0.00005	<0.00007	<0.00007	<0.00007	0.000143J	<0.0003	<3.1E-05	<0.00003	<0.00003	
Naphthalene	91-20-3	8270	4.90E-01	1.50E+00	0.0058	<0.0001	0.0002J	<0.00005	<0.00005	0.0004	<0.00008	9.99E-05J	0.000367J	0.00118	<0.0002	<0.00002	<0.00002	<0.00002	
Nitrobenzene	98-95-3	8270	4.90E-02	1.50E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.00011	<0.00011	<0.00011	<0.00024	<2.4E-05	<2.4E-05	<2.4E-05		
N-Nitrosodiphenylamine	86-30-6	8270	1.90E-01	4.20E-01	<0.00009	<0.00009	<0.00009	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.0001	<0.00025	<2.6E-05	<2.5E-05	<2.5E-05		
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	<0.00079	<8.1E-05	<7.9E-05	<7.9E-05		
Phenanthrene	85-01-8	8270	7.30E-01	2.20E+00	0.00073	0.00012J	<0.00007	0.00011J	0.00011J	0.00058	<0.00006	<0.00006	0.000132J	0.000295J	<0.00021	<2.1E-05	<2.1E-05	<2.1E-05	
Phenol	108-95-2	8270	7.30E+00	2.20E+01	<0.00007	<0.00007	<0.00007	<0.00005	<0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.00035	<3.6E-05	<3.5E-05	<3.5E-05		
Pyrene	129-00-0	8270	7.30E-01	2.20E+00	0.00017J	<0.00007	<0.00007	0.00036	0.00051	0.0019	<0.00011	<0.00011	<0.00011	0.00118	<0.00019	<1.9E-05	<1.9E-05	<1.9E-05	

- Notes:
1. Sampling locations shown on Figure 1
  2. Concentrations > RAL and non-detects are bold type.
  3. Concentrations > cPCL and non-detects are highlighted.
  4. TRRP PCLs (30 TAC §350, Tables 1, 2, and 3), last updated April 27, 2018.
  5. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  6. J = Estimated value, < = Compound not detected at the specified detection limit.

**Table 5B-5  
Summary of Groundwater Arsenic and Lead Results - A-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

Residential Assessment C/I Assessment Level	Arsenic (mg/L)				Lead (mg/L)			
	0.01				0.015			
	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019
MW-03	0.000895 J	0.00242	0.00363	<b>0.0191</b>	<0.0006	<0.0006	0.000787 J	0.00131 J
MW-04	0.00454	0.00092J	0.00492	0.000963 J	0.0016 J	<0.0006	0.00201	<0.0006
MW-05	0.00588	0.00255	0.00488	0.00387	0.00222	0.00149J	<0.0006	0.00149 J
MW-09	0.00104 J	0.0012J	0.00085 J	0.00202	<0.0006	<0.0006	<0.0006	0.000931 J
MW-12A	<b>0.017</b>	0.00133J	0.00093 J	0.00192 J	<0.0006	0.00092J	0.000655 J	<0.0006
MW-13	0.00303	0.00984	<b>0.014</b>	<b>0.0602</b>	<0.0006	<0.0006	<0.0006	0.00133 J
MW-15A	<b>0.0264</b>	<b>0.0137</b>	<b>0.019</b>	<b>0.027</b>	<0.0006	<0.0006	<0.0006	0.000722 J
MW-17	<b>0.0444</b>	<b>0.0419</b>	<b>0.0415</b>	<b>0.046</b>	<0.0006	<0.0006	<0.0006	<0.0006
MW-18A	0.0043	<b>0.0239</b>	<b>0.0291</b>	0.0031	<0.0006	<0.0006	<0.0006	<0.0006
MW-20A	0.0087	0.00568	0.00895	0.00788	<0.0006	<0.0006	<0.0006	<0.0006
MW-22AR	0.000896 J	0.000716J	0.00293	0.00488	<0.0006	<0.0006	<0.0006	0.00526
MW-25A	<b>0.0171</b>	0.00714	0.00171 J	0.00216	<0.0006	0.0079	<0.0006	<0.0006
MW-26A	<b>0.032</b>	<b>0.0427</b>	<b>0.0491</b>	<b>0.166</b>	<0.0006	0.000908J	<0.0006	<0.0006
MW-27A	0.000978 J	<0.0004	0.00207	NS	<0.0006	0.000601J	<0.0006	NS
MW-28A	0.0076	0.0053	<b>0.0177</b>	<b>0.0116</b>	<0.0006	0.00381	0.00763	<0.0006
MW-32AR	0.00294	<b>0.0228</b>	<b>0.0441</b>	<b>0.0316</b>	<0.0006	<0.0006	<0.0006	0.000644 J
MW-33A	<b>0.0202</b>	<b>0.0201</b>	0.00573	0.01	<0.0006	<0.0006	<0.0006	<0.0006
MW-35A	<b>0.0166</b>	<b>0.0714</b>	<b>0.0189</b>	<b>0.0198</b>	0.000985 J	0.00464	<0.0006	0.000654 J
MW-36A	0.00108 J	0.00753	0.00117 J	0.00107 J	<0.0006	<b>0.0184</b>	0.00204	0.00108 J
MW-38A	<0.0004	<b>0.0138</b>	<b>0.0124</b>	<b>0.0186</b>	<0.0006	<0.0006	<0.0006	<0.0006
MW-44A	<b>0.0275</b>	<b>0.0169</b>	<b>0.0165</b>	<b>0.0101</b>	<0.0006	<0.0006	<0.0006	<0.0006
MW-49A	0.00163 J	0.00233	0.000922 J	0.0012 J	0.000693 J	<0.0006	0.000913 J	0.00778
MW-50A	0.00205	<0.0004	0.00857	0.00134 J	<0.0006	0.00404	<0.0006	<0.0006
MW-51A	<0.0004	<0.0004	<0.0004	<0.0004	0.000748 J	<0.0006	<0.0006	<0.0006
MW-58A	0.000713 J	0.00106J	0.00143 J	0.00232	<0.0006	<0.0006	<0.0006	<0.0006
MW-59A	0.00181 J	0.00131J	<b>0.0101</b>	0.00243	<0.0006	<0.0006	<0.0006	<0.0006
MW-60A	0.000649 J	0.000706J	0.000636 J	0.00453	<0.0006	<0.0006	<0.0006	<0.0006
MW-61A	0.000743 J	0.00116J	0.00172 J	0.00069 J	<0.0006	0.0012J	<0.0006	<0.0006
MW-64A	0.000419 J	<b>0.0117</b>	0.00111 J	<0.0004	<0.0006	<0.0006	0.00377	<0.0006
MW-68A	NS	NS	NS	0.00966	NS	NS	NS	NS
MW-69A	0.00916	0.0017J	<b>0.0142</b>	0.000717 J	0.00293	<0.0006	0.0145	0.000712 J
MW-77A	<b>0.0263</b>	<b>0.0187</b>	<b>0.019</b>	0.00207	<0.0006	<0.0006	<0.0006	<0.0006
MW-79A	<b>0.0184</b>	<b>0.0149</b>	<b>0.0134</b>	<b>0.0133</b>	<0.0006	<0.0006	<0.0006	<0.0006

- Note:
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 April 27, 2018.
  6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  7. J = Estimated value, < = Compound not detected at the specified detection limit.

**Table 5B-6**  
**Summary of Groundwater Arsenic and Lead Results - B-CZ/B-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

Level C/I Assessment Level	Arsenic (mg/L)					Lead (mg/L)				
	0.01					0.015				
	Jan/Feb 2018	March/April 2018	May/June 2018	July 2018	January 2019	Jan/Feb 2018	March/April 2018	May/June 2018	July 2018	January 2019
MW-14	<0.0004	<0.0004	<0.0004	NS	0.000752 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-15B	0.00895	0.00329	<b>0.0111</b>	NS	0.00244	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-22BR	<b>0.0219</b>	<b>0.0159</b>	<b>0.0301</b>	NS	<b>0.0535</b>	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-33BR	0.00144 J	0.00187J	0.00294	NS	0.00143 J	<0.0006	0.000625J	<0.0006	NS	0.000636 J
MW-35B	0.00465	0.00595	<b>0.0116</b>	NS	0.00862	<0.0006	0.000835J	<0.0006	NS	0.00165 J
MW-36B	0.00116 J	0.000942J	0.000817 J	NS	0.00118 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-38B	0.000636 J	0.000972J	<b>0.0386</b>	NS	<0.0004	<0.0006	0.000962J	<0.0006	NS	<0.0006
MW-39B	<b>0.0108</b>	0.00188J	0.00178 J	NS	0.00365	0.00121 J	<0.0006	<0.0006	NS	<0.0006
MW-40B	<b>0.0679</b>	<b>0.0606</b>	<b>0.0494</b>	NS	<b>0.085</b>	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-42B	0.00186 J	0.00108J	0.00112 J	NS	0.00216	0.00118 J	<0.0006	<0.0006	NS	0.00412
MW-49B	0.000564 J	0.000746J	0.00146 J	NS	NS	<0.0006	<0.0006	<0.0006	NS	NS
MW-57B	<b>0.0419</b>	0.00179J	0.00285	NS	NS	<0.0006	<0.0006	<0.0006	NS	NS
MW-59B	<0.0004	<0.0004	<0.0004	NS	0.000983 J	0.00135 J	0.0031	<0.0006	NS	0.00108 J
MW-62B	0.00842	<b>0.0173</b>	<b>0.028</b>	NS	<0.0004	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-63B	0.00114 J	0.00211	0.000818 J	NS	0.00338	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-67B	0.000751 J	0.000565J	0.000416 J	NS	<0.0004	0.0022	0.000991J	0.000661 J	NS	0.00331
MW-68B	<b>0.0117</b>	<b>0.014</b>	<b>0.0112</b>	NS	<b>0.0125</b>	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-71B	0.00174 J	0.00214	0.000851 J	NS	0.00158 J	<0.0006	0.00832	0.00428	NS	0.000845 J
MW-72B	0.00127 J	0.000624J	0.000951 J	NS	0.00106 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-74B	0.00162 J	0.00142J	0.00131 J	NS	0.0014 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-80B	0.00286	0.00187J	0.00202	NS	0.0018 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-81B	0.00207	0.00134J	0.00203	NS	0.00116 J	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-82B	0.00271	0.00175J	<b>0.0103</b>	NS	0.00838	<0.0006	<0.0006	<0.0006	NS	<0.0006
MW-83B	<b>0.0353</b>	<b>0.0185</b>	<b>0.0673</b>	<b>0.0731</b>	<b>0.0916</b>	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
MW-84B	0.00269	0.00277	<0.0004	<0.0004	0.00219	<0.0006	<0.0006	<0.0006	0.00121 J	<0.0006
MW-89B	NI	NI	NI	0.00138 J	0.000683 J	NI	NI	NI	<0.0006	<0.0006
MW-90B	NI	NI	NI	0.00169 J	0.00346	NI	NI	NI	<0.0006	<0.0006
P-11	<b>0.0374</b>	<b>0.016</b>	<b>0.0622</b>	NS	<b>0.0183</b>	0.00215	0.0015J	<0.0006	NS	0.00192 J
TW-41B	<b>0.0376</b>	<b>0.0953</b>	<b>0.0976</b>	NS	<b>0.125</b>	<0.0006	<0.0006	<0.0006	NS	<0.0006

- Note:
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 April 27, 2018.
  6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  7. J = Estimated value, < = Compound not detected at the specified detection limit.
  8. NI - Not Installed / NS - Not Sampled



**Table 5B-7  
Summary of Groundwater Arsenic and Lead Results - C-TZ Monitoring Wells  
UPRR Houston Wood Preserving Works**

Residential Assessment Level C/I Assessment Level	Arsenic (mg/L)				Lead (mg/L)			
	0.01				0.015			
	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019
MW-12C	0.0025	0.00184J	0.0017 J	0.000796 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-15C	0.000738 J	0.000598J	0.000777 J	0.000629 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-17C	0.00112 J	0.00688	0.00479	0.0013 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-18C	0.00467	0.00327	0.00342	<b>0.0257</b>	<0.0006	<0.0006	<0.0006	<0.0006
MW-19C	0.00158 J	0.00107J	0.00294	0.00149 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-21C	0.00128 J	0.00109J	0.00116 J	0.00187 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-25C	0.00283	0.003	0.00305	0.00359	0.0079	0.00585	0.00514	<0.0006
MW-27C	0.00261	<0.0004	0.00212	0.000786 J	<b>0.0159</b>	<0.0006	<0.0006	0.000831 J
MW-28C	0.00206	0.00184J	0.00184 J	0.000447 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-34CR	0.00106 J	0.000801J	0.000689 J	0.00132 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-47C	NS	NS	NS	<0.0004	NS	NS	NS	0.000859 J
MW-48C	0.000831 J	0.000581J	0.000562 J	0.000924 J	0.00259	<0.0006	<0.0006	0.00141 J
MW-51C	0.000614 J	0.0004J	<0.0004	<0.0004	0.000858 J	<0.0006	<0.0006	<0.0006
MW-53C	0.000502 J	0.000443J	0.000694 J	<0.0004	0.000712 J	0.00085J	<0.0006	<0.0006
MW-54C	0.00128 J	0.00133J	0.0012 J	0.00123 J	<0.0006	<0.0006	<0.0006	<0.0006
MW-68C	<0.0004	0.000618J	<0.0004	<0.0004	<0.0006	<0.0006	<0.0006	<0.0006
MW-76C	0.00157 J	0.000631J	0.000527 J	0.000579 J	0.00239	<0.0006	<0.0006	<0.0006
MW-83C	0.000609 J	<0.0004	0.00139 J	0.00616	<0.0006	<0.0006	<0.0006	<0.0006
MW-85C	0.00152 J	0.00287	0.00588	0.00136 J	<0.0006	0.00249	<0.0006	<0.0006
MW-86C	0.00156 J	0.00612	0.00768	0.00405	<0.0006	<0.0006	<0.0006	<0.0006
MW-87C	<0.0004	<0.0004	<0.0004	0.000587 J	<0.0006	<0.0006	<0.0006	0.00124 J
MW-88C	0.000557 J	0.000653J	0.00346	0.000864 J	<0.0006	<0.0006	<0.0006	<0.0006

- Note:
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 April 27, 2018.
  6. RAL = Residential Assessment Level, C/I = Commercial/Industrial
  7. J = Estimated value, < = Compound not detected at the specified detection limit.

**Table 5B-8**  
**Summary of Groundwater Arsenic and Lead Results - D-TZ Monitoring Wells**  
**UPRR Houston Wood Preserving Works**

	Arsenic (mg/L)				Lead (mg/L)			
Residential Assessment Level	0.01				0.015			
C/I Assessment Level	0.01				0.015			
	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019	Jan/Feb 2018	March/April 2018	May/June 2018	January 2019
MW-36D	0.000773 J	0.00137J	<0.0004	0.000417 J	0.00182 J	<b>0.0206</b>	0.00476	0.00091 J
MW-59D	<0.0004	<0.0004	0.00111 J	0.000765 J	<0.0006	0.0018	0.00438	0.000917 J
MW-65D	<0.0004	0.00761	0.00292	0.00202	<0.0006	0.0006	<0.0006	<0.0006
MW-66D	0.000711 J	0.00663	0.00223	0.00204	0.00162 J	0.0006	<0.0006	<0.0006

Note:

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 April 27, 2018.
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-03	48.34	9/2/1993	8.17			40.17
	48.34	12/21/1993	3.81			44.53
	48.34	3/24/1994	4.74			43.6
	48.34	6/22/1994	6.35			41.99
	48.34	9/28/1994	7.56			40.78
	48.34	10/13/1994	8.21			40.13
	48.34	1/24/1995	3.18			45.16
	48.34	4/11/1995	3.22			45.12
	48.34	7/11/1995	7.90			40.44
	48.34	1/23/1996	6.27			42.07
	48.34	7/19/1996	8.77			39.57
	48.34	9/17/1996	9.31			39.03
	48.34	10/31/1996	7.61			40.73
	48.34	11/22/1996	9.48			38.86
	48.34	12/27/1996	6.14			42.2
	48.34	1/22/1997	5.68			42.66
	48.34	2/21/1997	3.13			45.21
	48.34	3/25/1997	3.48			44.86
	48.34	4/23/1997	5.17			43.17
	48.34	4/24/1997	5.25			43.09
	48.34	5/13/1997	3.41			44.93
	48.34	6/20/1997	5.91			42.43
	48.34	6/25/1997	3.11			45.23
	48.34	7/1/1997	4.91			43.43
	48.34	7/24/1997	7.90			40.44
	48.34	8/16/1997	8.91			39.43
	48.34	8/22/1997	9.65			38.69
	48.34	9/25/1997	6.96			41.38
	48.34	10/22/1997	5.50			42.84
	48.34	11/25/1997	5.55			42.79
	48.34	12/19/1997	5.10			43.24
	48.34	1/20/1998	3.58			44.76
	48.34	3/3/1998	3.37			44.97
	48.34	3/18/1998	3.16			45.18
	48.34	4/24/1998	7.54			40.8
	48.34	5/21/1998	7.50			40.84
	48.34	7/30/1998	8.44			39.9
	48.34	8/25/1998	7.56			40.78
	48.34	9/21/1998	5.28			43.06
	48.34	10/26/1998	6.96			41.38
	48.34	11/23/1998	5.11			43.23
	48.34	1/29/1999	4.21			44.13
	48.34	2/26/1999	4.32			44.02
	48.34	3/16/1999	4.16			44.18
	48.34	4/29/1999	4.33			44.01
	48.34	6/1/1999	4.39			43.95
	48.34	7/30/1999	5.88			42.46
	48.34	8/27/1999	4.57			43.77
	48.34	9/27/1999	10.48			37.86
	48.34	10/29/1999	11.61			36.73
	48.34	12/29/1999	10.11			38.23
	48.34	2/4/2000	13.22			35.12
	48.34	2/25/2000	9.14			39.2
	48.34	3/27/2000	8.06			40.28
	48.34	4/7/2000	7.64			40.7
	48.34	5/31/2000	7.70			40.64
	48.34	6/1/2000	7.66			40.68
	48.34	7/28/2000	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	8/30/2000	10.59			37.75
	48.34	9/19/2000	12.29			36.05
	48.34	10/27/2000	9.09			39.25
	48.34	11/21/2000	9.11			39.23
	48.34	5/1/2001	7.26			41.08
	48.34	10/1/2001	7.57			40.77
	48.34	3/11/2002	7.40			40.94
	48.34	9/23/2002	4.60			43.74
	48.34	3/10/2003	2.89			45.45
	48.34	9/23/2003	3.74			44.6
	48.34	3/15/2004	3.27			45.07
	48.34	9/13/2004	9.03			39.31
	48.34	7/18/2005	3.94			44.4
	48.34	1/4/2006	9.13			39.21
	48.34	7/27/2006	3.30			45.04
	48.34	3/7/2007	2.62			45.72
	48.34	7/27/2007	3.74			44.6
	48.34	1/30/2008	2.85			45.49
	48.34	7/16/2008	7.96			40.38
	48.34	2/4/2009	7.18			41.16
	48.34	7/24/2009	7.63			40.71
	48.34	1/8/2010	5.06			43.28
	48.34	7/12/2010	3.86			44.48
	48.34	1/12/2011	3.71			44.63
	48.34	7/12/2011	6.42			41.92
	48.34	1/26/2012	--			
	48.34	7/9/2012	4.06			44.28
	48.34	1/7/2013	5.09			43.25
	48.34	7/22/2013	8.24			40.1
	48.34	1/7/2014	8.09			40.25
	48.34	7/15/2014	8.78			39.56
	48.34	1/5/2015	7.06			41.28
48.34	2/11/2018	5.29			43.05	
48.34	3/11/2018	5.72			42.62	
48.34	5/14/2018	5.61			42.73	
48.34	7/2/2018	5.93			42.41	
48.34	13/2019	5.03			43.31	
MW-04	49.85	9/2/1993	8.57			41.28
	49.85	12/21/1993	5.42			44.43
	49.85	3/24/1994	5.85			44
	49.85	6/22/1994	6.77			43.08
	49.85	9/28/1994	8.18			41.67
	49.85	10/13/1994	8.93			40.92
	49.85	1/24/1995	4.72			45.13
	49.85	4/11/1995	4.57			45.28
	49.85	7/11/1995	6.47			43.38
	49.85	1/23/1996	7.85			42
	49.85	7/19/1996	9.62			40.23
	49.85	9/17/1996	10.09			39.76
	49.85	10/31/1996	7.93			41.92
	49.85	11/22/1996	10.62			39.23
	49.85	12/27/1996	8.06			41.79
	49.85	1/22/1997	6.07			43.78
	49.85	2/21/1997	4.86			44.99
	49.85	3/25/1997	5.16			44.69
	49.85	4/23/1997	6.25			43.6
	49.85	4/24/1997	6.45			43.4
49.85	5/13/1997	5.07			44.78	

**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-04	49.85	6/20/1997	6.69			43.16
	49.85	6/25/1997	4.68			45.17
	49.85	7/1/1997	5.91			43.94
	49.85	7/24/1997	8.61			41.24
	49.85	8/16/1997	9.62			40.23
	49.85	8/22/1997	10.35			39.5
	49.85	9/25/1997	8.13			41.72
	49.85	10/22/1997	7.23			42.62
	49.85	11/25/1997	7.25			42.6
	49.85	12/19/1997	6.76			43.09
	49.85	1/20/1998	5.40			44.45
	49.85	3/3/1998	5.00			44.85
	49.85	3/18/1998	4.82			45.03
	49.85	4/24/1998	8.63			41.22
	49.85	5/21/1998	9.30			40.55
	49.85	7/30/1998	10.19			39.66
	49.85	8/25/1998	9.05			40.8
	49.85	9/21/1998	7.05			42.8
	49.85	10/26/1998	8.12			41.73
	49.85	11/23/1998	6.01			43.84
	49.85	1/29/1999	5.19			44.66
	49.85	2/26/1999	5.22			44.63
	49.85	3/16/1999	6.21			43.64
	49.85	4/29/1999	6.33			43.52
	49.85	6/1/1999	6.39			43.46
	49.85	7/30/1999	7.79			42.06
	49.85	8/27/1999	6.51			43.34
	49.85	9/27/1999	11.32			38.53
	49.85	10/29/1999	12.21			37.64
	49.85	12/29/1999	11.52			38.33
	49.85	2/4/2000	14.33			35.52
	49.85	2/25/2000	10.63			39.22
	49.85	3/27/2000	9.38			40.47
	49.85	4/7/2000	9.09			40.76
	49.85	5/31/2000	9.13			40.72
	49.85	6/1/2000	9.10			40.75
	49.85	7/28/2000	9.18			40.67
	49.85	8/30/2000	12.17			37.68
	49.85	9/19/2000	13.39			36.46
	49.85	10/27/2000	10.69			39.16
	49.85	11/21/2000	9.61			40.24
	49.85	5/1/2001	8.41			41.44
	49.85	10/1/2001	8.68			41.17
	49.85	3/11/2002	5.41			44.44
	49.85	9/23/2002	5.29			44.56
	49.85	3/10/2003	4.36			45.49
	49.85	9/23/2003	5.28			44.57
	49.85	3/15/2004	4.80			45.05
	49.85	9/13/2004	9.80			40.05
	49.85	7/18/2005	5.84			44.01
	49.85	1/4/2006	10.48			39.37
	49.85	7/27/2006	5.30			44.55
	49.85	3/7/2007	4.10			45.75
	49.85	7/27/2007	5.36			44.49
	49.85	1/29/2008	4.18			45.67
	49.85	7/16/2008	8.66			41.19
	49.85	2/4/2009	8.93			40.92
	49.85	7/24/2009	9.27			40.58

**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	1/8/2010	6.34			43.51
	49.85	7/12/2010	5.02			44.83
	49.85	1/12/2011	5.26			44.59
	49.85	7/12/2011	8.06			41.79
	49.85	1/26/2012	--			
	49.85	7/9/2012	3.74			46.11
	49.85	1/7/2013	4.62			45.23
	49.85	7/22/2013	7.59			42.26
	49.85	1/7/2014	7.16			42.69
	49.85	7/15/2014	7.62			42.23
	49.85	1/5/2015	6.12			43.73
	49.85	8/10/2015	4.26			45.59
	49.85	1/13/2016	3.92			45.93
	49.85	7/6/2016	4.31			45.54
	49.85	1/12/2017	4.67			45.18
	49.85	7/6/2017	5.12			44.73
	49.85	9/5/2017	5.01			44.84
	49.85	2/11/2018	5.12			44.73
	49.85	3/11/2018	5.67			44.18
	MW-05	49.24	9/2/1993	4.90		
49.24		12/21/1993	2.21			47.03
49.24		3/24/1994	2.30			46.94
49.24		6/22/1994	2.80			46.44
49.24		9/28/1994	3.90			45.34
49.24		10/13/1994	5.05			44.19
49.24		1/24/1995	1.36			47.88
49.24		4/11/1995	3.90			45.34
49.24		7/11/1995	5.33			43.91
49.24		1/23/1996	7.42			41.82
49.24		7/19/1996	8.61			40.63
49.24		9/17/1996	9.01			40.23
49.24		10/31/1996	7.84			41.4
49.24		11/22/1996	9.68			39.56
49.24		12/27/1996	7.66			41.58
49.24		1/22/1997	5.89			43.35
49.24		2/21/1997	4.45			44.79
49.24		3/25/1997	4.65			44.59
49.24		4/23/1997	5.53			43.71
49.24		4/24/1997	5.68			43.56
49.24	5/13/1997	4.39			44.85	
49.24	6/20/1997	5.67			43.57	
49.24	6/25/1997	3.97			45.27	
49.24	7/1/1997	5.06			44.18	
49.24	7/24/1997	7.46			41.78	
49.24	8/16/1997	8.57			40.67	
49.24	8/22/1997	9.20			40.04	
49.24	9/25/1997	7.28			41.96	
49.24	10/22/1997	6.70			42.54	
49.24	11/25/1997	6.70			42.54	
49.24	12/19/1997	6.26			42.98	
49.24	1/20/1998	5.05			44.19	
49.24	3/4/1998	4.54			44.7	
49.24	3/18/1998	4.36			44.88	
49.24	4/24/1998	7.67			41.57	



**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-05	49.24	5/21/1998	8.80			40.44
	49.24	7/30/1998	9.90			39.34
	49.24	8/25/1998	8.86			40.38
	49.24	9/21/1998	6.59			42.65
	49.24	10/26/1998	7.77			41.47
	49.24	11/23/1998	5.79			43.45
	49.24	1/29/1999	4.88			44.36
	49.24	2/26/1999	4.96			44.28
	49.24	3/16/1999	5.81			43.43
	49.24	4/29/1999	5.91			43.33
	49.24	6/1/1999	5.99			43.25
	49.24	7/30/1999	7.00			42.24
	49.24	8/27/1999	6.13			43.11
	49.24	9/27/1999	10.17			39.07
	49.24	10/29/1999	11.65			37.59
	49.24	12/29/1999	10.90			38.34
	49.24	2/4/2000	13.77			35.47
	49.24	2/25/2000	9.46			39.78
	49.24	3/27/2000	8.62			40.62
	49.24	4/7/2000	8.20			41.04
	49.24	5/31/2000	8.26			40.98
	49.24	6/1/2000	8.21			41.03
	49.24	7/28/2000	8.26			40.98
	49.24	8/30/2000	11.33			37.91
	49.24	9/19/2000	12.33			36.91
	49.24	10/27/2000	9.94			39.3
	49.24	11/21/2000	9.21			40.03
	49.24	5/1/2001	7.47			41.77
	49.24	10/1/2001	7.79			41.45
	49.24	3/11/2002	4.92			44.32
	49.24	9/23/2002	4.76			44.48
	49.24	3/10/2003	3.77			45.47
49.24	9/23/2003	4.61			44.63	
49.24	3/15/2004	4.22			45.02	
49.24	9/13/2004	8.58			40.66	
49.24	7/18/2005	5.61			43.63	
49.24	1/4/2006	9.76			39.48	
49.24	7/27/2006	4.85			44.39	
49.24	3/7/2007	5.94			43.3	
49.24	7/27/2007	4.53			44.71	
49.24	1/29/2008	3.71			45.53	
49.24	7/15/2008	7.77			41.47	
49.24	2/4/2009	8.33			40.91	
49.24	7/24/2009	8.67			40.57	
49.24	1/8/2010	6.06			43.18	
49.24	7/12/2010	4.86			44.38	
49.24	1/12/2011	5.06			44.18	
49.24	7/12/2011	10.96			38.28	
49.24	2/2/2012	4.9			44.34	
49.24	7/9/2012	4.61			44.63	
49.24	1/7/2013	7.58			41.66	
49.24	7/22/2013	10.44			38.8	
MW-09	49.26	9/2/1993	7.43			41.86
	49.26	12/21/1993	4.89			44.4
	49.26	3/24/1994	4.92			44.37
	49.26	6/22/1994	5.51			43.78
	49.26	9/28/1994	6.90			42.39
	49.26	10/13/1994	7.66			41.63

**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-09	49.26	1/24/1995	4.10			45.19
	49.26	4/11/1995	3.74			45.55
	49.26	7/11/1995	5.08			44.21
	49.26	1/23/1996	7.09			42.2
	49.26	7/19/1996	8.27			41.02
	49.26	9/17/1996	8.58			40.71
	49.26	10/31/1996	7.27			42.02
	49.26	11/22/1996	9.17			40.12
	49.26	12/27/1996	7.05			42.24
	49.26	1/22/1997	5.42			43.87
	49.26	2/21/1997	4.09			45.2
	49.26	3/25/1997	4.17			45.12
	49.26	4/23/1997	5.05			44.24
	49.26	4/24/1997	5.21			44.08
	49.26	5/13/1997	4.16			45.13
	49.26	6/20/1997	5.32			43.97
	49.26	6/25/1997	3.80			45.49
	49.26	7/1/1997	4.57			44.72
	49.26	7/24/1997	7.03			42.26
	49.26	8/16/1997	8.26			41.03
	49.26	8/22/1997	8.67			40.62
	49.26	9/25/1997	6.99			42.3
	49.26	10/22/1997	6.10			43.19
	49.26	11/25/1997	6.12			43.17
	49.26	12/19/1997	5.62			43.67
	49.26	1/20/1998	4.60			44.69
	49.26	3/4/1998	4.15			45.14
	49.26	3/18/1998	4.02			45.27
	49.26	4/24/1998	7.32			41.97
	49.26	5/21/1998	8.10			41.19
	49.26	7/30/1998	9.12			40.17
	49.26	8/25/1998	8.41			40.88
	49.26	9/21/1998	6.11			43.18
	49.26	10/26/1998	7.61			41.68
	49.26	11/23/1998	5.43			43.86
	49.26	1/29/1999	4.60			44.69
	49.26	2/26/1999	4.68			44.61
	49.26	3/16/1999	5.46			43.83
	49.26	4/29/1999	5.66			43.63
	49.26	6/1/1999	5.66			43.63
	49.26	7/30/1999	7.11			42.18
	49.26	8/27/1999	5.86			43.43
	49.26	9/27/1999	9.81			39.48
	49.26	10/29/1999	10.63			38.66
	49.26	12/29/1999	9.99			39.3
	49.26	2/4/2000	12.44			36.85
	49.26	2/25/2000	8.88			40.41
	49.26	3/27/2000	8.22			41.07
	49.26	4/7/2000	8.10			41.19
	49.26	5/31/2000	8.15			41.14
	49.26	6/1/2000	8.00			41.29
	49.26	7/28/2000	8.11			41.18
	49.26	8/30/2000	11.10			38.19
	49.26	9/19/2000	11.91			37.38
	49.26	10/27/2000	9.84			39.45
	49.26	11/21/2000	8.89			40.4
	49.26	5/1/2001	7.16			42.13
	49.26	10/1/2001	7.39			41.9

**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	3/11/2002	4.61			44.68
	49.26	9/23/2002	4.45			44.84
	49.26	3/10/2003	3.59			45.67
	49.26	9/23/2003	4.31			44.95
	49.26	3/15/2004	4.18			45.08
	49.26	9/13/2004	8.39			40.87
	49.26	7/18/2005	5.53			43.73
	49.26	1/4/2006	9.46			39.8
	49.26	7/27/2006	4.85			44.41
	49.26	3/7/2007	5.58			43.68
	49.26	7/27/2007	3.78			45.48
	49.26	1/29/2008	3.52			45.74
	49.26	7/15/2008	7.04			42.22
	49.26	2/4/2009	8.01			41.25
	49.26	7/24/2009	8.34			40.92
	49.26	1/8/2010	5.89			43.37
	49.26	7/12/2010	4.32			44.94
	49.26	1/12/2011	4.61			44.65
	49.26	7/12/2011	10.71			38.55
	49.26	1/26/2012	4.73			44.53
	49.26	7/9/2012	4.23			45.03
	49.26	1/7/2013	6.73			42.53
	49.26	7/22/2013	9.16			40.1
	49.26	1/7/2014	8.72			40.54
	49.26	7/16/2014	8.17			41.09
	49.26	1/5/2015	8.01			41.25
	49.26	8/10/2015	6.17			43.09
	49.26	1/13/2016	5.81			43.45
	49.26	7/6/2016	6.14			43.12
	49.26	1/12/2017	6.71			42.55
	49.26	7/6/2017	7.09			42.17
	49.26	9/5/2017	7.06			42.20
49.26	2/11/2018	5.16			44.10	
49.26	3/11/2018	6.01			43.25	
49.26	5/14/2018	6.21			43.05	
49.26	7/2/2018	6.67			42.59	
49.26	1/3/2019	5.61			43.65	
MW-12A	49.96	3/25/1997	5.52			44.44
	49.96	4/23/1997	6.51			43.45
	49.96	4/24/1997	6.66			43.3
	49.96	5/13/1997	5.47			44.49
	49.96	6/20/1997	6.81			43.15
	49.96	9/25/1997	8.08			41.88
	49.96	10/22/1997	7.10			42.86
	49.96	11/25/1997	7.12			42.84
	49.96	12/19/1997	6.96			43
	49.96	1/20/1998	5.69			44.27
	49.96	3/4/1998	4.52			45.44
	49.96	3/18/1998	5.28			44.68
	49.96	4/24/1998	8.70			41.26
	49.96	5/21/1998	9.10			40.86
	49.96	8/25/1998	10.05			39.91
	49.96	9/21/1998	7.11			42.85
	49.96	10/26/1998	9.11			40.85
	49.96	11/23/1998	6.01			43.95
	49.96	1/29/1999	5.44			44.52
	49.96	2/26/1999	5.52			44.44
49.96	3/16/1999	6.21			43.75	

**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--12A	49.96	4/29/1999	6.38			43.58
	49.96	6/1/1999	6.31			43.65
	49.96	7/30/1999	7.88			42.08
	49.96	8/27/1999	6.56			43.4
	49.96	9/27/1999	11.61			38.35
	49.96	10/29/1999	12.79			37.17
	49.96	11/18/1999	13.18			36.78
	49.96	12/29/1999	12.03			37.93
	49.96	2/4/2000	15.43			34.53
	49.96	2/25/2000	11.34			38.62
	49.96	3/27/2000	9.22			40.74
	49.96	4/7/2000	8.80			41.16
	49.96	5/31/2000	8.84			41.12
	49.96	6/1/2000	8.81			41.15
	49.96	7/28/2000	8.87			41.09
	49.96	8/30/2000	11.76			38.2
	49.96	9/19/2000	13.22			36.74
	49.96	10/27/2000	10.54			39.42
	49.96	11/21/2000	10.16			39.8
	49.96	5/1/2001	8.60			41.36
	49.96	10/1/2001	8.73			41.23
	49.96	3/11/2002	6.01			43.95
	49.96	9/23/2002	5.87			44.09
	49.96	3/10/2003	5.37			44.59
	49.96	9/23/2003	5.96			44
	49.96	3/15/2004	5.54			44.42
	49.96	9/13/2004	10.30			39.66
	49.96	7/18/2005	7.01			42.95
	49.96	1/4/2006	10.57			39.39
	49.96	7/27/2006	6.60			43.36
	49.96	3/7/2007	6.94			43.02
	49.96	7/27/2007	5.79			44.17
	49.96	1/30/2008	5.29			44.67
	49.96	7/15/2008	9.19			40.77
	49.96	2/4/2009	8.81			41.15
	49.96	7/24/2009	9.13			40.83
	49.96	1/8/2010	5.47			44.49
	49.96	7/12/2010	9.72			40.24
	49.96	1/12/2011	5.59			44.37
	49.96	7/12/2011	12.46			37.5
	49.96	1/26/2012	5.78			44.18
	49.96	7/9/2012	5.96			44
	49.96	1/7/2013	9.04			40.92
	49.96	7/22/2013	11.64			38.32
	49.96	1/7/2014	7.38			42.58
	49.96	7/16/2014	9.82			40.14
	49.96	1/5/2015	6.46			43.50
	49.96	8/10/2015	5.26			44.70
	49.96	1/13/2016	4.67			45.29
	49.96	7/6/2016	4.96			45.00
	49.96	1/12/2017	5.67			44.29
	49.96	7/6/2017	6.03			43.93
	49.96	9/5/2017	5.86			44.10
	49.96	2/11/2018	6.48			43.48
	49.96	3/11/2018	7.12			42.84
	49.96	5/14/2018	8.92			41.04
	49.96	1/3/2019	8.37			41.59

**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	3/25/1997	5.60			44.42
	50.02	4/23/1997	6.64			43.38
	50.02	4/24/1997	6.74			43.28
	50.02	5/13/1997	5.55			44.47
	50.02	6/20/1997	7.01			43.01
	50.02	9/25/1997	8.32			41.7
	50.02	10/22/1997	7.25			42.77
	50.02	11/25/1997	7.29			42.73
	50.02	12/19/1997	6.86			43.16
	50.02	1/20/1998	5.88			44.14
	50.02	3/4/1998	5.64	44.08	1.72	44.38
	50.02	3/18/1998	5.38	44.07	1.73	44.64
	50.02	4/9/1998	7.87		0.98	42.15
	50.02	4/16/1998	8.31		1.35	41.71
	50.02	4/24/1998	8.72	43.82	1.98	41.3
	50.02	5/8/1998	NM		0.50	
	50.02	5/12/1998	NM		0.50	
	50.02	5/21/1998	10.48			39.54
	50.02	5/25/1998	NM		1.00	
	50.02	6/9/1998	NM		1.00	
	50.02	6/16/1998	NM		1.20	
	50.02	6/26/1998	NM		1.50	
	50.02	7/2/1998	NM		1.50	
	50.02	7/10/1998	NM		2.00	
	50.02	7/14/1998	NM		2.00	
	50.02	7/23/1998	NM		2.00	
	50.02	8/5/1998	NM		2.00	
	50.02	8/13/1998	NM		2.00	
	50.02	8/18/1998	NM		2.00	
	50.02	8/25/1998	10.22			39.8
	50.02	9/15/1998	NM		2.00	
	50.02	9/21/1998	7.73			42.29
	50.02	9/30/1998	NM		4.00	
	50.02	10/8/1998	NM		4.00	
	50.02	10/16/1998	NM		4.00	
	50.02	10/26/1998	8.88			41.14
	50.02	11/6/1998	NM		4.00	
	50.02	11/13/1998	NM		1.49	
	50.02	11/19/1998	NM		4.00	
	50.02	11/23/1998	6.11			43.91
	50.02	12/16/1998	NM		4.00	
	50.02	1/7/1999	NM		4.00	
	50.02	1/15/1999	NM		4.00	
	50.02	1/22/1999	NM		4.00	
	50.02	1/26/1999	NM		4.00	
	50.02	1/29/1999	5.70			44.32
	50.02	2/4/1999	NM		4.00	
	50.02	2/9/1999	NM		3.00	
	50.02	2/26/1999	5.83	39.95	5.85	44.19
	50.02	3/16/1999	6.30	43.60	2.20	43.72
	50.02	4/29/1999	6.44	38.90	6.90	43.58
	50.02	5/21/1999	7.40	36.90	8.90	42.62
	50.02	5/27/1999	7.38	36.90	8.90	42.64
	50.02	6/1/1999	6.40	37.90	7.90	43.62
	50.02	6/10/1999	7.36	36.90	8.90	42.66
	50.02	7/30/1999	7.98			42.04
	50.02	8/27/1999	6.61	38.90	6.90	43.41
	50.02	9/27/1999	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	10/29/1999	12.76	41.84	3.96	37.26
	50.02	11/18/1999	13.22			36.8
	50.02	12/29/1999	12.01	41.84	3.96	38.01
	50.02	2/4/2000	13.22	41.84	3.96	36.8
	50.02	2/25/2000	11.44	41.84	3.96	38.58
	50.02	3/27/2000	NM			
	50.02	4/7/2000	8.73	41.81	3.99	41.29
	50.02	5/31/2000	8.77	41.81	3.99	41.25
	50.02	6/1/2000	8.73	41.81	3.99	41.29
	50.02	7/28/2000	8.77	41.89	3.91	41.25
	50.02	8/30/2000	11.66	41.82	3.98	38.36
	50.02	9/19/2000	13.33	40.89	4.91	36.69
	50.02	10/27/2000	11.75	41.80	4.00	38.27
	50.02	11/21/2000	10.64	43.48	2.32	39.38
	50.02	5/1/2001	8.71	43.46	2.34	41.31
	50.02	10/1/2001	8.37		15.00	41.65
	50.02	3/14/2002	6.37	36.99	8.81	43.65
	50.02	9/23/2002	6.10	40.03	5.77	43.92
	50.02	3/10/2003	5.45			44.57
	50.02	9/24/2003	6.29	39.85	5.95	43.73
	50.02	3/15/2004	5.63			44.39
	50.02	9/13/2004	10.44	38.72	7.08	39.58
	50.02	7/18/2005	7.14	38.40	7.40	42.88
	50.02	1/4/2006	10.75	35.98	9.82	39.27
	50.02	7/27/2006	6.07	35.74	10.06	43.95
	50.02	3/7/2007	6.96	34.60	11.20	43.06
	50.02	7/27/2007	5.36	33.45	12.35	44.66
	50.02	1/31/2008	5.75	33.34	12.46	44.27
	50.02	7/15/2008	9.38	38.88	6.92	40.64
	50.02	2/4/2009	8.89	38.14	7.66	41.13
	50.02	7/24/2009	9.18	38.51	7.29	40.84
	50.02	1/8/2010	6.81	37.46	8.34	43.21
	50.02	5/27/2010	7.29	39.5	6.30	42.73
	50.02	6/28/2010	7.39	44.1	1.70	42.63
	50.02	7/12/2010	7.47	44.25	1.55	42.55
	50.02	8/31/2010	7.26	45.42	0.38	42.76
	50.02	1/12/2011	7.01	45.39	0.41	43.01
	50.02	7/12/2011	10.09	45.39	0.41	39.93
	50.02	3/8/2012	6.87	40.2	5.60	43.15
	50.02	7/9/2012	7.16	40.1	5.70	42.86
	50.02	1/7/2013	9.17	39.86	5.94	40.85
	50.02	7/22/2013	11.16	39.04	6.76	38.86
	50.02	1/7/2014	11.34	45.12	0.68	38.68
	50.02	7/15/2014	10.59	44.89	0.91	39.43
	50.02	1/5/2015	10.06	44.91	1.29	39.96
	50.02	8/10/2015	7.39	46.1	0.10	42.63
	50.02	1/13/2016	6.06	45.79	0.41	43.96
	50.02	7/6/2016	6.29	45.72	0.48	43.73
	50.02	1/12/2017	7.02	45.81	0.39	43.00
	50.02	7/6/2017	7.01	45.71	1.89	43.01
	50.02	9/5/2017	7.03	45.6	2.00	42.99
	50.02	2/7/2018	7.13	45.87	0.33	42.89
	50.02	3/11/2018	7.42	45.96	0.24	42.6
	50.02	5/14/2018	8.59	45.91	0.29	41.43
	50.02	1/3/2019	7.96	45.87	0.33	42.06
MW-12C	50.14	5/13/1997	39.34			10.8
	50.14	6/20/1997	38.94			11.2
	50.14	9/25/1997	36.70			13.44



**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	10/22/1997	36.09			14.05
	50.14	11/25/1997	36.13			14.01
	50.14	12/19/1997	35.34			14.8
	50.14	1/20/1998	32.60			17.54
	50.14	3/4/1998	31.56			18.58
	50.14	3/18/1998	31.64			18.5
	50.14	4/24/1998	31.06			19.08
	50.14	5/21/1998	38.20			11.94
	50.14	8/25/1998	31.00			19.14
	50.14	9/21/1998	29.86			20.28
	50.14	10/26/1998	30.12			20.02
	50.14	11/23/1998	28.38			21.76
	50.14	1/29/1999	27.61			22.53
	50.14	2/26/1999	27.69			22.45
	50.14	3/16/1999	28.00			22.14
	50.14	4/29/1999	28.21			21.93
	50.14	6/1/1999	28.20			21.94
	50.14	7/30/1999	29.80			20.34
	50.14	8/27/1999	28.41			21.73
	50.14	9/27/1999	29.20			20.94
	50.14	10/29/1999	29.78			20.36
	50.14	11/18/1999	30.17			19.97
	50.14	12/29/1999	29.09			21.05
	50.14	2/4/2000	29.66			20.48
	50.14	2/25/2000	30.32			19.82
	50.14	3/27/2000	28.91			21.23
	50.14	4/7/2000	27.40			22.74
	50.14	5/31/2000	27.44			22.7
	50.14	6/1/2000	27.43			22.71
	50.14	7/28/2000	27.45			22.69
	50.14	8/30/2000	33.61			16.53
	50.14	9/19/2000	30.03			20.11
	50.14	10/27/2000	33.94			16.2
	50.14	11/21/2000	29.12			21.02
	50.14	5/1/2001	26.85			23.29
	50.14	10/1/2001	26.85			23.29
	50.14	3/11/2002	25.59			24.55
	50.14	9/23/2002	26.57			23.57
	50.14	3/10/2003	24.85			25.29
	50.14	9/23/2003	26.06			24.08
	50.14	3/15/2004	24.31			25.83
	50.14	9/13/2004	26.15			23.99
	50.14	7/18/2005	26.23			23.91
	50.14	1/4/2006	22.26			27.88
	50.14	7/27/2006	25.28			24.86
	50.14	3/7/2007	23.78			26.36
	50.14	7/27/2007	22.05			28.09
	50.14	1/30/2008	22.69			27.45
	50.14	7/15/2008	24.41			25.73
	50.14	2/4/2009	24.59			25.55
	50.14	7/24/2009	24.91			25.23
	50.14	1/8/2010	23.03			27.11
	50.14	7/12/2010	23.91			26.23
	50.14	1/12/2011	23.76			26.38
	50.14	7/12/2011	25.98			24.16
	50.14	1/26/2012	25.76			24.38
	50.14	7/9/2012	24.59			25.55
	50.14	1/7/2013	26.04			24.1

**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	7/22/2013	27.09			23.05
	50.14	1/7/2014	26.52			23.62
	50.14	7/16/2014	25.15			24.99
	50.14	1/5/2015	26.01			24.13
	50.14	8/10/2015	24.26			25.88
	50.14	1/13/2016	23.83			26.31
	50.14	7/6/2016	24.13			26.01
	50.14	1/12/2017	24.49			25.65
	50.14	7/6/2017	24.88			25.26
	50.14	9/5/2017	24.84			25.30
	50.14	2/11/2018	25.13			25.01
	50.14	3/11/2018	24.04			26.1
	50.14	4/14/2018	25.96			24.18
50.14	1/3/2019	25.34			24.8	
MW-13	50.65	3/25/1997	9.43			41.22
	50.65	4/23/1997	9.87			40.78
	50.65	4/24/1997	9.92			40.73
	50.65	5/13/1997	9.30			41.35
	50.65	6/20/1997	10.11			40.54
	50.65	9/25/1997	10.75			39.9
	50.65	10/22/1997	10.09			40.56
	50.65	11/25/1997	10.11			40.54
	50.65	12/19/1997	10.01			40.64
	50.65	1/20/1998	9.32			41.33
	50.65	3/4/1998	9.23			41.42
	50.65	3/18/1998	8.90			41.75
	50.65	4/24/1998	10.74			39.82
	50.65	5/21/1998	12.11			38.54
	50.65	8/25/1998	12.00			38.56
	50.65	9/21/1998	10.13			40.43
	50.65	10/26/1998	11.15			39.41
	50.65	11/23/1998	9.22			41.34
	50.65	1/29/1999	8.00			42.65
	50.65	2/26/1999	8.11			42.54
	50.65	3/16/1999	9.51			41.14
	50.65	4/29/1999	9.79			40.86
	50.65	6/1/1999	9.70			40.95
	50.65	7/30/1999	11.01			39.64
	50.65	8/27/1999	9.96			40.69
	50.65	9/27/1999	12.84			37.81
	50.65	10/29/1999	13.88			36.77
	50.65	11/17/1999	14.00			36.65
	50.65	12/29/1999	13.08			37.57
	50.65	2/4/2000	15.61			35.04
	50.65	2/25/2000	12.17			38.48
	50.65	3/27/2000	10.95			39.7
	50.65	4/7/2000	10.51			40.14
	50.65	5/31/2000	10.57			40.08
50.65	6/1/2000	10.51			40.14	
50.65	7/28/2000	10.54			40.11	
50.65	8/30/2000	13.63			37.02	
50.65	9/19/2000	14.57			36.08	
50.65	10/27/2000	11.11			39.54	
50.65	11/21/2000	11.44			39.21	
50.65	5/1/2001	10.70			39.95	
50.65	10/1/2001	10.31			40.34	
50.65	3/11/2002	9.62			41.03	
50.65	9/23/2002	9.17			41.48	

**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	3/10/2003	9.17			41.48
	50.65	9/23/2003	9.14			41.51
	50.65	3/15/2004	9.30			41.35
	50.65	9/13/2004	11.98			38.67
	50.65	7/18/2005	10.25			40.4
	50.65	1/4/2006	12.03			38.62
	50.65	7/27/2006	8.82			41.83
	50.65	3/7/2007	9.95			40.7
	50.65	7/27/2007	8.90			41.75
	50.65	1/30/2008	8.85			41.8
	50.65	7/15/2008	10.89			39.76
	50.65	2/4/2009	10.59			40.06
	50.65	7/23/2009	11.07			39.58
	50.65	1/8/2010	9.22			41.43
	50.65	7/12/2010	11.12			39.53
	50.65	1/12/2011	8.89			41.76
	50.65	7/12/2011	12.96			37.69
	50.65	1/26/2012	9.31			41.34
	50.65	7/9/2012	9.14			41.51
	50.65	1/7/2013	10.68			39.97
	50.65	7/22/2013	12.13			38.52
	50.65	1/7/2014	10.13			40.52
	50.65	7/16/2014	11.04			39.61
	50.65	1/5/2015	9.34			41.31
	50.65	8/10/2015	7.67			42.98
	50.65	1/13/2016	7.01			43.64
	50.65	7/6/2016	7.39			43.26
	50.65	1/12/2017	7.81			42.84
	50.65	7/6/2017	7.96			42.69
	50.65	9/5/2017	9.01			41.64
50.65	2/11/2018	9.58			41.07	
50.65	3/11/2018	10.09			40.56	
50.65	5/14/2018	10.96			39.69	
50.65	1/3/2019	10.52			40.13	
MW-14	50.66	3/25/1997	7.71			42.95
	50.66	4/23/1997	8.31			42.35
	50.66	4/24/1997	8.34			42.32
	50.66	5/13/1997	7.83			42.83
	50.66	6/20/1997	8.64			42.02
	50.66	9/25/1997	9.95			40.71
	50.66	10/22/1997	8.89			41.77
	50.66	11/25/1997	8.86			41.8
	50.66	12/19/1997	8.62			42.04
	50.66	1/20/1998	8.08			42.58
	50.66	3/4/1998	7.72			42.94
	50.66	3/18/1998	7.66			43
	50.66	4/24/1998	9.75			40.91
	50.66	5/21/1998	11.00			39.66
	50.66	8/25/1998	12.00			38.66
	50.66	9/21/1998	9.41			41.25
	50.66	10/26/1998	11.10			39.56
	50.66	11/23/1998	8.08			42.58
	50.66	1/29/1999	7.10			43.56
	50.66	2/26/1999	7.21			43.45
	50.66	3/16/1999	8.74			41.92
	50.66	4/29/1999	8.93			41.73
	50.66	6/1/1999	8.92			41.74
	50.66	7/30/1999	10.44			40.22

**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	8/27/1999	9.21			41.45
	50.66	9/27/1999	12.56			38.1
	50.66	10/29/1999	13.56			37.1
	50.66	11/17/1999	13.63			37.03
	50.66	12/29/1999	12.88			37.78
	50.66	2/4/2000	14.22			36.44
	50.66	2/25/2000	11.73			38.93
	50.66	3/27/2000	10.54			40.12
	50.66	4/7/2000	10.14			40.52
	50.66	5/31/2000	10.17			40.49
	50.66	6/1/2000	10.13			40.53
	50.66	7/28/2000	10.17			40.49
	50.66	8/30/2000	13.22			37.44
	50.66	9/19/2000	14.27			36.39
	50.66	10/27/2000	11.56			39.1
	50.66	11/21/2000	11.17			39.49
	50.66	5/1/2001	9.71			40.95
	50.66	10/1/2001	10.64			40.02
	50.66	3/11/2002	8.45			42.21
	50.66	9/23/2002	7.90			42.76
	50.66	3/10/2003	8.59			42.07
	50.66	9/23/2003	7.70			42.96
	50.66	3/15/2004	7.96			42.7
	50.66	9/13/2004	11.05			39.61
	50.66	7/18/2005	9.55			41.11
	50.66	1/4/2006	11.83			38.83
	50.66	7/27/2006	7.80			42.86
	50.66	3/7/2007	8.96			41.7
	50.66	7/27/2007	8.01			42.65
	50.66	1/30/2008	7.66			43
	50.66	7/15/2008	10.41			40.25
	50.66	2/4/2009	10.27			40.39
	50.66	7/23/2009	10.67			39.99
	50.66	1/8/2010	8.24			42.42
	50.66	7/12/2010	10.54			40.12
	50.66	1/12/2011	18.09			32.57
	50.66	7/12/2011	12.93			37.73
	50.66	1/26/2012	8.57			42.09
	50.66	7/9/2012	8.61			42.05
	50.66	1/7/2013	10.46			40.2
	50.66	7/22/2013	11.91			38.75
50.66	1/7/2014	9.39			41.27	
50.66	7/16/2014	10.58			40.08	
50.66	1/5/2015	8.79			41.87	
50.66	8/10/2015	6.34			44.32	
50.66	1/13/2016	5.79			44.87	
50.66	7/6/2016	6.06			44.60	
50.66	1/12/2017	6.59			44.07	
50.66	7/6/2017	6.92			43.74	
50.66	9/5/2017	6.83			43.83	
50.66	2/11/2018	8.66			42.00	
50.66	3/11/2018	8.99			41.67	
50.66	5/14/2018	10.09			40.57	
50.66	1/3/2019	9.37			41.29	
MW-15A	50.41	3/25/1997	8.22			42.19
	50.41	4/23/1997	8.28			42.13
	50.41	4/24/1997	8.51			41.9
	50.41	5/13/1997	8.06			42.35

**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-15A	50.41	6/20/1997	8.64			41.77
	50.41	9/25/1997	9.75			40.66
	50.41	10/22/1997	9.09			41.32
	50.41	11/25/1997	9.13			41.28
	50.41	12/19/1997	8.89			41.52
	50.41	1/20/1998	8.35			42.06
	50.41	3/4/1998	8.09			42.32
	50.41	3/18/1998	7.98			42.43
	50.41	4/24/1998	9.57			40.84
	50.41	5/21/1998	11.10			39.31
	50.41	8/25/1998	11.78			38.63
	50.41	9/21/1998	9.59			40.82
	50.41	10/26/1998	10.69			39.72
	50.41	11/23/1998	8.46			41.95
	50.41	1/29/1999	7.11			43.3
	50.41	2/26/1999	7.23			43.18
	50.41	3/16/1999	9.17			41.24
	50.41	4/29/1999	9.29			41.12
	50.41	6/1/1999	9.29			41.12
	50.41	7/30/1999	10.83			39.58
	50.41	8/27/1999	9.39			41.02
	50.41	9/27/1999	12.02			38.39
	50.41	10/29/1999	13.11			37.3
	50.41	11/17/1999	13.44			36.97
	50.41	12/29/1999	12.49			37.92
	50.41	2/4/2000	15.71			34.7
	50.41	2/25/2000	11.34			39.07
	50.41	3/27/2000	10.66			39.75
	50.41	4/7/2000	10.20			40.21
	50.41	5/31/2000	10.23			40.18
	50.41	6/1/2000	10.22			40.19
	50.41	7/28/2000	10.23			40.18
	50.41	8/30/2000	13.34			37.07
	50.41	9/19/2000	14.01			36.4
	50.41	10/27/2000	11.77			38.64
	50.41	11/21/2000	11.09			39.32
	50.41	5/1/2001	9.85			40.56
	50.41	10/1/2001	9.73			40.68
	50.41	3/11/2002	8.81			41.6
	50.41	9/23/2002	8.21			42.2
	50.41	3/10/2003	7.76			42.65
	50.41	9/23/2003	7.87			42.54
	50.41	3/15/2004	7.94			42.47
	50.41	9/13/2004	10.72			39.69
	50.41	7/18/2005	9.33			41.08
	50.41	1/4/2006	11.66			38.75
	50.41	7/27/2006	7.92			42.49
	50.41	3/7/2007	9.19			41.22
	50.41	7/27/2007	7.88			42.53
	50.41	1/30/2008	8.02			42.39
	50.41	7/15/2008	10.26			40.15
	50.41	2/4/2009	10.59			39.82
	50.41	7/23/2009	11.01			39.4
	50.41	1/8/2010	8.64			41.77
	50.41	7/12/2010	10.81			39.6
	50.41	1/12/2011	8.77			41.64
	50.41	7/12/2011	12.78			37.63
	50.41	1/26/2012	9.29			41.12

**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-15A	50.41	7/9/2012	5.92			44.49
	50.41	1/7/2013	10.77			39.64
	50.41	7/22/2013	12.21			38.2
	50.41	1/7/2014	9.85			40.56
	50.41	7/16/2014	10.65			39.76
	50.41	1/5/2015	9.07			41.34
	50.41	8/10/2015	6.49			43.92
	50.41	1/13/2016	5.79			44.62
	50.41	7/6/2016	6.21			44.20
	50.41	1/12/2017	6.82			43.59
	50.41	7/6/2017	7.47			42.94
	50.41	9/5/2017	7.43			42.98
	50.41	2/11/2018	8.89			41.52
	50.41	3/11/2018	9.23			41.18
	50.41	5/14/2018	10.18			40.23
50.41	1/3/2019	9.41			41	
MW-15B	50.20	1/26/2012	10.13			40.07
	50.20	7/9/2012	8.32			41.88
	50.20	1/7/2013	10.71			39.49
	50.20	7/22/2013	11.97			38.23
	50.20	1/7/2014	9.81			40.39
	50.20	7/15/2014	10.36			39.84
	50.20	1/5/2015	9.26			40.94
	50.20	8/10/2015	7.29			42.91
	50.20	1/13/2016	6.81			43.39
	50.20	7/6/2016	7.56			42.64
	50.20	1/12/2017	8.09			42.11
	50.20	7/6/2017	8.61			41.59
	50.20	9/5/2017	8.56			41.64
	50.20	2/11/2018	8.74			41.46
	50.20	3/11/2018	9.09			41.11
50.20	5/14/2018	9.91			40.29	
50.20	1/3/2019	9.4			40.8	
MW-15C	50.01	5/13/1997	33.46			16.55
	50.01	6/20/1997	34.18			15.83
	50.01	9/25/1997	33.77			16.24
	50.01	10/22/1997	32.89			17.12
	50.01	11/25/1997	32.95			17.06
	50.01	12/19/1997	32.01			18
	50.01	1/20/1998	29.90			20.11
	50.01	3/4/1998	28.56			21.45
	50.01	3/18/1998	28.53			21.48
	50.01	4/24/1998	28.46			21.55
	50.01	5/21/1998	35.00			15.01
	50.01	8/25/1998	29.30			20.71
	50.01	9/21/1998	28.15			21.86
	50.01	10/26/1998	28.11			21.9
	50.01	11/23/1998	26.50			23.51
	50.01	1/29/1999	25.44			24.57
	50.01	2/26/1999	25.51			24.5
	50.01	3/16/1999	26.11			23.9
	50.01	4/29/1999	26.33			23.68
	50.01	6/1/1999	26.39			23.62
50.01	7/30/1999	27.99			22.02	
50.01	8/27/1999	26.51			23.5	
50.01	9/27/1999	27.46			22.55	
50.01	10/29/1999	28.26			21.75	
50.01	11/17/1999	28.55			21.46	



**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-15C	50.01	12/29/1999	27.61			22.4
	50.01	2/4/2000	28.11			21.9
	50.01	2/25/2000	28.23			21.78
	50.01	3/27/2000	27.45			22.56
	50.01	4/7/2000	26.11			23.9
	50.01	5/31/2000	26.13			23.88
	50.01	6/1/2000	26.03			23.98
	50.01	7/28/2000	26.14			23.87
	50.01	8/30/2000	29.11			20.9
	50.01	9/19/2000	28.67			21.34
	50.01	10/27/2000	27.64			22.37
	50.01	11/21/2000	27.56			22.45
	50.01	5/1/2001	25.24			24.77
	50.01	10/1/2001	25.40			24.61
	50.01	3/11/2002	24.17			25.84
	50.01	9/23/2002	25.35			24.66
	50.01	3/10/2003	23.52			26.49
	50.01	9/23/2003	24.88			25.13
	50.01	3/15/2004	22.97			27.04
	50.01	9/13/2004	24.80			25.21
	50.01	7/18/2005	25.17			24.84
	50.01	1/4/2006	26.23			23.78
	50.01	7/27/2006	24.31			25.7
	50.01	3/7/2007	22.76			27.25
	50.01	7/27/2007	21.03			28.98
	50.01	1/30/2008	21.80			28.21
	50.01	7/15/2008	23.63			26.38
	50.01	2/4/2009	23.73			26.28
	50.01	7/23/2009	23.96			26.05
	50.01	1/8/2010	21.88			28.13
	50.01	7/12/2010	23.08			26.93
	50.01	1/12/2011	23.04			26.97
	50.01	7/12/2011	25.09			24.92
	50.01	1/26/2012	24.37			25.64
50.01	7/9/2012	24.41			25.6	
50.01	1/7/2013	25.21			24.8	
50.01	7/22/2013	26.10			23.91	
50.01	1/7/2014	25.26			24.75	
50.01	7/16/2014	24.15			25.86	
50.01	1/5/2015	25.34			24.67	
50.01	8/10/2015	22.74			27.27	
50.01	1/13/2016	21.92			28.09	
50.01	7/6/2016	22.26			27.75	
50.01	1/12/2017	22.69			27.32	
50.01	7/6/2017	23.31			26.70	
50.01	9/5/2017	23.29			26.72	
50.01	2/11/2018	23.63			26.38	
50.01	3/11/2018	22.47			27.54	
50.01	5/14/2018	23.33			26.68	
50.01	1/3/2019	23.87			26.14	
MW-16	51.51	3/25/1997	7.41			44.1
	51.51	4/23/1997	8.44			43.07
	51.51	4/24/1997	8.52			42.99
	51.51	5/13/1997	8.29			43.22
	51.51	6/20/1997	8.41			43.1
	51.51	9/25/1997	10.71			40.8
	51.51	10/22/1997	9.53			41.98
	51.51	11/25/1997	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	12/19/1997	9.10			42.41
	51.51	1/20/1998	8.60			42.91
	51.51	3/4/1998	8.13			43.38
	51.51	3/18/1998	8.59			42.92
	51.51	4/24/1998	9.96			41.55
	51.51	5/21/1998	11.43			40.08
	51.51	7/30/1998	12.56			38.95
	51.51	8/25/1998	11.53			39.98
	51.51	9/21/1998	9.81			41.7
	51.51	10/26/1998	10.44			41.07
	51.51	11/23/1998	8.98			42.53
	51.51	1/29/1999	7.12			44.39
	51.51	2/26/1999	7.23			44.28
	51.51	3/16/1999	10.06			41.45
	51.51	4/29/1999	10.16			41.35
	51.51	6/1/1999	10.16			41.35
	51.51	7/30/1999	11.76			39.75
	51.51	8/27/1999	10.33			41.18
	51.51	9/27/1999	11.79			39.72
	51.51	10/29/1999	12.93			38.58
	51.51	11/17/1999	13.71			37.8
	51.51	12/29/1999	12.20			39.31
	51.51	2/4/2000	15.11			36.4
	51.51	2/25/2000	11.10			40.41
	51.51	3/27/2000	11.48			40.03
	51.51	4/7/2000	11.09			40.42
	51.51	5/31/2000	11.11			40.4
	51.51	6/1/2000	11.00			40.51
	51.51	7/28/2000	11.11			40.4
	51.51	8/30/2000	13.10			38.41
	51.51	9/19/2000	14.83			36.68
	51.51	10/27/2000	11.66			39.85
	51.51	11/21/2000	11.29			40.22
	51.51	5/1/2001	9.92			41.59
	51.51	10/1/2001	9.93			41.58
	51.51	3/11/2002	9.12			42.39
	51.51	9/23/2002	8.65			42.86
	51.51	3/10/2003	7.74			43.77
	51.51	9/23/2003	8.48			43.03
	51.51	3/15/2004	8.09			43.42
	51.51	9/13/2004	10.38			41.13
	51.51	7/18/2005	10.42			41.09
	51.51	1/4/2006	12.48			39.03
	51.51	7/27/2006	9.37			42.14
	51.51	3/7/2007	9.66			41.85
	51.51	7/27/2007	7.85			43.66
	51.51	1/31/2008	8.42	25.40	3.40	43.09
	51.51	7/15/2008	10.16			41.35
	51.51	2/5/2009	11.93			39.58
	51.51	7/23/2009	12.67			38.84
	51.51	1/8/2010	8.66			42.85
	51.51	7/12/2010	10.31			41.2
	51.51	1/12/2011	9.89			41.62
	51.51	7/12/2011	12.98			38.53
	51.51	1/26/2012	9.92			41.59
	51.51	7/9/2012	9.68			41.83
	51.51	1/7/2013	11.41			40.1
	51.51	7/22/2013	12.39			39.12

**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	1/7/2014	12.02			39.49
	51.51	7/15/2014	9.69			41.82
	51.51	1/5/2015	11.07			40.44
	51.51	8/10/2015	9.42			42.09
MW-17	50.92	3/25/1997	9.97			40.95
	50.92	4/23/1997	10.41			40.51
	50.92	4/24/1997	10.51			40.41
	50.92	5/13/1997	10.32			40.6
	50.92	6/20/1997	11.07			39.85
	50.92	9/25/1997	12.39			38.53
	50.92	10/22/1997	11.19			39.73
	50.92	11/25/1997	11.21			39.71
	50.92	12/19/1997	11.01			39.91
	50.92	1/20/1998	10.25			40.67
	50.92	3/4/1998	9.93			40.99
	50.92	3/18/1998	9.94			40.98
	50.92	4/9/1998	11.32			39.6
	50.92	4/16/1998	11.52			39.4
	50.92	4/24/1998	11.80			39.12
	50.92	5/8/1998	NM			
	50.92	5/12/1998	NM			
	50.92	5/21/1998	13.30			37.62
	50.92	5/25/1998	NM			
	50.92	6/9/1998	NM			
	50.92	6/16/1998	NM			
	50.92	6/26/1998	NM			
	50.92	7/2/1998	NM			
	50.92	7/10/1998	NM			
	50.92	7/14/1998	NM			
	50.92	7/23/1998	NM			
	50.92	8/5/1998	NM			
	50.92	8/13/1998	NM			
	50.92	8/25/1998	13.78			37.14
	50.92	9/15/1998	NM			
	50.92	9/21/1998	11.49			39.43
	50.92	9/30/1998	NM			
	50.92	10/8/1998	NM			
	50.92	10/16/1998	NM			
	50.92	10/26/1998	12.22			38.7
	50.92	11/6/1998	NM			
	50.92	11/13/1998	NM			
	50.92	11/19/1998	NM			
	50.92	11/23/1998	10.21			40.71
	50.92	12/16/1998	NM			
50.92	1/7/1999	NM				
50.92	1/15/1999	NM				
50.92	1/22/1999	NM				
50.92	1/26/1999	NM				
50.92	1/29/1999	10.88			40.04	
50.92	2/4/1999	NM				
50.92	2/9/1999	NM				
50.92	2/26/1999	10.93			39.99	
50.92	3/16/1999	11.18			39.74	
50.92	4/29/1999	11.00			39.92	
50.92	5/21/1999	11.25			39.67	
50.92	5/27/1999	11.31			39.61	
50.92	6/1/1999	11.07			39.85	
50.92	6/10/1999	11.28			39.64	

**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	7/30/1999	12.67			38.25
	50.92	8/27/1999	11.27			39.65
	50.92	9/27/1999	14.67			36.25
	50.92	10/29/1999	15.11			35.81
	50.92	11/17/1999	16.08			34.84
	50.92	12/29/1999	14.43			36.49
	50.92	2/4/2000	17.21			33.71
	50.92	2/25/2000	13.63			37.29
	50.92	3/27/2000	13.08	32.60	0.70	37.84
	50.92	4/7/2000	12.63	32.30	1.00	38.29
	50.92	5/31/2000	12.67	32.30	1.00	38.25
	50.92	6/1/2000	12.61	32.30	1.00	38.31
	50.92	7/28/2000	12.69	32.30	1.00	38.23
	50.92	8/30/2000	15.56			35.36
	50.92	9/19/2000	16.24	32.20	1.10	34.68
	50.92	10/27/2000	14.10			36.82
	50.92	11/21/2000	13.12			37.8
	50.92	5/1/2001	11.82	32.44	0.86	39.1
	50.92	10/1/2001	12.55	32.30	1.00	38.37
	50.92	3/14/2002	10.91	31.79	1.51	40.01
	50.92	9/23/2002	10.48			40.44
	50.92	3/10/2003	9.76			41.16
	50.92	9/24/2003	10.59	32.85	0.45	40.33
	50.92	3/15/2004	10.15			40.77
	50.92	9/13/2004	13.09			37.83
	50.92	7/18/2005	12.06	32.90	0.40	38.86
	50.92	1/4/2006	13.90	32.90	0.40	37.02
	50.92	7/27/2006	10.71	33.28	0.02	40.21
	50.92	3/7/2007	10.91	33.00	0.30	40.01
	50.92	7/27/2007	9.33	33.02	0.28	41.59
	50.92	1/31/2008	10.00	31.17	2.13	40.92
	50.92	7/15/2008	12.95	33.08	0.23	37.97
	50.92	2/4/2009	12.64	Trace	Trace	38.28
	50.92	7/12/2010	12.96			37.96
MW-17	50.92	1/8/2010	10.62			40.3
	50.92	7/12/2010	12.96			37.96
	50.92	1/12/2011	11.06			39.86
	50.92	7/12/2011	14.93			35.99
	50.92	1/26/2012	11.2			39.72
	50.92	7/9/2012	11.02			39.9
	50.92	1/7/2013	13.14			37.78
	50.92	7/22/2013	14.62			36.3
	50.92	1/7/2014	12.36			38.56
	50.92	7/15/2014	12.54			38.38
	50.92	1/5/2015	11.71			39.21
	50.92	8/10/2015	9.61			41.31
	50.92	1/13/2016	9.02			41.90
	50.92	7/6/2016	9.47			41.45
	50.92	1/12/2017	10.06			40.86
	50.92	7/6/2017	10.62			40.30
	50.92	9/5/2017	10.51			40.41
	50.92	2/11/2018	10.76			40.16
	50.92	3/11/2018	11.21			39.71
	50.92	5/14/2018	12.21			38.71
	50.92	1/3/2019	11.72			39.2
	50.17	3/15/2004	22.75			27.42
	50.17	9/13/2004	24.56			25.61
	50.17	7/18/2005	25.02			25.15

**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-17C	50.17	1/4/2006	26.07			24.1
	50.17	7/27/2006	24.15			26.02
	50.17	3/7/2007	22.51			27.66
	50.17	7/27/2007	20.93			29.24
	50.17	1/30/2008	21.74			28.43
	50.17	7/15/2008	23.65			26.52
	50.17	2/4/2009	23.72			26.45
	50.17	7/23/2009	24.08			26.09
	50.17	1/8/2010	21.98			28.19
	50.17	7/12/2010	23.03			27.14
	50.17	1/12/2011	23.16			27.01
	50.17	7/12/2011	25.11			25.06
	50.17	1/26/2012	24.27			25.9
	50.17	7/9/2012	24.32			25.85
	50.17	1/7/2013	24.76			25.41
	50.17	7/22/2013	25.89			24.28
	50.17	1/7/2014	25.06			25.11
	50.17	7/15/2014	23.98			26.19
	50.17	1/5/2015	24.62			25.55
	50.17	8/10/2015	22.47			27.70
	50.17	1/13/2016	21.81			28.36
	50.17	7/6/2016	22.16			28.01
	50.17	1/12/2017	22.67			27.50
	50.17	7/6/2017	23.09			27.08
	50.17	9/5/2017	23.01			27.16
	50.17	2/11/2018	23.11			27.06
50.17	3/11/2018	22.21			27.96	
50.17	5/14/2018	23.02			27.15	
50.17	1/3/2019	22.71			27.46	
MW-18A	51.57	3/25/1997	15.41			36.16
	51.57	4/23/1997	15.80			35.77
	51.57	5/13/1997	14.92			36.65
	51.57	6/20/1997	16.02			35.55
	51.57	9/25/1997	15.15			36.42
	51.57	10/22/1997	16.38			35.19
	51.57	11/25/1997	16.37			35.2
	51.57	12/19/1997	16.11			35.46
	51.57	1/20/1998	15.49			36.08
	51.57	3/4/1998	15.19			36.38
	51.57	3/18/1998	14.28			37.29
	51.57	4/24/1998	17.53			34.04
	51.57	5/21/1998	18.41			33.16
	51.57	7/30/1998	18.59			32.98
	51.57	8/25/1998	16.95			34.62
	51.57	9/21/1998	16.39			35.18
	51.57	10/26/1998	15.77			35.8
	51.57	11/23/1998	16.26			35.31
	51.57	1/29/1999	17.02			34.55
	51.57	2/26/1999	17.11			34.46
	51.57	4/29/1999	16.01			35.56
	51.57	6/1/1999	16.11			35.46
	51.57	7/30/1999	17.55			34.02
	51.57	8/27/1999	16.39			35.18
	51.57	9/27/1999	19.13			32.44
	51.57	10/29/1999	20.50			31.07
51.57	11/17/1999	21.63			29.94	
51.57	12/29/1999	19.83			31.74	
51.57	2/4/2000	23.71			27.86	

**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-18A	51.57	2/25/2000	18.80			32.77
	51.57	3/27/2000	17.98			33.59
	51.57	4/7/2000	17.61			33.96
	51.57	5/31/2000	17.65			33.92
	51.57	6/1/2000	17.60			33.97
	51.57	7/28/2000	17.67			33.9
	51.57	8/30/2000	20.30			31.27
	51.57	9/19/2000	19.54			32.03
	51.57	10/27/2000	18.75			32.82
	51.57	11/21/2000	16.52			35.05
	51.57	5/1/2001	17.91	27.85	7.94	33.66
	51.57	10/1/2001	17.47			34.1
	51.57	3/11/2002	16.68			34.89
	51.57	9/23/2002	15.30			36.27
	51.57	3/10/2003	15.77			35.8
	51.57	9/23/2003	25.08			26.49
	51.57	3/15/2004	15.58			35.99
	51.57	9/13/2004	18.32			33.25
	51.57	7/18/2005	14.88			36.69
	51.57	1/4/2006	17.96			33.61
	51.57	7/27/2006	14.15			37.42
	51.57	3/7/2007	17.32			34.25
	51.57	7/27/2007	15.22			36.35
	51.57	1/30/2008	15.63			35.94
	51.57	7/15/2008	17.43			34.14
	51.57	2/5/2009	18.67			32.9
	51.57	7/23/2009	19.03			32.54
	51.57	1/8/2010	16.51			35.06
	51.57	7/12/2010	18.11			33.46
	51.57	1/12/2011	15.82			35.75
	51.57	7/12/2011	19.02			32.55
	51.57	1/26/2012	16.9			34.67
	51.57	7/9/2012	15.06			36.51
51.57	1/7/2013	18.39			33.18	
51.57	7/22/2013	18.74			32.83	
51.57	1/7/2014	18.06			33.51	
51.57	7/16/2014	18.14			33.43	
51.57	1/5/2015	17.39			34.18	
51.57	8/10/2015	15.02			36.55	
51.57	1/13/2016	14.36			37.21	
51.57	7/6/2016	14.71			36.86	
51.57	1/12/2017	15.09			36.48	
51.57	7/6/2017	15.59			35.98	
51.57	9/5/2017	15.49			36.08	
51.57	2/11/2018	16.62			34.95	
51.57	3/11/2018	17.12			34.45	
51.57	5/14/2018	17.71			33.86	
51.57	1/3/2019	17.52			34.05	
MW-18C	51.47	5/13/1997	29.45			22.02
	51.47	6/20/1997	30.37			21.1
	51.47	9/25/1997	31.53			19.94
	51.47	10/22/1997	30.71			20.76
	51.47	11/25/1997	30.75			20.72
	51.47	12/19/1997	30.10			21.37
	51.47	1/20/1998	28.30			23.17
	51.47	3/4/1998	27.03			24.44
	51.47	3/18/1998	26.81			24.66
	51.47	4/9/1998	27.04			24.43

**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-18C	51.47	4/16/1998	27.03			24.44
	51.47	4/24/1998	27.25			24.22
	51.47	5/8/1998	NM			
	51.47	5/12/1998	NM			
	51.47	5/21/1998	27.68			23.79
	51.47	5/25/1998	NM			
	51.47	6/9/1998	NM			
	51.47	6/16/1998	NM			
	51.47	6/26/1998	NM			
	51.47	7/2/1998	NM			
	51.47	7/10/1998	NM			
	51.47	7/14/1998	NM			
	51.47	7/23/1998	NM			
	51.47	7/30/1998	28.40			23.07
	51.47	8/5/1998	NM			
	51.47	8/13/1998	NM			
	51.47	8/25/1998	28.88			22.59
	51.47	9/15/1998	NM			
	51.47	9/21/1998	27.94			23.53
	51.47	9/30/1998	NM			
	51.47	10/8/1998	NM			
	51.47	10/16/1998	NM			
	51.47	10/26/1998	27.62			23.85
	51.47	11/6/1998	NM			
	51.47	11/11/1998	26.85		0.67	24.62
	51.47	11/19/1998	NM			
	51.47	11/23/1998	26.21			25.26
	51.47	12/16/1998	NM			
	51.47	1/7/1999	NM			
	51.47	1/15/1999	NM			
	51.47	1/22/1999	NM			
	51.47	1/26/1999	NM			
	51.47	1/29/1999	25.36			26.11
	51.47	2/4/1999	NM			
	51.47	2/9/1999	NM			
	51.47	2/26/1999	25.41			26.06
	51.47	4/29/1999	26.33			25.14
	51.47	5/21/1999	25.75			25.72
	51.47	5/27/1999	25.76			25.71
	51.47	6/1/1999	26.38			25.09
	51.47	6/10/1999	25.68			25.79
	51.47	7/30/1999	25.61			25.86
	51.47	8/27/1999	26.51			24.96
	51.47	9/27/1999	27.28			24.19
	51.47	10/29/1999	27.95			23.52
	51.47	11/17/1999	28.42			23.05
	51.47	12/29/1999	27.26			24.21
	51.47	2/4/2000	27.84			23.63
	51.47	2/25/2000	27.83			23.64
	51.47	3/27/2000	27.48			23.99
	51.47	4/7/2000	25.80			25.67
	51.47	5/31/2000	25.83			25.64
	51.47	6/1/2000	25.81			25.66
	51.47	7/28/2000	25.86			25.61
	51.47	8/30/2000	28.42			23.05
	51.47	9/19/2000	28.77	80.44	0.97	22.7
	51.47	10/27/2000	28.69			22.78
	51.47	11/21/2000	27.67			23.8



**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	5/1/2001	25.20			26.27
	51.47	10/1/2001	25.59			25.8
	51.47	3/14/2002	24.35			27.12
	51.47	9/25/2002	25.45			26.02
	51.47	3/10/2003	23.60			27.87
	51.47	9/24/2003	25.15			26.32
	51.47	3/15/2004	24.23			27.24
	51.47	9/13/2004	25.12	78.22	1.70	26.35
	51.47	7/18/2005	25.50	66.20	0.30	25.97
	51.47	1/4/2006	26.71			24.76
	51.47	7/27/2006	24.80			26.67
	51.47	3/7/2007	23.11			28.36
	51.47	7/27/2007	24.80			26.67
	51.47	1/30/2008	22.64			28.83
	51.47	7/15/2008	24.43			27.04
	51.47	2/5/2009	24.34			27.13
	51.47	7/23/2009	24.61			26.86
	51.47	1/8/2010	22.56			28.91
	51.47	7/12/2010	23.77			27.7
	51.47	7/12/2011	25.87			25.6
	51.47	1/26/2012	26.82			24.65
	51.47	1/12/2011	24.03			27.44
	51.47	7/9/2012	24.82			26.65
	51.47	1/7/2013	25.61			25.86
	51.47	7/22/2013	26.76			24.71
	51.47	1/7/2014	25.68			25.79
	51.47	7/16/2014	24.60			26.87
	51.47	1/5/2015	25.02			26.45
	51.47	8/10/2015	23.41			28.06
	51.47	1/13/2016	22.76			28.71
	51.47	7/6/2016	23.12			28.35
	51.47	1/12/2017	23.73			27.74
	51.47	7/6/2017	24.13			27.34
51.47	9/5/2017	24.08			27.39	
51.47	2/11/2018	23.7			27.77	
51.47	3/11/2018	22.88			28.59	
51.47	5/14/2018	23.47			28.00	
51.47	1/3/2019	23.01			28.46	
MW-19C	53.05	11/23/1998	28.84			24.21
	53.05	1/29/1999	28.21			24.84
	53.05	2/26/1999	28.28			24.77
	53.05	3/16/1999	28.31			24.74
	53.05	4/29/1999	28.56			24.49
	53.05	6/1/1999	28.48			24.57
	53.05	7/30/1999	30.00			23.05
	53.05	8/27/1999	28.61			24.44
	53.05	9/27/1999	29.72			23.33
	53.05	10/29/1999	30.46			22.59
	53.05	11/17/1999	30.76			22.29
	53.05	12/29/1999	29.44			23.61
	53.05	2/4/2000	30.22			22.83
	53.05	2/25/2000	29.93			23.12
	53.05	3/27/2000	29.80			23.25
	53.05	4/7/2000	28.40			24.65
	53.05	5/31/2000	28.44			24.61
	53.05	6/1/2000	28.33			24.72
	53.05	7/28/2000	28.37			24.68
	53.05	8/30/2000	29.99			23.06

**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-19C	53.05	9/19/2000	30.97			22.08
	53.05	10/27/2000	28.49			24.56
	53.05	11/21/2000	29.88			23.17
	53.05	5/1/2001	27.61	71.55	3.56	25.44
	53.05	10/1/2001	27.84			25.21
	53.05	3/11/2002	26.68			26.37
	53.05	9/23/2002	27.66			25.39
	53.05	3/10/2003	25.77			27.28
	53.05	9/23/2003	27.21			25.84
	53.05	3/15/2004	25.36			27.69
	53.05	9/13/2004	27.20			25.85
	53.05	7/18/2005	27.71			25.34
	53.05	1/4/2006	28.78			24.27
	53.05	7/27/2006	26.91			26.14
	53.05	3/7/2007	25.22			27.83
	53.05	7/27/2007	23.71			29.34
	53.05	1/31/2008	24.57			28.48
	53.05	7/15/2008	26.38			26.67
	53.05	2/4/2009	26.44			26.61
	53.05	7/23/2009	26.81			26.24
	53.05	1/9/2010	24.47			28.58
	53.05	7/12/2010	25.67			27.38
	53.05	1/12/2011	25.86			27.19
	53.05	7/12/2011	27.81			25.24
	53.05	1/26/2012	26.74			26.31
	53.05	7/9/2012	27.26			25.79
	53.05	1/7/2013	27.73			25.32
	53.05	7/22/2013	28.58			24.47
	53.05	1/7/2014	27.71			25.34
	53.05	7/15/2014	26.65			26.40
	53.05	1/5/2015	27.34			25.71
	53.05	8/10/2015	25.21			27.84
	53.05	1/13/2016	24.68			28.37
53.05	7/6/2016	NM				
53.05	2/11/2018	21.74			31.31	
53.05	3/11/2018	24.74			28.31	
53.05	5/14/2018	25.72			27.33	
53.05	1/3/2019	25.03			28.02	
MW-20A	50.43	11/23/1998	8.31			42.116
	50.43	1/29/1999	8.70			41.726
	50.43	2/26/1999	8.81			41.616
	50.43	3/16/1999	9.26			41.166
	50.43	4/29/1999	9.33			41.096
	50.43	6/1/1999	9.30			41.126
	50.43	7/30/1999	10.91			39.516
	50.43	8/27/1999	9.56			40.866
	50.43	9/27/1999	10.79			39.636
	50.43	10/29/1999	11.96			38.466
	50.43	11/17/1999	13.06			37.366
	50.43	12/29/1999	11.11			39.316
	50.43	2/4/2000	14.89			35.536
	50.43	2/25/2000	10.33			40.096
	50.43	3/27/2000	10.79			39.636
	50.43	4/7/2000	10.41			40.016
	50.43	5/31/2000	10.46			39.966
	50.43	6/1/2000	10.41			40.016
	50.43	7/28/2000	10.47			39.956
	50.43	8/30/2000	12.56			37.866

**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-20A	50.43	9/19/2000	13.68			36.746
	50.43	10/27/2000	11.01			39.416
	50.43	11/21/2000	10.64			39.786
	50.43	5/1/2001	9.40			41.03
	50.43	10/1/2001	10.42			40.01
	50.43	3/11/2002	8.59			41.836
	50.43	9/23/2002	8.51			41.916
	50.43	3/10/2003	7.42			43.006
	50.43	9/23/2003	7.95			42.476
	50.43	3/15/2004	7.72			42.706
	50.43	9/13/2004	10.22			40.206
	50.43	7/18/2005	9.88			40.546
	50.43	1/4/2006	11.72			38.706
	50.43	7/27/2006	8.59			41.836
	50.43	3/7/2007	8.91			41.516
	50.43	7/27/2007	7.63			42.796
	50.43	1/30/2008	7.91			42.516
	50.43	7/15/2008	10.05			40.376
	50.43	2/4/2009	10.18			40.246
	50.43	7/23/2009	10.47			39.956
	50.43	1/9/2010	8.23			42.196
	50.43	7/12/2010	10.62			39.806
	50.43	1/12/2011	8.76			41.666
	50.43	7/12/2011	12.53			37.896
	50.43	1/26/2012	11.61			38.816
	50.43	7/9/2012	9.18			41.246
	50.43	1/7/2013	10.66			39.766
	50.43	7/22/2013	12.17			38.256
	50.43	1/7/2014	11.62			38.806
	50.43	7/15/2014	9.83			40.60
	50.43	1/5/2015	11.09			39.34
	50.43	8/10/2015	9.34			41.09
50.43	7/6/2017	8.12			42.31	
50.43	9/6/2017	8.06			42.37	
50.43	2/11/2018	9.22			41.21	
50.43	3/11/2018	9.03			41.396	
50.43	5/14/2018	9.89			40.536	
50.43	1/3/2019	9.26			41.17	
MW-21C	49.05	11/23/1998	27.83			21.223
	49.05	1/29/1999	27.11			21.943
	49.05	2/26/1999	27.26			21.793
	49.05	3/16/1999	27.42			21.633
	49.05	4/29/1999	27.99			21.063
	49.05	6/1/1999	27.80			21.253
	49.05	7/30/1999	29.00			20.053
	49.05	8/27/1999	27.99			21.063
	49.05	9/27/1999	28.43			20.623
	49.05	10/29/1999	29.12			19.933
	49.05	11/18/1999	29.25			19.803
	49.05	12/29/1999	10.89			38.163
	49.05	2/4/2000	28.94			20.113
	49.05	2/25/2000	11.43			37.623
	49.05	3/27/2000	28.13			20.923
	49.05	4/7/2000	26.79			22.263
	49.05	5/31/2000	26.83			22.223
	49.05	6/1/2000	26.83			22.223
	49.05	7/28/2000	26.88			22.173
	49.05	8/30/2000	29.91			19.143

**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	9/19/2000	29.15			19.903
	49.05	10/27/2000	30.21			18.843
	49.05	11/21/2000	28.33			20.723
	49.05	5/1/2001	26.01			23.04
	49.05	10/1/2001	26.05			23
	49.05	3/11/2002	24.80			24.253
	49.05	9/23/2002	25.50			23.553
	49.05	3/10/2003	23.82			25.233
	49.05	9/23/2003	25.08			23.973
	49.05	3/15/2004	23.48			25.573
	49.05	9/13/2004	25.44			23.613
	49.05	7/18/2005	25.33			23.723
	49.05	1/4/2006	26.44			22.613
	49.05	7/27/2006	24.55			24.503
	49.05	3/7/2007	22.91			26.143
	49.05	7/27/2007	21.29			27.763
	49.05	1/29/2008	22.09			26.963
	49.05	7/15/2008	23.31			25.743
	49.05	2/4/2009	24.03			25.023
	49.05	7/24/2009	24.29			24.763
	49.05	1/9/2010	21.89			27.163
	49.05	7/12/2010	23.01			26.043
	49.05	1/12/2011	23.21			25.843
	49.05	7/12/2011	25.09			23.963
	49.05	1/26/2012	24.48			24.573
	49.05	7/9/2012	23.39			25.663
	49.05	1/7/2013	25.17			23.883
	49.05	7/22/2013	26.49			22.563
	49.05	1/7/2014	25.94			23.113
	49.05	7/15/2014	24.61			24.44
	49.05	1/5/2015	25.31			23.74
	49.05	8/10/2015	23.37			25.68
	49.05	1/13/2016	22.71			26.34
49.05	7/6/2016	23.04			26.01	
49.05	1/12/2017	23.59			25.46	
49.05	7/6/2017	24.02			25.03	
49.05	9/5/2017	23.96			25.09	
49.05	2/11/2018	24.08			24.97	
49.05	3/11/2018	23.07			25.98	
49.05	5/14/2018	23.97			25.08	
49.05	1/3/2019	23.17			25.88	
MW-22A	46.07	11/23/1998	NM			
	46.07	1/29/1999	2.10			43.969
	46.07	2/26/1999	2.21			43.859
	46.07	3/16/1999	2.65			43.419
	46.07	4/29/1999	2.71			43.359
	46.07	6/1/1999	2.68			43.389
	46.07	7/30/1999	4.12			41.949
	46.07	8/27/1999	2.81			43.259
	46.07	9/27/1999	8.53			37.539
	46.07	10/29/1999	10.23			35.839
	46.07	11/18/1999	9.92			36.149
	46.07	12/29/1999	9.56			36.509
	46.07	2/4/2000	12.31			33.759
	46.07	2/25/2000	8.72			37.349
	46.07	3/27/2000	6.30			39.769
	46.07	4/7/2000	6.03			40.039
	46.07	5/31/2000	6.12			39.949

**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-22A	46.07	6/1/2000	6.00			40.069
	46.07	7/28/2000	6.13			39.939
	46.07	8/30/2000	9.09			36.979
	46.07	9/19/2000	10.12			35.949
	46.07	10/27/2000	8.64			37.429
	46.07	11/21/2000	7.69			38.379
	46.07	5/1/2001	5.15			40.92
	46.07	10/1/2001	5.49			40.58
	46.07	3/11/2002	2.34			43.729
	46.07	9/23/2002	2.11			43.959
	46.07	3/10/2003	1.68			44.389
	46.07	9/23/2003	2.30			43.769
	46.07	3/15/2004	2.05			44.019
	46.07	9/14/2004	6.89			39.179
	46.07	7/18/2005	3.65			42.419
	46.07	1/6/2006	7.29			38.779
	46.07	7/27/2006	1.65			44.419
	46.07	3/7/2007	NM			
	46.07	7/27/2007	2.84			43.229
	46.07	1/29/2008	1.05			45.019
	46.07	7/14/2008	5.33			40.739
	46.07	2/3/2009	5.24			40.829
	46.07	7/23/2009	5.91			40.159
	46.07	1/9/2010	1.32			44.749
	46.07	7/12/2010	6.52			39.549
	46.07	1/12/2011	3.21			42.859
	46.07	7/11/2011	8.39			37.679
	46.07	1/27/2012	0.98			45.089
	46.07	7/10/2012	1.74			44.326
	46.07	1/8/2013	3.09			42.979
	46.07	7/22/2013	NM			
	46.07	1/7/2014	3.81			42.26
	46.07	7/15/2014	3.22			42.85
46.07	1/5/2015	NM				
46.07	8/10/2015	NM				
46.07	1/13/2016	NM				
46.07	7/6/2016	NM				
46.07	1/12/2017	NM				
46.07	7/6/2017	NM				
46.07	9/5/2017	NM		REPLACED		
MW-22AR	45.56	2/11/2018	3.43			42.13
	45.56	3/11/2018	2.24			43.32
	45.56	5/14/2018	4.41			41.15
	45.56	7/2/2018	4.48			41.08
	45.56	1/3/2019	3.67			41.89
MW-22B	45.86	11/23/1998	2.25			43.606
	45.86	1/29/1999	2.28			43.576
	45.86	2/26/1999	2.34			43.516
	45.86	3/16/1999	2.42			43.436
	45.86	4/29/1999	2.56			43.296
	45.86	6/1/1999	2.60			43.256
	45.86	7/30/1999	4.31			41.546
	45.86	8/27/1999	2.83			43.026
	45.86	9/27/1999	8.45			37.406
	45.86	10/29/1999	10.11			35.746
	45.86	11/18/1999	9.75			36.106
45.86	12/29/1999	9.43			36.426	

**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	2/4/2000	12.56			33.296
	45.86	2/25/2000	8.63			37.226
	45.86	3/27/2000	6.00			39.856
	45.86	4/7/2000	5.64			40.216
	45.86	5/31/2000	5.69			40.166
	45.86	6/1/2000	5.61			40.246
	45.86	7/28/2000	5.67			40.186
	45.86	8/30/2000	8.57			37.286
	45.86	9/19/2000	9.94			35.916
	45.86	10/27/2000	7.03			38.826
	45.86	11/21/2000	7.63			38.226
	45.86	5/1/2001	4.93			40.93
	45.86	10/1/2001	5.40			40.46
	45.86	3/11/2002	1.75			44.106
	45.86	9/23/2002	2.11			43.746
	45.86	3/10/2003	1.02			44.836
	45.86	9/23/2003	2.99			42.866
	45.86	3/15/2004	1.20			44.656
	45.86	9/14/2004	NM			
	45.86	7/18/2005	NM			
	45.86	1/6/2006	7.05			38.806
	45.86	7/27/2006	1.58			44.276
	45.86	3/7/2007	NM			
	45.86	7/27/2007	2.85			43.006
	45.86	1/29/2008	0.85			45.006
	45.86	7/14/2008	5.45			40.406
	45.86	2/3/2009	4.78			41.076
	45.86	7/23/2009	5.39			40.466
	45.86	1/9/2010	3.27			42.586
	45.86	7/12/2010	6.21			39.646
	45.86	1/12/2011	0.37			45.486
	45.86	7/11/2011	8.32			37.536
	45.86	1/27/2012	0.06			45.796
	45.86	7/10/2012	1.27			44.586
	45.86	1/8/2013	NM			
	45.86	7/22/2013	NM			
	45.86	1/7/2014	4.14			41.716
	45.86	7/15/2014	3.79			42.07
	45.86	1/5/2015	3.87			41.99
	45.86	8/10/2015	2.62			43.24
45.86	1/13/2016	2.09			43.77	
45.86	7/6/2016	NM				
45.86	1/12/2017	NM				
45.86	7/6/2017	NM				
45.86	9/5/2017	NM	REPLACED			
MW-22BR	45.71	2/11/2018	4.14			41.57
	45.71	3/12/2018	3.29			42.42
	45.71	5/14/2018	5.27			40.44
	45.71	7/2/2018	5.39			40.32
	45.71	1/3/2019	4.29			41.42
MW-23C	51.91	11/23/1998	27.41			24.504
	51.91	1/29/1999	26.80			25.114
	51.91	2/26/1999	26.88			25.034
	51.91	3/16/1999	26.93			24.984
	51.91	4/29/1999	27.09			24.824
	51.91	6/1/1999	27.00			24.914
	51.91	7/30/1999	29.55			22.364

**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	8/27/1999	27.29			24.624	
	51.91	9/27/1999	28.40			23.514	
	51.91	10/29/1999	29.11			22.804	
	51.91	11/17/1999	29.49			22.424	
	51.91	12/29/1999	28.46			23.454	
	51.91	2/4/2000	28.96			22.954	
	51.91	2/25/2000	28.96			22.954	
	51.91	3/27/2000	28.61			23.304	
	51.91	4/7/2000	27.10			24.814	
	51.91	5/31/2000	27.15			24.764	
	51.91	6/1/2000	27.11			24.804	
	51.91	7/28/2000	27.15			24.764	
	51.91	8/30/2000	29.96			21.954	
	51.91	9/19/2000	29.77			22.144	
	51.91	10/27/2000	28.44			23.474	
	51.91	11/21/2000	28.61			23.304	
	51.91	5/1/2001	26.26			25.65	
	51.91	10/1/2001	26.50			25.41	
	51.91	3/11/2002	25.33			26.584	
	51.91	9/23/2002	26.43			25.484	
	51.91	3/10/2003	24.53			27.384	
	51.91	9/23/2003	25.95			25.964	
	51.91	3/15/2004	24.15			27.764	
	51.91	9/13/2004	25.97			25.944	
	51.91	7/18/2005	26.46			25.454	
	51.91	1/4/2006	27.53			24.384	
	51.91	3/7/2007	23.96			27.954	
	51.91	7/27/2007	22.41			29.504	
	51.91	1/31/2008	23.22		75.98	1.71	28.694
	48.89 <sup>1</sup>	2/4/2009	22.11		72.05	1.47	26.78
	48.89 <sup>1</sup>	7/23/2009	22.93		73.01	0.51	25.961
	48.89 <sup>1</sup>	1/9/2010	20.29		71.8	1.72	28.601
	48.89 <sup>1</sup>	5/27/2010	22.81		71.5	2.02	26.081
48.89 <sup>1</sup>	6/28/2010	22.93		72.15	1.37	25.961	
48.89 <sup>1</sup>	7/12/2010	21.41		72.4	1.12	27.481	
48.89 <sup>1</sup>	8/31/2010	21.61		72.65	0.87	27.281	
48.89 <sup>1</sup>	1/12/2011	21.7		71.25	1.45	27.191	
48.89	7/12/2011	23.11		70.65	2.05	25.782	
48.89	1/26/2012	22.81		71.57	1.13	26.082	
48.89	7/9/2012	22.31		71.45	1.25	26.582	
48.89	1/7/2013	23.32		71.06	1.64	25.572	
48.89	7/22/2013	24.38				24.512	
48.89	1/7/2014	23.51		70.8	2.30	25.38	
48.89	7/15/2014	24.06		70.96	2.14	24.83	
48.89	1/5/2015	22.47		71.72	1.08	26.42	
48.89	8/10/2015	19.34		72.17	0.63	29.55	
48.89	1/13/2016	23.16		71.91	0.89	25.73	
48.89	7/6/2016	23.09		71.56	1.24	25.80	
48.89	1/12/2017	23.74		71.81	0.99	25.15	
48.89	7/6/2017	23.61		77.27	0.53	25.28	
48.89	9/5/2017	23.67		77.29	0.51	25.22	
48.89	2/7/2018	23.86		77.46	0.34	25.03	
48.89	3/11/2018	23.99		77.41	0.39	24.9	
48.89	5/14/2018	25.02		77.49	0.31	23.87	
48.89	1/3/2019	24.29		77.31	0.49	24.6	
MW-24A	45.79	3/27/2000	7.87			37.92	
	45.79	4/7/2000	7.63			38.16	
	45.79	5/31/2000	7.65			38.14	



**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)
MW-24A	45.79	6/1/2000	7.43			38.36
	45.79	7/28/2000	7.60			38.19
	45.79	8/30/2000	10.44			35.35
	45.79	9/19/2000	10.57			35.22
	45.79	10/27/2000	NM			NM
	45.79	11/21/2000	7.09			38.7
	45.79	5/1/2001	6.72			39.07
	45.79	10/1/2001	7.81			37.98
	45.79	3/11/2002	3.91			41.88
	45.79	9/23/2002	5.04			40.75
	45.79	3/10/2003	2.76			43.03
	45.79	9/23/2003	4.66			41.13
	45.79	3/15/2004	3.10			42.69
	45.79	9/14/2004	8.24			37.55
	45.79	7/18/2005	6.03			39.76
	45.79	1/6/2006	8.93			36.86
	45.79	7/27/2006	4.21			41.58
	45.79	3/7/2007	3.86			41.93
45.79	1/30/2008	NM			NM	
MW-24AR	45.65	2/5/2009	5.18			40.47
	45.65	7/23/2009	7.36			38.29
	45.65	1/9/2010	3.72			41.93
	45.65	7/12/2010	4.29			41.36
	45.65	1/13/2011	3.58			42.07
	45.65	7/11/2011	6.38			39.27
	45.65	1/27/2012	4.59			41.06
	45.65	7/10/2012	4.38			41.27
	45.65	1/8/2013	5.59			40.06
	45.65	7/23/2013	10.14	71.06		35.51
	45.65	1/8/2014	7.11			38.54
	45.65	1/5/2015	NM			NM
	45.65	7/6/2016	NM			NM
MW-24B	46.06	3/27/2000	11.91			34.15
	46.06	4/7/2000	11.60			34.46
	46.06	5/31/2000	11.63			34.43
	46.06	6/1/2000	11.51			34.55
	46.06	7/28/2000	11.69			34.37
	46.06	8/30/2000	13.91			32.15
	46.06	9/19/2000	14.72			31.34
	46.06	10/27/2000	12.44			33.62
	46.06	11/21/2000	11.38			34.68
	46.06	5/1/2001	10.71			35.35
	46.06	10/1/2001	11.75			34.31
	46.06	3/11/2002	9.01			37.05
	46.06	9/23/2002	9.69			36.37
	46.06	3/10/2003	7.83			38.23
	46.06	9/23/2003	8.98			37.08
	46.06	3/15/2004	7.33			38.73
	46.06	9/14/2004	9.24			36.82
	46.06	7/18/2005	9.54			36.52
	46.06	1/6/2006	11.86			34.2
	46.06	7/27/2006	10.50			35.56
	46.06	3/7/2007	8.88			37.18
	46.06	7/27/2007	9.85			36.21
	46.06	1/28/2008	7.37			38.69
	46.06	7/14/2008	11.41			34.65
	46.06	2/3/2009	11.18			34.88
	46.06	7/23/2009	12.26			33.8

**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	1/9/2010	9.89			36.17
	46.06	7/12/2010	12.82			33.24
	46.06	1/13/2011	11.1			34.96
	46.06	7/11/2011	14.09			31.97
	46.06	1/27/2012	11.36			34.7
	46.06	7/10/2012	10.49			35.57
	46.06	1/8/2013	12.96			33.1
	46.06	7/23/2013	8.49			37.57
	46.06	1/5/2015	NM			NM
MW-24C	46.05	3/27/2000	25.77			20.28
	46.05	4/7/2000	24.27			21.78
	46.05	5/31/2000	24.30			21.75
	46.05	6/1/2000	24.22			21.83
	46.05	7/28/2000	24.26			21.79
	46.05	8/30/2000	27.34			18.71
	46.05	9/19/2000	26.59			19.46
	46.05	10/27/2000	27.64			18.41
	46.05	11/21/2000	25.43			20.62
	46.05	5/1/2001	23.90			22.15
	46.05	10/1/2001	23.71			22.34
	46.05	3/11/2002	22.40			23.65
	46.05	9/23/2002	23.04			23.01
	46.05	3/10/2003	21.71			24.34
	46.05	9/23/2003	23.04			23.01
	46.05	3/15/2004	21.45			24.6
	46.05	9/14/2004	22.45			23.6
	46.05	7/18/2005	22.19			23.86
	46.05	1/6/2006	23.57			22.48
	46.05	7/27/2006	22.61			23.44
	46.05	3/7/2007	21.07			24.98
	46.05	7/27/2007	19.62			26.43
	46.05	1/28/2008	19.43			26.62
	46.05	7/14/2008	20.63			25.42
	46.05	2/3/2009	21.68			24.37
	46.05	7/23/2009	23.07			22.98
	46.05	1/9/2010	20.46			25.59
	46.05	7/12/2010	20.44			25.61
	46.05	1/13/2011	20.26			25.79
	46.05	7/11/2011	21.59			24.46
	46.05	1/27/2012	21.23			24.82
46.05	7/10/2012	20.81			25.24	
46.05	1/8/2013	22.42			23.63	
46.05	7/23/2013	23.81			22.24	
	46.05	1/5/2015	NM			
MW-25A	44.65	3/27/2000	9.15			35.5
	44.65	4/7/2000	8.79			35.86
	44.65	5/31/2000	8.81			35.84
	44.65	6/1/2000	8.86			35.79
	44.65	7/28/2000	8.84			35.81
	44.65	8/30/2000	11.43			33.22
	44.65	9/19/2000	11.12			33.53
	44.65	10/27/2000	10.09			34.56
	44.65	11/21/2000	8.10			36.55
	44.65	5/1/2001	8.94			35.71
	44.65	10/1/2001	8.81			35.84
	44.65	3/11/2002	7.23			37.42
	44.65	9/23/2002	5.65			39
	44.65	3/10/2003	5.84			38.81

**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	9/23/2003	5.35			39.3
	44.65	3/15/2004	5.75			38.9
	44.65	9/14/2004	7.00			37.65
	44.65	7/18/2005	6.42			38.23
	44.65	1/6/2006	9.29			35.36
	44.65	7/27/2006	5.10			39.55
	44.65	3/7/2007	4.76			39.89
	44.65	7/27/2007	4.22			40.43
	44.65	1/28/2008	4.25			40.4
	44.65	7/14/2008	8.59			36.06
	44.65	2/3/2009	8.90			35.75
	44.65	7/23/2009	8.71			35.94
	44.65	1/9/2010	6.84			37.81
	44.65	7/12/2010	7.78			36.87
	44.65	1/12/2011	6.26			38.39
	44.65	7/11/2011	10.22			34.43
	44.65	1/27/2012	5.24			39.41
	44.65	7/10/2012	4.56			40.09
	44.65	1/8/2013	8.62			36.03
	44.65	7/23/2013	9.37			35.28
	44.65	1/8/2014	8.92			35.73
	44.65	7/16/2014	8.61			36.04
	44.65	1/5/2015	8.71			35.94
	44.65	8/10/2015	6.94			37.71
	44.65	1/13/2016	6.07			38.58
	44.65	7/6/2016	6.62			38.03
	44.65	1/12/2017	6.98			37.67
	44.65	7/6/2017	7.31			37.34
44.65	9/5/2017	7.16			37.49	
44.65	2/11/2018	5.71			38.94	
44.65	3/12/2018	6.06			38.59	
44.65	5/14/2018	7.49			37.16	
44.65	1/3/2019	6.84			37.81	
MW-25C	44.49	3/27/2000	19.92			24.57
	44.49	4/7/2000	19.50			24.99
	44.49	5/31/2000	19.56			24.93
	44.49	6/1/2000	19.51			24.98
	44.49	7/28/2000	19.54			24.95
	44.49	8/30/2000	22.14			22.35
	44.49	9/19/2000	21.30	66.73	0.90	23.19
	44.49	10/27/2000	20.63			23.86
	44.49	11/21/2000	27.63			16.86
	44.49	5/1/2001	18.14			26.35
	44.49	10/1/2001	18.29		0.40	26.2
	44.49	3/14/2002	17.39	64.32	4.13	27.1
	44.49	9/23/2002	17.81	61.41	6.00	26.68
	44.49	3/10/2003	16.73			27.76
	44.49	9/23/2003	22.35			22.14
	44.49	3/15/2004	16.15			28.34
	44.49	9/14/2004	17.00	60.14	2.56	27.49
	44.49	7/18/2005	15.57			28.92
	44.49	1/6/2006	18.49			26
	44.49	7/27/2006	15.32	60.64	2.03	29.17
	44.49	3/7/2007	15.87	59.82	2.18	28.62
	44.49	7/27/2007	14.25	60.61	1.04	30.24
	44.49	1/28/2008	14.91	60.88	0.67	29.58
	44.49	7/14/2008	17.24	60.95	0.60	27.25
	44.49	2/3/2009	15.97	TRACE	TRACE	28.52

**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-25C	44.49	7/23/2009	16.39			28.1
	44.49	1/9/2010	13.68	61.45	0.65	30.81
	44.49	5/27/2010	16.09			28.4
	44.49	6/28/2010	16.26			28.23
	44.49	7/12/2010	16.05			28.44
	44.49	8/31/2010	16.21			28.28
	44.49	1/12/2011	16.29			28.2
	44.49	7/11/2011	18.81			25.68
	44.49	1/27/2012	17.29			27.2
	44.49	7/10/2012	16.53			27.96
	44.49	1/8/2013	18.34			26.15
	44.49	7/23/2013	18.74			25.75
	44.49	1/8/2014	18.23			26.26
	44.49	7/16/2014	18.66			25.83
	44.49	1/5/2015	17.81			26.68
	44.49	8/10/2015	16.09			28.40
	44.49	1/13/2016	15.61			28.88
	44.49	7/6/2016	16.02			28.47
	44.49	1/12/2017	16.64			27.85
	44.49	7/5/2017	16.84			27.65
44.49	9/5/2017	16.81			27.68	
44.49	2/11/2018	15.27			29.22	
44.49	3/12/2018	15.63			28.86	
44.49	5/14/2018	16.02			28.47	
44.49	1/3/2019	15.29			29.2	
MW-26A	44.62	3/27/2000	7.40			37.22
	44.62	4/7/2000	6.99			37.63
	44.62	5/31/2000	7.10			37.52
	44.62	6/1/2000	7.00			37.62
	44.62	7/28/2000	7.11			37.51
	44.62	8/30/2000	9.69			34.93
	44.62	9/19/2000	11.43			33.19
	44.62	10/27/2000	8.11			36.51
	44.62	11/21/2000	8.24			36.38
	44.62	5/1/2001	6.01			38.61
	44.62	10/1/2001	6.34			38.28
	44.62	3/11/2002	4.05			40.57
	44.62	9/23/2002	4.29			40.33
	44.62	3/10/2003	2.84			41.78
	44.62	9/23/2003	4.84			39.78
	44.62	3/15/2004	3.30			41.32
	44.62	9/14/2004	6.80			37.82
	44.62	7/18/2005	6.72			37.9
	44.62	1/6/2006	9.34			35.28
	44.62	7/27/2006	4.42			40.2
	44.62	3/7/2007	4.70			39.92
	44.62	7/27/2007	3.98			40.64
	44.62	1/29/2008	2.37			42.25
	44.62	7/14/2008	7.87			36.75
	44.62	2/3/2009	6.89			37.73
	44.62	7/23/2009	7.88			36.74
	44.62	1/9/2010	4.31			40.31
	44.62	7/12/2010	8.12			36.5
	44.62	1/13/2011	2.38			42.24
	44.62	7/11/2011	10.27			34.35
44.62	1/27/2012	3.09			41.53	
44.62	7/10/2012	2.77			41.85	
44.62	1/8/2013	7.27			37.35	

**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-26A	44.62	7/23/2013	9.72			34.9
	44.62	1/8/2014	6.33			38.29
	44.62	7/16/2014	7.64			36.98
	44.62	1/5/2015	5.74			38.88
	44.62	8/10/2015	4.03			40.59
	44.62	1/13/2016	3.41			41.21
	44.62	7/6/2016	3.72			40.90
	44.62	1/12/2017	4.92			39.70
	44.62	7/5/2017	5.34			39.28
	44.62	9/5/2017	5.27			39.35
	44.62	2/11/2018	4.43			40.19
	44.62	3/12/2018	4.77			39.85
	44.62	5/14/2018	6.61			38.01
44.62	1/3/2019	6.06			38.56	
MW-27A	44.90	5/1/2001	6.41			38.49
	44.90	10/1/2001	5.31			39.59
	44.90	3/11/2002	4.21			40.69
	44.90	9/23/2002	3.31			41.59
	44.90	3/10/2003	4.05			40.85
	44.90	9/23/2003	3.24			41.66
	44.90	3/15/2004	2.99			41.91
	44.90	9/14/2004	5.09			39.81
	44.90	7/18/2005	4.45			40.45
	44.90	1/6/2006	4.55			40.35
	44.90	7/27/2006	4.26			40.64
	44.90	3/7/2007	3.01			41.89
	45.04	7/27/2007	2.12			42.92
	45.04	1/28/2008	1.88			43.16
	45.04	7/14/2008	4.57			40.47
	45.04	2/3/2009	4.27			40.77
	45.04	7/23/2009	4.36			40.68
	45.04	1/9/2010	3.69			41.35
	45.04	7/12/2010	5.31			39.73
	45.04	1/12/2011	3.76			41.28
	45.04	7/12/2011	6.72			38.32
	45.04	1/26/2012				NM
	45.04	7/10/2012	well covered			NM
	45.04	1/7/2013	well covered			NM
	45.04	7/23/2013	NM			NM
	45.04	8/10/2015	NM			NM
	45.04	2/11/2018	4.21			40.83
	45.04	3/12/2018	4.59			40.45
45.04	5/14/2018	5.06			39.98	
45.04	1/3/2019	NM			NM	
MW-27C	45.04	5/1/2001	17.82			27.22
	45.04	10/1/2001	17.82			27.22
	45.04	3/11/2002	16.36			28.68
	45.04	9/23/2002	16.49			28.55
	45.04	3/10/2003	18.68			26.36
	45.04	9/23/2003	16.89			28.15
	45.04	3/15/2004	14.35			30.69
	45.04	9/14/2004	14.49			30.55
	45.04	7/18/2005	16.12			28.92
	45.04	1/6/2006	18.07			26.97
	45.04	7/27/2006	17.13			27.91
	45.04	3/7/2007	15.47			29.57
	44.90	7/27/2007	14.85			30.05
	45.04	1/28/2008	14.31			30.73

**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-27C	45.04	7/14/2008	17.51			27.53
	45.04	2/3/2009	15.76			29.28
	45.04	7/23/2009	16.38			28.66
	45.04	1/9/2010	14.82			30.22
	45.04	7/12/2010	16.12			28.92
	45.04	1/12/2011	15.84			29.2
	45.04	7/11/2011	18.17			26.87
	45.04	1/27/2012	17.14			27.9
	45.04	7/10/2012	16.56			28.48
	45.04	1/8/2013	17.04			28
	45.04	7/23/2013	18.61			26.43
	45.04	1/8/2014	18.12			26.92
	45.04	7/16/2014	16.94			28.10
	45.04	1/5/2015	17.74			27.30
	45.04	8/10/2015	15.71			29.33
	45.04	1/13/2016	15.04			30.00
	45.04	7/6/2016	15.32			29.72
	45.04	1/12/2017	15.91			29.13
	45.04	7/5/2017	16.39			28.65
	45.04	9/5/2017	16.36			28.68
45.04	2/11/2018	16.59			28.45	
45.04	3/12/2018	16.97			28.07	
45.04	5/14/2018	15.89			29.15	
45.04	1/3/2019	14.32			30.72	
MW-28A	43.86	5/1/2001	7.45			36.41
	43.86	10/1/2001	8.26			35.6
	43.86	3/11/2002	4.90			38.96
	43.86	9/23/2002	5.71			38.15
	43.86	3/10/2003	3.11			40.75
	43.86	9/23/2003	5.81			38.05
	43.86	9/14/2004	9.34			34.52
	43.86	7/18/2005	7.52			36.34
	43.86	1/6/2006	9.32			34.54
	43.86	7/27/2006	5.54			38.32
	43.86	3/7/2007	5.06			38.8
	43.86	7/27/2007	2.86			41
	43.86	1/29/2008	2.61			41.25
	43.86	7/14/2008	8.74			35.12
	43.86	2/3/2009	8.36			35.5
	43.86	7/23/2009	8.94			34.92
	43.86	1/9/2010	4.54			39.32
	43.86	7/12/2010	8.66			35.2
	43.86	1/12/2011	3.87			39.99
	43.86	7/11/2011	11.43			32.43
	43.86	1/27/2012	2.66			41.2
	43.86	7/10/2012	4.52			39.34
	43.86	1/8/2013	8.11			35.75
	43.86	7/23/2013	10.78			33.08
	43.86	1/8/2014	7.71			36.15
	43.86	7/16/2014	8.19			35.67
	43.86	1/5/2015	7.21			36.65
	43.86	8/10/2015	5.72			38.14
43.86	1/13/2016	5.09			38.77	
43.86	7/6/2016	5.42			38.44	
43.86	1/12/2017	5.89			37.97	
43.86	7/5/2017	6.13			37.73	
43.86	9/5/2017	6.06			37.80	
43.86	2/11/2018	5.31			38.55	

**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-28A	43.86	3/12/2018	5.61			38.25
	43.86	5/14/2018	6.02			37.84
	43.86	1/3/2019	5.41			38.45
MW-28C	43.96	5/1/2001	17.14			26.82
	43.96	10/1/2001	17.51			26.45
	43.96	3/11/2002	16.29			27.67
	43.96	9/23/2002	17.75			26.21
	43.96	3/10/2003	15.84			28.12
	43.96	9/23/2003	17.48			26.48
	43.96	3/15/2004	15.56			28.4
	43.96	9/14/2004	17.20			26.76
	43.96	7/18/2005	16.60			27.36
	43.96	1/6/2006	17.61			26.35
	43.96	7/27/2006	17.73			26.23
	43.96	3/7/2007	15.59			28.37
	43.96	7/27/2007	12.90			31.06
	43.96	1/29/2008	14.35			29.61
	43.96	7/14/2008	16.26			27.7
	43.96	2/3/2009	16.03			27.93
	43.96	7/23/2009	16.53			27.43
	43.96	1/9/2010	14.89			29.07
	43.96	7/12/2010	15.89			28.07
	43.96	1/12/2011	18.37			25.59
	43.96	7/11/2011	18.16			25.8
	43.96	1/27/2012	16.12			27.84
	43.96	7/10/2012	16.79			27.17
	43.96	1/8/2013	17.62			26.34
	43.96	7/23/2013	18.87			25.09
	43.96	1/8/2014	17.59			26.37
	43.96	7/16/2014	16.98			26.98
	43.96	1/5/2015	16.84			27.12
	43.96	8/10/2015	14.39			29.57
	43.96	1/13/2016	13.72			30.24
	43.96	7/6/2016	14.03			29.93
	43.96	1/12/2017	14.64			29.32
	43.96	7/5/2017	14.88			29.08
43.96	9/5/2017	14.89			29.07	
43.96	2/11/2018	17.33			26.63	
43.96	3/12/2018	14.73			29.23	
43.96	5/14/2018	16.59			27.37	
43.96	1/3/2019	15.88			28.08	
MW-29A	46.59	5/1/2001	5.01			41.58
	46.59	10/1/2001	5.38			41.21
	46.59	3/11/2002	1.51			45.08
	46.59	9/23/2002	1.65			44.94
	46.59	3/10/2003	1.42			45.17
	46.59	9/23/2003	1.50			45.09
	46.59	3/15/2004	1.85			44.74
	46.59	9/14/2004	6.35			40.24
	46.59	7/18/2005	3.12			43.47
	46.59	1/6/2006	6.57			40.02
	46.59	7/27/2006	1.44			45.15
	46.59	3/7/2007	1.95			44.64
	46.59	7/27/2007	2.49			44.1
	46.59	1/28/2008	1.28			45.31
	46.59	7/14/2008	4.14			42.45
	46.59	2/3/2009	3.50			43.09
	46.59	7/23/2009	4.09			42.5



**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-29A	46.59	1/9/2010	1.76			44.83
	46.59	7/12/2010	3.62			42.97
	46.59	1/13/2011	3.07			43.52
	46.59	7/11/2011	7.14			39.45
	46.59	7/10/2012	4.17			42.42
	46.59	1/8/2013	4.91			41.68
	46.59	7/23/2013	--			--
	Plugged					NM
MW-29B	46.26	5/1/2001	19.01			27.25
	46.26	10/1/2001	19.41			26.85
	46.26	3/11/2002	18.04			28.22
	46.26	9/23/2002	18.82			27.44
	46.26	3/10/2003	17.21			29.05
	46.26	9/23/2003	18.09			28.17
	46.26	3/15/2004	17.10			29.16
	46.26	9/14/2004	17.76			28.5
	46.26	7/18/2005	18.11			28.15
	46.26	1/6/2006	18.83			27.43
	46.26	7/27/2006	18.41			27.85
	46.26	3/7/2007	17.21			29.05
	46.26	7/27/2007	15.49			30.77
	46.26	1/28/2008	15.32			30.94
	46.26	7/14/2008	18.23			28.03
	46.26	2/3/2009	17.72			28.54
	46.26	7/23/2009	16.19			30.07
	46.26	1/9/2010	16.02			30.24
	46.26	7/12/2010	19.29			26.97
	46.26	1/13/2011	17.73			28.53
46.26	7/11/2011	20.06			26.2	
46.26	7/10/2012	9.71	9.71		36.55	
46.26	1/8/2013	9.92	9.92		36.34	
	Plugged					
MW-29C	46.46	5/1/2001	25.51			20.95
	46.46	10/1/2001	25.04			21.42
	46.46	3/11/2002	23.51			22.95
	46.46	9/23/2002	24.10			22.36
	46.46	3/10/2003	22.71			23.75
	46.46	9/23/2003	23.48			22.98
	46.46	3/15/2004	22.24			24.22
	46.46	9/14/2004	24.12			22.34
	46.46	7/18/2005	23.75			22.71
	46.46	1/6/2006	25.12			21.34
	46.46	7/27/2006	23.35			23.11
	46.46	3/7/2007	22.38			24.08
	46.46	7/27/2007	20.42			26.04
	46.46	1/28/2008	21.08			25.38
	46.46	7/14/2008	22.38			24.08
	46.46	2/3/2009	22.86			23.6
	46.46	7/23/2009	22.81			23.65
	46.46	1/9/2010	20.71			25.75
	46.46	7/12/2010	21.32			25.14
	46.46	1/13/2011	20.39			26.07
46.46	7/11/2011	23.17			23.29	
46.46	7/10/2012	20.69	20.69		25.77	
46.46	1/8/2013	21.27	21.27		25.19	
46.46	7/23/2013	--	--		--	
	Plugged					
MW-30A	50.45	3/15/2004	9.71			40.74

**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-30A	50.45	9/13/2004	12.76			37.69
	50.45	7/18/2005	11.80			38.65
	50.45	1/4/2006	13.52			36.93
	50.45	7/27/2006	10.45			40
	50.45	3/7/2007	10.98			39.47
	50.45	7/27/2007	9.49			40.96
	50.45	1/30/2008	9.62			40.83
	50.45	7/15/2008	12.52			37.93
	50.45	2/4/2009	13.01			37.44
	50.45	7/23/2009	13.71			36.74
	50.45	1/9/2010	10.87			39.58
	50.45	7/12/2010	12.61			37.84
	50.45	1/12/2011	10.06			40.39
	50.45	7/12/2011	14.76			35.69
	50.45	1/26/2012	10.78			39.67
	50.45	7/9/2012	11.13			39.32
	50.45	1/8/2013	12.91			37.54
	50.45	7/23/2013	14.16			36.29
	50.45	1/8/2014	13.81			36.64
	50.45	7/15/2014	12.10			38.35
50.45	1/5/2015	13.22			37.23	
50.45	8/10/2015	12.16		Plugged and Abandoned	38.29	
MW-31A	52.08	3/15/2004	10.97			41.11
	52.08	9/13/2004	13.00			39.08
	52.08	7/18/2005	13.05			39.03
	52.08	1/4/2006	14.77			37.31
	52.08	7/27/2006	11.83			40.25
	52.08	3/7/2007	12.43			39.65
	52.08	7/27/2007	10.83			41.25
	52.08	1/31/2008	10.99			41.09
	52.08	7/15/2008	13.68			38.4
	52.08	2/4/2009	14.23			37.85
	52.08	7/23/2009	14.73			37.35
	52.08	1/9/2010	12.31			39.77
	52.08	7/12/2010	14.06			38.02
	52.08	1/12/2011	11.62			40.46
	52.08	7/12/2011	15.92			36.16
	52.08	1/26/2012	12.24			39.84
	52.08	7/9/2012	12.79			39.29
	52.08	1/8/2013	14.14			37.94
	52.08	7/23/2013	16.24			35.84
	52.08	1/8/2014	15.96			36.12
52.08	7/15/2014	13.19			38.89	
52.08	1/5/2015	15.16			36.92	
52.08	8/10/2015	12.76		Plugged and Abandoned	39.32	
MW-32A	43.77	3/15/2004	1.00			42.77
	43.77	9/14/2004	6.03	29.00	3.48	37.74
	43.77	7/18/2005	5.82	26.56	5.92	37.95
	43.77	1/6/2006	6.93	24.92	7.57	36.84
	43.77	7/27/2006	12.96	25.71	6.74	30.81
	43.77	3/7/2007	4.03	25.26	7.19	39.74
	43.77	7/27/2007	1.95	30.76	1.70	41.82
	43.77	1/28/2008	2.18			41.59
	43.77	7/14/2008	6.14	26.25	6.20	37.63
	43.77	2/3/2009	5.71	26.29	6.16	38.06
	43.77	7/23/2009	6.29	26.51	5.94	37.48
	43.77	1/9/2010	3.55	25.41	7.04	40.22
	43.77	5/27/2010	5.86	26.2	6.25	37.91

**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	6/28/2010	6.02	29.1	3.35	37.75
	43.77	7/12/2010	6.12	29.45	3.00	37.65
	43.77	8/31/2010	5.43	30.67	1.78	38.34
	43.77	1/13/2011	2.63	29.15	3.30	41.14
	43.77	7/11/2011	5.92	28.82	3.63	37.85
	Plugged					
MW-32AR	44.56	1/27/2012	3.22			41.34
	44.56	7/10/2012	3.73			40.83
	44.56	1/8/2013	6.64			37.92
	44.56	7/23/2013	9.42			35.14
	44.56	1/8/2014	5.64			38.92
	44.56	7/16/2014	6.74			37.82
	44.56	1/5/2015				
	44.56	8/10/2015	3.18			41.38
	44.56	1/13/2016	2.66			41.90
	44.56	7/6/2016	3.14			41.42
	44.56	1/12/2017	3.67			40.89
	44.56	7/5/2017	4.16			40.40
	44.56	9/6/2017	4.03			40.53
	44.56	2/11/2018	4.06			40.50
	44.56	3/12/2018	5.02			39.54
44.56	5/14/2018	5.91			38.65	
44.56	1/3/2019	5.42			39.14	
MW-32B	44.41	1/27/2012	3.11	30.52	5.77	41.3
	44.41	7/10/2012	3.81	30.16	6.13	40.6
	44.41	1/8/2013	6.34	30.02	6.38	38.07
	44.41	7/23/2013	7.14			37.27
	44.41	1/8/2014	6.72	34.82	1.58	37.69
	44.41	7/16/2014	6.72	34.29	2.11	37.69
	44.41	1/5/2015	6.02	35.77	0.63	38.39
	44.41	8/10/2015	4.41	36.09	0.31	40.00
	44.41	1/13/2016	3.61	36.07	0.33	40.80
	44.41	7/6/2016	3.91	35.96	0.44	40.50
	44.41	1/12/2017	4.83	36.02	0.38	39.58
	44.41	7/5/2017	4.86	36.13	0.27	39.55
	44.41	9/6/2017	4.78	36.24	3.67	39.63
	44.41	2/7/2018	5.16	36.21	0.19	39.25
	44.41	3/12/2018	5.41	36.13	0.27	39.00
	44.41	5/15/2018	6.47	36.21	0.19	37.94
44.41	1/3/2019	6.09	36.29	0.11	38.32	
MW-33A	44.25	3/15/2004	3.90			40.35
	44.25	9/14/2004	7.85			36.4
	44.25	7/18/2005	6.35			37.9
	44.25	1/6/2006	8.00			36.25
	44.25	7/27/2006	4.73			39.52
	44.25	3/7/2007	5.22			39.03
	44.25	7/27/2007	3.48			40.77
	44.25	1/29/2008	3.34			40.91
	44.25	7/14/2008	7.42	25.19	0.03	36.83
	44.25	2/3/2009	7.28			36.97
	44.25	7/23/2009	7.63			36.62
	44.25	1/9/2010	4.79			39.46
	44.25	7/12/2010	7.61			36.64
	44.25	1/13/2011	3.19			41.06
	44.25	7/11/2011	9.87			34.38
	44.25	1/27/2012	2.69			41.56
	44.25	7/10/2012	3.86			40.39
	44.25	1/8/2013	6.76			37.49

**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-33A	44.25	7/23/2013	9.83			34.42
	44.25	1/8/2014	6.71			37.54
	44.25	7/16/2014	7.09			37.16
	44.25	1/5/2015	5.02			39.23
	44.25	8/10/2015	4.09			40.16
	44.25	1/13/2016	3.51			40.74
	44.25	7/6/2016	3.89			40.36
	44.25	1/12/2017	5.01			39.24
	44.25	7/5/2017	5.59			38.66
	44.25	9/6/2017	5.51			38.74
	44.25	2/11/2018	4.38			39.87
	44.25	3/12/2018	4.86			39.39
	44.25	5/14/2018	6.42			37.83
44.25	1/3/2019	5.77			38.48	
MW-33B	44.35	3/7/2007	4.21			40.04
	44.35	7/27/2007	3.72			40.53
	44.35	1/29/2008	2.37	39.12	3.37	41.88
	44.35	7/14/2008	5.74	37.44	5.05	38.51
	44.35	2/3/2009	9.28	36.91	5.58	34.97
	44.35	7/23/2009	NM			NM
	44.35	1/9/2010	4.61	35.21	7.28	39.74
	44.35	5/27/2010	6.82			37.53
	44.35	6/28/2010	6.91			37.44
	44.35	7/12/2010	7.02			37.33
	44.35	8/31/2010	7.22			37.13
	44.35	1/13/2011	3.11	29.7	0.30	41.24
	44.35	7/11/2011	10.19	29.75	0.25	34.16
44.35	1/5/2015	NM			NM	
MW-33BR	44.35	1/27/2012	4.07			40.28
	44.35	7/10/2012	2.59			41.76
	44.35	1/8/2013	3.86			40.49
	44.35	7/23/2013	9.68			34.67
	44.35	1/8/2014	7.41			36.94
	44.35	7/16/2014	6.72			37.63
	44.35	1/5/2015	5.22			39.13
	44.35	8/10/2015	3.96			40.39
	44.35	1/13/2016	3.22			41.13
	44.35	7/6/2016	3.71			40.64
	44.35	1/12/2017	4.74			39.61
	44.35	7/5/2017	5.19			39.16
	44.35	9/6/2017	4.99			39.36
	44.35	2/11/2018	4.74			39.61
	44.35	3/12/2018	5.19			39.16
44.35	5/14/2018	6.03			38.32	
44.35	1/3/2019	5.18			39.17	
MW-34C	45.31	3/15/2004	17.40			27.91
	45.31	9/14/2004	18.82			26.49
	45.31	7/18/2005	19.41	65.29	7.19	25.9
	45.31	1/6/2006	20.54	65.27	8.38	24.77
	45.31	7/27/2006	18.55	63.84	8.61	26.76
	45.31	4/9/2007	16.34	62.06	10.39	28.97
	45.31	7/27/2007	NM			
	45.31	1/29/2008	16.32			28.99
	45.31	7/15/2008	18.13	43.49	29.01	27.18
	45.31	2/5/2009	18.08	61.79	10.71	27.23
	45.31	7/23/2009	NM			
	45.31	1/9/2010	16.41	69.20	3.30	28.9
	45.31	7/12/2010	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-34C	45.31	1/12/2011	16.41	64.90		28.9
	45.31	7/11/2011	19.08	65.26		26.23
	45.31	2/8/2012	18.41			26.9
	45.31	7/10/2012	NM			
	45.31	1/8/2013	NM			
	45.31	7/23/2013	NM			
MW-34CR	46.47	7/16/2014	19.17			27.30
	46.47	1/5/2015	19.01			27.46
	46.47	8/10/2015	17.39			29.08
	46.47	1/13/2016	15.99			30.48
	46.47	7/6/2016	16.06			30.41
	46.47	1/12/2017	16.94			29.53
	46.47	7/5/2017	17.01			29.46
	46.47	9/6/2017	17.11			29.36
	46.47	2/11/2018	18.19			28.28
	46.47	3/12/2018	18.52			27.95
	46.47	5/14/2018	18.26			28.21
	46.47	1/3/2019	18.26			28.21
MW-35A	44.75	3/7/2007	3.49			41.82
	44.75	7/27/2007	3.05			42.26
	44.75	1/29/2008	1.82			43.49
	44.75	7/14/2008	6.21			39.1
	44.75	2/3/2009	5.54			39.77
	44.75	7/23/2009	5.76			39.55
	44.75	1/9/2010	4.14			41.17
	44.75	7/12/2010	6.04			39.27
	44.75	1/13/2011	2.46			42.85
	44.75	7/11/2011	8.44			36.87
	44.75	1/27/2012	1.35			43.96
	44.75	7/10/2012	2.33			42.98
	44.75	1/8/2013	5.37			39.94
	44.75	7/23/2013	9.18			36.13
	44.75	1/8/2014	5.06			40.25
	44.75	7/15/2014	6.51			38.24
	44.75	1/5/2015	4.22			40.53
	44.75	8/10/2015	3.68			41.07
	44.75	1/13/2016	3.08			41.67
	44.75	7/6/2016	3.34			41.41
	44.75	1/12/2017	3.87			40.88
	44.75	7/5/2017	4.41			40.34
	44.75	9/6/2017	NM			
44.75	2/11/2018	3.69			41.06	
44.75	3/11/2018	4.06			40.69	
44.75	5/14/2018	8.71			36.04	
44.75	1/3/2019	8.06			36.69	
MW-35B	44.83	3/7/2007	3.31			41.52
	44.83	7/27/2007	3.29			41.54
	44.83	1/29/2008	1.95			42.88
	44.83	7/14/2008	6.40			38.43
	44.83	2/3/2009	5.79			39.04
	44.83	7/23/2009	6.42			38.41
	44.83	1/9/2010	3.51			41.32
	44.83	7/12/2010	6.39			38.44
	44.83	1/13/2011	2.96			41.87
	44.83	7/11/2011	8.67			36.16
	44.83	1/27/2012	1.59			43.24
	44.83	7/10/2012	2.74			42.09
	44.83	1/8/2013	6.09			38.74

**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-35B	44.83	7/23/2013	9.22			35.61
	44.83	1/8/2014	5.31			39.52
	44.83	7/15/2014	6.75			38.08
	44.83	1/5/2015	4.81			40.02
	44.83	8/10/2015	3.97			40.86
	44.83	1/13/2016	3.26			41.57
	44.83	7/6/2016	3.57			41.26
	44.83	1/12/2017	4.06			40.77
	44.83	7/5/2017	4.66			40.17
	44.83	9/6/2017	NM			
	44.83	2/11/2018	4.06			40.77
	44.83	3/11/2018	4.31			40.52
	44.83	5/14/2018	6.11			38.72
44.83	1/3/2019	5.33			39.5	
MW-36A	44.53	3/7/2007	8.71			35.82
	44.53	7/27/2007	6.54			37.99
	44.53	1/29/2008	5.59			38.94
	44.53	7/14/2008	9.33			35.2
	44.53	2/3/2009	10.69			33.84
	44.53	7/23/2009	12.03			32.5
	44.53	1/9/2010	9.23			35.3
	44.53	7/12/2010	9.14			35.39
	44.53	1/13/2011	8.62			35.91
	44.53	7/11/2011	12.16			32.37
	44.53	1/27/2012	6.82			37.71
	44.53	7/10/2012	6.68			37.85
	44.53	1/8/2013	7.61			36.92
	44.53	7/23/2013	11.36			33.17
	44.53	1/8/2014	9.23			35.3
	44.53	7/16/2014	8.62			35.91
	44.53	1/5/2015	8.67			35.86
	44.53	8/10/2015	6.47			38.06
	44.53	1/13/2016	5.79			38.74
	44.53	7/6/2016	6.13			38.40
44.53	1/12/2017	6.58			37.95	
44.53	7/5/2017	7.01			37.52	
44.53	9/6/2017	6.92			37.61	
44.53	2/11/2018	7.77			36.76	
44.53	3/11/2018	8.06			36.47	
44.53	5/14/2018	8.92			35.61	
44.53	1/3/2019	8.22			36.31	
MW-36B	44.07	7/12/2010	1.32			42.75
	44.07	1/13/2011	9.71			34.36
	44.07	7/11/2011	11.57			32.5
	44.07	1/27/2012	0.46			43.61
	44.07	7/10/2012	6.64			37.43
	44.07	1/8/2013	6.71			37.36
	44.07	7/23/2013	9.39			34.68
	44.07	1/8/2014	4.09			39.98
	44.07	7/16/2014	3.61			40.46
	44.07	1/5/2015	3.21			40.86
	44.07	8/10/2015	1.46			42.61
	44.07	1/13/2016	1.06			43.01
	44.07	7/6/2016	4.06			40.01
	44.07	1/12/2017	4.59			39.48
	44.07	7/5/2017	4.72			39.35
44.07	9/6/2017	4.41			39.66	
44.07	2/11/2018	0.32			43.75	

**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-36B	44.07	3/11/2018	1.81			42.26
	44.07	5/14/2018	1.62			42.45
	44.07	1/3/2019	1.09			42.98
MW-36D	44.33	7/12/2010	85.39			-41.06
	44.33	1/13/2011	85.03			-40.7
	44.33	7/11/2011	85.33			-41
	44.33	1/27/2012	85.62			-41.29
	44.33	7/10/2012	85.17			-40.84
	44.33	1/8/2013	85.37			-41.04
	44.33	7/23/2013	85.93			-41.6
	44.33	1/8/2014	85.32			-40.99
	44.33	7/16/2014	84.77			-40.44
	44.33	1/5/2015	85.01			-40.68
	44.33	8/10/2015	84.67			-40.34
	44.33	1/13/2016	84.29			-39.96
	44.33	7/6/2016	84.42			-40.09
	44.33	1/12/2017	84.73			-40.40
	44.33	7/5/2017	84.89			-40.56
	44.33	9/6/2017	84.86			-40.53
	44.33	2/11/2018	82.59			-38.26
	44.33	3/11/2018	82.77			-38.44
44.33	5/14/2018	83.09			-38.76	
44.33	1/3/2019	82.51			-38.18	
MW-38A	46.39	3/7/2007	3.26			43.13
	46.39	7/27/2007	3.08			43.31
	46.39	1/29/2008	1.85			44.54
	46.39	7/14/2008	5.84			40.55
	46.39	2/3/2009	5.15			41.24
	46.39	7/23/2009	5.06			41.33
	46.39	1/9/2010	2.27			44.12
	46.39	7/12/2010	6.42			39.97
	46.39	1/13/2011	1.76			44.63
	46.39	7/11/2011	8.16			38.23
	46.39	1/27/2012	1.8			44.59
	46.39	7/10/2012	2.52			43.87
	46.39	1/8/2013	4.62			41.77
	46.39	7/23/2013	8.34			38.05
	46.39	1/8/2014	4.77			41.62
	46.39	7/15/2014	6.20			40.19
	46.39	1/5/2015	4.16			42.23
	46.39	8/10/2015	3.61			42.78
	46.39	1/13/2016	3.02			43.37
	46.39	7/6/2016	3.42			42.97
46.39	1/12/2017	4.01			42.38	
46.39	7/5/2017	4.21			42.18	
46.39	9/6/2017	4.12			42.27	
46.39	2/11/2018	2.61			43.78	
46.39	3/11/2018	4.12			42.27	
46.39	5/14/2018	5.41			40.98	
46.39	1/3/2019	4.66			41.73	
MW-38B	45.51	3/15/2004	1.07			44.44
	45.51	9/14/2004	6.10			39.41
	45.51	7/18/2005	2.41			43.1
	45.51	1/6/2006	6.33			39.18
	45.51	7/27/2006	1.27			44.24
	45.51	3/7/2007	2.38			43.13
	45.51	7/27/2007	2.25			43.26
	45.51	1/29/2008	0.61			44.9



**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	7/14/2008	4.86			40.65
	45.51	2/3/2009	4.33			41.18
	45.51	7/23/2009	4.47			41.04
	45.51	1/9/2010	1.44			44.07
	45.51	7/12/2010	5.72			39.79
	45.51	1/13/2011	0.68			44.83
	45.51	7/11/2011	7.82			37.69
	45.51	1/27/2012	0.85			44.66
	45.51	7/10/2012	0.74			44.77
	45.51	1/8/2013	3.97			41.54
	45.51	7/23/2013	7.51			38
	45.51	1/8/2014	3.47			42.04
	45.51	7/15/2014	5.50			40.01
	45.51	1/5/2015	3.07			42.44
	45.51	8/10/2015	2.17			43.34
	45.51	1/13/2016	2.41			43.10
	45.51	7/6/2016	2.96			42.55
	45.51	1/12/2017	3.81			41.70
	45.51	7/5/2017	4.07			41.44
	45.51	9/6/2017	3.91			41.60
	45.51	2/11/2018	2.02			43.49
	45.51	3/11/2018	3.22			42.29
	45.51	5/14/2018	4.62			40.89
45.51	1/3/2019	3.79			41.72	
MW-39B	49.58	3/15/2004	5.48			44.1
	49.58	9/13/2004	10.02			39.56
	49.58	7/18/2005	7.21			42.37
	49.58	1/4/2006	10.37			39.21
	49.58	7/27/2006	6.08			43.5
	49.58	3/7/2007	6.91			42.67
	49.58	7/27/2007	5.74			43.84
	49.58	1/30/2008	6.34			43.24
	49.58	7/15/2008	8.96			40.62
	49.58	2/4/2009	8.60			40.98
	49.58	7/24/2009	9.13			40.45
	49.58	1/8/2010	5.61			43.97
	49.58	7/12/2010	9.31			40.27
	49.58	1/12/2011	5.64			43.94
	49.58	7/12/2011	11.97			37.61
	49.58	1/26/2012	5.84			43.74
	49.58	7/9/2012	5.77			43.81
	49.58	1/7/2013	8.68			40.9
	49.58	7/22/2013	11.17			38.41
	49.58	1/7/2014	7.23			42.35
	49.58	7/16/2014	9.46			40.12
	49.58	1/5/2015	6.71			42.87
	49.58	8/10/2015	4.82			44.76
	49.58	1/13/2016	4.17			45.41
	49.58	7/6/2016	4.26			45.32
	49.58	1/12/2017	5.61			43.97
	49.58	7/5/2017	5.87			43.71
49.58	9/6/2017	5.66			43.92	
49.58	2/11/2018	6.09			43.49	
49.58	3/11/2018	7.04			42.54	
49.58	5/14/2018	8.73			40.85	
49.58	1/3/2019	7.97			41.61	
MW-40B	49.59	3/15/2004	5.46			44.13
	49.59	9/13/2004	9.72			39.87

**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-40B	49.59	7/18/2005	7.19			42.4
	49.59	1/4/2006	10.25			39.34
	49.59	7/27/2006	6.18			43.41
	49.59	3/7/2007	6.81			42.78
	49.59	7/27/2007	5.00			44.59
	49.59	1/30/2008	5.23			44.36
	49.59	7/15/2008	8.76			40.83
	49.59	2/4/2009	8.57			41.02
	49.59	7/24/2009	9.06			40.53
	49.59	1/8/2010	5.37			44.22
	49.59	7/12/2010	9.17			40.42
	49.59	1/12/2011	5.81			43.78
	49.59	7/12/2011	11.46			38.13
	49.59	1/26/2012	5.68			43.91
	49.59	7/9/2012	5.74			43.85
	49.59	1/7/2013	8.63			40.96
	49.59	7/22/2013	11.06			38.53
	49.59	1/7/2014	7.24			42.35
	49.59	7/16/2014	9.27			40.32
	49.59	1/5/2015	7.02			42.57
	49.59	8/10/2015	5.02			44.57
	49.59	1/13/2016	4.39			45.20
	49.59	7/6/2016	4.67			44.92
	49.59	1/12/2017	5.22			44.37
	49.59	7/5/2017	5.77			43.82
	49.59	9/6/2017	5.71			43.88
49.59	2/11/2018	6.21			43.38	
49.59	3/11/2018	6.82			42.77	
49.59	5/14/2018	8.44			41.15	
49.59	1/3/2019	7.91			41.68	
MW-41B	49.37	3/15/2004	4.66			44.71
	49.37	9/13/2004	9.76	35.01	9.80	39.61
	49.37	7/18/2005	5.96	32.23	12.58	43.41
	49.37	1/4/2006	10.03	32.21	12.60	39.34
	49.37	7/27/2006	5.65	29.55	15.26	43.72
	49.37	3/7/2007	4.41	29.13	15.68	44.96
	49.37	7/27/2007	5.27	12.00	32.81	44.1
	49.37	2/22/2008	5.04	25.14	19.67	44.7
	49.37	7/15/2008	8.87	25.09	19.72	40.5
	49.37	2/4/2009	8.93	23.79	21.02	40.44
	49.37	7/24/2009	9.46	23.91	20.90	39.91
	49.37	1/8/2010	5.92	23.65	21.16	43.45
	49.37	5/27/2010	6.13	25.45	19.36	43.24
	49.37	6/28/2010	6.21	38.2	6.61	43.16
	49.37	7/12/2010	6.32	38.45	6.36	43.05
	49.37	8/31/2010	6.26	39.22	5.59	43.11
	49.37	1/12/2011	6.02	39.6	5.21	43.35
	49.37	7/12/2011	8.86	39.75	5.06	40.51
	49.37	3/8/2012	6.31	20.67	24.14	43.06
	49.37	7/9/2012	8.23			41.14
	49.37	1/7/2013	9.09	41.13	3.68	40.28
	49.37	7/22/2013	10.31	39.29	5.52	39.06
	49.37	1/7/2014	9.06	39.17	5.64	40.31
	49.37	7/15/2014	8.62	37.86	6.95	40.75
	49.37	1/5/2015	8.26	39.02	5.79	41.11
	49.37	8/10/2015	6.01	40.39	4.42	43.36
49.37	1/13/2016	5.51	39.91	4.90	43.86	
49.37	7/6/2016	5.72	40.01	4.80	43.65	

**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-41B	49.37	1/12/2017	6.39	40.56	4.25	42.98
	49.37	7/6/2017	6.34	40.57	1.73	43.03
	49.37	9/6/2017	6.36	40.62	1.68	43.01
	49.37	2/7/2018	6.97	40.76	1.54	42.40
	49.37	3/11/2018	7.21	40.63	1.67	42.16
	49.37	5/14/2018	8.71	40.82	1.48	40.66
	49.37	7/2/2018	8.97	40.96	1.34	40.4
	49.37	1/3/2019	8.22	40.83	1.47	41.15
MW-42B	50.52	3/7/2007	7.31			43.21
	50.52	7/27/2007	5.74			44.78
	50.52	1/30/2008	6.62			43.9
	50.52	7/15/2008	8.73			41.79
	50.52	2/4/2009	9.32			41.2
	50.52	7/24/2009	9.61			40.91
	50.52	1/8/2010	6.02			44.5
	50.52	7/12/2010	7.13			43.39
	50.52	1/12/2011	6.33			44.19
	50.52	7/12/2011	11.76			38.76
	50.52	1/26/2012	6.62			43.9
	50.52	7/9/2012	6.81			43.71
	50.52	1/7/2013	9.23			41.29
	50.52	7/22/2013	11.08			39.44
	50.52	1/7/2014	8.02			42.5
	50.52	7/15/2014	7.37			43.15
	50.52	1/5/2015	7.31			43.21
	50.52	8/10/2015	5.67			44.85
	50.52	1/13/2016	4.92			45.60
	50.52	7/6/2016	5.36			45.16
	50.52	1/12/2017	5.94			44.58
50.52	7/6/2017	6.27			44.25	
50.52	9/6/2017	6.39			44.13	
50.52	2/11/2018	6.84			43.68	
50.52	3/11/2018	7.12			43.40	
50.52	5/14/2018	8.76			41.76	
50.52	7/2/2018	8.99			41.53	
50.52	1/3/2019	8.02			42.50	
MW-44A	45.11	3/7/2007	10.86			34.25
	45.11	7/27/2007	7.46			37.65
	45.11	1/30/2008	8.44			36.67
	45.11	7/14/2008	10.75			34.36
	45.11	2/3/2009	12.55			32.56
	45.11	7/23/2009	12.76			32.35
	45.11	1/9/2010	10.23			34.88
	45.11	7/12/2010	11.24			33.87
	45.11	1/12/2011	9.63			35.48
	45.11	7/11/2011	12.59			32.52
	45.11	1/27/2012	9.27			35.84
	45.11	7/10/2012	10.11			35
	45.11	1/8/2013	11.01			34.1
	45.11	7/23/2013	12.24			32.87
	45.11	1/8/2014	11.91			33.2
	45.11	7/16/2014	11.32			33.79
	45.11	1/5/2015	11.27			33.84
	45.11	8/10/2015	9.71			35.40
	45.11	1/13/2016	9.11			36.00
	45.11	7/6/2016	9.26			35.85
45.11	1/12/2017	9.71			35.40	
45.11	7/5/2017	10.06			35.05	

**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-44A	45.11	9/6/2017	9.94			35.17
	45.11	2/11/2018	8.79			36.32
	45.11	3/11/2018	9.83			35.28
	45.11	5/14/2018	9.91			35.20
	45.11	1/3/2019	9.23			35.88
MW-44C	45.03	3/15/2004	17.54			27.49
	45.03	9/14/2004	18.35			26.68
	45.03	7/18/2005	18.90	64.77	5.35	26.13
	45.03	1/6/2006	20.03	66.50	5.37	25
	45.03	7/27/2006	18.47	63.35	6.75	26.56
	45.03	3/7/2007	16.02	62.30	7.75	29.01
	45.03	7/27/2007	14.83	65.45	5.50	30.2
	45.03	1/29/2008	15.95			29.08
	45.03	7/14/2008	17.91	64.95	6.18	27.12
	45.03	2/3/2009	16.72	64.15	6.98	28.31
	45.03	7/23/2009	17.12	64.05	6.75	27.91
	45.03	1/9/2010	15.57	63.81	6.99	29.46
	45.03	5/27/2010	16.67	64.7	6.10	28.36
	45.03	6/28/2010	16.77	67.85	2.95	28.26
	45.03	7/12/2010	16.91	70.35	0.45	28.12
	45.03	8/31/2010	16.89	70.63	0.17	28.14
	45.03	1/12/2011	16.77	70.05	0.75	28.26
	45.03	7/11/2011	19.31	70.05	0.75	25.72
	45.03	1/27/2012	17.91	63.88	6.92	27.12
	45.03	7/10/2012	17.61	63.7	7.10	27.42
	45.03	1/8/2013	19.02	62.94	7.86	26.01
	45.03	7/23/2013	20.36	70.26	0.54	24.67
	45.03	1/8/2014	19.67	70.42	0.38	25.36
	45.03	7/16/2014	18.72	69.31	1.49	26.31
	45.03	1/5/2015	18.67	69.82	0.98	26.36
	45.03	8/10/2015	16.31	70.29	0.51	28.72
	45.03	1/13/2016	16.26	69.93	0.87	28.77
	45.03	7/6/2016	16.47	69.71	1.09	28.56
	45.03	1/12/2017	17.22	70.11	0.69	27.81
	45.03	7/5/2017	17.33	70.34	0.46	27.70
45.03	9/6/2017	17.36	70.43	-0.87	27.67	
45.03	2/8/2018	17.77	70.34	0.46	27.26	
45.03	5/15/2018	NM				
45.13	1/4/2019	18.42	70.41	0.39	26.71	
MW-45C	44.73	3/15/2004	17.15			27.58
	44.73	9/14/2004	17.82	61.66	9.02	26.91
	44.73	7/18/2005	18.38	60.76	9.89	26.35
	44.73	1/6/2006	19.51	62.87	8.87	25.22
	44.73	7/27/2006	17.92	61.64	8.94	26.81
	44.73	3/7/2007	15.95	60.81	9.79	28.78
	44.73	7/27/2007	14.38			30.35
	44.73	1/29/2008	14.86	61.39	9.46	29.87
	44.73	7/14/2008	17.22	61.25	9.88	27.51
	44.73	2/3/2009	17.00	61.24	9.61	27.73
	44.73	7/23/2009	17.46	61.30	9.55	27.27
	44.73	1/9/2010	14.98	61.56	9.29	29.75
	44.73	5/27/2010	16.31	61.1	9.75	28.42
	44.73	6/28/2010	16.42	63.45	7.40	28.31
	44.73	7/12/2010	16.61	68.8	2.05	28.12
	44.73	8/31/2010	16.46	69.62	1.23	28.27
	44.73	1/12/2011	16.31	69.1	1.75	28.42
	44.73	7/11/2011	18.29	69.3	1.55	26.44
	44.73	3/8/2012	16.31	70.6	0.25	28.42

**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-45C	44.73	7/10/2012	20.69	70.21	0.64	24.04
	44.73	1/8/2013	21.39	69.91	0.69	23.34
	44.73	7/23/2013	22.72	70.39	0.21	22.01
	44.73	1/8/2014	22.13	70.35	0.25	22.6
	44.73	7/16/2014	21.32	69.91	0.69	23.41
	44.73	1/5/2015	20.19	70.55	0.05	24.54
	44.73	8/10/2015	18.61			26.12
	44.73	1/13/2016	17.49			27.24
	44.73	7/6/2016	17.62			27.11
	44.73	1/12/2017	18.22			26.51
	44.73	7/5/2017	17.96			26.77
	44.73	9/6/2017	18.16			26.57
	44.73	2/8/2018	18.62	70.6	0.00	26.11
	44.73	3/11/2018	18.83			25.9
	44.73	5/15/2018	19.61			25.12
44.73	1/4/2019	19.02			25.71	
MW-46C	44.94	3/15/2004	16.16	ND	ND	28.78
	44.94	9/14/2004	17.97	ND	ND	26.97
	44.94	7/18/2005	18.50	69.05	3.78	26.44
	44.94	1/13/2006	19.66	70.20	3.22	25.28
	44.94	7/27/2006	17.96	68.89	3.90	26.98
	44.94	3/7/2007	16.01	69.32	3.43	28.93
	44.94	7/27/2007	14.54	69.31	3.59	30.4
	44.94	1/30/2008	15.68	70.81	2.00	29.26
	44.94	7/14/2008	17.38	69.97	2.84	27.56
	44.94	2/3/2009	16.78	69.28	3.53	28.16
	44.94	7/23/2009	17.59	69.35	3.55	27.35
	44.94	1/9/2010	14.53	68.74	4.16	30.41
	44.94	5/27/2010	16.26	69.4	3.50	28.68
	44.94	6/28/2010	16.39	70.85	2.05	28.55
	44.94	7/12/2010	16.29	72.25	0.65	28.65
	44.94	8/31/2010	16.13	72.46	0.44	28.81
	44.94	1/12/2011	15.96	71.75	1.15	28.98
	44.94	7/11/2011	18.07	71.65	1.25	26.87
	44.94	1/26/2012	16.54	ND	ND	28.4
	44.94	7/10/2012	20.34	72.8	0.10	24.6
	44.94	1/8/2013	21.18	71.31	1.59	23.76
	44.94	7/23/2013	21.96	72.16	0.74	22.98
	44.94	1/8/2014	21.81	72.55	0.35	23.13
	44.94	7/16/2014	20.86	71.39	1.51	24.08
	44.94	1/5/2015	20.47	72.06	0.84	24.47
	44.94	8/10/2015	18.39	72.42	0.48	26.55
	44.94	1/13/2016	18.24	72.59	0.31	26.70
	44.94	7/6/2016	18.54	72.49	0.41	26.40
	44.94	1/12/2017	19.27	72.46	0.44	25.67
	44.94	7/5/2017	19.12	72.34	0.56	25.82
44.94	9/6/2017	19.29	72.34	0.56	25.65	
44.94	2/8/2018	19.96	72.46	0.44	24.98	
44.94	3/11/2018	20.04	72.32	0.58	24.90	
44.94	5/15/2018	21.02	72.59	0.31	23.92	
44.94	1/4/2019	20.49	72.46	0.44	24.45	
MW-47C	45.61	7/27/2007	16.62			28.99
	45.61	1/29/2008	16.04			29.57
	45.61	7/14/2008	18.15			27.46
	45.61	2/4/2009	18.39			27.22
	45.61	7/23/2009	18.61			27
	45.61	1/9/2010	16.46			29.15
	45.61	7/12/2010	18.33			27.28

**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-47C	45.61	1/12/2011	17.86			27.75
	45.61	7/11/2011	19.94			25.67
	45.61	1/26/2012	18.77			26.84
	45.61	7/9/2012	18.17			27.44
	45.61	1/8/2013	19.47			26.14
	45.61	7/23/2013	20.61			25
	45.61	1/8/2014	19.57			26.04
	45.61	7/16/2014	19.02			26.59
	45.61	1/5/2015	19.07			26.54
	45.61	8/10/2015	17.41			28.20
	45.61	1/13/2016	16.83			28.78
	45.61	7/6/2016	17.01			28.60
	45.61	1/12/2017	17.59			28.02
	45.52	7/5/2017	NM			
	45.52	9/6/2017	NM			
	45.52					45.52
MW-48C	44.68	3/15/2004	17.31			27.37
	44.68	9/14/2004	18.60			26.08
	44.68	7/18/2005	19.17			25.51
	44.68	1/6/2006	20.33			24.35
	44.68	7/27/2006	18.73			25.95
	44.68	3/7/2007	16.52			28.16
	44.68	7/27/2007	15.22			29.46
	44.68	1/29/2008	16.32			28.36
	44.68	7/14/2008	17.63			27.05
	44.68	2/4/2009	17.97			26.71
	44.68	7/24/2009	18.39			26.29
	44.68	1/9/2010	15.81			28.87
	44.68	7/12/2010	17.42			27.26
	44.68	1/12/2011	17.52			27.16
	44.68	7/11/2011	19.58			25.1
	44.68	1/26/2012	18.52			26.16
	44.68	7/9/2012	17.12			27.56
	44.68	1/8/2013	18.26			26.42
	44.68	7/23/2013	20.17			24.51
	44.68	1/8/2014	19.19			25.49
	44.68	7/16/2014	18.38			26.30
	44.68	1/5/2015	18.76			25.92
	44.68	8/10/2015	16.34			28.34
	44.68	1/13/2016	15.72			28.96
	44.68	7/6/2016	16.16			28.52
	44.68	1/12/2017	16.71			27.97
	44.68	7/5/2017	17.17			27.51
44.68	9/6/2017	17.15			27.53	
44.68	2/11/2018	17.36			27.32	
44.68	3/11/2018	16.74			27.94	
44.68	5/14/2018	17.33			27.35	
44.68	1/4/2019	16.67			28.01	
MW-49A	46.18	3/7/2007	12.91			33.27
	46.18	7/27/2007	8.86			37.32
	46.18	1/31/2008	12.02			34.16
	46.18	7/15/2008	12.99			33.19
	46.18	2/4/2009	13.29			32.89
	46.18	7/24/2009	13.71			32.47
	46.18	1/9/2010	11.07			35.11
	46.18	7/12/2010	11.62			34.56
	46.18	1/12/2011	10.82			35.36
46.18	7/11/2011	12.31			33.87	

**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-49A	46.18	1/26/2012	9.48			36.7
	46.18	7/9/2012	9.79			36.39
	46.18	1/8/2013	11.31			34.87
	46.18	7/23/2013	11.92			34.26
	46.18	1/8/2014	11.56			34.62
	46.18	7/16/2014	10.57			35.61
	46.18	1/5/2015	16.12			30.06
	46.18	8/10/2015	9.61			36.57
	46.18	1/13/2016	9.34			36.84
	46.18	7/6/2016	9.57			36.61
	46.18	1/12/2017	10.03			36.15
	46.18	7/5/2017	10.32			35.86
	46.18	9/6/2017	10.24			35.94
	46.18	2/11/2018	10.29			35.89
	46.18	3/11/2018	10.56			35.62
46.18	5/14/2018	12.34			33.84	
46.18	1/4/2019	11.81			34.37	
MW-49B	46.22	2/4/2009	11.65			34.57
	46.22	7/24/2009	11.93			34.29
	46.22	1/9/2010	9.73			36.49
	46.22	7/12/2010	11.36			34.86
	46.22	1/12/2011	8.04			38.18
	46.22	7/11/2011	12.29			33.93
	46.22	1/26/2012	10.74			35.48
	46.22	7/9/2012	7.38			38.84
	46.22	1/8/2013	11.27	33.56	1.19	34.95
	46.22	7/23/2013	11.83	33.91	0.84	34.39
	46.22	1/8/2014	11.24			34.98
	46.22	7/16/2014	9.62			36.60
	46.22	1/5/2015	10.74			35.48
	46.22	8/10/2015	8.17			38.05
	46.22	1/13/2016	7.74			38.48
	46.22	7/6/2016	8.02			38.20
	46.22	1/12/2017	8.46			37.76
	46.22	7/5/2017	8.72			37.50
	46.22	9/6/2017	8.67			37.55
	46.22	2/11/2018	10.03			36.19
46.22	3/11/2018	10.64			35.58	
46.22	5/14/2018	13.27			32.95	
46.22	1/4/2019	12.59			33.63	
MW-50A	46.96	3/7/2007	8.16			38.8
	46.96	7/27/2007	4.70			42.26
	46.96	1/31/2008	5.68			41.28
	46.96	7/16/2008	7.99			38.97
	46.96	2/4/2009	9.31			37.65
	46.96	7/24/2009	9.49			37.47
	46.96	1/9/2010	7.02			39.94
	46.96	7/12/2010	8.74			38.22
	46.96	1/12/2011	5.61			41.35
	46.96	7/11/2011	9.86			37.1
	46.96	1/26/2012	7.21			39.75
	46.96	7/9/2012	4.63			42.33
	46.96	1/8/2013	5.91			41.05
	46.96	7/23/2013	7.13			39.83
	46.96	1/8/2014	6.71			40.25
	46.96	7/16/2014	6.29			40.67
	46.96	1/5/2015	6.22			40.74
	46.96	8/10/2015	5.01			41.95



**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	1/13/2016	4.06			42.90
	46.96	7/6/2016	4.71			42.25
	46.96	1/12/2017	5.21			41.75
	46.96	7/5/2017	5.63			41.33
	46.96	9/6/2017	5.51			41.45
	46.96	2/11/2018	4.39			42.57
	46.96	3/11/2018	4.81			42.15
	46.96	5/15/2018	5.27			41.69
	46.96	1/3/2019	4.62			42.34
MW-51A	47.80	3/7/2007	6.96			40.84
	47.80	7/27/2007	5.45			42.35
	47.80	1/31/2008	5.92			41.88
	47.80	7/15/2008	NM			
	47.80	2/4/2009	9.98			37.82
	47.80	7/24/2009	10.34			37.46
	47.80	1/9/2010	7.83			39.97
	47.80	7/12/2010	9.16			38.64
	47.80	1/12/2011	8.56			39.24
	47.80	7/11/2011	12.74			35.06
	47.80	1/26/2012	7.33			40.47
	47.80	7/9/2012	7.26			40.54
	47.80	1/8/2013	7.62			40.18
	47.80	7/23/2013	10.54			37.26
	47.80	1/8/2014	10.21			37.59
	47.80	7/16/2014	8.51			39.29
	47.80	1/5/2015	9.87			39.29
	47.80	8/10/2015	7.96			39.84
	47.80	1/13/2016	7.13			40.67
	47.80	7/6/2016	7.29			40.51
	47.80	1/12/2017	7.63			40.17
	47.80	7/5/2017	7.74			40.06
	47.80	9/6/2017	7.63			40.17
47.80	2/11/2018	5.92			41.88	
47.80	3/12/2018	6.41			41.39	
47.80	5/15/2018	7.16			40.64	
47.80	1/4/2019	6.67			41.13	
MW-51C	47.48	7/16/2014	22.21			25.27
	47.48	1/5/2015	NM			
	47.48	8/10/2015	18.79			28.69
	47.48	1/13/2016	18.06			29.42
	47.48	7/6/2016	18.26			29.22
	47.48	1/12/2017	18.68			28.80
	47.48	7/5/2017	19.12			28.36
	47.48	9/6/2017	19.02			28.46
	47.48	2/11/2018	17.63			29.85
	47.48	3/12/2018	18.03			29.45
	47.48	5/15/2018	20.83			26.65
47.48	1/3/2019	20.17			27.31	
MW-52A	51.91	3/7/2007	13.66			38.25
	51.91	7/27/2007	11.76			40.15
	51.91	1/31/2008	12.60			39.31
	51.91	7/15/2008	14.42			37.49
	51.91	2/5/2009	15.52			36.39
	51.91	7/23/2009	16.39			35.52
	51.91	1/9/2010	12.57			39.34
	51.91	7/12/2010	14.19			37.72
	51.91	1/12/2011	9.06			42.85
	51.91	7/12/2011	16.53			35.38

**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-52A	51.91	1/26/2012	12.99			38.92
	51.91	7/9/2012	12.43			39.48
	51.91	1/7/2013	14.94			36.97
	51.91	7/22/2013	16.29			35.62
	51.91	1/7/2014	16.01			35.9
	51.91	7/15/2014	15.39			36.52
	51.91	1/5/2015	15.37			36.54
	51.91	8/10/2015	13.61			38.30
	51.91	1/13/2016	12.96			38.95
	51.91	7/6/2016	NM			NM
MW-53C	45.49	3/7/2007	16.12			29.37
	45.49	7/27/2007	14.55			30.94
	45.49	1/29/2008	15.12			30.37
	45.49	7/14/2008	16.86			28.63
	45.49	2/3/2009	16.69			28.8
	45.49	7/23/2009	17.62			27.87
	45.49	1/9/2010	15.19			30.3
	45.49	7/12/2010	15.71			29.78
	45.49	1/12/2011	16.58			28.91
	45.49	7/11/2011	18.61			26.88
	45.49	1/27/2012	17.54			27.95
	45.49	7/10/2012	17.73			27.76
	45.49	1/8/2013	18.14			27.35
	45.49	7/23/2013	19.28			26.21
	45.49	1/8/2014	21.12			24.37
	45.49	7/16/2014	17.37			28.12
	45.49	1/5/2015	20.71			24.78
	45.49	8/10/2015	18.72			26.77
	45.49	1/13/2016	18.06			27.43
	45.49	7/6/2016	18.42			27.07
	45.49	1/12/2017	18.89			26.60
	45.49	7/5/2017	19.16			26.33
	45.49	9/6/2017	19.13			26.36
	45.49	2/11/2018	16.43			29.06
45.49	3/11/2018	15.54			29.95	
45.49	5/14/2018	16.56			28.93	
45.49	1/4/2019	15.93			29.56	
MW-54C	44.99	3/7/2007	15.74			29.25
	44.99	7/27/2007	14.63			30.36
	44.99	1/28/2008	15.28			29.71
	44.99	7/14/2008	16.68			28.31
	44.99	2/3/2009	16.87			28.12
	44.99	7/23/2009	17.84			27.15
	44.99	1/9/2010	15.46			29.53
	44.99	7/12/2010	16.49			28.5
	44.99	1/12/2011	16.46			28.53
	44.99	7/11/2011	18.23			26.76
	44.99	1/27/2012	17.42			27.57
	44.99	7/10/2012	17.36			27.63
	44.99	1/8/2013	17.81			27.18
	44.99	7/23/2013	18.89			26.1
	44.99	1/8/2014	18.14			26.85
	44.99	7/16/2014	17.49			27.50
	44.99	1/5/2015	17.86			27.13
	44.99	8/10/2015	16.02			28.97
	44.99	1/13/2016	15.33			29.66
	44.99	7/6/2016	15.66			29.33
44.99	1/12/2017	16.17			28.82	

**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-54C	44.99	7/5/2017	16.61			28.38
	44.99	9/6/2017	16.59			28.40
	44.99	2/11/2018	15.4			29.59
	44.99	3/11/2018	15.68			29.31
	44.99	5/14/2018	16.31			28.68
	44.99	1/4/2019	15.71			29.28
MW-55A	52.01	2/4/2009	13.79			38.22
	52.01	7/23/2009	14.06			37.95
	52.01	1/9/2010	10.83			41.18
	52.01	7/12/2010	12.72			39.29
	52.01	1/12/2011	10.13			41.88
	52.01	7/12/2011	15.18			36.83
	52.01	1/26/2012	11.71			40.3
	52.01	7/9/2012	12.29			39.72
	52.01	1/7/2013	13.34			38.67
	52.01	7/22/2013	14.19			37.82
	52.01	1/7/2014	12.73			39.28
	52.01	7/15/2014	11.30			40.71
	52.01	1/5/2015	12.51			39.50
	52.01	8/10/2015	10.79			41.22
MW-55B	52.04	1/26/2012	13.28			38.76
	52.04	7/9/2012	13.93			38.11
	52.04	1/7/2013	13.73			38.31
	52.04	7/22/2013	14.59			37.45
	52.04	1/7/2014	12.89			39.15
	52.04	7/15/2014	12.49			39.55
	52.04	1/5/2015	12.41			39.63
	52.04	8/10/2015	10.19			41.85
MW-57A	47.72	2/5/2009	12.73		0.00	34.99
	47.72	7/23/2009	12.91		0.00	34.81
	47.72	1/9/2010	9.78		0.00	37.94
	47.72	7/12/2010	8.56	24.55	2.55	39.16
	47.72	1/12/2011	9.83	22.76	4.14	37.89
	47.72	7/12/2011	13.88	22.79	4.11	33.84
	47.72	1/26/2012	10.54	22.78	4.12	37.18
	47.72	7/9/2012	9.72	22.65	4.25	38
	47.72	1/7/2013	10.61	22.14	4.76	37.11
	47.72	7/22/2013	13.21	23.05	3.85	34.51
	47.72	1/7/2014	11.79	26.15	0.75	35.93
	47.72	7/15/2014	10.42	26.09	0.81	37.30
	47.72	1/5/2015	10.13	26.75	0.15	37.59
	47.72	8/10/2015	7.46	26.9	0.00	40.26
	47.72	7/6/2016	7.39			40.33
	47.72	1/12/2017	8.07			39.65
	47.72	7/6/2017	8.41			39.31
	47.72	9/6/2017	8.46			39.26
	47.72	2/7/2018	8.98			38.74
	47.72	3/11/2018	9.24			38.48
47.72	5/14/2018	9.67			38.05	
47.72	1/4/2019	9.52			38.2	
MW-57B	50.90	1/26/2012	28.83	42.51	0.44	22.07
	50.90	7/9/2012	27.93	42.45	0.50	22.97
	50.90	1/7/2013	28.63	41.36	1.59	22.27
	50.90	7/22/2013	16.34	41.67	1.28	34.56
	50.90	1/7/2014	15.04			35.86
	50.90	7/15/2014	15.71			35.19
	50.90	1/5/2015	14.32			36.58
	50.90	8/10/2015	12.42			38.48

**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-57B	50.90	7/6/2016	12.44			38.46
	50.90	1/12/2017	13.24			37.66
	50.90	7/6/2017	13.57			37.33
	50.90	9/6/2017	13.79			37.11
	50.90	2/7/2018	12.42			38.48
	50.90	3/11/2018	12.62			38.28
	50.90	5/14/2018	13.29			37.61
	50.90	1/4/2019	13.03			37.87
MW-58A	47.76	2/5/2009	14.55			33.21
	47.76	7/23/2009	14.04			33.72
	47.76	1/9/2010	12.29			35.47
	47.76	7/12/2010	14.03			33.73
	47.76	1/12/2011	11.88			35.88
	47.76	7/12/2011	16.16			31.6
	47.76	1/26/2012	12.26			35.5
	47.76	7/9/2012	11.62			36.14
	47.76	1/7/2013	11.91			35.85
	47.76	7/22/2013	13.71			34.05
	47.76	1/7/2014	13.26			34.5
	47.76	7/15/2014	13.06			34.70
	47.76	1/5/2015	13.06			34.70
	47.76	8/10/2015	11.29			36.47
	47.76	7/6/2016	7.46			40.30
	47.76	1/12/2017	8.04			39.72
	47.76	7/6/2017	8.39			39.37
	47.76	9/6/2017	8.33			39.43
	47.76	2/11/2018	6.47			41.29
	47.76	3/11/2018	12.71			35.05
47.76	5/14/2018	12.94			34.82	
47.76	1/4/2019	12.29			35.47	
MW-59A	44.18	2/5/2009	10.71			33.47
	44.18	7/23/2009	9.96			34.22
	44.18	1/9/2010	8.62			35.56
	44.18	7/12/2010	9.97			34.21
	44.18	1/12/2011	8.06			36.12
	44.18	7/11/2011	10.54			33.64
	44.18	1/26/2012	6.36			37.82
	44.18	7/9/2012	7.63			36.55
	44.18	1/8/2013	9.09			35.09
	44.18	7/23/2013	9.76			34.42
	44.18	1/8/2014	9.34			34.84
	44.18	7/16/2014	9.17			35.01
	44.18	1/5/2015	8.71			35.47
	44.18	8/10/2015	5.76			38.42
	44.18	1/13/2016	5.01			39.17
	44.18	7/6/2016	5.26			38.92
	44.18	1/12/2017	5.81			38.37
	44.18	7/5/2017	6.14			38.04
	44.18	9/6/2017	6.09			38.09
	44.18	2/11/2018	6.26			37.92
44.18	3/12/2018	9.13			35.05	
44.18	5/14/2018	8.81			35.37	
44.18	1/4/2019	8.12			36.06	
MW-59B	44.36	7/12/2010	7.43			36.93
	44.36	1/12/2011	6.89			37.47
	44.36	7/11/2011	11.03			33.33
	44.36	1/26/2012	4.44			39.92
	44.36	7/9/2012	7.48			36.88

**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-59B	44.36	1/8/2013	9.36			35
	44.36	7/23/2013	9.94			34.42
	44.36	1/8/2014	9.52			34.84
	44.36	7/16/2014	8.67			35.69
	44.36	1/5/2015	8.92			35.44
	44.36	8/10/2015	5.91			38.45
	44.36	1/13/2016	5.22			39.14
	44.36	7/6/2016	5.39			38.97
	44.36	1/12/2017	5.97			38.39
	44.36	7/5/2017	6.27			38.09
	44.36	9/6/2017	6.06			38.30
	44.36	2/11/2018	7.59			36.77
	44.36	3/12/2018	9.61			34.75
	44.36	5/14/2018	9.09			35.27
44.36	1/4/2019	8.27			36.09	
MW-59D	44.22	2/5/2009	84.17			-39.95
	44.22	7/23/2009	83.53			-39.31
	44.22	1/9/2010	81.73			-37.51
	44.22	7/12/2010	82.16			-37.94
	44.22	1/12/2011	82.83			-38.61
	44.22	7/11/2011	82.89			-38.67
	44.22	1/26/2012	82.93			-38.71
	44.22	7/9/2012	82.36			-38.14
	44.22	1/8/2013	82.81			-38.59
	44.22	7/23/2013	83.04			-38.82
	44.22	1/8/2014	83.14			-38.92
	44.22	7/16/2014	82.67			-38.45
	44.22	1/5/2015	82.07			-37.85
	44.22	8/10/2015	81.77			-37.55
	44.22	1/13/2016	81.03			-36.81
	44.22	7/6/2016	81.62			-37.40
	44.22	1/12/2017	82.09			-37.87
	44.22	7/5/2017	82.17			-37.95
	44.22	9/6/2017	82.16			-37.94
44.22	2/11/2018	81.09			-36.87	
44.22	3/12/2018	81.17			-36.95	
44.22	5/14/2018	81.79			-37.57	
44.22	1/4/2019	81.02			-36.8	
MW-60A	46.79	2/4/2009	9.56			37.23
	46.79	7/23/2009	9.71			37.08
	46.79	1/9/2010	7.72			39.07
	46.79	7/12/2010	8.61			38.18
	46.79	1/12/2011	5.82			40.97
	46.79	7/11/2011	9.86			36.93
	46.79	1/26/2012	4.34			42.45
	46.79	7/9/2012	5.42			41.37
	46.79	1/8/2013	6.91			39.88
	46.79	7/23/2013	10.42			36.37
	46.79	1/8/2014	8.06			38.73
	46.79	7/16/2014	7.29			39.50
	46.79	1/5/2015	7.39			39.40
	46.79	8/10/2015	6.32			40.47
	46.79	1/13/2016	5.67			41.12
	46.79	7/6/2016	6.13			40.66
	46.79	1/12/2017	--			
	46.79	9/6/2017	NM			
	46.79	2/11/2018	3.49			43.30
46.79	3/12/2018	3.71			43.08	

**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-60A	46.79	5/14/2018	5.19			41.60
	46.79	1/4/2019	4.33			42.46
MW-61A	44.67	2/3/2009	8.35			36.32
	44.67	7/23/2009	8.47			36.2
	44.67	1/9/2010	6.49			38.18
	44.67	7/12/2010	8.09			36.58
	44.67	1/12/2011	6.56			38.11
	44.67	7/11/2011	9.67			35
	44.67	1/26/2012	2.48			42.19
	44.67	7/9/2012	4.55			40.12
	44.67	1/8/2013	6.72			37.95
	44.67	7/23/2013	9.16			35.51
	44.67	1/8/2014	7.04			37.63
	44.67	7/16/2014	6.34			38.33
	44.67	1/5/2015	6.52			38.15
	44.67	8/10/2015	4.02			40.65
	44.67	1/13/2016	3.34			41.33
	44.67	7/6/2016	3.97			40.70
	44.67	1/12/2017	4.34			40.33
	44.67	7/5/2017	4.47			40.20
	44.67	9/6/2017	4.39			40.28
	44.67	2/11/2018	5.52			39.15
44.67	3/12/2018	6.62			38.05	
44.67	5/14/2018	6.27			38.40	
44.67	1/4/2019	5.58			39.09	
MW-62B	48.16	2/4/2009	6.99			41.17
	48.16	7/24/2009	7.39			40.77
	48.16	1/8/2010	5.13			43.03
	48.16	7/12/2010	5.79			42.37
	48.16	1/12/2011	4.21			43.95
	48.16	7/12/2011	11.06			37.1
	48.16	1/26/2012	3.18			44.98
	48.16	7/9/2012	4.87			43.29
	48.16	1/8/2013	5.92			42.24
	48.16	7/23/2013	7.01			41.15
	48.16	1/8/2014	6.52			41.64
	48.16	7/15/2014	6.06			42.10
	48.16	1/5/2015	6.02			42.14
	48.16	8/10/2015	4.16			44.00
	48.16	1/13/2016	3.64			44.52
	48.16	7/6/2016	4.09			44.07
	48.16	1/12/2017	4.71			43.45
	48.16	7/6/2017	5.09			43.07
	48.16	9/6/2017	4.71			43.45
	48.16	2/11/2018	4.12			44.04
48.16	3/11/2018	5.37			42.79	
48.16	5/14/2018	6.81			41.35	
48.16	7/2/2018	6.92			41.24	
48.16	1/4/2019	6.03			42.13	
MW-63B	44.48	2/5/2009	31.54			12.94
	44.48	7/23/2009	9.52			34.96
	44.48	1/9/2010	1.34			43.14
	44.48	7/12/2010	5.71			38.77
	44.48	1/13/2011	7.13			37.35
	44.48	7/11/2011	4.21			40.27
	44.48	1/27/2012	2.96			41.52
	44.48	7/10/2012	1.32			43.16
44.48	1/8/2013	8.54			35.94	

**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-63B	44.48	7/23/2013	9.43			35.05
	44.48	1/8/2014	7.72			36.76
	44.48	7/16/2014	7.03			37.45
	44.48	1/5/2015	7.09			37.39
	44.48	8/10/2015	5.34			39.14
	44.48	1/13/2016	4.69			39.79
	44.48	7/6/2016	5.01			39.47
	44.48	1/12/2017	5.84			38.64
	44.48	7/5/2017	6.19			38.29
	44.48	9/6/2017	6.12			38.36
	44.48	2/11/2018	5.31			39.17
	44.48	3/11/2018	6.39			38.09
	44.48	5/14/2018	7.19			37.29
44.48	1/4/2019	6.47			38.01	
MW-64A	48.31	2/4/2009	9.02			39.29
	48.31	7/24/2009	9.13			39.18
	48.31	1/9/2010	6.52			41.79
	48.31	7/12/2010	6.82			41.49
	48.31	1/12/2011	4.77			43.54
	48.31	7/12/2011	8.17			40.14
	48.31	1/26/2012	4.81			43.5
	48.31	7/9/2012	5.93			42.38
	48.31	1/7/2013	7.03			41.28
	48.31	7/22/2013	8.79			39.52
	48.31	1/7/2014	8.39			39.92
	48.31	7/15/2014	7.72			40.59
	48.31	1/5/2015	7.79			40.52
	48.31	8/10/2015	5.71			42.60
	48.31	1/13/2016	5.06			43.25
	48.31	7/6/2016	5.67			42.64
	48.31	1/12/2017	6.07			42.24
	48.31	7/6/2017	6.27			42.04
	48.31	9/6/2017	6.16			42.15
	48.31	2/11/2018	5.46			42.85
48.31	3/12/2018	5.83			42.48	
48.31	5/14/2018	6.39			41.92	
48.31	1/4/2019	5.39			42.92	
MW-65D	44.55	2/5/2009	86.72			-42.17
	44.55	7/23/2009	86.47			-41.92
	44.55	1/9/2010	84.39			-39.84
	44.55	7/12/2010	84.39			-39.84
	44.55	1/12/2011	83.96			-39.41
	44.55	7/11/2011	85.81			-41.26
	44.55	1/27/2012	85.76			-41.21
	44.55	1/8/2013	85.81			-41.26
	44.55	7/23/2013	85.83			-41.28
	44.55	1/8/2014	85.78			-41.23
	44.55	7/16/2014	84.91			-40.36
	44.55	1/5/2015	85.31			-40.76
	44.55	8/10/2015	85.06			-40.51
	44.55	1/13/2016	84.81			-40.26
	44.55	7/6/2016	85.09			-40.54
	44.55	1/12/2017	85.52			-40.97
	44.55	7/5/2017	85.72			-41.17
	44.55	9/6/2017	85.7			-41.15
	44.55	2/11/2018	83.42			-38.87
	44.55	3/12/2018	83.28			-38.73
44.55	5/14/2018	83.74			-39.19	



**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-65D	44.55	1/4/2019	83.03			-38.48
MW-66D	44.55	2/5/2009	86.18			-39.67
	46.51	7/23/2009	85.82			-39.31
	46.51	1/9/2010	84.02			-37.51
	46.51	7/12/2010	84.86			-38.35
	46.51	1/12/2011	NM			
	46.51	7/11/2011	84.93			-38.42
	46.51	1/26/2012	84.88			-38.37
	46.51	7/9/2012	85.02			-38.51
	46.51	1/8/2013	86.09			-39.58
	46.51	7/23/2013	86.42			-39.91
	46.51	1/8/2014	86.09			-39.58
	46.51	7/16/2014	85.26			-38.75
	46.51	1/5/2015	85.42			-38.91
	46.51	8/10/2015	85.21			-38.70
	46.51	1/13/2016	84.71			-38.20
	46.51	7/6/2016	84.86			-38.35
	46.51	1/12/2017	85.26			-38.75
	46.51	7/5/2017	85.66			-39.15
	46.51	9/6/2017	85.67			-39.16
	46.51	2/11/2018	83.28			-36.77
	46.51	3/12/2018	83.37			-36.86
	46.51	5/14/2018	84.06			-37.55
	46.51	1/4/2019	83.36			-36.85
MW-67B	43.93	7/12/2010	5.76			38.17
	43.93	1/13/2011	10.62			33.31
	43.93	7/11/2011	17.64			26.29
	43.93	1/27/2012	9.87			34.06
	43.93	7/10/2012	11.19			32.74
	43.93	1/8/2013	11.72			32.21
	43.93	7/23/2013	10.69			33.24
	43.93	1/8/2014	10.64			33.29
	43.93	7/16/2014	11.22			32.71
	43.93	1/5/2015	10.22			33.71
	43.93	1/13/2016	6.17			37.76
	43.93	7/6/2016	6.39			37.54
	43.93	1/12/2017	7.04			36.89
	43.93	7/5/2017	7.14			36.79
	43.93	9/6/2017	6.97			36.96
	43.93	2/11/2018	8.89			35.04
	43.93	3/12/2018	9.13			34.80
	43.93	5/14/2018	10.16			33.77
	43.93	1/4/2019	9.42			34.51
MW-68B	44.63	1/27/2012	1.16			43.47
	44.63	7/10/2012	3.82			40.81
	44.63	1/8/2013	6.76			37.87
	44.63	7/23/2013	10.33			34.3
	44.63	1/8/2014	5.82			38.81
	44.63	7/16/2014	7.41			37.22
	44.63	1/5/2015	4.32			40.31
	44.63	8/10/2015	3.56			41.07
	44.63	1/13/2016	2.86			41.77
	44.63	7/6/2016	3.07			41.56
	44.63	1/12/2017	3.86			40.77
	44.63	7/5/2017	3.97			40.66
	44.63	9/6/2017	3.84			40.79
	44.63	2/11/2018	3.07			41.56
	44.63	3/12/2018	4.24			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-68B	44.63	5/14/2018	6.46			38.17
	44.63	1/4/2019	5.82			38.81
MW-68C	44.80	7/12/2010	16.52			28.28
	44.80	1/13/2011	16.92			27.88
	44.80	7/11/2011	19.34			25.46
	44.80	1/27/2012	17.66			27.14
	44.80	7/10/2012	17.96			26.84
	44.80	1/8/2013	19.39			25.41
	44.80	7/23/2013	19.87			24.93
	44.80	1/8/2014	19.29			25.51
	44.80	7/16/2014	18.39			26.41
	44.80	1/5/2015	18.71			26.09
	44.80	8/10/2015	16.29			28.51
	44.80	1/13/2016	15.74			29.06
	44.80	7/6/2016	15.94			28.86
	44.80	1/12/2017	16.54			28.26
	44.80	7/5/2017	17.02			27.78
	44.80	9/6/2017	17.01			27.79
	44.80	2/11/2018	16.21			28.59
	44.80	3/12/2018	16.88			27.92
	44.80	5/14/2018	17.35			27.45
44.80	1/4/2019	16.74			28.06	
MW-69A	45.71	7/12/2010	11.81			33.9
	45.71	1/12/2011	11.16			34.55
	45.71	7/11/2011	NM			
	45.71	1/26/2012	10.44			35.27
	45.71	7/9/2012	4.21			41.5
	45.71	1/8/2013	5.31			40.4
	45.71	7/23/2013	7.34			38.37
	45.71	1/8/2014	7.02			38.69
	45.71	7/16/2014	6.34			39.37
	45.71	1/5/2015	6.71			39.00
	45.71	8/10/2015	3.61			42.10
	45.71	1/13/2016	2.91			42.80
	45.71	7/6/2016	3.79			41.92
	45.71	1/12/2017	4.34			41.37
	45.71	7/5/2017	4.59			41.12
	45.71	9/6/2017	4.43			41.28
	45.71	2/11/2018	11.21			34.50
45.71	3/11/2018	12.58			33.13	
45.71	5/14/2018	11.34			34.37	
45.71	1/4/2019	10.61			35.1	
MW-70B	44.86	1/27/2012	6.51	34.26	1.21	38.35
	44.86	7/10/2012	6.06	34.17	1.30	38.8
	44.86	1/8/2013	6.67	34.02	1.68	38.19
	44.86	7/23/2013	8.22	34.07	1.63	36.64
	44.86	1/8/2014	7.89	35.51	0.14	36.97
	44.86	7/16/2014	6.16	34.71	0.94	38.70
	44.86	1/5/2015	7.07	35.26	0.39	37.79
	44.86	8/10/2015	5.26	35.49	0.16	39.60
	44.86	1/13/2016	4.96	35.39	0.26	39.90
	44.86	7/6/2016	5.34	35.31	0.34	39.52
	44.86	1/12/2017	6.17	35.09	0.56	38.69
	44.86	7/5/2017	6.39	35.14	0.51	38.47
	44.86	9/6/2017	6.56	35.34	0.31	38.30
	44.86	2/8/2018	6.42	35.31	0.34	38.44
	44.86	3/12/2018	6.69	35.21	0.44	38.17
44.86	5/15/2018	7.52	35.39	0.26	37.34	

**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-70B	44.86	1/4/2019	6.96	35.31	0.34	37.9	
MW-71B	44.59	1/27/2012	7.08			37.51	
	44.59	7/10/2012	8.16			36.43	
	44.59	1/8/2013	4.09			40.5	
	44.59	7/23/2013	8.61			35.98	
	44.59	1/8/2014	16.36			28.23	
	44.59	7/16/2014	16.02			28.57	
	44.59	1/5/2015	15.83			28.76	
	44.59	8/10/2015	13.76			30.83	
	44.59	1/13/2016	13.09			31.50	
	44.59	7/6/2016	13.31			31.28	
	44.59	1/12/2017	13.94			30.65	
	44.59	7/5/2017	14.34			30.25	
	44.59	9/6/2017	14.21			30.38	
	44.59	1/25/2018	0.76			43.83	
	44.59	3/12/2018	1.61			42.98	
	44.59	5/14/2018	2.26			42.33	
	44.59	1/4/2019	1.58			43.01	
MW-72B	51.97	1/26/2012	38.76			13.21	
	51.97	7/9/2012	27.27			24.7	
	51.97	1/7/2013	20.08			31.89	
	51.97	7/22/2013	18.39			33.58	
	51.97	1/7/2014	17.31			34.66	
	51.97	7/15/2014	16.91			35.06	
	51.97	1/5/2015	16.74			35.23	
	51.97	8/10/2015	14.59			37.38	
	51.97	1/13/2016	13.93			38.04	
	51.97	7/6/2016	NM				
	51.97	2/11/2018	12.26			39.71	
	51.97	3/12/2018	19.71			32.26	
	51.97	5/14/2018	20.92			31.05	
	51.97	1/4/2019	20.13			31.84	
MW-73B	51.42	1/26/2012	25.48			25.94	
	51.42	7/9/2012	25.03			26.39	
	51.42	1/7/2013	26.11			25.31	
	51.42	7/22/2013	26.87			24.55	
	51.42	1/7/2014	26.19			25.23	
	51.42	7/15/2014	25.14			26.28	
	51.42	1/5/2015	25.81			25.61	
	51.42	8/10/2015	22.46			28.96	
			Plugged and Abandoned				
MW-74B	47.58	1/26/2012	7.63			39.95	
	47.58	7/9/2012	7.15			40.43	
	47.58	1/8/2013	9.62			37.96	
	47.58	7/23/2013	11.72			35.86	
	47.58	1/8/2014	9.59			37.99	
	47.58	7/16/2014	9.01			38.57	
	47.58	1/5/2015	9.07			38.51	
	47.58	8/10/2015	7.36			40.22	
	47.58	1/13/2016	6.86			40.72	
	47.58	7/6/2016	7.39			40.19	
	47.58	1/12/2017	7.84			39.74	
	47.58	7/5/2017	8.17			39.41	
	47.58	9/6/2017	8.02			39.56	
	47.58	2/11/2018	6.91			40.67	
	47.58	3/12/2018	7.22			40.36	
	47.58	5/15/2018	8.33			39.25	
	47.58	1/4/2019	7.62			39.96	

**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-75B	46.78	1/26/2012	9.07	35.26	1.84	37.71
	46.78	7/9/2012	9.32	35.2	1.90	37.46
	46.78	1/8/2013	10.16	34.13	2.97	36.62
	46.78	7/23/2013	9.74	35.71	1.39	37.04
	46.78	1/8/2014	10.13	36.72	0.43	36.65
	46.78	7/16/2014	11.41	35.71	1.44	35.37
	46.78	1/5/2015	11.33	36.79	0.36	35.45
	46.78	8/10/2015	8.86	37.07	0.08	37.92
	46.78	1/13/2016	7.81	36.84	0.31	38.97
	46.78	7/6/2016	7.8	36.53	0.62	38.98
	46.78	1/12/2017	8.04	36.36	0.79	38.74
	46.78	7/5/2017	8.04	36.36	0.79	38.74
	46.78	9/6/2017	8.22	36.47	3.15	38.56
	46.78	2/8/2018	8.17	36.91	2.71	38.61
	46.78	3/12/2018	8.37	36.94	2.68	38.41
46.78	5/15/2018	9.22	37.03	2.59	37.56	
46.78	1/4/2019	9.28	36.96	2.66	37.5	
MW-76C	47.84	7/16/2014	22.68			25.16
	47.84	1/5/2015	23.41			24.43
	47.84	8/10/2015	21.19			26.65
	47.84	1/13/2016	20.81			27.03
	47.84	7/6/2016	21.09			26.75
	47.84	1/12/2017	21.67			26.17
	47.84	7/5/2017	21.99			25.85
	47.84	9/6/2017	21.93			25.91
	47.84	2/11/2018	20.74			27.10
	47.84	3/12/2018	21.02			26.82
	47.84	5/15/2018	21.46			26.38
47.84	1/4/2019	20.67			27.17	
MW-77A	49.05	7/16/2014	6.62			42.43
	49.05	1/5/2015	6.27			42.78
	49.05	8/10/2015	4.34			44.71
	49.05	1/13/2016	3.96			45.09
	49.05	7/6/2016	4.29			44.76
	49.05	1/12/2017	4.73			44.32
	49.05	7/5/2017	4.91			44.14
	49.05	9/6/2017	4.78			44.27
	49.05	2/11/2018	7.62			41.43
	49.05	3/12/2018	8.09			40.96
	49.05	5/15/2018	7.06			41.99
49.05	1/4/2019	6.34			42.71	
MW-78A	48.68	7/16/2014	8.02	28.72	1.38	40.66
	48.68	1/5/2015	9.17	21.17	8.93	39.51
	48.68	8/10/2015	7.34	23.71	6.39	41.34
	48.68	1/13/2016	6.63	21.77	3.58	42.05
	48.68	7/6/2016	6.71	21.97	3.38	41.97
	48.68	1/12/2017	7.42	22.74	2.61	41.26
	48.68	7/5/2017	7.79	23.59	1.76	40.89
	48.68	9/6/2017	7.81	23.48	6.19	40.87
	48.68	2/11/2018	8.29	23.97	1.38	40.39
	48.68	3/12/2018	8.46	23.91	1.44	40.22
	48.68	5/15/2018	9.28	24.07	1.28	39.4
48.68	1/4/2019	8.78	24.39	0.96	39.9	
MW-79A	48.95	7/16/2014	7.26			41.69
	48.95	1/5/2015	5.29			43.66
	48.95	8/10/2015	3.71			45.24
	48.95	1/13/2016	3.06			45.89
	48.95	7/6/2016	3.76			45.19

**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-79A	48.95	1/12/2017	4.06			44.89
	48.95	7/5/2017	4.31			44.64
	48.95	9/6/2017	4.16			44.79
	48.95	2/11/2018	10.82			38.13
	48.95	3/12/2018	11.26			37.69
	48.95	5/15/2018	9.46			39.49
MW-80B	47.11	1/4/2019	8.8			40.15
	47.11	7/16/2014	5.29			41.82
	47.11	1/5/2015	6.17			40.94
	47.11	8/10/2015	4.33			42.78
	47.11	1/13/2016	3.96			43.15
	47.11	7/6/2016	4.56			42.55
	47.11	1/12/2017	5.06			42.05
	47.11	7/5/2017	5.34			41.77
	47.11	9/6/2017	5.26			41.85
	47.11	2/11/2018	11.34			35.77
	47.11	3/11/2018	11.77			35.34
MW-81B	47.11	5/15/2018	11.36			35.75
	47.11	1/4/2019	10.71			36.4
	46.77	7/16/2014	6.47			40.30
	46.77	1/5/2015	7.06			39.71
	46.77	8/10/2015	5.22			41.55
	46.77	1/13/2016	4.77			42.00
	46.77	7/6/2016	5.16			41.61
	46.77	1/12/2017	5.72			41.05
	46.77	7/5/2017	5.96			40.81
	46.77	9/6/2017	5.71			41.06
	46.77	2/11/2018	7.04			39.73
MW-82B	46.77	3/11/2018	7.51			39.26
	46.77	5/15/2018	8.23			38.54
	46.77	1/4/2019	7.67			39.1
	44.64	2/11/2018	2.53			42.11
MW-83B	44.64	3/11/2018	3.44			41.20
	44.64	5/14/2018	5.61			39.03
	44.64	1/4/2019	4.83			39.81
	45.33	2/11/2018	4.06			41.27
MW-83C	45.33	3/11/2018	4.69			40.64
	45.33	5/14/2018	7.47			37.86
	45.33	7/19/2018	5.87			39.46
	45.33	1/4/2019	6.82			38.51
MW-84B	45.42	2/11/2018	17.52			27.90
	45.42	3/11/2018	16.96			28.46
	45.42	5/14/2018	18.11			27.31
	45.42	1/4/2019	17.42			28.00
MW-85C	44.50	2/11/2018	4.37			40.13
	44.50	3/11/2018	4.93			39.57
	44.50	5/14/2018	7.36			37.14
	44.50	7/19/2018	6.07			38.43
MW-86C	44.50	1/4/2019	6.71			37.79
	49.10	2/11/2018	22.51			26.59
	49.10	3/11/2018	22.77			26.33
	49.10	5/15/2018	22.61			26.49
MW-87C	49.10	1/4/2019	21.92			27.18
	46.61	2/11/2018	20.14			26.47
	46.61	3/11/2018	19.91			26.70
	46.61	5/15/2018	20.26			26.35
MW-87C	46.61	1/4/2019	19.51			27.10
	44.26	2/11/2018	15.86			28.40

**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-87C	44.26	3/11/2018	16.29			27.97
	44.26	5/14/2018	16.26			28.00
	44.26	1/4/2019	15.52			28.74
MW-88C	51.17	2/11/2018	24.7			26.47
	51.17	3/11/2018	23.93			27.24
	51.17	5/14/2018	24.67			26.50
	51.17	1/4/2019	24.01			27.16
MW-89B	44.57	7/19/2018	6.78			37.79
	44.57	1/4/2019	8.21			36.36
MW-90B	44.39	7/19/2018	5.63			38.76
	44.39	1/4/2019	7.16			37.23
P-10	47.69	9/2/1993	6.87			40.85
	47.69	12/21/1993	3.32			44.4
	47.69	3/24/1994	3.88			43.84
	47.69	6/22/1994	4.98			42.74
	47.69	9/28/1994	6.38			41.34
	47.69	10/13/1994	7.07			40.65
	47.69	1/24/1995	2.67			45.05
	47.69	4/11/1995	2.59			45.13
	47.69	7/11/1995	4.69			43.03
	47.69	1/23/1996	5.84			41.88
	47.69	7/19/1996	10.04			37.68
	47.69	9/17/1996	8.34			39.38
	47.69	10/31/1996	6.97			40.75
	47.69	11/22/1996	8.84			38.88
	47.69	12/27/1996	6.20			41.52
	47.69	1/22/1997	4.10			43.62
	47.69	2/21/1997	2.86			44.86
	47.69	3/25/1997	3.19			44.53
	47.69	4/23/1997	4.42			43.3
	47.69	4/24/1997	4.57			43.15
	47.69	5/13/1997	3.14			44.58
	47.69	6/20/1997	4.94			42.78
	47.69	6/25/1997	2.74			44.98
	47.69	7/1/1997	4.13			43.59
	47.69	7/24/1997	7.91			39.81
	47.69	8/16/1997	7.86			39.86
	47.69	8/22/1997	8.67			39.05
	47.69	9/25/1997	6.54			41.18
	47.69	10/22/1997	5.36			42.36
	47.69	11/25/1997	5.36			42.36
	47.69	12/19/1997	4.72			43
	47.69	1/20/1998	3.40			44.32
	47.69	1/29/1998	3.11			44.61
	47.69	3/18/1998	2.84			44.88
47.69	4/24/1998	6.80			40.92	
47.69	5/21/1998	7.35			40.37	
47.69	7/30/1998	8.23			39.49	
47.69	8/25/1998	7.34			40.38	
47.69	9/21/1998	5.25			42.47	
47.69	10/26/1998	6.11			41.61	
47.69	11/23/1998	4.10			43.62	
47.69	2/26/1999	3.21			44.51	
47.69	3/16/1999	4.21			43.51	
47.69	4/29/1999	4.53			43.19	
47.69	6/1/1999	4.53			43.19	
47.69	7/30/1999	6.00			41.72	
47.69	8/27/1999	4.72			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)
P-10	47.69	9/27/1999	9.58			38.14
	47.69	10/29/1999	10.61			37.11
	47.69	12/29/1999	11.55			36.17
	47.69	2/4/2000	13.71			34.01
	47.69	2/25/2000	10.44			37.28
	47.69	3/27/2000	7.53			40.19
	47.69	4/7/2000	7.09			40.63
	47.69	5/31/2000	7.14			40.58
	47.69	6/1/2000	7.11			40.61
	47.69	7/28/2000	7.15			40.57
	47.69	8/30/2000	10.15			37.57
	47.69	9/19/2000	11.56			36.16
	47.69	10/27/2000	8.66			39.06
	47.69	11/21/2000	9.64			38.08
	47.69	5/1/2001	6.52			41.2
	47.69	10/1/2001	6.85			40.87
	47.69	3/11/2002	3.41			44.31
	47.69	9/23/2002	3.54			44.18
	47.69	3/10/2003	2.43			45.26
	47.69	9/23/2003	1.61			46.08
	47.69	3/15/2004	2.85			44.84
	47.69	9/13/2004	7.99			39.7
	47.69	7/18/2005	4.20			43.49
	47.69	1/4/2006	8.58			39.11
	47.69	7/27/2006	3.46			44.23
	47.69	1/23/2007	2.36			45.33
	47.69	3/7/2007	NM			
	47.69	7/27/2007	3.75			43.94
	47.69	1/29/2008	2.30			45.39
	47.69	7/16/2008	6.91			40.78
	47.69	1/22/2009	6.35			41.34
	47.69	7/23/2009	NM			
	47.69	1/8/2010	4.06			43.63
	47.69	7/12/2010	2.06			45.63
	47.73	1/12/2011	4.13			43.60
	47.73	7/12/2011	9.84			37.89
47.73	1/27/2012	3.12			44.61	
47.73	7/10/2013	10.79			36.94	
47.73	1/8/2014	5.51			42.22	
47.73	7/2/2014	7.74			39.99	
47.73	1/7/2015	3.96			43.77	
47.73	8/10/2015	5.39			42.34	
47.71	1/12/2016	2.47			45.24	
47.71	7/6/2016	5.18			42.53	
47.71	1/12/2017	4.52			43.19	
47.71	7/12/2017	6.07			41.64	
47.71	1/3/2018	6.71			41.00	
47.71	1/3/2019	6.32			41.39	
P-11	48.98	9/2/1993	7.87			41.15
	48.98	12/21/1993	4.57			44.45
	48.98	3/24/1994	5.04			43.98
	48.98	6/22/1994	6.19			42.83
	48.98	9/28/1994	7.40			41.62
	48.98	10/13/1994	8.14			40.88
	48.98	1/24/1995	3.90			45.12
	48.98	4/11/1995	3.77			45.25
	48.98	7/11/1995	5.69			43.33
48.98	1/23/1996	6.81			42.21	

**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	7/19/1996	7.81			41.21
	48.98	9/17/1996	9.15			39.87
	48.98	10/31/1996	7.52			41.5
	48.98	11/22/1996	9.46			39.56
	48.98	12/27/1996	6.64			42.38
	48.98	1/22/1997	4.70			44.32
	48.98	2/21/1997	3.88			45.14
	48.98	3/25/1997	4.09			44.93
	48.98	4/23/1997	5.27			43.75
	48.98	4/24/1997	5.41			43.61
	48.98	5/13/1997	4.12			44.9
	48.98	6/20/1997	5.79			43.23
	48.98	6/25/1997	3.83			45.19
	48.98	7/1/1997	5.01			44.01
	48.98	7/24/1997	7.56			41.46
	48.98	8/16/1997	8.74			40.28
	48.98	8/22/1997	9.37			39.65
	48.98	9/25/1997	7.24			41.78
	48.98	10/22/1997	5.98			43.04
	48.98	11/25/1997	6.00			43.02
	48.98	12/19/1997	5.52			43.5
	48.98	1/20/1998	4.30			44.72
	48.98	3/4/1998	4.08			44.94
	48.98	3/18/1998	3.92			45.1
	48.98	4/24/1998	7.61			41.41
	48.98	5/21/1998	8.10			40.92
	48.98	7/30/1998	9.21			39.81
	48.98	8/25/1998	8.44			40.58
	48.98	9/21/1998	5.91			43.11
	48.98	10/26/1998	7.59			41.43
	48.98	11/23/1998	5.41			43.61
	48.98	1/29/1999	4.11			44.91
	48.98	2/26/1999	4.22			44.8
	48.98	3/16/1999	4.96			44.06
	48.98	4/29/1999	5.15			43.87
	48.98	6/1/1999	5.15			43.87
	48.98	7/30/1999	6.66			42.36
	48.98	8/27/1999	5.23			43.79
	48.98	9/27/1999	10.49			38.53
	48.98	10/29/1999	11.91			37.11
	48.98	12/29/1999	11.12			37.9
	48.98	2/4/2000	12.13			36.89
	48.98	2/25/2000	10.46			38.56
	48.98	3/27/2000	8.32			40.7
	48.98	4/7/2000	7.91			41.11
	48.98	5/31/2000	7.96			41.06
	48.98	6/1/2000	7.93			41.09
	48.98	7/28/2000	7.97			41.05
	48.98	8/30/2000	10.88			38.14
	48.98	9/19/2000	12.32			36.7
	48.98	10/27/2000	10.94			38.08
	48.98	11/21/2000	9.77			39.25
	48.98	5/1/2001	7.48			41.54
	48.98	10/1/2001	7.74			41.28
	48.98	3/11/2002	4.51			44.51
	48.98	9/23/2002	4.46			44.56
	48.98	3/10/2003	3.69			45.29
	48.98	9/23/2003	4.54			44.44



**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	3/15/2004	4.51			44.47
	48.98	9/13/2004	9.14			39.84
	48.98	7/18/2005	5.27			43.71
	48.98	1/4/2006	9.56			39.42
	48.98	7/27/2006	4.54			44.44
	48.98	3/7/2007	NM			
	48.98	7/27/2007	4.61			44.37
	48.98	1/30/2008	2.71			46.27
	48.98	7/15/2008	7.93			41.05
	48.98	2/4/2009	7.82			41.16
	48.98	7/24/2009	7.74			41.24
	48.98	1/8/2010	5.67			43.31
	48.98	7/12/2010	6.78			42.2
	48.98	1/12/2011	4.21			44.77
	48.98	7/12/2011	11.51			37.47
	48.98	1/26/2012	4.25			44.73
	48.98	1/7/2013	7.96			41.02
	48.98	7/22/2013	10.96			38.02
	48.98	1/7/2014	6.52			42.46
	48.98	7/16/2014	8.87			40.11
	48.98	1/5/2015	5.61			43.37
	48.98	8/10/2015	3.86			45.12
	48.98	1/13/2016	3.26			45.72
	48.98	7/6/2016	3.74			45.24
	48.98	1/12/2017	4.36			44.62
	48.98	7/6/2017	4.62			44.36
	48.98	9/6/2017	4.62			44.36
	48.98	2/11/2018	5.09			43.89
	48.98	3/11/2018	5.54			43.44
	48.98	5/14/2018	7.14			41.84
48.98	7/2/2018	7.28			41.7	
48.98	1/4/2019	6.43			42.55	
P-12	48.78	9/2/1993	7.02			41.8
	48.78	12/21/1993	4.30			44.52
	48.78	3/24/1994	4.45			44.37
	48.78	6/22/1994	5.06			43.76
	48.78	9/28/1994	6.46			42.36
	48.78	10/13/1994	7.19			41.63
	48.78	1/24/1995	3.63			45.19
	48.78	4/11/1995	3.25			45.57
	48.78	7/11/1995	4.62			44.2
	48.78	1/23/1996	6.62			42.2
	48.78	7/19/1996	8.64			40.18
	48.78	9/17/1996	8.12			40.7
	48.78	10/31/1996	6.81			42.01
	48.78	11/22/1996	8.70			40.12
	48.78	12/27/1996	6.57			42.25
	48.78	1/22/1997	4.93			43.89
	48.78	2/21/1997	3.61			45.21
	48.78	3/25/1997	3.70			45.12
	48.78	4/23/1997	4.58			44.24
	48.78	4/24/1997	4.74			44.08
	48.78	5/13/1997	3.69			45.13
	48.78	6/20/1997	4.86			43.96
	48.78	6/25/1997	3.35			45.47
	48.78	7/1/1997	4.11			44.71
	48.78	7/24/1997	6.58			42.24
	48.78	8/16/1997	7.80			41.02

**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-12	48.78	8/22/1997	8.22			40.6
	48.78	9/25/1997	6.54			42.28
	48.78	10/22/1997	5.66			43.16
	48.78	11/25/1997	5.70			43.12
	48.78	12/19/1997	5.13			43.69
	48.78	1/20/1998	4.15			44.67
	48.78	3/4/1998	3.78			45.04
	48.78	3/18/1998	3.61			45.21
	48.78	4/24/1998	6.90			41.92
	48.78	5/21/1998	7.80			41.02
	48.78	7/30/1998	8.15			40.67
	48.78	8/25/1998	8.31			40.51
	48.78	9/21/1998	5.64			43.18
	48.78	10/26/1998	7.66			41.16
	48.78	11/23/1998	5.65			43.17
	48.78	1/29/1999	4.20			44.62
	48.78	2/26/1999	4.31			44.51
	48.78	3/16/1999	4.99			43.83
	48.78	4/29/1999	5.10			43.72
	48.78	6/1/1999	5.10			43.72
	48.78	7/30/1999	6.75			42.07
	48.78	8/27/1999	5.34			43.48
	48.78	9/27/1999	9.36			39.46
	48.78	10/29/1999	10.11			38.71
	48.78	12/29/1999	9.44			39.38
	48.78	2/4/2000	12.10			36.72
	48.78	2/25/2000	8.63			40.19
	48.78	3/27/2000	7.76			41.06
	48.78	4/7/2000	7.35			41.47
	48.78	5/31/2000	7.39			41.43
	48.78	6/1/2000	7.34			41.48
	48.78	7/28/2000	7.37			41.45
	48.78	8/30/2000	10.66			38.16
	48.78	9/19/2000	11.45			37.37
	48.78	10/27/2000	10.94			37.88
	48.78	11/21/2000	8.93			39.89
	48.78	5/1/2001	6.70			42.12
	48.78	10/1/2001	6.93			41.89
	48.78	3/11/2002	4.15			44.67
	48.78	9/23/2002	3.90			44.92
	48.78	3/10/2003	3.13			45.65
	48.78	9/23/2003	3.86			44.92
	48.78	3/15/2004	NM			
	48.78	9/13/2004	7.93			40.85
	48.78	7/18/2005	5.06			43.72
	48.78	1/4/2006	8.98			39.8
	48.78	7/27/2006	4.35			44.43
	48.78	1/22/2007	3.19			45.59
	48.78	3/7/2007	NM			
	48.78	7/27/2007	4.22			44.56
	48.78	1/29/2008	3.03			45.75
	48.78	7/16/2008	6.78			42
	48.78	1/22/2009	6.99			41.79
	48.78	7/24/2009	NM			
	48.78	1/8/2010	4.13			44.65
	48.78	7/12/2010	3.93			44.85
	48.80	1/12/2011	4.83			43.97
	48.80	7/12/2011	10.02			38.78

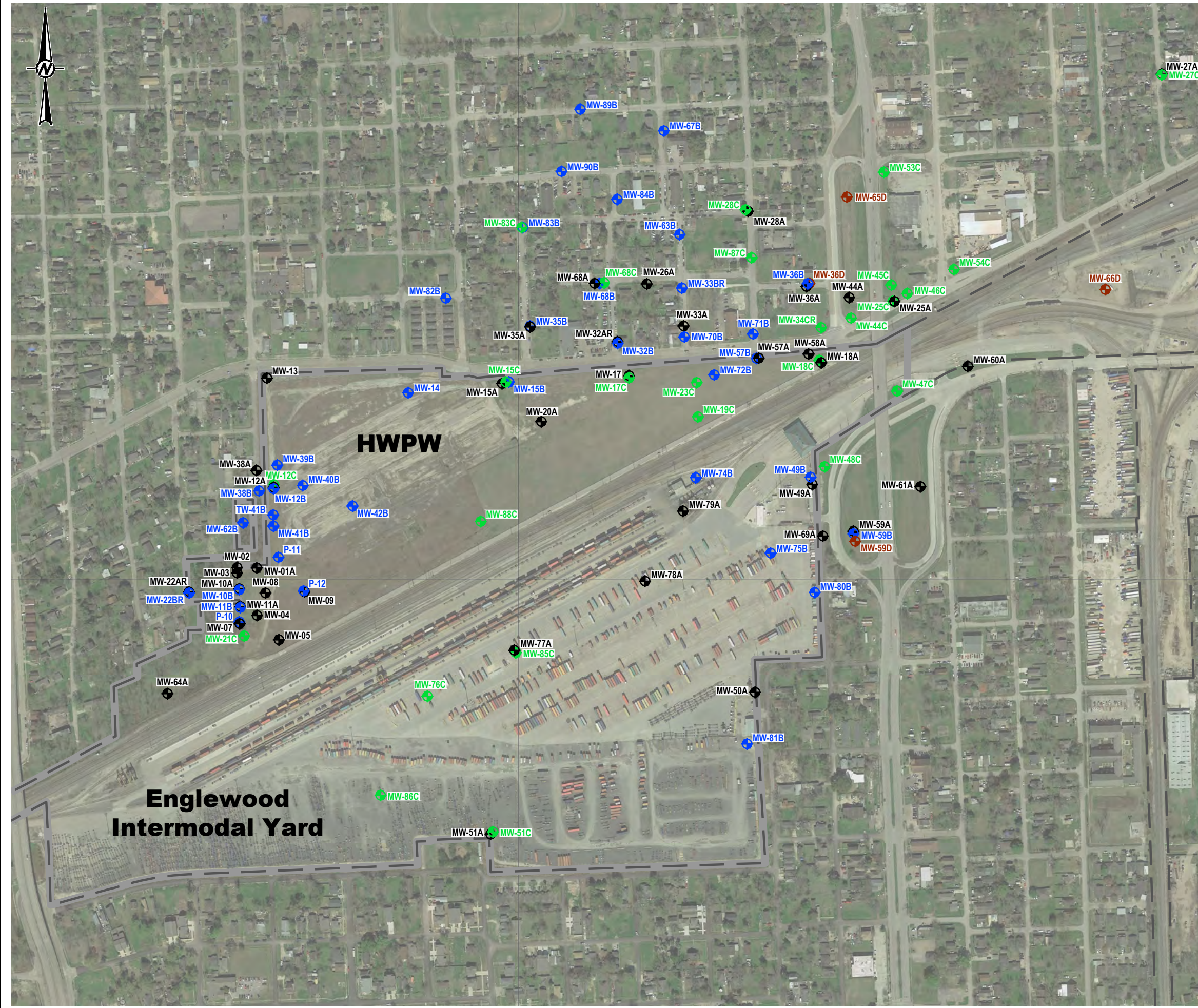
**Table 5D  
GROUNDWATER MEASUREMENTS  
UPRR Houston Wood Preserving Works**

Well ID	TOC Elevation (ft)	Date	Depth to Water (ft)	Depth to DNAPL (ft BTOC)	DNAPL Thickness (ft)	GW Elevation (ft)
P-12	48.80	1/27/2012	4.52			44.28
	48.80	7/9/2012	5.15			43.65
	48.80	7/10/2013	9.73			39.07
	48.80	1/8/2014	6.41			42.39
	48.80	7/2/2014	6.46			42.34
	48.80	1/7/2015	3.19			45.61
	48.80	8/10/2015	4.06			44.74
	48.76	1/12/2016	3.26			45.50
	48.76	7/6/2016	5.09			43.67
	48.76	1/12/2017	5.11			43.65
	48.76	7/12/2017	6.39			42.37
	48.76	1/3/2018	7.14			41.62
48.76	1/3/2019	6.69			42.07	
TW-41B	49.67	2/4/2009	8.44			41.23
	49.67	7/24/2009	8.34			41.33
	49.67	1/8/2010	4.86			44.81
	49.67	7/12/2010	6.12			43.55
	49.67	1/12/2011	5.17			44.5
	49.67	7/12/2011	12.02			37.65
	49.67	1/26/2012	5.27			44.4
	49.67	7/9/2012	6.23			43.44
	49.67	1/7/2013	8.54			41.13
	49.67	7/22/2013	11.53			38.14
	49.67	1/7/2014	7.32			42.35
	49.67	7/16/2014	9.65			40.02
	49.67	1/5/2015	NM			
	49.67	8/10/2015	4.96			44.71
	49.67	1/13/2016	4.13			45.54
	49.67	7/6/2016	4.31			45.36
	49.67	1/12/2017	4.93			44.74
	49.67	7/6/2017	5.32			44.35
	49.67	9/6/2017	5.26			44.41
	49.67	2/11/2018	5.86			43.81
49.67	3/11/2018	6.69			42.98	
49.67	5/14/2018	8.67			41.00	
49.67	7/2/2018	8.87			40.8	
49.67	1/4/2019	7.97			41.7	
TW-56A	51.89	2/5/2009	17.48			34.41
	51.89	7/23/2009	17.17			34.72
	51.89	1/8/2010	14.53			37.36
	51.89	7/12/2010	15.78			36.11
	51.89	1/12/2011	14.09			37.8
	51.89	7/12/2011	17.89			34
	51.89	1/26/2012	15.06			36.83
	51.89	1/7/2013	16.92			34.97
	51.89	7/22/2013	18.12			33.77
	51.89	1/7/2014	NM			
	51.89	7/15/2014	16.05			35.84
	51.89	1/5/2015	NM			
51.89	8/10/2015	6.39			45.5	

**FIGURES**



Path: \\uswest\arcad\proj\19119232 - HWPW\2019-07-10 - MW Location Map.dwg | Last Edited By: admind | Date: 2019-07-10 | Time: 10:28:30 AM



**LEGEND**

- 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

**REFERENCE(S)**

PARCEL BOUNDARIES: CITY OF HOUSTON GEOGRAPHIC INFORMATION & MANAGEMENT SYSTEMS (GIMS).  
AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.



CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
MONITORING WELL LOCATION MAP

CONSULTANT	YYYY-MM-DD	2019-07-10
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 1

1 in IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B









**LEGEND**

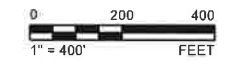
- UPRR PROPERTY BOUNDARY
- HISTORIC STRUCTURE AND FEATURE
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- B-TZ/B-CZ BOUNDARY
- GROUNDWATER ELEVATION (FT, HVD) (NM = NOT MEASURED)
- GROUNDWATER ELEVATION CONTOUR (FT, HVD) C.I. = 2 FT
- INFERRED GROUNDWATER FLOW DIRECTION
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

**NOTE(S)**

1. VERTICAL DATUM BASED ON CITY OF HOUSTON VERTICAL DATUM (HVD).
2. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
3. \*\* - NOT USED TO GENERATE CONTOURS.

**REFERENCE(S)**

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



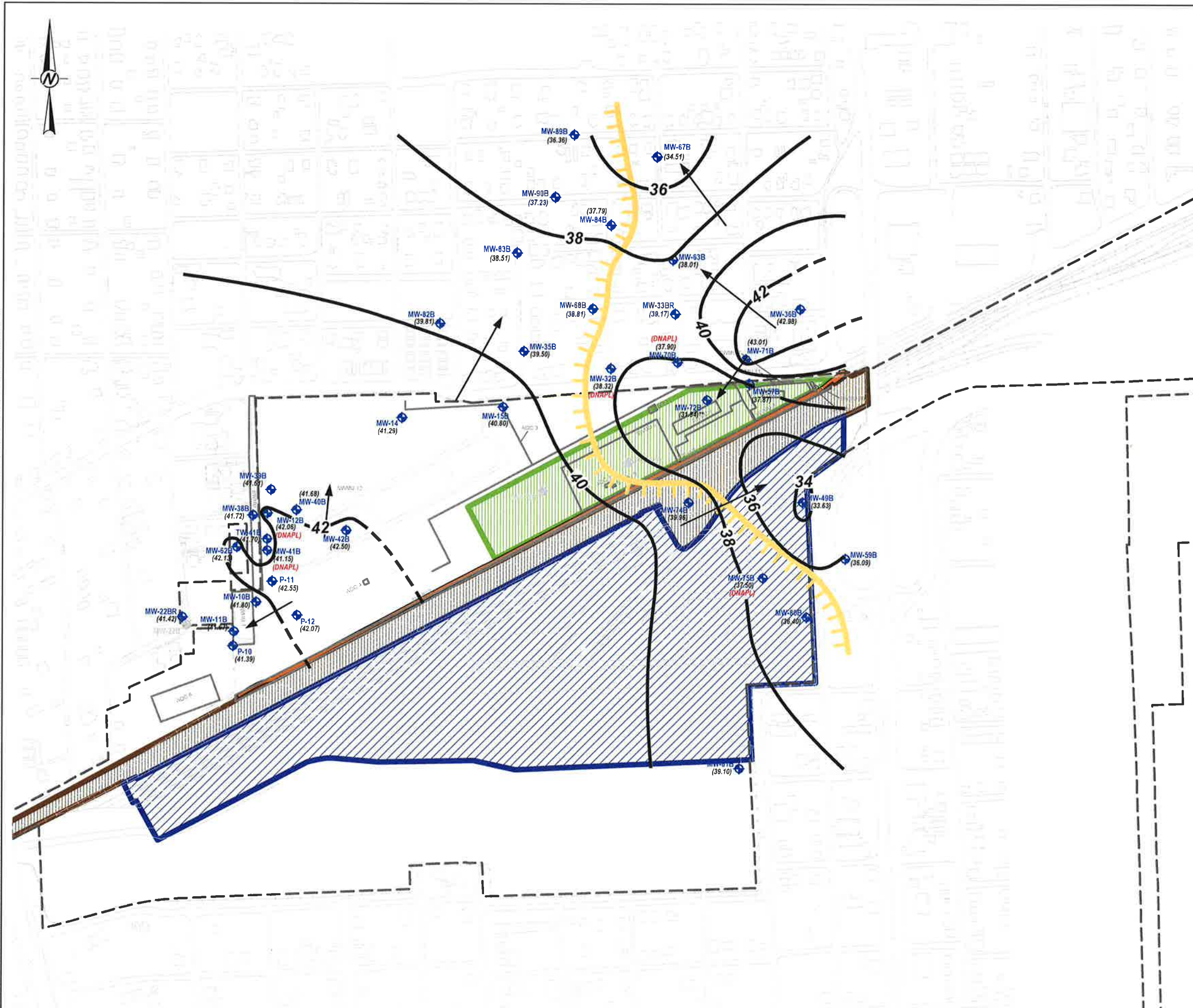
CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
GROUNDWATER GRADIENT MAP B-TZ AND B-CZ  
JANUARY 2019

CONSULTANT	YYYY-MM-DD	2019-07-09
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	SG
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 5A-2



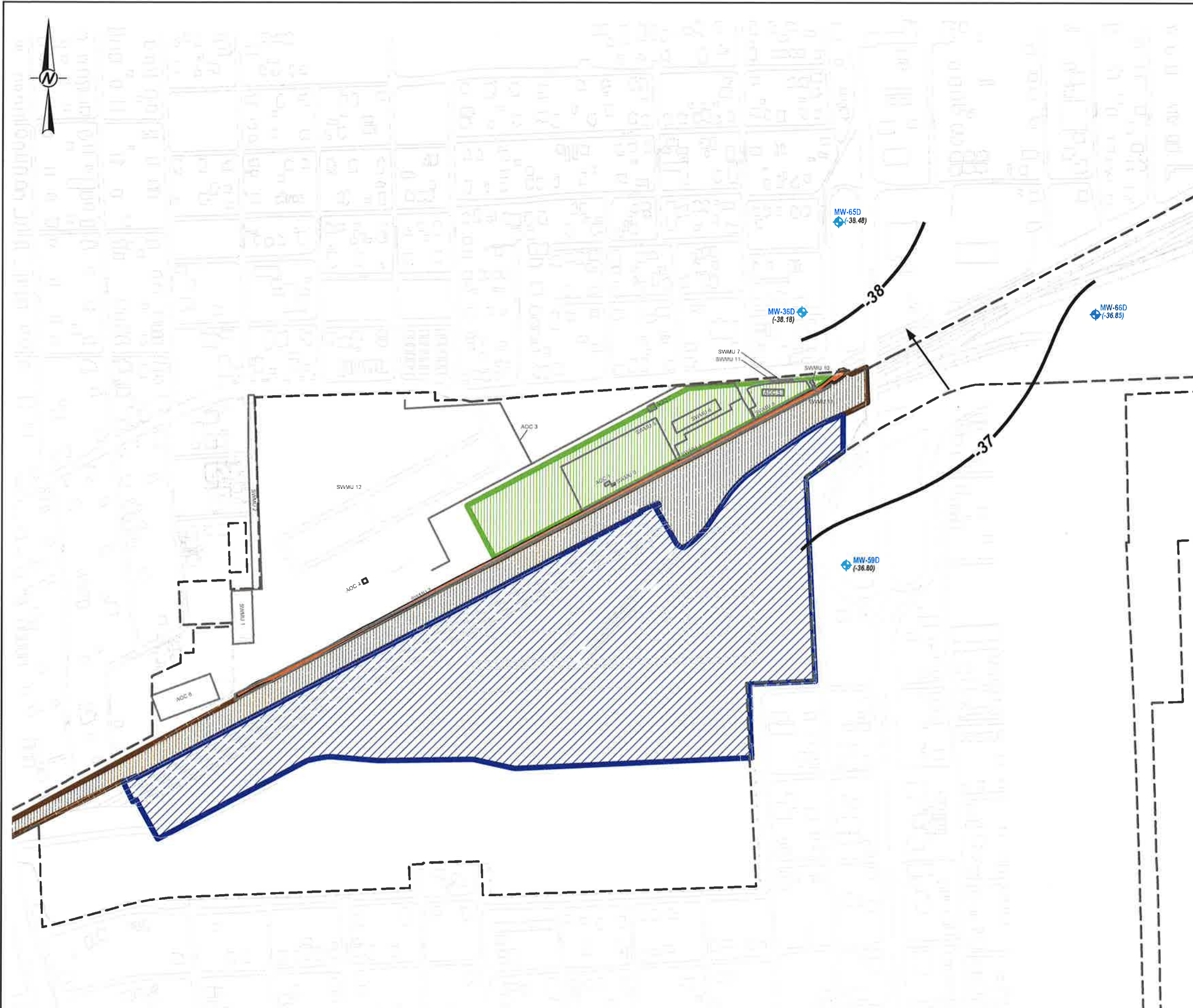
File Name: 19119232 - Groundwater Gradient Map - 2019-07-09 - 11:13 AM | Project By: submittal Date: 2019-07-09 Time: 2:05:04 PM







Path: C:\Users\matzner\Temp\Drawings\1919232\_5A50\_1.dwg, File Name: FIG 5A-4 Groundwater Gradient Map D-TZ, January 2019.dwg, Last Edited By: adamand, Date: 2019-05-06 Time: 10:52:29 AM



**LEGEND**

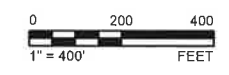
- UPRR PROPERTY BOUNDARY
- HISTORIC STRUCTURE AND FEATURE
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- ◆ D-TZ MONITORING WELL LOCATION
- (-38.37) GROUNDWATER ELEVATION (FT, HVD)  
(NM = NOT MEASURED)
- 39 GROUNDWATER ELEVATION CONTOUR (FT, HVD)  
C.I. = 1 FT
- ↖ INFERRED GROUNDWATER FLOW DIRECTION
- RAILROAD BALLAST CAP AREA
- ASPHALT CAP AREA
- SOIL CAP
- CONCRETE CAP AREA

**NOTE(S)**

1. VERTICAL DATUM BASED ON CITY OF HOUSTON VERTICAL DATUM (HVD).
2. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).

**REFERENCE(S)**

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
**GROUNDWATER GRADIENT MAP D-TZ**  
JANUARY 2019

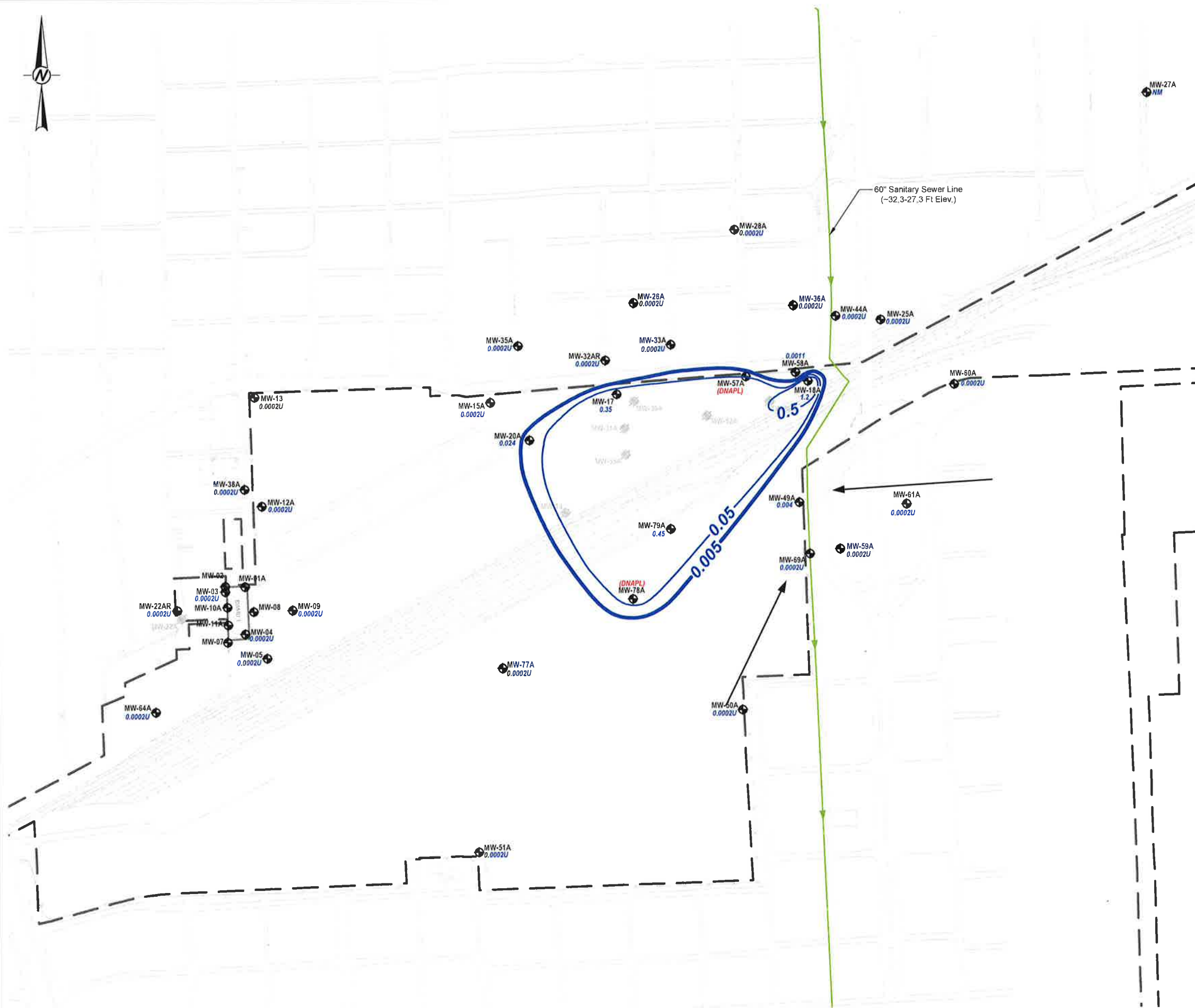
CONSULTANT	YYYY-MM-DD	DATE
<b>GOLDER</b>	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	SG
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 5A-4

1/4" IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B.



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**LEGEND**

- UPRR PROPERTY BOUNDARY
- ROAD, PARLING LOT, SIDEWALK
- FENCE
- RAILROAD
- A-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- 0.108** BENZENE CONCENTRATION IN mg/L
- 0.005** BENZENE CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

**NOTE(S)**

1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
2. CONTOURS ARE BOLDED AT THE RAL AND C/I PCL (0,005 mg/L).
3. NM - NOT MEASURED

**REFERENCE(S)**  
BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.

STATE OF TEXAS  
ERIC C. MATZNER  
GEOLOGY  
LIC. # 795  
PROFESSIONAL GEOSCIENTIST  
7/19/19

0 200 400  
1" = 400' FEET

CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
**A-TZ GROUNDWATER COC CONCENTRATION MAP  
BENZENE - JANUARY 2019**

CONSULTANT	YYYY-MM-DD	2019-07-10
DESIGNED		AJD
PREPARED		AJD
REVIEWED		MH
APPROVED		ECM

PROJECT NO. 19119232      REV. 0      FIGURE 5B-5

IF THIS DOCUMENT DOES NOT CHECK OUT IN THE SYSTEM, THE SHEET DATE HAS BEEN DISOBTAINED. PLEASE ADVISE.







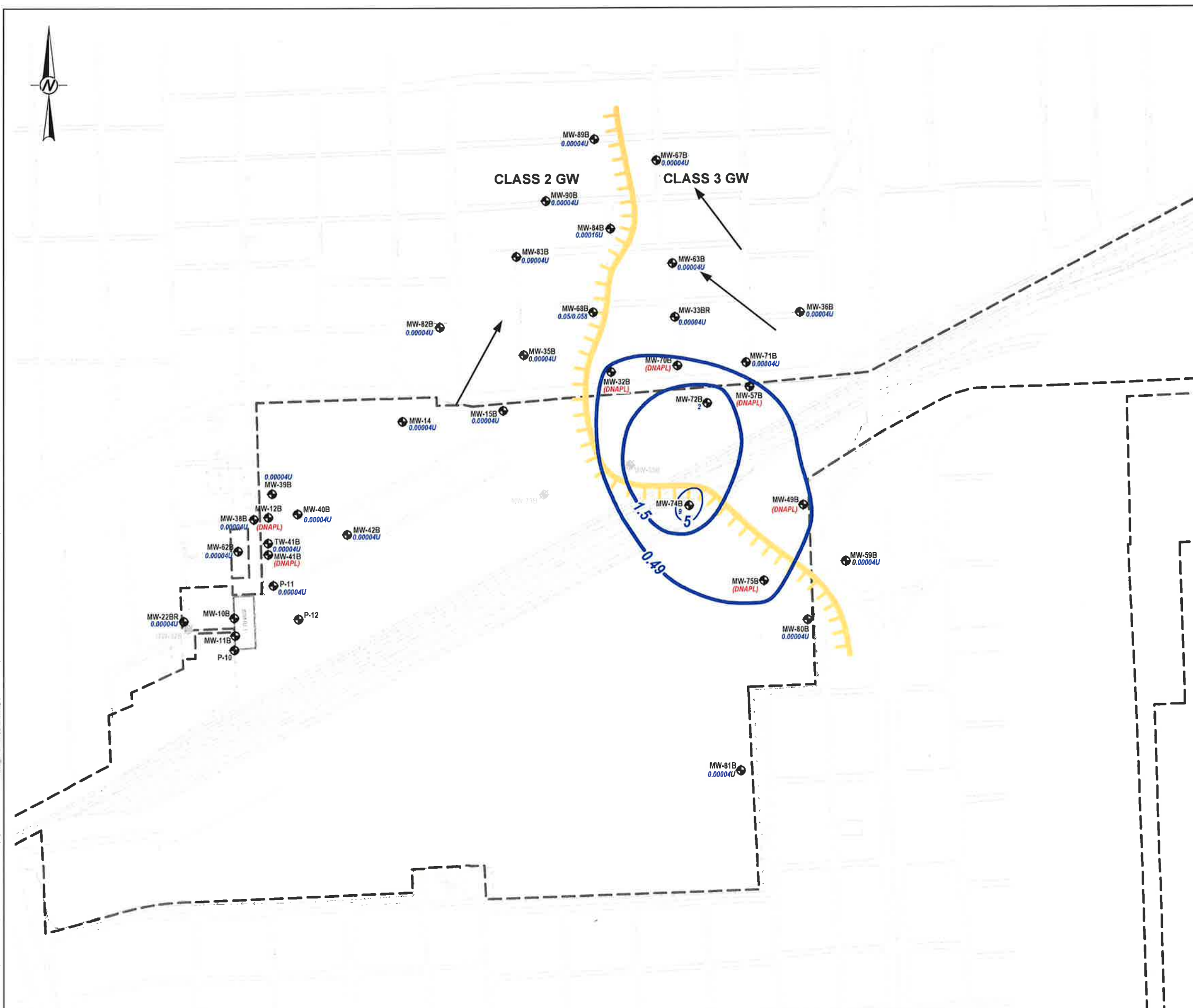










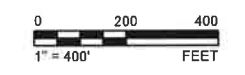


**LEGEND**

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- B-CZ (CLASS 3 GW)
- B-TZ/B-CZ BOUNDARY
- B-TZ (CLASS 2 GW)
- 13.6 2,4-DIMETHYLPHENOL CONCENTRATION IN mg/L
- 0.49 2,4-DIMETHYLPHENOL CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

- NOTE(S)**
1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
  2. CONTOURS ARE BOLDED AT THE RAL AND C/I PCL:  
 CLASS 2 GW PCL: 0.49 mg/L (RES.) & 1.5 mg/L (C/I)  
 CLASS 3 GW PCL: 49 mg/L (RES.) & 150 mg/L (C/I)

**REFERENCE(S)**  
 BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



CLIENT  
 UNION PACIFIC RAILROAD CO.

PROJECT  
 HOUSTON WOOD PRESERVING WORKS

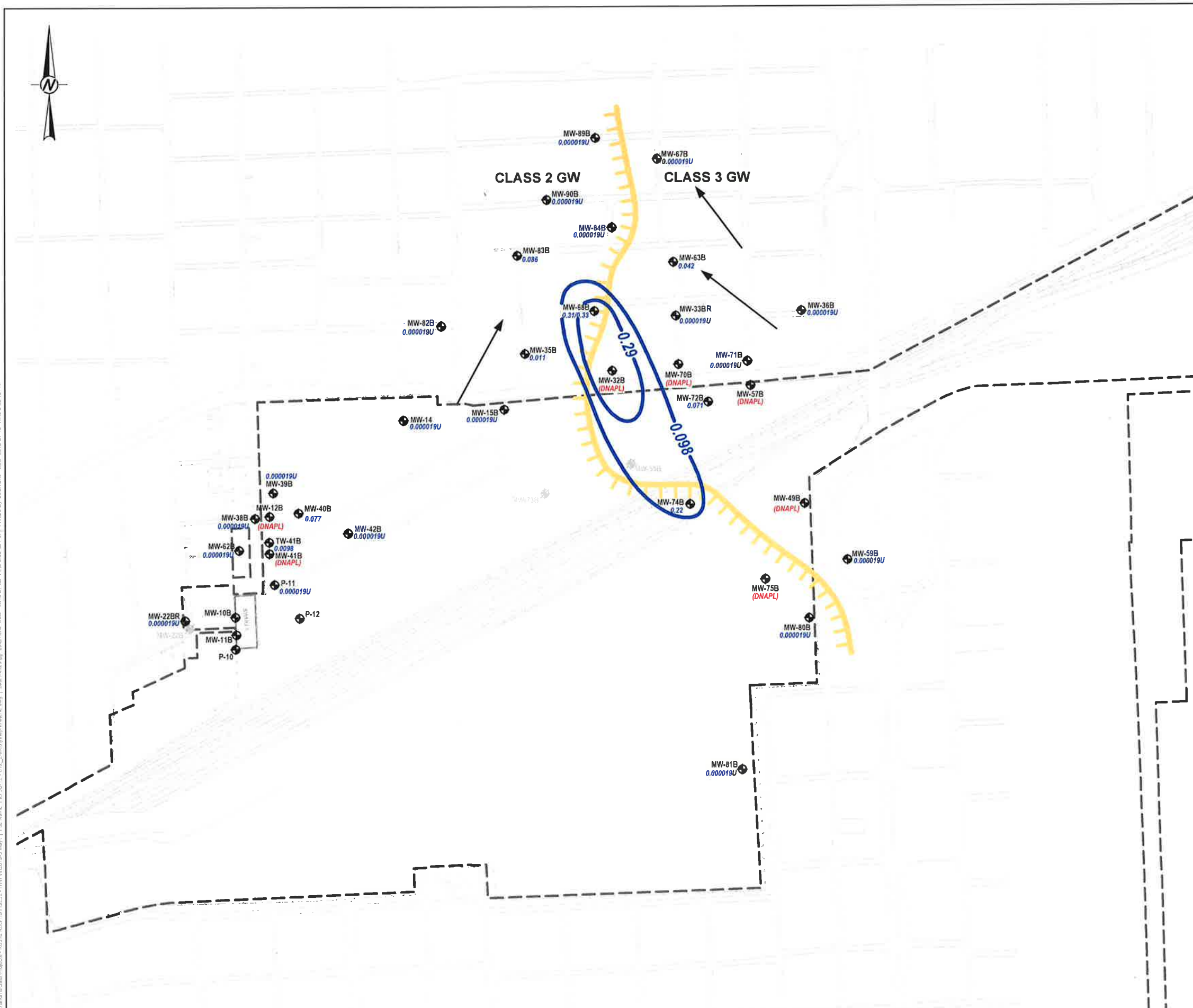
TITLE  
 B-CZ/B-TZ GROUNDWATER COC CONCENTRATION MAP  
 2,4-DIMETHYLPHENOL - JANUARY 2019

CONSULTANT	YYYY-MM-DD	2019-07-09
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 5B-11

Path: \\sarahjackson\Projects - Round Bay\19119232 - HWPW\071919\5 May\1 - File Name: FIG 5B-11 - FIG 5B-11 - GroundwaterMonitoring - User Edited By: sarahjackson Date: 2019-07-09 Time: 11:22:30 AM | Printed By: sarahjackson Date: 2019-07-09 Time: 5:47:37 PM

1. If this document does not attach print or scan, the client files have been submitted.

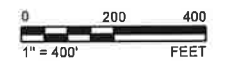


**LEGEND**

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- B-CZ (CLASS 3 GW)
- B-TZ/B-CZ BOUNDARY
- B-TZ (CLASS 2 GW)
- 0.276 2-METHYLNAPHTHALENE CONCENTRATION IN mg/L
- 0.098 2-METHYLNAPHTHALENE CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

- NOTE(S)**
- DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
  - CONTOURS ARE BOLDED AT THE RAL AND C/I PCL:  
 CLASS 2 GW PCL: 0.098 mg/L (RES.) & 0.29 mg/L (C/I)  
 CLASS 3 GW PCL: 9.8 mg/L (RES.) & 29 mg/L (C/I)

**REFERENCE(S)**  
 BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



**CLIENT**  
 UNION PACIFIC RAILROAD CO.

**PROJECT**  
 HOUSTON WOOD PRESERVING WORKS

**TITLE**  
 B-CZ/B-TZ GROUNDWATER COC CONCENTRATION MAP  
 2-METHYLNAPHTHALENE - JANUARY 2019

CONSULTANT	YYYY-MM-DD	2019-07-10
DESIGNED		AJD
PREPARED		AJD
REVIEWED		MH
APPROVED		ECM



PROJECT NO. 19119232      REV. 0      FIGURE 5B-12

Path: \\wv\houston\data\Projects - Round Rock\19119232 - HMP\001915-May11\Fig 5B-12-6TZ-2-Methylnaphthalene.dwg | Last Edited By: adamond | Date: 2019-07-10 Time: 9:03:19 AM  
 Plot: \\wv\houston\data\Projects - Round Rock\19119232 - HMP\001915-May11\Fig 5B-12-6TZ-2-Methylnaphthalene.dwg | Last Edited By: adamond | Date: 2019-07-10 Time: 9:03:19 AM

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**LEGEND**

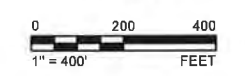
- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- C-TZ MONITORING WELL LOCATION
- 8.01** BENZENE CONCENTRATION IN mg/L
- 0.005** BENZENE CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

**NOTE(S)**

- DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
- CONTOURS ARE BOLDED AT THE RAL AND C/I PCL (0.005 mg/L).

**REFERENCE(S)**

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



**CLIENT**

UNION PACIFIC RAILROAD CO.

**PROJECT**

HOUSTON WOOD PRESERVING WORKS

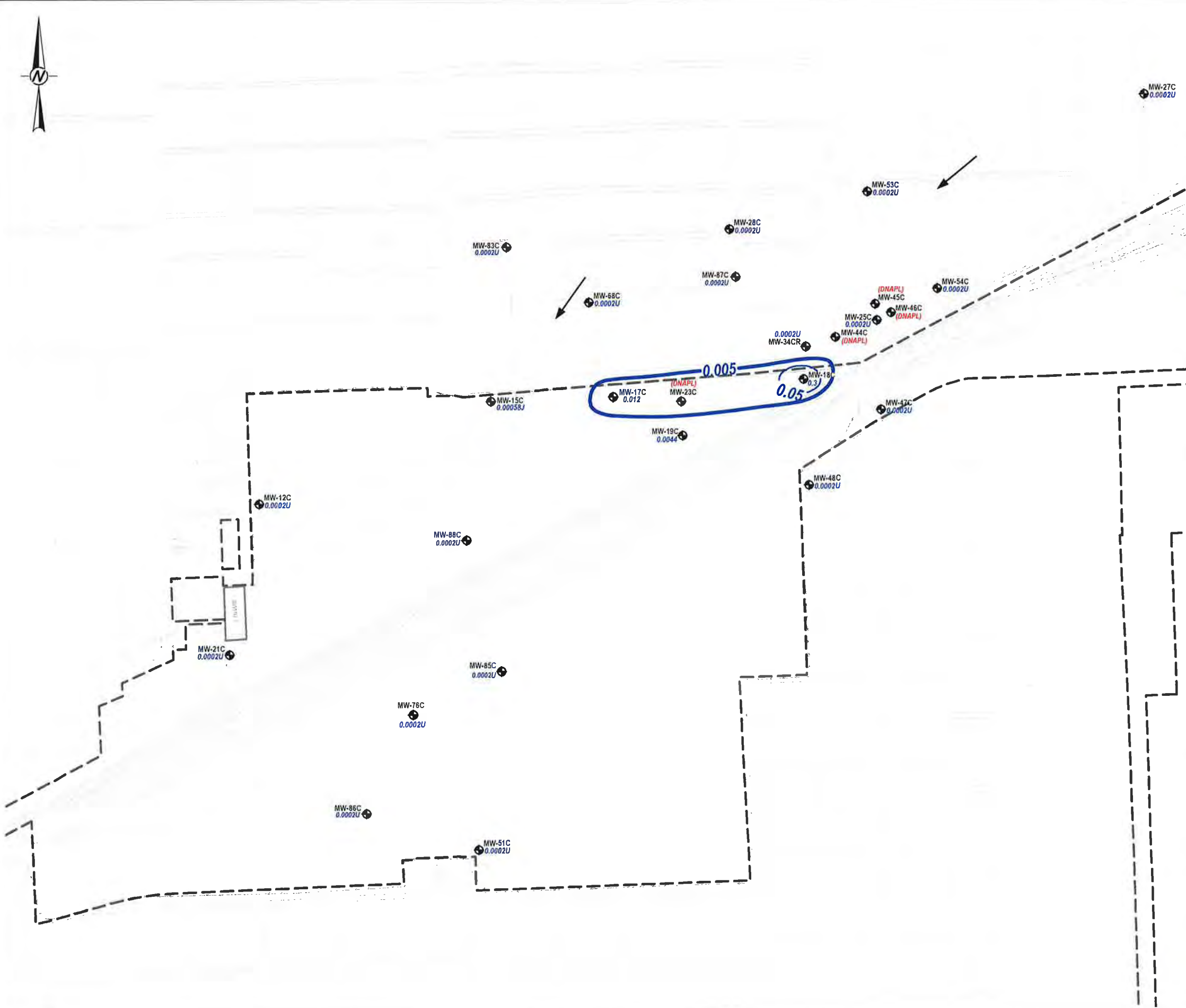
**TITLE**

C-TZ GROUNDWATER COC CONCENTRATION MAP  
BENZENE - JANUARY 2019

CONSULTANT	YYYY-MM-DD	2019-07-10
DESIGNED	AJD	
PREPARED	AJD	
REVIEWED	MH	
APPROVED	ECM	

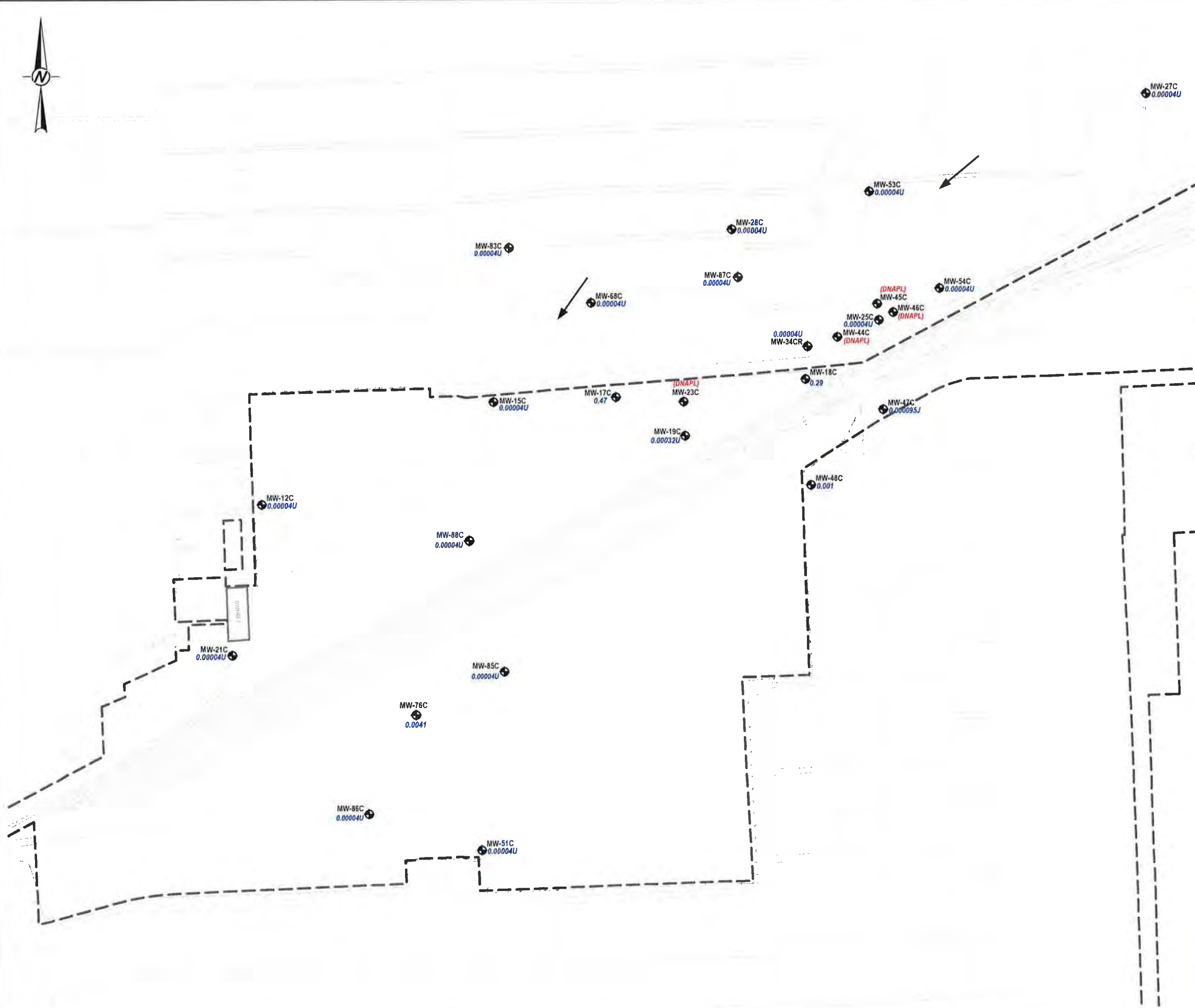
PROJECT NO 19119232      REV 0      FIGURE 5B-15

Path: \\houston\gis\projects\19119232\HWPW2019-07-10\19119232\_5B-15.dwg    File Name: FIG 5B-15-15.dwg    Title: 19119232\_5B-15.dwg    Plotted By: adamone    Date: 2019-07-15 Time: 09:30 AM





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LEGEND

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- C-TZ MONITORING WELL LOCATION
- 0.0325** 2,4-DIMETHYLPHENOL CONCENTRATION IN mg/L
- 0.49** 2,4-DIMETHYLPHENOL CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

NOTE(S)

1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
2. CONTOURS ARE BOLDED AT THE RAL AND C/I PCL (0.49 mg/L AND 1.5 mg/L, RESPECTIVELY).

REFERENCE(S)

BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
**C-TZ GROUNDWATER COC CONCENTRATION MAP  
2,4-DIMETHYLPHENOL - JANUARY 2019**

CONSULTANT	YYYY-MM-DD	2019-07-10
DESIGNED	AJD	
PREPARED	AJD	
REVIEWED	MH	
APPROVED	ECM	



PROJECT NO  
19119232

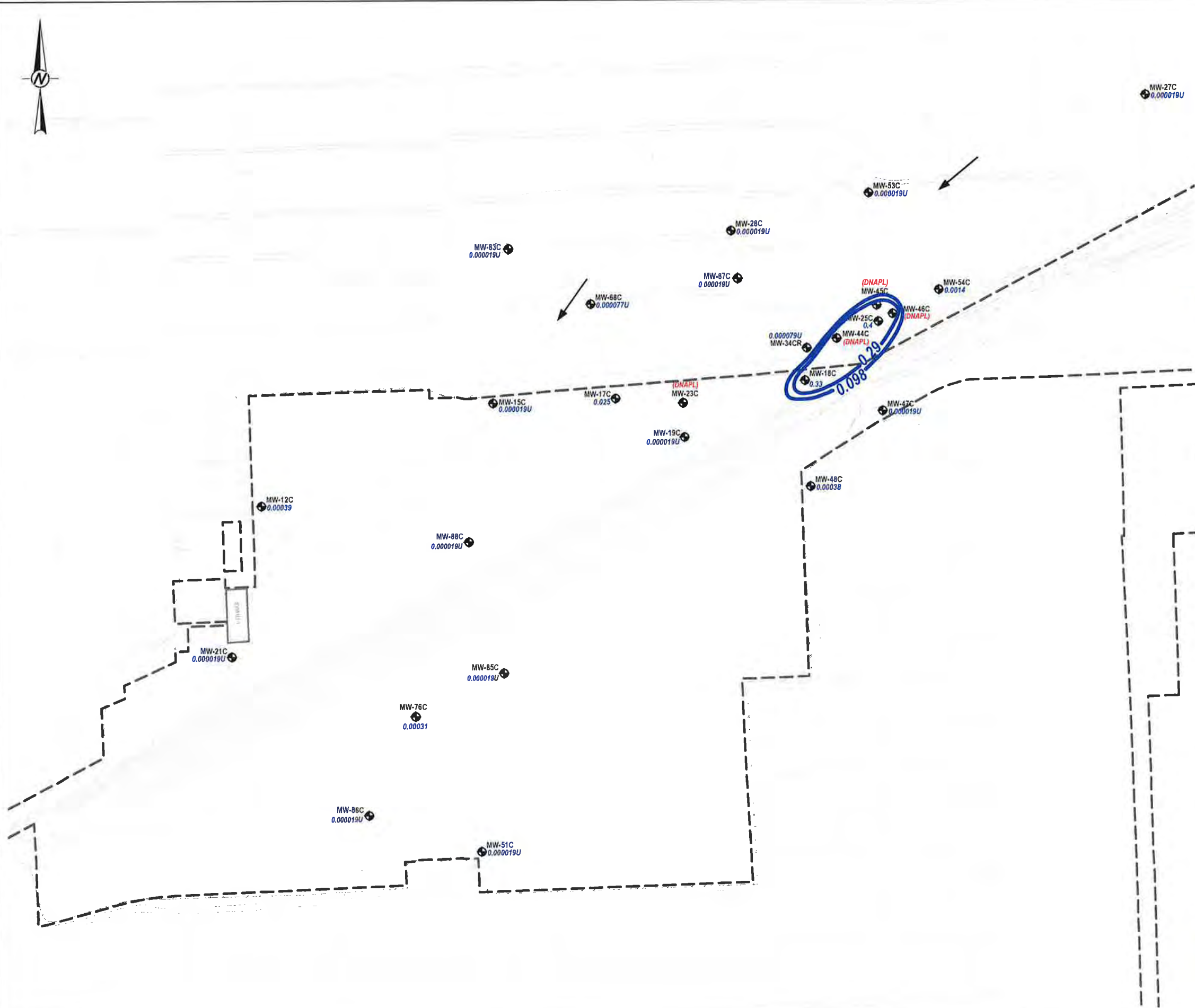
REV.  
0

FIGURE  
5B-16





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**LEGEND**

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- C-TZ MONITORING WELL LOCATION
- 0.778** 2-METHYLNAPHTHALENE CONCENTRATION IN mg/L
- 0.098** 2-METHYLNAPHTHALENE CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

**NOTE(S)**

1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
2. CONTOURS ARE BOLDED AT THE RAL AND C/I PCL (0.098 mg/L AND 0.29 mg/L, RESPECTIVELY).

**REFERENCE(S)**  
BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004



CLIENT  
UNION PACIFIC RAILROAD CO.

PROJECT  
HOUSTON WOOD PRESERVING WORKS

TITLE  
**C-TZ GROUNDWATER COC CONCENTRATION MAP  
2-METHYLNAPHTHALENE - JANUARY 2019**

CONSULTANT	YYYY-MM-DD	2019-07-10
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM



PROJECT NO. 19119232      REV 0      FIGURE 5B-17





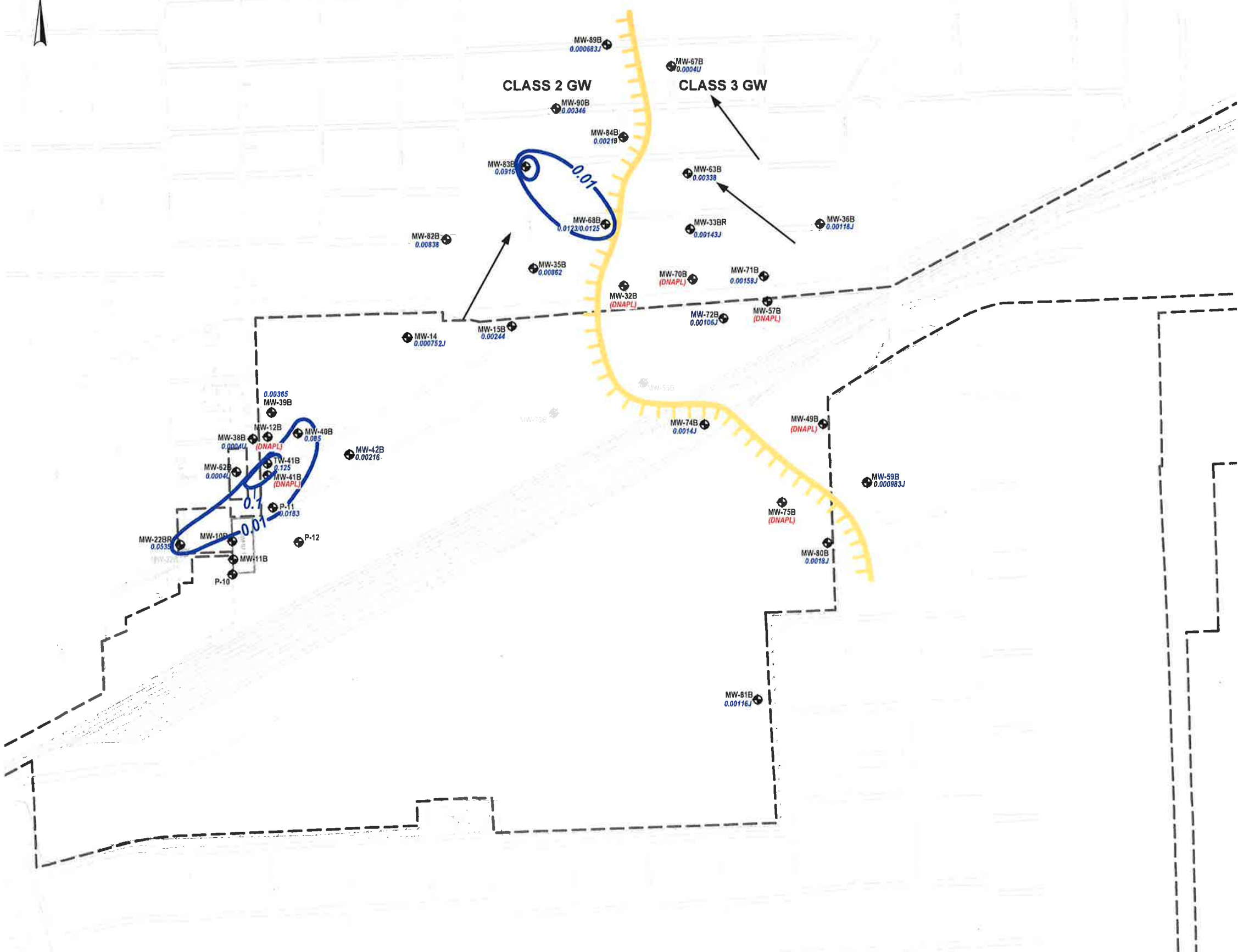








Path: \\brahms\share\Projects - Round\19119232-110100\2019-5\Map\1 - B-TZ\_Arsenic January 2019.dwg | Last Edited By: asahmed | Date: 2019-07-10 Time: 9:27:47 AM



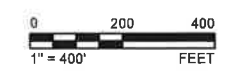
**LEGEND**

- UPRR PROPERTY BOUNDARY
- ROAD, PARKING LOT, SIDEWALK
- FENCE
- RAILROAD
- B-TZ MONITORING WELL LOCATION
- PLUGGED AND ABANDONED MONITORING WELL
- B-CZ (CLASS 3 GW) B-TZ/B-CZ BOUNDARY
- B-TZ (CLASS 2 GW)
- 0.346 ARSENIC CONCENTRATION IN mg/L
- 0.01 ARSENIC CONCENTRATION CONTOUR (mg/L)
- INFERRED GROUNDWATER FLOW DIRECTION

**NOTE(S)**

1. DNAPL = DENSE NON-AQUEOUS PHASE LIQUIDS DETECTED IN MONITORING WELL (JANUARY 2019).
2. CONTOURS ARE BOLDED AT THE RAL AND C/I PCL (0.01 mg/L).

**REFERENCE(S)**  
BASE MAP FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.



CLIENT  
**UNION PACIFIC RAILROAD CO.**

PROJECT  
**HOUSTON WOOD PRESERVING WORKS**

TITLE  
**B-CZ/B-TZ GROUNDWATER COC CONCENTRATION MAP  
ARSENIC - JANUARY 2019**

CONSULTANT	YYYY-MM-DD	2019-07-10
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	MH
	APPROVED	ECM

PROJECT NO. 19119232      REV. 0      FIGURE 5B-21

IF THIS DOCUMENT FOR A NOT PUBLIC WORKS, THE SINGLE COPY BEING PROVIDED FOR PUBLIC USE.



**ATTACHMENT A**

**Data Usability Summary and  
Analytical Reports from January  
2019 Site-Wide Sampling Event**



# Memorandum

February 26, 2019

To: Eric Matzner Ref. No.: 11183954-1620

From: <sup>CK</sup> Chris G. Knight/mkd/176-NF Tel: 512-506-8803

cc: Jesse Orth, Jon Lang; Julie Lidstone

**Subject: Data Usability Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

## 1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for groundwater samples collected in support of the Site Wide Groundwater Monitoring Event at the Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works site during January-February 2019. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data packages HS19010437, HS19010488, HS19010754, HS19011117, HS19011199, and HS19020155. The intended use of the data is to support the Site Wide Groundwater Monitoring Event at the site by providing current concentration of chemicals of concern.

Data were reviewed and validated by Chris G. Knight of GHD, in accordance with Title 30 of the Texas Administrative Code Section 350.54 (30 TAC 350.54) as described in the Texas Commission on Environmental Quality (TCEQ) Regulatory Guidance document entitled "Review and Reporting of COC Concentration Data under TRRP", (RG-366/TRRP-13), revised May 2010, herein referred to as "TRRP-13 Guidance". Evaluation of the data was based on information obtained from the chain of custody forms, the finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), duplicate analyses, field quality assurance/quality control (QA/QC) samples, the laboratory review checklists (LRC), and the laboratory exception reports (ER).

A sample collection and analysis summary is presented in Table 1. This summary provides a cross-reference of field sample identification numbers and location identification. Each sample is assigned a unique field identification number.

The validated sample results are presented in Table 2. A summary of the analytical methodology is presented in Table 3.





## **2. Laboratory Qualifications**

The Laboratory's quality assurance program is consistent with the quality standards outlined in the National Environmental Laboratory Accreditation Program (NELAP). This laboratory was accredited under Texas Certification number # TX104704231 at the time the analysis was performed and the certificate is included in Attachment A.

## **3. Project Objectives**

### **3.1 Sampling/Analytical QA/QC Objectives**

The QA/QC program was designed to identify contamination resulting from the sampling, sample transport and analytical process through the analysis of trip blank samples, field blank samples, field duplicate sample sets, and method blanks. The QA/QC program was designed to evaluate the quality of the resulting data with respect to bias and precision through analysis of LCS analyses, matrix spike/matrix spike duplicate (MS/MSD) analyses, and duplicate sample analysis.

## **4. Data Review/Validation Results**

### **4.1 Sample Holding Time and Preservation**

Samples were shipped with a chain of custody and the paper work was filled out properly with the following exceptions:

- i) The collection time on the sample containers did not match the sample times listed on the chain of custody for the following samples: WG-1620-TW41B-20190109 and WG-1620-MW05-20190109. The sample times listed on the chain of custody were used. No further action was required.
- ii) WG-1620-FB02-20190109 was missing the sample date and time on the container labels. The sample was logged in using the date and time listed on the chain of custody. No further action was required.
- iii) 1620-MW71B-20190115 was missing the sample time on the voa vial labels. The sample was logged in using the time listed on the chain of custody. No further action was required.
- iv) All samples submitted on January 25, 2019 in data package HS19011199 were missing collection dates and times from their container lables. All samples were logged in using the date and time listed on the chain of custodies. No further action was required.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

The sample chain of custody documents and the analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.



#### **4.2 Sample Containers**

Sample containers used were certified pre-cleaned glass and plastic containers provided by the laboratory. These containers meet or exceed analyte specifications established in the United States Environmental Protection Agency (USEPA) *Specifications and Guidance for Contaminant-free Sample Containers*.

#### **4.3 Calibrations**

According to the LRC, initial calibration and continuing calibration data met the criteria for the selected method.

#### **4.4 Laboratory Method Blank Analyses**

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. As these were not discrete samples handled in the field, these blanks are not listed on the sample identification cross-reference list found in the data packages.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch and results are reported in the laboratory data packages.

The method blank result was non-detect or below the method quantitation limit (MQL), indicating that laboratory contamination was not a factor for this investigation.

#### **4.5 Internal Standard and Surrogate Spike Recoveries**

Recoveries of internal standards are addressed in the LRC of the data packages. All internal standard recoveries associated with the compounds of interest were acceptable per the LRC.

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project. Each individual surrogate compound is expected to meet the laboratory control limits. According to the TRRP-13 Guidelines, one outlying surrogate is acceptable for methods with multiple surrogate spike compounds as long as the recovery is at least ten percent. Sample analyzed at elevated sample dilutions (greater than five times) were not assessed.

Surrogate recoveries were assessed against laboratory control limits and/or the guidance in TRRP-13. All surrogate recoveries met the above criteria.

#### **4.6 Laboratory Control Sample Analysis**

LCS or LCS/laboratory control sample duplicate (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project.



For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch.

The LCS or LCS/LCSD contained all analytes specified in the methods. All LCS recoveries and/or RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision (where applicable) with the following exceptions:

- i) One LCS/LCSD was reported with elevated RPDs for several SVOCs. All associated sample results were non-detect and not affected by the indicated variability. No further action was required.

#### **4.7 Matrix Spike/Matrix Spike Duplicate Analysis**

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of interest and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

The MS/MSD analysis was performed as specified in Table 1. The recovery ranges established by the laboratory is adopted as the acceptance criteria for the project.

The MS/MSD samples were spiked with all analytes specified in the methods. All percent recoveries and the RPD value were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision with the following exceptions:

- i) One MS/MSD was reported with elevated recoveries for chlorobenzene and ethylbenzene. Non-detect sample results associated with high MS/MSD recoveries were not qualified – they would not be impacted by any indicated high bias. If only the MS or MSD recovery was outside of control limits, no qualification of the data was performed based on the acceptable recovery of the companion spike and the acceptable RPD. No further action was required.
- ii) One MS/MSD was reported with low recoveries for multiple SVOCs due to possible matrix interference and were not assessed. No further action was required.

The laboratory performed additional MS/MSD on non-site samples. These cannot be used to assess accuracy and precision for the site samples.

#### **4.8 Duplicate Sample Analyses**

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory as specified in Table 1 for metals analysis. The laboratory performed additional site-specific duplicate analyses internally. The relative percent differences (RPD) established by the laboratory are adopted as the acceptance criteria for the project.

All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

The laboratory performed additional duplicate analyses on non-site samples. These cannot be used to assess precision for the site samples.



#### **4.9 Field QA/QC Samples**

The field QA/QC consisted of six trip blank samples, eight field blank samples, and five field duplicate sample sets.

##### ***Trip Blank Sample Analysis***

To evaluate contamination from sample collection, transportation, storage, and analytical activities, six trip blank samples were submitted to the laboratory for VOCs analysis. All results were non-detect for the compounds of interest.

##### ***Field Blank Sample Analysis***

To assess ambient conditions at the site, eight field blank samples were submitted for analysis, as identified in Table 1. All results were non-detect for the compounds of interest with the following exceptions (see Table 4):

- i) The following field blanks yielded low level detections for multiple SVOCs: WQ-1620-FB01-20190108, WQ-1620-FB02-20190109, WQ-1620-FB03-20190111, WQ-1620-FB04-20190114, WQ-1620-FB05-20190115, WQ-1620-FB07-20190123, and WQ-1620-FB08-20190124. Associated sample results that were significantly greater than the concentrations found in the field blanks or were non-detect were not impacted. No further action was required. Associated sample results with comparable concentrations were qualified as non-detect.

##### ***Field Duplicate Sample Analysis***

To assess the analytical and sampling protocol precision, one field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than thirty percent for water samples. The RPDs are only used when sample concentrations are above the estimated regions of detection.

Field duplicate summary data are presented in Table 2. All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

#### **4.10 Field Procedures**

Golder Associates, Inc. collected groundwater samples in accordance with their Standard Operating Procedures (SOP) for sample collection.

#### **4.11 Analyte Reporting**

The laboratory reported detected results for each analyte down to the sample detection limit (SDL), which is defined as the method detection limit (MDL) with sample-specific adjustments for dilutions, aliquot size, volumes, etc. Positive analyte detections less than the MQL but greater than the SDL were qualified as estimated (J) in Table 2 unless qualified otherwise in this memorandum.

All detectability check standard (DCS) results supported the laboratory MDL.



## **5. Conclusion**

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Site Wide Groundwater Monitoring Event at the site by providing current concentration of chemicals of concern with the specific qualifications noted herein.

Table 1

**Sample Collection and Analysis Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-MW13-20190108	MW-13	Water	01/08/2019	09:45	X	X	X	MS/MSD-P
WG-1620-MW14-20190108	MW-14	Water	01/08/2019	10:40	X	X	X	
WG-1620-MW15A-20190108	MW-15A	Water	01/08/2019	11:30	X	X	X	
WG-1620-MW15C-20190108	MW-15C	Water	01/08/2019	12:20	X	X	X	
WG-1620-MW15B-20190108	MW-15B	Water	01/08/2019	13:05	X	X	X	
WG-1620-MW20A-20190108	MW-20A	Water	01/08/2019	15:00	X	X	X	
WG-1620-MW88C-20190108	MW-88C	Water	01/08/2019	16:00	X	X	X	
WG-1620-MW42B-20190108	MW-42B	Water	01/08/2019	16:55	X	X	X	
WG-1620-MW40B-20190108	MW-40B	Water	01/08/2019	17:45	X	X	X	
WG-1620-MW39B-20190108	MW-39B	Water	01/08/2019	18:45	X	X	X	
WQ-1620-FB01-20190108	-	Water	01/08/2019	19:00	X	X	X	Field Blank
WQ-1620-TB01-20190108	-	Water	01/09/2019	00:00	X			Trip Blank
WG-1620-MW12A-20190109	MW-12A	Water	01/09/2019	07:35	X	X	X	
WG-1620-MW12C-20190109	MW-12C	Water	01/09/2019	08:25	X	X	X	
WG-1620-TW41B-20190109	TW-41B	Water	01/09/2019	10:35	X	X	X	
WG-1620-MW05-20190109	MW-05	Water	01/09/2019	11:25	X	X	X	MS/MSD-P
WG-1620-P11-20190109	P-11	Water	01/09/2019	12:25	X	X	X	
WG-1620-MW03-20190109	MW-03	Water	01/09/2019	13:15	X	X	X	
WG-1620-MW09-20190109	MW-09	Water	01/09/2019	14:05	X	X	X	
WG-1620-MW04-20190109	MW-04	Water	01/09/2019	15:05	X	X	X	MS/MSD-P

Table 1

**Sample Collection and Analysis Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-MW21C-20190109	MW-21C	Water	01/09/2019	16:20	X	X	X	
WG-1620-FD01-20190109	MW-21C	Water	01/09/2019	16:20	X	X	X	Field duplicate of MW21C
WG-1620-MW17-20190109	MW-17	Water	01/09/2019	17:20	X	X	X	
WQ-1620-FB02-20190109	-	Water	01/09/2019	17:35	X	X	X	Field Blank
WQ-1620-TB02-20190110	-	Water	01/10/2019	00:00	X			Trip Blank
WG-1620-MW17C-20190110	MW-17C	Water	01/10/2019	07:25	X	X	X	
WG-1620-MW18C-20190110	MW-18C	Water	01/10/2019	08:20	X	X	X	
WG-1620-MW18A-20190110	MW-18A	Water	01/10/2019	10:45	X	X	X	
WG-1620-MW48C-20190110	MW-48C	Water	01/10/2019	11:45	X	X	X	
WG-1620-MW69A-20190110	MW-69A	Water	01/10/2019	12:45	X	X	X	
WG-1620-MW80B-20190110	MW-80B	Water	01/10/2019	13:50	X	X	X	
WG-1620-MW50A-20190110	MW-50A	Water	01/10/2019	14:40	X	X	X	
WG-1620-MW81B-20190110	MW-81B	Water	01/10/2019	15:30	X	X	X	
WG-1620-MW51A-20190110	MW-51A	Water	01/10/2019	16:40	X	X	X	
WG-1620-MW51C-20190110	MW-51C	Water	01/10/2019	17:30	X	X	X	
WG-1620-MW86C-20190111	MW-86C	Water	01/11/2019	08:25	X	X	X	
WG-1620-FD02-20190111	MW-86C	Water	01/11/2019	08:25	X	X	X	Field duplicate of MW86C
WG-1620-MW60A-20190111	MW-60A	Water	01/11/2019	10:15	X	X	X	
WQ-1620-FB03-20190111	-	Water	01/11/2019	11:15	X	X	X	Field Blank
WG-1620-MW53C-20190114	MW-53C	Water	01/14/2019	12:05	X	X	X	



Table 1

**Sample Collection and Analysis Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-MW54C-20190114	MW-54C	Water	01/14/2019	13:00	X	X	X	
WG-1620-MW36B-20190114	MW-36B	Water	01/14/2019	14:05	X	X	X	
WG-1620-MW36A-20190114	MW-36A	Water	01/14/2019	14:55	X	X	X	
WG-1620-MW28A-20190114	MW-28A	Water	01/14/2019	15:50	X	X	X	
WG-1620-MW28C-20190114	MW-28C	Water	01/14/2019	16:35	X	X	X	MS/MSD; DUP
WG-1620-MW63B-20190114	MW-63B	Water	01/14/2019	17:40	X	X	X	
WG-1620-FB04-20190114	-	Water	01/14/2019	18:00	X	X	X	Field Blank
WQ-1620-TB04-20190115	-	Water	01/15/2019	00:00	X			Trip Blank
WG-1620-MW26A-20190115	MW-26A	Water	01/15/2019	07:40	X	X	X	
WG-1620-MW68B-20190115	MW-68B	Water	01/15/2019	08:55	X	X	X	
WG-1620-FD03-20190115	MW-68B	Water	01/15/2019	08:55	X	X	X	Field duplicate of MW68B
WG-1620-MW68C-20190115	MW-68C	Water	01/15/2019	09:45	X	X	X	
WG-1620-MW83B-20190115	MW-83B	Water	01/15/2019	10:40	X	X	X	
WG-1620-MW83C-20190115	MW-83C	Water	01/15/2019	11:15	X	X	X	
WG-1620-MW35A-20190115	MW-35A	Water	01/15/2019	12:45	X	X	X	
WG-1620-MW35B-20190115	MW-35B	Water	01/15/2019	13:25	X	X	X	
WG-1620-MW25A-20190115	MW-25A	Water	01/15/2019	14:25	X	X	X	
WG-1620-MW25C-20190115	MW-25C	Water	01/15/2019	15:10	X	X	X	
WG-1620-MW34CR-20190115	MW-34CR	Water	01/15/2019	15:55	X	X	X	
WG-1620-MW71B-20190115	MW-71B	Water	01/15/2019	16:50	X	X	X	

Table 1

**Sample Collection and Analysis Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-FB05-20190115	-	Water	01/15/2019	17:15	X	X	X	Field Blank
WG-1620-MW44A-20190122	MW-44A	Water	01/22/2019	07:25	X	X	X	
WG-1620-MW87C-20190122	MW-87C	Water	01/22/2019	08:15	X	X	X	
WG-1620-MW33BR-20190122	MW-33BR	Water	01/22/2019	09:05	X	X	X	
WG-1620-MW33A-20190122	MW-33A	Water	01/22/2019	10:00	X	X	X	
WG-1620-FD04-20190122	MW-33A	Water	01/22/2019	10:00	X	X	X	Field duplicate of MW33A
WG-1620-MW38B-20190122	MW-38B	Water	01/22/2019	11:00	X	X	X	
WG-1620-MW22AR-20190122	MW-22AR	Water	01/22/2019	11:50	X	X	X	
WG-1620-MW22BR-20190122	MW-22BR	Water	01/22/2019	12:35	X	X	X	
WG-1620-MW38A-20190122	MW-38A	Water	01/22/2019	13:40	X	X	X	
WG-1620-MW82B-20190122	MW-82B	Water	01/22/2019	14:55	X	X	X	MS/MSD-P; DUP
WG-1620-MW90B-20190122	MW-90B	Water	01/22/2019	16:00	X	X	X	
WG-1620-MW89B-20190122	MW-89B	Water	01/22/2019	16:50	X	X	X	
WG-1620-MW27C-20190122	MW-27C	Water	01/22/2019	17:45	X	X	X	
WQ-1620-FB06-20190122	-	Water	01/22/2019	18:00	X	X	X	Field Blank
WQ-1620-TB05-20190123	-	Water	01/23/2019	00:00	X			Trip Blank
WG-1620-MW62B-20190123	MW-62B	Water	01/23/2019	07:15	X	X	X	
WG-1620-MW64A-20190123	MW-64A	Water	01/23/2019	08:10	X	X	X	
WG-1620-MW61A-20190123	MW-61A	Water	01/23/2019	09:20	X	X	X	MS/MSD; DUP
WG-1620-MW47C-20190123	MW-47C	Water	01/23/2019	10:15	X	X	X	

Table 1

**Sample Collection and Analysis Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-MW58A-20190123	MW-58A	Water	01/23/2019	11:20	X	X	X	
WG-1620-MW32AR-20190123	MW-32AR	Water	01/23/2019	12:15	X	X	X	
WG-1620-MW76C-20190123	MW-76C	Water	01/23/2019	13:20	X	X	X	
WG-1620-MW74B-20190123	MW-74B	Water	01/23/2019	14:15	X	X	X	
WG-1620-MW79A-20190123	MW-79A	Water	01/23/2019	15:05	X	X	X	
WG-1620-MW49A-20190123	MW-49A	Water	01/23/2019	15:50	X	X	X	
WG-1620-MW59A-20190123	MW-59A	Water	01/23/2019	16:40	X	X	X	
WQ-1620-FB07-20190123	-	Water	01/23/2019	17:00	X	X	X	Field Blank
WG-1620-MW59B-20190123	MW-59B	Water	01/23/2019	17:30	X	X	X	
WQ-1620-TB06-20190124	-	Water	01/24/2019	00:00	X			Trip Blank
WG-1620-MW59D-20190124	MW-59D	Water	01/24/2019	07:20	X	X	X	
WG-1620-FD05-20190124	MW-59D	Water	01/24/2019	07:20	X	X	X	Field duplicate of MW59D
WG-1620-MW36D-20190124	MW-36D	Water	01/24/2019	08:25	X	X	X	
WG-1620-MW65D-20190124	MW-65D	Water	01/24/2019	09:25	X	X	X	MS/MSD-P; DUP
WG-1620-MW66D-20190124	MW-66D	Water	01/24/2019	10:30	X	X	X	
WG-1620-MW84B-20190124	MW-84B	Water	01/24/2019	11:40	X	X	X	
WG-1620-MW67B-20190124	MW-67B	Water	01/24/2019	12:50	X	X	X	MS/MSD; DUP
WG-1620-MW19C-20190124	MW-19C	Water	01/24/2019	13:50	X	X	X	
WG-1620-MW72B-20190124	MW-72B	Water	01/24/2019	14:55	X	X	X	
WQ-1620-FB08-20190124	-	Water	01/24/2019	16:15	X	X	X	Field Blank

**Table 1**

**Sample Collection and Analysis Summary  
 Site Wide Groundwater Monitoring Event  
 Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
 Houston, Texas  
 January-February 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameter:			Comments
					VOCs	SVOCs	Metals	
WG-1620-TB07-20190201	-	Water	02/01/2019	00:00	X			Trip Blank
WG-1620-MW77A-201290201	MW-77A	Water	02/01/2019	13:05	X	X	X	
WG-1620-MW85C-201290201	MW-85C	Water	02/01/2019	14:00	X	X	X	

Notes:

- VOCs - Volatile Organic Compounds
- SVOCs - Semi-volatile Organic Compounds
- MS/MSD - Matrix Spike/Matrix Spike Duplicate
- MS/MSD-P - Matrix Spike/Matrix Spike Duplicate (partial parameters)
- DUP - Laboratory Duplicate
- "-" - Not Applicable

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-03	MW-04	MW-05	MW-09	MW-12A
	Sample Name:	WG-1620-MW03-20190109	WG-1620-MW04-20190109	WG-1620-MW05-20190109	WG-1620-MW09-20190109	WG-1620-MW12A-20190109
	Sample Date:	01/09/2019	01/09/2019	01/09/2019	01/09/2019	01/09/2019
Parameters	Unit					
<b>Volatile Organic Compounds</b>						
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	0.0041	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>						
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000059	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	0.000079 J	<0.000014	0.000093 J	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000051	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.000037	<0.000037	<0.000037
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000031 J
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000026
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000080	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-03	MW-04	MW-05	MW-09	MW-12A
Sample Name:	WG-1620-MW03-20190109	WG-1620-MW04-20190109	WG-1620-MW05-20190109	WG-1620-MW09-20190109	WG-1620-MW12A-20190109
Sample Date:	01/09/2019	01/09/2019	01/09/2019	01/09/2019	01/09/2019

Parameters	Unit	MW-03	MW-04	MW-05	MW-09	MW-12A
<b>Semi-volatile Organic Compounds (Continued)</b>						
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019	<0.000019
<b>Metals</b>						
Arsenic	mg/L	0.0191	0.000963 J	0.00387	0.00202	0.00192 J
Lead	mg/L	0.00131 J	<0.000600	0.00149 J	0.000931 J	<0.000600

## Notes:

&lt; - Not detected at the associated reporting limit

J - Estimated concentration

"--" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-12C	MW-13	MW-14	MW-15A
Sample Name:	WG-1620-MW12C-20190109	WG-1620-MW13-20190108	WG-1620-MW14-20190108	WG-1620-MW15A-20190108
Sample Date:	01/09/2019	01/08/2019	01/08/2019	01/08/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	0.00080 J
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	0.00039	<0.000019	0.0098
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.093	<0.000027	0.10
Acenaphthylene	mg/L	0.00082	<0.000015	<0.000015
Anthracene	mg/L	0.0084	0.00039	0.0025
Benzo(a)anthracene	mg/L	0.00014	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.000041 J	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00011 J	<0.000037	<0.000037
Chrysene	mg/L	0.00013	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	0.000022 J
Dibenzofuran	mg/L	0.067	<0.000020	0.023
Fluoranthene	mg/L	0.0071	<0.000010	0.0012
Fluorene	mg/L	0.085	<0.000030	0.038
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.00017	<0.00022	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	0.052	<0.000021	0.0090



**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-12C</b>	<b>MW-13</b>	<b>MW-14</b>	<b>MW-15A</b>
<b>Sample Name:</b>	<b>WG-1620-MW12C-20190109</b>	<b>WG-1620-MW13-20190108</b>	<b>WG-1620-MW14-20190108</b>	<b>WG-1620-MW15A-20190108</b>
<b>Sample Date:</b>	<b>01/09/2019</b>	<b>01/08/2019</b>	<b>01/08/2019</b>	<b>01/08/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.0031	<0.000019	<0.000019	0.00051
<b>Metals</b>					
Arsenic	mg/L	0.000796 J	0.0602	0.000752 J	0.0270
Lead	mg/L	<0.000600	0.00133 J	<0.000600	0.000722 J

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-15B	MW-15C	MW-17	MW-17C
	Sample Name:	WG-1620-MW15B-20190108	WG-1620-MW15C-20190108	WG-1620-MW17-20190109	WG-1620-MW17C-20190110
	Sample Date:	01/08/2019	01/08/2019	01/09/2019	01/10/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.0020	<0.00020
Benzene	mg/L	<0.00020	0.00058 J	0.35	0.012
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.0030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	0.21	0.027
Methylene chloride	mg/L	<0.0010	<0.0010	<0.010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	0.68	0.0087
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	0.66	0.050
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.00021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	1.9	0.47
2,4-Dinitrotoluene	mg/L	<0.000059	<0.000058	<0.00058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.00042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.00021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	0.23	0.025
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.00020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.00047	<0.000047
Acenaphthene	mg/L	0.0026	0.020	0.091	0.031
Acenaphthylene	mg/L	0.00015	0.0014	0.0029	0.00047
Anthracene	mg/L	0.00023	0.00031	0.0057	0.0012
Benzo(a)anthracene	mg/L	<0.000051	<0.000050	<0.00050	0.000062 J
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.00020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.00030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.00037	0.00062
Chrysene	mg/L	<0.000021	<0.000021	<0.00021	0.000059 J
Di-n-butylphthalate (DBP)	mg/L	0.000022 J	<0.000020	<0.00020	<0.000020
Dibenzofuran	mg/L	0.00014	0.0053	0.072	0.027
Fluoranthene	mg/L	0.00045	0.00075	0.0015	0.00078
Fluorene	mg/L	0.000055 J	0.00056	0.043	0.012
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.00025	<0.000025
Naphthalene	mg/L	<0.000020	<0.00032	5.5	1.1
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.00024	<0.000024
Pentachlorophenol	mg/L	<0.000080	<0.000079	<0.00079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	0.028	0.010

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-15B</b>	<b>MW-15C</b>	<b>MW-17</b>	<b>MW-17C</b>
<b>Sample Name:</b>	WG-1620-MW15B-20190108	WG-1620-MW15C-20190108	WG-1620-MW17-20190109	WG-1620-MW17C-20190110
<b>Sample Date:</b>	01/08/2019	01/08/2019	01/09/2019	01/10/2019

Parameters	Unit	MW-15B	MW-15C	MW-17	MW-17C
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	2.2	0.033
Pyrene	mg/L	0.00027	0.00041	0.00081 J	0.00045
<b>Metals</b>					
Arsenic	mg/L	0.00244	0.000629 J	0.0460	0.00130 J
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-18A	MW-18C	MW-19C	MW-20A
Sample Name:	WG-1620-MW18A-20190110	WG-1620-MW18C-20190110	WG-1620-MW19C-20190124	WG-1620-MW20A-20190108
Sample Date:	01/10/2019	01/10/2019	01/24/2019	01/08/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.0050	<0.0020	<0.00020
Benzene	mg/L	1.2	0.30	0.0044
Chlorobenzene	mg/L	<0.0075	<0.0030	<0.00030
Ethylbenzene	mg/L	0.34	0.41	0.0040
Methylene chloride	mg/L	<0.025	<0.010	<0.0010
Toluene	mg/L	0.92	0.030	0.0057
Vinyl chloride	mg/L	<0.0050	<0.0020	--
Xylenes (total)	mg/L	1.0	0.69	0.022
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.00021	<0.00021	<0.000021
2,4-Dimethylphenol	mg/L	0.0054	0.29	<0.00032
2,4-Dinitrotoluene	mg/L	<0.00058	<0.00059	<0.000058
2,6-Dinitrotoluene	mg/L	<0.00042	<0.00042	<0.000042
2-Chloronaphthalene	mg/L	<0.00021	<0.00021	<0.000021
2-Methylnaphthalene	mg/L	0.10	0.33	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.00020	<0.00020	<0.000020
4-Nitrophenol	mg/L	<0.00047	<0.00047	<0.000047
Acenaphthene	mg/L	0.048	0.21	0.00078
Acenaphthylene	mg/L	0.0016	0.0075	<0.000015
Anthracene	mg/L	0.0064	0.0070	0.000057 J
Benzo(a)anthracene	mg/L	<0.00050	<0.00051	<0.000050
Benzo(a)pyrene	mg/L	<0.00020	<0.00020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.00030	<0.00030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.00037	<0.00037	0.000096 J
Chrysene	mg/L	<0.00021	<0.00021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.00020	<0.00020	<0.000020
Dibenzofuran	mg/L	0.047	0.13	<0.000020
Fluoranthene	mg/L	0.0020	0.0023	<0.000010
Fluorene	mg/L	0.021	0.095	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.00025	<0.00025	<0.000025
Naphthalene	mg/L	3.2	4.4	<0.00036
Nitrobenzene	mg/L	<0.00024	<0.00024	<0.000024
Pentachlorophenol	mg/L	0.014	<0.00080	<0.000079
Phenanthrene	mg/L	0.024	0.084	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-18A</b>	<b>MW-18C</b>	<b>MW-19C</b>	<b>MW-20A</b>
<b>Sample Name:</b>	<b>WG-1620-MW18A-20190110</b>	<b>WG-1620-MW18C-20190110</b>	<b>WG-1620-MW19C-20190124</b>	<b>WG-1620-MW20A-20190108</b>
<b>Sample Date:</b>	<b>01/10/2019</b>	<b>01/10/2019</b>	<b>01/24/2019</b>	<b>01/08/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	0.0032	<0.00035	<0.00013	<0.000035
Pyrene	mg/L	0.0012	0.0012	<0.000019	0.00025
<b>Metals</b>					
Arsenic	mg/L	0.00310	0.0257	0.00149 J	0.00788
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-21C	MW-21C	MW-22AR	MW-22BR
Sample Name:	WG-1620-MW21C-20190109	WG-1620-FD01-20190109	WG-1620-MW22AR-20190122	WG-1620-MW22BR-20190122
Sample Date:	01/09/2019	01/09/2019 Duplicate	01/22/2019	01/22/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	0.00071
Acenaphthylene	mg/L	<0.000015	<0.000015	0.022
Anthracene	mg/L	<0.000014	<0.000014	<0.000015
Benzo(a)anthracene	mg/L	<0.000014	<0.000014	0.00048
Benzo(a)pyrene	mg/L	<0.000050	<0.000050	<0.000050
bis(2-Chloroethoxy)methane	mg/L	<0.000020	<0.000020	<0.000020
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000030	<0.000030	<0.000030
Chrysene	mg/L	<0.000037	<0.000037	<0.000037
Di-n-butylphthalate (DBP)	mg/L	<0.000021	<0.000021	0.00065 J
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000021
Fluoranthene	mg/L	<0.000020	<0.000020	0.00051
Fluorene	mg/L	<0.000010	<0.000010	<0.000029 J
N-Nitrosodiphenylamine	mg/L	<0.000010	<0.000010	0.00079 J
Naphthalene	mg/L	<0.000030	<0.000030	0.0011
Nitrobenzene	mg/L	<0.000025	<0.000025	0.0025
Pentachlorophenol	mg/L	<0.000021	<0.000021	<0.000025
Phenanthrene	mg/L	<0.000020	<0.000020	<0.000025
	mg/L	<0.000024	<0.000024	0.00017
	mg/L	<0.000024	<0.000024	<0.000024
	mg/L	<0.000079	<0.000079	<0.000079
	mg/L	<0.000079	<0.000079	<0.000079
	mg/L	<0.000021	<0.000021	0.00068 J

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

	Location ID:	MW-21C	MW-21C	MW-22AR	MW-22BR
	Sample Name:	WG-1620-MW21C-20190109	WG-1620-FD01-20190109	WG-1620-MW22AR-20190122	WG-1620-MW22BR-20190122
	Sample Date:	01/09/2019	01/09/2019 Duplicate	01/22/2019	01/22/2019
Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	0.000084 J	0.00046
<b>Metals</b>					
Arsenic	mg/L	0.00187 J	0.00178 J	0.00488	0.0535
Lead	mg/L	<0.000600	<0.000600	0.00526	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable



Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-25A	MW-25C	MW-26A	MW-27C
Sample Name:	WG-1620-MW25A-20190115	WG-1620-MW25C-20190115	WG-1620-MW26A-20190115	WG-1620-MW27C-20190122
Sample Date:	01/15/2019	01/15/2019	01/15/2019	01/22/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	0.00056 J
Ethylbenzene	mg/L	<0.00030	0.038	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	0.013	<0.00020
Vinyl chloride	mg/L	<0.00020	<0.00020	--
Xylenes (total)	mg/L	<0.00030	0.27	<0.00030
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000051	0.40	<0.000090
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.000036 J	0.13	0.042
Acenaphthylene	mg/L	<0.000015	0.0012	0.00027
Anthracene	mg/L	0.000015 J	0.011	0.00087
Benzo(a)anthracene	mg/L	<0.000050	0.00065	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	0.00021	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000078	<0.000037	<0.000037
Chrysene	mg/L	<0.000021	0.00074	<0.000021
Di-n-butylphthalate (DBP)	mg/L	0.000020 J	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	0.14	0.00050
Fluoranthene	mg/L	0.000015 J	0.0079	0.0044
Fluorene	mg/L	<0.000030	0.062	0.0039
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.00029	3.5	<0.00049
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	0.000029 J	0.077	0.00012

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Location ID:	MW-25A	MW-25C	MW-26A	MW-27C
Sample Name:	WG-1620-MW25A-20190115	WG-1620-MW25C-20190115	WG-1620-MW26A-20190115	WG-1620-MW27C-20190122
Sample Date:	01/15/2019	01/15/2019	01/15/2019	01/22/2019

Parameters	Unit	MW-25A	MW-25C	MW-26A	MW-27C
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.000027 J	0.0052	0.0025	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.00216	0.00359	0.166	0.000786 J
Lead	mg/L	<0.000600	<0.000600	<0.000600	0.000831 J

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-28A	MW-28C	MW-32AR	MW-33A
	Sample Name:	WG-1620-MW28A-20190114	WG-1620-MW28C-20190114	WG-1620-MW32AR-20190123	WG-1620-MW33A-20190122
	Sample Date:	01/14/2019	01/14/2019	01/23/2019	01/22/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	0.00013 J	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000055	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.000092 J	<0.000027	0.00010	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	0.000020 J	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.000061 J	<0.000037	<0.000044	<0.000037
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	0.000025 J
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	0.000020 J	<0.000020
Dibenzofuran	mg/L	<0.00011	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	<0.000010	<0.000010	0.000051 J	0.00033
Fluorene	mg/L	0.000056 J	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.0024	<0.000020	0.000067 J	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	0.000034 J	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-28A</b>	<b>MW-28C</b>	<b>MW-32AR</b>	<b>MW-33A</b>
<b>Sample Name:</b>	WG-1620-MW28A-20190114	WG-1620-MW28C-20190114	WG-1620-MW32AR-20190123	WG-1620-MW33A-20190122
<b>Sample Date:</b>	01/14/2019	01/14/2019	01/23/2019	01/22/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.000065 J	<0.000019	0.000036 J	0.00015
<b>Metals</b>					
Arsenic	mg/L	0.0116	0.000447 J	0.0316	0.0100
Lead	mg/L	<0.000600	<0.000600	0.000644 J	<0.000600

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-33A	MW-33BR	MW-34CR	MW-35A
Sample Name:	WG-1620-FD04-20190122	WG-1620-MW33BR-20190122	WG-1620-MW34CR-20190115	WG-1620-MW35A-20190115
Sample Date:	01/22/2019 Duplicate	01/22/2019	01/15/2019	01/15/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	0.0025	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	0.013	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	0.0021
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	0.016
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	0.0013	0.000029 J
Acenaphthylene	mg/L	<0.000015	<0.000015	0.000068 J
Anthracene	mg/L	<0.000014	<0.000014	0.00044
Benzo(a)anthracene	mg/L	0.000062 J	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.000037
Chrysene	mg/L	0.000034 J	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	0.000021 J
Dibenzofuran	mg/L	<0.000020	0.000079 J	0.000027 J
Fluoranthene	mg/L	0.00044	0.000053 J	0.000014 J
Fluorene	mg/L	<0.000030	<0.000030	0.0022
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.000020	0.000040 J	0.22
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	0.0025

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-33A	MW-33BR	MW-34CR	MW-35A
	Sample Name:	WG-1620-FD04-20190122	WG-1620-MW33BR-20190122	WG-1620-MW34CR-20190115	WG-1620-MW35A-20190115
	Sample Date:	01/22/2019 Duplicate	01/22/2019	01/15/2019	01/15/2019
<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.00034	0.000030 J	<0.000019	0.000070 J
<b>Metals</b>					
Arsenic	mg/L	0.00995	0.00143 J	0.00132 J	0.0198
Lead	mg/L	<0.000600	0.000636 J	<0.000600	0.000654 J

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-35B	MW-36A	MW-36B	MW-36D
	Sample Name:	WG-1620-MW35B-20190115	WG-1620-MW36A-20190114	WG-1620-MW36B-20190114	WG-1620-MW36D-20190124
	Sample Date:	01/15/2019	01/14/2019	01/14/2019	01/24/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	0.0033	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	0.0094	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	<0.00020	<0.00020	--
Xylenes (total)	mg/L	0.0040	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	0.011	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.013	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	0.00018	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	0.0011	<0.000014	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	0.000077 J	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.000058 J	<0.000020	<0.000020	0.000027 J
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.00014	<0.000037	0.00022	0.000055 J
Chrysene	mg/L	0.000098 J	<0.000021	<0.000021	0.000031 J
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	0.015	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	0.0013	<0.000010	<0.000010	0.000048 J
Fluorene	mg/L	0.0066	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	0.079	<0.000062	<0.000020	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	0.0086	<0.000021	<0.000021	<0.000021



**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-35B</b>	<b>MW-36A</b>	<b>MW-36B</b>	<b>MW-36D</b>
<b>Sample Name:</b>	<b>WG-1620-MW35B-20190115</b>	<b>WG-1620-MW36A-20190114</b>	<b>WG-1620-MW36B-20190114</b>	<b>WG-1620-MW36D-20190124</b>
<b>Sample Date:</b>	<b>01/15/2019</b>	<b>01/14/2019</b>	<b>01/14/2019</b>	<b>01/24/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.00075	<0.000019	<0.000019	0.000042 J
<b>Metals</b>					
Arsenic	mg/L	0.00862	0.00107 J	0.00118 J	0.000417 J
Lead	mg/L	0.00165 J	0.00108 J	<0.000600	0.000910 J

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-38A	MW-38B	MW-39B	MW-40B
	Sample Name:	WG-1620-MW38A-20190122	WG-1620-MW38B-20190122	WG-1620-MW39B-20190108	WG-1620-MW40B-20190108
	Sample Date:	01/22/2019	01/22/2019	01/08/2019	01/08/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	0.0063
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	0.041
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	0.0048
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	0.052
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	0.000055 J	<0.000019	<0.000019	0.077
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.014	<0.000027	0.00062	0.12
Acenaphthylene	mg/L	0.00020	<0.000015	<0.000015	0.00083
Anthracene	mg/L	0.00017	0.00010	0.00016	0.0070
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.000037	0.000079 J
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	0.000045 J
Di-n-butylphthalate (DBP)	mg/L	0.000068 J	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	0.00014	<0.000020	<0.000020	0.069
Fluoranthene	mg/L	0.0013	<0.000010	0.000067 J	0.0041
Fluorene	mg/L	0.0024	<0.000030	<0.000030	0.087
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	0.00015	<0.000020	<0.000092	1.3
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	0.00058	<0.000021	0.000039 J	0.068

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Location ID:	MW-38A	MW-38B	MW-39B	MW-40B
Sample Name:	WG-1620-MW38A-20190122	WG-1620-MW38B-20190122	WG-1620-MW39B-20190108	WG-1620-MW40B-20190108
Sample Date:	01/22/2019	01/22/2019	01/08/2019	01/08/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.0011	<0.000019	0.000052 J	0.0020
<b>Metals</b>					
Arsenic	mg/L	0.0186	<0.000400	0.00365	0.0850
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-42B	MW-44A	MW-47C	MW-48C
	Sample Name:	WG-1620-MW42B-20190108	WG-1620-MW44A-20190122	WG-1620-MW47C-20190123	WG-1620-MW48C-20190110
	Sample Date:	01/08/2019	01/22/2019	01/23/2019	01/10/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	<0.00020	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	0.000095 J	0.0010
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	0.00038
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	0.037	<0.000027	0.000098 J
Acenaphthylene	mg/L	<0.000015	0.00036	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	0.00044	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.000061 J	<0.000037	<0.000056	<0.000037
Chrysene	mg/L	<0.000021	0.000026 J	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	0.000034 J	<0.000020
Fluoranthene	mg/L	0.00011	0.0058	0.000028 J	<0.000010
Fluorene	mg/L	<0.000030	0.0097	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.000020	0.00011	0.00083	0.0085
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	0.000052 J	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-42B</b>	<b>MW-44A</b>	<b>MW-47C</b>	<b>MW-48C</b>
<b>Sample Name:</b>	WG-1620-MW42B-20190108	WG-1620-MW44A-20190122	WG-1620-MW47C-20190123	WG-1620-MW48C-20190110
<b>Sample Date:</b>	01/08/2019	01/22/2019	01/23/2019	01/10/2019

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	0.0020
Pyrene	mg/L	0.00010	0.0033	0.000021 J	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.00216	0.0101	<0.000400	0.000924 J
Lead	mg/L	0.00412	<0.000600	0.000859 J	0.00141 J

## Notes:

< - Not detected at the associated reporting limit  
J - Estimated concentration  
"-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-49A	MW-50A	MW-51A	MW-51C
	Sample Name:	WG-1620-MW49A-20190123	WG-1620-MW50A-20190110	WG-1620-MW51A-20190110	WG-1620-MW51C-20190110
	Sample Date:	01/23/2019	01/10/2019	01/10/2019	01/10/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	0.0040	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	0.0031	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.0023	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	<0.00020	--	--	--
Xylenes (total)	mg/L	0.0087	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000055	<0.000037	0.000078 J	0.00013 J
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	0.000089 J	<0.000020	0.00012	0.00017
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-49A	MW-50A	MW-51A	MW-51C
Sample Name:	WG-1620-MW49A-20190123	WG-1620-MW50A-20190110	WG-1620-MW51A-20190110	WG-1620-MW51C-20190110
Sample Date:	01/23/2019	01/10/2019	01/10/2019	01/10/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.00120 J	0.00134 J	<0.000400	<0.000400
Lead	mg/L	0.00778	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable



Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-53C	MW-54C	MW-58A	MW-59A
Sample Name:	WG-1620-MW53C-20190114	WG-1620-MW54C-20190114	WG-1620-MW58A-20190123	WG-1620-MW59A-20190123
Sample Date:	01/14/2019	01/14/2019	01/23/2019	01/23/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	0.0011
Chlorobenzene	mg/L	<0.00030	<0.00030	0.00046 J
Ethylbenzene	mg/L	<0.00030	<0.00030	0.0032
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	0.0014
Vinyl chloride	mg/L	--	--	<0.00020
Xylenes (total)	mg/L	<0.00030	<0.00030	0.0050
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	0.00010 J
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	0.0014	0.000072 J
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	0.014	0.023
Acenaphthylene	mg/L	<0.000015	<0.00020	0.00038
Anthracene	mg/L	<0.000014	0.0013	0.0020
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	0.000039 J	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	0.000056 J	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	0.000096 J	<0.000070
Chrysene	mg/L	<0.000021	0.000038 J	0.000030 J
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	0.000032 J
Dibenzofuran	mg/L	<0.000020	0.015	0.013
Fluoranthene	mg/L	<0.000010	0.0020	0.0020
Fluorene	mg/L	<0.000030	0.0085	0.015
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.00025	0.019	0.00042
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	0.0052	0.0038

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Location ID:	MW-53C	MW-54C	MW-58A	MW-59A
Sample Name:	WG-1620-MW53C-20190114	WG-1620-MW54C-20190114	WG-1620-MW58A-20190123	WG-1620-MW59A-20190123
Sample Date:	01/14/2019	01/14/2019	01/23/2019	01/23/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	0.000074 J	<0.000035
Pyrene	mg/L	<0.000019	0.0010	0.00088	<0.000019
<b>Metals</b>					
Arsenic	mg/L	<0.000400	0.00123 J	0.00232	0.00243
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-59B	MW-59D	MW-59D	MW-60A
	Sample Name:	WG-1620-MW59B-20190123	WG-1620-MW59D-20190124	WG-1620-FD05-20190124	WG-1620-MW60A-20190111
	Sample Date:	01/23/2019	01/24/2019	01/24/2019 Duplicate	01/11/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	<0.00020	--	--	<0.00020
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.000033 J	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000056	<0.000037	<0.000037	<0.000092
Chrysene	mg/L	0.000036 J	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	0.000064 J
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	0.000051 J	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	0.000072 J	<0.000020	<0.000020	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-59B	MW-59D	MW-59D	MW-60A
Sample Name:	WG-1620-MW59B-20190123	WG-1620-MW59D-20190124	WG-1620-FD05-20190124	WG-1620-MW60A-20190111
Sample Date:	01/23/2019	01/24/2019	01/24/2019 Duplicate	01/11/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.000053 J	<0.000019	<0.000019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.000983 J	0.000765 J	0.000637 J	0.00453
Lead	mg/L	0.00108 J	0.000917 J	0.000727 J	<0.000600

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-61A	MW-62B	MW-63B	MW-64A
	Sample Name:	WG-1620-MW61A-20190123	WG-1620-MW62B-20190123	WG-1620-MW63B-20190114	WG-1620-MW64A-20190123
	Sample Date:	01/23/2019	01/23/2019	01/14/2019	01/23/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	0.35	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	0.00073 J	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	0.48	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	0.0071	<0.00020
Vinyl chloride	mg/L	<0.00020	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	0.11	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.00021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.00040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.00059	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.00042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.00021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	0.042	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.00020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.00047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.00027	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	0.0029	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	0.00017 J	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.00051	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.00020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.00030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.00037	<0.000037
Chrysene	mg/L	<0.000021	<0.000021	<0.00021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.00020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	0.0087	<0.000020
Fluoranthene	mg/L	<0.000010	<0.000010	<0.00010	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	0.0029	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.00025	<0.000025
Naphthalene	mg/L	<0.000020	<0.000020	2.1	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.00024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.00080	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	0.00094 J	<0.000021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-61A</b>	<b>MW-62B</b>	<b>MW-63B</b>	<b>MW-64A</b>
<b>Sample Name:</b>	<b>WG-1620-MW61A-20190123</b>	<b>WG-1620-MW62B-20190123</b>	<b>WG-1620-MW63B-20190114</b>	<b>WG-1620-MW64A-20190123</b>
<b>Sample Date:</b>	<b>01/23/2019</b>	<b>01/23/2019</b>	<b>01/14/2019</b>	<b>01/23/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.00035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	<0.00019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.000690 J	<0.000400	0.00338	<0.000400
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-65D	MW-66D	MW-67B	MW-68B
	Sample Name:	WG-1620-MW65D-20190124	WG-1620-MW66D-20190124	WG-1620-MW67B-20190124	WG-1620-MW68B-20190115
	Sample Date:	01/24/2019	01/24/2019	01/24/2019	01/15/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	2.0
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	0.00056 J
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	0.50
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	0.086
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	1.2
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.00021
2,4-Dimethylphenol	mg/L	<0.000090	<0.000040	<0.000040	0.050
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.00058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.00042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.00021
2-Methylnaphthalene	mg/L	0.00016	<0.000019	<0.000019	0.33
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.00020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.00047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	0.100
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	0.0012
Anthracene	mg/L	<0.000014	<0.000014	<0.000014	0.0080
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.00050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.00020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.00030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.000060 J	0.00017 J	0.000051 J	<0.00037
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.00021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.00020
Dibenzofuran	mg/L	0.000039 J	<0.000020	<0.000020	0.10
Fluoranthene	mg/L	0.000027 J	<0.000010	<0.000010	0.0031
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	0.057
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.00025
Naphthalene	mg/L	<0.0026	<0.000020	<0.000020	5.0
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.00024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.00079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	0.065



**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-65D	MW-66D	MW-67B	MW-68B
Sample Name:	WG-1620-MW65D-20190124	WG-1620-MW66D-20190124	WG-1620-MW67B-20190124	WG-1620-MW68B-20190115
Sample Date:	01/24/2019	01/24/2019	01/24/2019	01/15/2019

Parameters	Unit	MW-65D	MW-66D	MW-67B	MW-68B
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.00019	<0.000035	<0.000035	0.0019 J
Pyrene	mg/L	<0.000019	<0.000019	<0.000019	0.0015
<b>Metals</b>					
Arsenic	mg/L	0.00202	0.00204	<0.000400	0.0123
Lead	mg/L	<0.000600	<0.000600	0.00331	<0.000600

## Notes:

< - Not detected at the associated reporting limit  
J - Estimated concentration  
"--" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Location ID:	MW-68B	MW-68C	MW-69A	MW-71B
Sample Name:	WG-1620-FD03-20190115	WG-1620-MW68C-20190115	WG-1620-MW69A-20190110	WG-1620-MW71B-20190115
Sample Date:	01/15/2019 Duplicate	01/15/2019	01/10/2019	01/15/2019
Parameters	Unit			
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020
Benzene	mg/L	1.9	<0.00020	0.0024
Chlorobenzene	mg/L	0.00056 J	<0.00030	<0.00030
Ethylbenzene	mg/L	0.49	<0.00030	0.00093 J
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.084	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--
Xylenes (total)	mg/L	1.2	0.0011	<0.00030
<b>Semi-volatile Organic Compounds</b>				
1,2-Diphenylhydrazine	mg/L	<0.00021	<0.00021	<0.00021
2,4-Dimethylphenol	mg/L	0.058	<0.00040	<0.00040
2,4-Dinitrotoluene	mg/L	0.0013 J	<0.00059	<0.00058
2,6-Dinitrotoluene	mg/L	<0.00042	<0.00042	<0.00042
2-Chloronaphthalene	mg/L	<0.00021	<0.00021	<0.00021
2-Methylnaphthalene	mg/L	0.31	<0.00077	<0.00019
4,6-Dinitro-2-methylphenol	mg/L	0.0011 J	<0.00020	<0.00020
4-Nitrophenol	mg/L	0.0074 J	<0.00047	<0.00047
Acenaphthene	mg/L	0.13	<0.00027	<0.00027
Acenaphthylene	mg/L	0.0014	<0.00015	<0.00015
Anthracene	mg/L	0.0098	<0.00014	<0.00014
Benzo(a)anthracene	mg/L	<0.00050	<0.00051	<0.00050
Benzo(a)pyrene	mg/L	<0.00020	<0.00020	0.00021 J
bis(2-Chloroethoxy)methane	mg/L	0.0036	<0.00030	<0.00030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.00037	<0.00044	<0.00037
Chrysene	mg/L	<0.00021	<0.00021	<0.00021
Di-n-butylphthalate (DBP)	mg/L	<0.00020	<0.00020	0.00022 J
Dibenzofuran	mg/L	0.12	0.00066 J	<0.00020
Fluoranthene	mg/L	0.0039	<0.00010	0.00039 J
Fluorene	mg/L	0.065	0.00057 J	<0.00030
N-Nitrosodiphenylamine	mg/L	0.0051	<0.00025	<0.00025
Naphthalene	mg/L	3.8	<0.00079	<0.00020
Nitrobenzene	mg/L	<0.00024	<0.00024	<0.00024
Pentachlorophenol	mg/L	<0.00079	<0.00080	<0.00079
Phenanthrene	mg/L	0.073	0.00062 J	<0.00021

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-68B</b>	<b>MW-68C</b>	<b>MW-69A</b>	<b>MW-71B</b>
<b>Sample Name:</b>	WG-1620-FD03-20190115	WG-1620-MW68C-20190115	WG-1620-MW69A-20190110	WG-1620-MW71B-20190115
<b>Sample Date:</b>	01/15/2019 Duplicate	01/15/2019	01/10/2019	01/15/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	0.0015 J	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.0018	<0.000019	<0.000019	0.000037 J
<b>Metals</b>					
Arsenic	mg/L	0.0125	<0.000400	0.000717 J	0.00158 J
Lead	mg/L	<0.000600	<0.000600	0.000712 J	0.000845 J

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-72B</b>	<b>MW-74B</b>	<b>MW-76C</b>	<b>MW-77A</b>
<b>Sample Name:</b>	<b>WG-1620-MW72B-20190124</b>	<b>WG-1620-MW74B-20190123</b>	<b>WG-1620-MW76C-20190123</b>	<b>WG-1620-MW77A-201290201</b>
<b>Sample Date:</b>	<b>01/24/2019</b>	<b>01/23/2019</b>	<b>01/23/2019</b>	<b>02/01/2019</b>

Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	0.011	<0.0020	<0.00020	<0.00020
Benzene	mg/L	0.63	0.83	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.0030	<0.0030	<0.00030	<0.00030
Ethylbenzene	mg/L	0.20	0.22	<0.00030	<0.00030
Methylene chloride	mg/L	<0.010	<0.010	<0.0010	<0.0010
Toluene	mg/L	0.58	0.69	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	0.63	0.63	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.00021	<0.00021	<0.000021	<0.000022
2,4-Dimethylphenol	mg/L	2.0	9.0	0.0041	<0.000042
2,4-Dinitrotoluene	mg/L	<0.00058	<0.00058	<0.000058	<0.000060
2,6-Dinitrotoluene	mg/L	<0.00042	<0.00042	<0.000042	<0.000044
2-Chloronaphthalene	mg/L	<0.00021	<0.00021	<0.000021	<0.000022
2-Methylnaphthalene	mg/L	0.071	0.22	0.00031	<0.000020
4,6-Dinitro-2-methylphenol	mg/L	<0.00020	<0.00020	<0.000020	<0.000021
4-Nitrophenol	mg/L	0.0073 J	<0.00047	<0.000047	<0.000049
Acenaphthene	mg/L	0.019	0.098	0.00011	<0.000028
Acenaphthylene	mg/L	0.00069 J	0.0032	<0.000015	<0.000016
Anthracene	mg/L	0.0015	0.0074	0.000041 J	<0.000015
Benzo(a)anthracene	mg/L	<0.00050	<0.00050	<0.000050	<0.000052
Benzo(a)pyrene	mg/L	<0.00020	<0.00020	<0.000020	<0.000021
bis(2-Chloroethoxy)methane	mg/L	<0.00030	<0.00030	<0.000030	<0.000031
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.00037	<0.00037	<0.000091	0.00010 J
Chrysene	mg/L	<0.00021	<0.00021	<0.000021	<0.000022
Di-n-butylphthalate (DBP)	mg/L	<0.00020	<0.00020	0.000027 J	0.000081 J
Dibenzofuran	mg/L	0.017	0.079	0.00011	<0.000021
Fluoranthene	mg/L	<0.00010	0.0038	<0.000010	<0.000010
Fluorene	mg/L	0.0091	0.056	0.000076 J	<0.000031
N-Nitrosodiphenylamine	mg/L	<0.00025	<0.00025	<0.000025	<0.000026
Naphthalene	mg/L	1.2	4.0	0.0070	<0.000021
Nitrobenzene	mg/L	<0.00024	<0.0024	<0.000024	<0.000025
Pentachlorophenol	mg/L	<0.00079	<0.00079	<0.000079	<0.000082
Phenanthrene	mg/L	0.0042	0.046	0.000086 J	<0.000022

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Location ID:	MW-72B	MW-74B	MW-76C	MW-77A
Sample Name:	WG-1620-MW72B-20190124	WG-1620-MW74B-20190123	WG-1620-MW76C-20190123	WG-1620-MW77A-20190201
Sample Date:	01/24/2019	01/23/2019	01/23/2019	02/01/2019

Parameters	Unit				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	0.58	5.0	0.0012	<0.000036
Pyrene	mg/L	<0.00019	0.0020	<0.000019	<0.000020
<b>Metals</b>					
Arsenic	mg/L	0.00106 J	0.00140 J	0.000579 J	0.00207
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "--" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-79A	MW-80B	MW-81B	MW-82B
	Sample Name:	WG-1620-MW79A-20190123	WG-1620-MW80B-20190110	WG-1620-MW81B-20190110	WG-1620-MW82B-20190122
	Sample Date:	01/23/2019	01/10/2019	01/10/2019	01/22/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.0020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	0.45	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.0030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	0.19	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.55	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	0.54	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.00021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	2.5	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.00058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.00042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.00021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	0.10	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.00020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.00047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	0.039	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	0.0015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	0.0021	<0.000014	<0.000014	0.000042 J
Benzo(a)anthracene	mg/L	<0.00050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.00020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.00030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.00037	<0.000037	0.000058 J	<0.000037
Chrysene	mg/L	<0.00021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.00020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	0.037	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	0.0010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	0.022	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.00025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	1.9	0.000068 J	0.00016	<0.000020
Nitrobenzene	mg/L	<0.00024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.00079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	0.012	<0.000021	<0.000021	<0.000021

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Location ID:	MW-79A	MW-80B	MW-81B	MW-82B
Sample Name:	WG-1620-MW79A-20190123	WG-1620-MW80B-20190110	WG-1620-MW81B-20190110	WG-1620-MW82B-20190122
Sample Date:	01/23/2019	01/10/2019	01/10/2019	01/22/2019

Parameters	Unit	MW-79A	MW-80B	MW-81B	MW-82B
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	0.51	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	0.00063 J	<0.000019	<0.000019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.0133	0.00180 J	0.00116 J	0.00838
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable



Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

<b>Location ID:</b>	<b>MW-83B</b>	<b>MW-83C</b>	<b>MW-84B</b>	<b>MW-85C</b>
<b>Sample Name:</b>	WG-1620-MW83B-20190115	WG-1620-MW83C-20190115	WG-1620-MW84B-20190124	WG-1620-MW85C-201290201
<b>Sample Date:</b>	01/15/2019	01/15/2019	01/24/2019	02/01/2019

Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	0.032	<0.00020	0.0024	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	0.091	<0.00030	0.0051	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.0082	<0.00020	0.00056 J	<0.00020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	0.100	<0.00030	0.0033	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	0.000087 J	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.00016	<0.000041
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000059
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000043
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	0.086	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000048
Acenaphthene	mg/L	0.026	<0.000027	0.000032 J	<0.000028
Acenaphthylene	mg/L	0.00034	<0.000015	0.000043 J	<0.000015
Anthracene	mg/L	0.0012	<0.000014	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000051
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000031
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000064	<0.000037	<0.000037	<0.000038
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	0.00015 J	0.000060 J	<0.000020	<0.000020
Dibenzofuran	mg/L	0.020	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	0.00051	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	0.0099	<0.000030	<0.000030	<0.000031
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000026
Naphthalene	mg/L	1.6	<0.00036	<0.000020	<0.000020
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000081
Phenanthrene	mg/L	0.0074	<0.000021	<0.000021	<0.000021

**Analytical Results Summary  
 Site Wide Groundwater Monitoring Event  
 Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
 Houston, Texas  
 January-February 2019**

<b>Location ID:</b>	<b>MW-83B</b>	<b>MW-83C</b>	<b>MW-84B</b>	<b>MW-85C</b>
<b>Sample Name:</b>	<b>WG-1620-MW83B-20190115</b>	<b>WG-1620-MW83C-20190115</b>	<b>WG-1620-MW84B-20190124</b>	<b>WG-1620-MW85C-201290201</b>
<b>Sample Date:</b>	<b>01/15/2019</b>	<b>01/15/2019</b>	<b>01/24/2019</b>	<b>02/01/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	0.000038 J	<0.000035	<0.000036
Pyrene	mg/L	0.00030	<0.000019	<0.000019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.0916	0.00616	0.00219	0.00136 J
Lead	mg/L	<0.000600	<0.000600	<0.000600	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "--" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-86C	MW-86C	MW-87C	MW-88C
	Sample Name:	WG-1620-MW86C-20190111	WG-1620-FD02-20190111	WG-1620-MW87C-20190122	WG-1620-MW88C-20190108
	Sample Date:	01/11/2019	01/11/2019 Duplicate	01/22/2019	01/08/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.00030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	<0.000027
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	<0.000014	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000057	<0.00010	<0.000037	<0.000037
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	0.000072 J	0.00011 J	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	0.000079 J	<0.000020	<0.000020	<0.000059
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

<b>Location ID:</b>	<b>MW-86C</b>	<b>MW-86C</b>	<b>MW-87C</b>	<b>MW-88C</b>
<b>Sample Name:</b>	<b>WG-1620-MW86C-20190111</b>	<b>WG-1620-FD02-20190111</b>	<b>WG-1620-MW87C-20190122</b>	<b>WG-1620-MW88C-20190108</b>
<b>Sample Date:</b>	<b>01/11/2019</b>	<b>01/11/2019 Duplicate</b>	<b>01/22/2019</b>	<b>01/08/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	<0.000019	<0.000019
<b>Metals</b>					
Arsenic	mg/L	0.00402	0.00405	0.000587 J	0.000864 J
Lead	mg/L	<0.000600	<0.000600	0.00124 J	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "-" Not Applicable

Table 2

**Analytical Results Summary**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

	Location ID:	MW-89B	MW-90B	P-11	TW-41B
	Sample Name:	WG-1620-MW89B-20190122	WG-1620-MW90B-20190122	WG-1620-P11-20190109	WG-1620-TW41B-20190109
	Sample Date:	01/22/2019	01/22/2019	01/09/2019	01/09/2019
Parameters	Unit				
<b>Volatile Organic Compounds</b>					
1,2-Dichloroethane	mg/L	<0.00020	<0.00020	<0.00020	<0.0020
Benzene	mg/L	<0.00020	<0.00020	<0.00020	<0.0020
Chlorobenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.0030
Ethylbenzene	mg/L	<0.00030	<0.00030	<0.00030	<0.0030
Methylene chloride	mg/L	<0.0010	<0.0010	<0.0010	<0.010
Toluene	mg/L	<0.00020	<0.00020	<0.00020	<0.0020
Vinyl chloride	mg/L	--	--	--	--
Xylenes (total)	mg/L	<0.00030	<0.00030	<0.00030	<0.0030
<b>Semi-volatile Organic Compounds</b>					
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000059	<0.000058	<0.000058	<0.000058
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	<0.000019	<0.000019	0.0098
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047	<0.000047	<0.000047
Acenaphthene	mg/L	<0.000027	<0.000027	<0.000027	0.058
Acenaphthylene	mg/L	<0.000015	<0.000015	<0.000015	0.00091
Anthracene	mg/L	<0.000014	<0.000014	<0.000014	0.0023
Benzo(a)anthracene	mg/L	<0.000051	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	<0.000020	<0.000020	<0.000020	0.000097 J
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	<0.000037	<0.000037	<0.000037	<0.000037
Chrysene	mg/L	<0.000021	<0.000021	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020
Dibenzofuran	mg/L	<0.000020	<0.000020	<0.000020	0.026
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	0.0014
Fluorene	mg/L	<0.000030	<0.000030	<0.000030	0.035
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025	<0.000025	<0.000025
Naphthalene	mg/L	<0.000020	0.000045 J	<0.000020	0.061
Nitrobenzene	mg/L	<0.000024	<0.000024	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000080	<0.000079	<0.000079	<0.000079
Phenanthrene	mg/L	<0.000021	<0.000021	<0.000021	0.0035

**Analytical Results Summary  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

<b>Location ID:</b>	<b>MW-89B</b>	<b>MW-90B</b>	<b>P-11</b>	<b>TW-41B</b>
<b>Sample Name:</b>	<b>WG-1620-MW89B-20190122</b>	<b>WG-1620-MW90B-20190122</b>	<b>WG-1620-P11-20190109</b>	<b>WG-1620-TW41B-20190109</b>
<b>Sample Date:</b>	<b>01/22/2019</b>	<b>01/22/2019</b>	<b>01/09/2019</b>	<b>01/09/2019</b>

<b>Parameters</b>	<b>Unit</b>				
<b>Semi-volatile Organic Compounds (Continued)</b>					
Phenol	mg/L	<0.000035	<0.000035	<0.000035	<0.000035
Pyrene	mg/L	<0.000019	<0.000019	<0.000019	0.00056
<b>Metals</b>					
Arsenic	mg/L	0.000683 J	0.00346	0.0183	0.125
Lead	mg/L	<0.000600	<0.000600	0.00192 J	<0.000600

Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration
- "--" Not Applicable

Table 3

**Analytical Methods**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Extraction to Analysis (Days)
VOCs	SW-846 8260C	Water	-	14
SVOCs	SW-846 8270	Water	7	40
Metals	SW-846 6020A	Water	-	180

## Notes:

- VOCs - Volatile Organic Compounds  
SVOCs - Semi-volatile Organic Compounds  
"-" - Not Applicable

## Method References:

- SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions



Table 4

**Qualified Sample Data Due to Analyte Concentrations in the Field Blanks**  
**Site Wide Groundwater Monitoring Event**  
**Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works**  
**Houston, Texas**  
**January-February 2019**

Parameter	Field Blank ID	Blank Date (dd/mm/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
SVOCs	WQ-1620-FB01-20190108	01/08/2019	Naphthalene	0.000096 J	WG-1620-MW13-20190108	0.00022	<0.00022	mg/L
					WG-1620-MW15A-20190108	0.00032	<0.00032	mg/L
					WG-1620-MW15C-20190108	0.00032	<0.00032	mg/L
					WG-1620-MW39B-20190108	0.000092 J	<0.000092	mg/L
					WG-1620-MW88C-20190108	0.000059 J	<0.000059	mg/L
SVOCs	WQ-1620-FB02-20190109	01/09/2019	Naphthalene	0.00031	WG-1620-MW12A-20190109	0.00026	<0.00026	mg/L
					WG-1620-MW12C-20190109	0.00017	<0.00017	mg/L
SVOCs	WQ-1620-FB03-20190111	01/11/2019	bis(2-Ethylhexyl)phthalate (DEHP)	0.000058 J	WG-1620-FD02-20190111	0.00010 J	<0.00010	mg/L
					WG-1620-MW60A-20190111	0.000092 J	<0.000092	mg/L
					WG-1620-MW86C-20190111	0.000057 J	<0.000057	mg/L
SVOCs	WQ-1620-FB04-20190114	01/14/2019	2-Methylnaphthalene	0.00021	WG-1620-MW28A-20190114	0.000055 J	<0.000055	mg/L
			Acenaphthylene	0.000045 J	WG-1620-MW54C-20190114	0.00020	<0.00020	mg/L
			Dibenzofuran	0.000026 J	WG-1620-MW28A-20190114	0.00011	<0.00011	mg/L
			Naphthalene	0.0031	WG-1620-MW28A-20190114	0.0024	<0.0024	mg/L
					WG-1620-MW36A-20190114	0.000062 J	<0.000062	mg/L
		WG-1620-MW53C-20190114	0.00025	<0.00025	mg/L			
SVOCs	WQ-1620-FB05-20190115	01/15/2019	2-Methylnaphthalene	0.000046 J	WG-1620-MW25A-20190115	0.000051 J	<0.000051	mg/L
					WG-1620-MW26A-20190115	0.000090 J	<0.000090	mg/L
					WG-1620-MW34CR-20190115	0.000079 J	<0.000079	mg/L
			bis(2-Ethylhexyl)phthalate (DEHP)	0.000057 J	WG-1620-MW68C-20190115	0.000077 J	<0.000077	mg/L
					WG-1620-MW25A-20190115	0.000078 J	<0.000078	mg/L
					WG-1620-MW35B-20190115	0.00014 J	<0.00014	mg/L
					WG-1620-MW68C-20190115	0.000044 J	<0.000044	mg/L

Table 4

**Qualified Sample Data Due to Analyte Concentrations in the Field Blanks  
Site Wide Groundwater Monitoring Event  
Union Pacific Railroad (UPRR) / Houston TX-Wood Preserving Works  
Houston, Texas  
January-February 2019**

Parameter	Field Blank ID	Blank Date (dd/mm/yyyy)	Analyte	Blank Result	Associated Sample ID	Original Result	Qualified Result	Units
SVOCs	WQ-1620-FB05-20190115	01/15/2019	bis(2-Ethylhexyl)phthalate (DEHP) Naphthalene	0.000057 J	WG-1620-MW83B-20190115	0.000064 J	<0.000064	mg/L
				0.000056	WG-1620-MW25A-20190115	0.000029	<0.000029	mg/L
					WG-1620-MW26A-20190115	0.000049	<0.000049	mg/L
					WG-1620-MW34CR-20190115	0.000069	<0.000069	mg/L
					WG-1620-MW68C-20190115	0.000079	<0.000079	mg/L
					WG-1620-MW83C-20190115	0.000036	<0.000036	mg/L
SVOCs	WQ-1620-FB07-20190123	01/23/2019	bis(2-Ethylhexyl)phthalate (DEHP)	0.000053 J	WG-1620-MW32AR-20190123	0.000044 J	<0.000044	mg/L
					WG-1620-MW47C-20190123	0.000056 J	<0.000056	mg/L
					WG-1620-MW49A-20190123	0.000055 J	<0.000055	mg/L
					WG-1620-MW58A-20190123	0.000070 J	<0.000070	mg/L
					WG-1620-MW59B-20190123	0.000056 J	<0.000056	mg/L
					WG-1620-MW76C-20190123	0.000091 J	<0.000091	mg/L
SVOCs	WQ-1620-FB08-20190124	01/24/2019	2,4-Dimethylphenol	0.000057	WG-1620-MW19C-20190124	0.000032	<0.000032	mg/L
					WG-1620-MW65D-20190124	0.000090 J	<0.000090	mg/L
					WG-1620-MW84B-20190124	0.00016 J	<0.00016	mg/L
			Naphthalene	0.000075	WG-1620-MW19C-20190124	0.00036	<0.00036	mg/L
					WG-1620-MW65D-20190124	0.0026	<0.0026	mg/L
			Phenol	0.000041	WG-1620-MW19C-20190124	0.00013 J	<0.00013	mg/L
					WG-1620-MW65D-20190124	0.00019 J	<0.00019	mg/L

Notes:

SVOCs - Semi-volatile Organic Compounds

< - Not detected at the associated reporting limit

J - Estimated concentration

**Attachment A**  
**Laboratory NELAP Certificate**



## Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to



# ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses ([www.tceq.texas.gov/goto/lab](http://www.tceq.texas.gov/goto/lab)). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704231-18-21

Effective Date: 5/1/2018

Expiration Date: 4/30/2019

A handwritten signature in black ink, reading "Stephani Bergesen Perdue".

Executive Director Texas Commission on  
Environmental Quality



# Texas Commission on Environmental Quality



## NELAP - Recognized Laboratory Fields of Accreditation

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-18-21  
Expiration Date: 4/30/2019  
Issue Date: 5/1/2018

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: *Drinking Water*

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Copper	TX	1055	10014605
Lead	TX	1075	10014605



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**Matrix: Non-Potable Water**

Method	Analyte	AB	Analyte ID	Method ID
EPA 1010	Ignitability	TX	1780	10116606
EPA 110.1	Color	TX	1605	10005206
EPA 120.1	Conductivity	TX	1610	10006403
EPA 1311	TCLP	TX	849	10118806
EPA 1312	SPLP	TX	850	10119003
EPA 150.1	pH	TX	1900	10008409
EPA 160.1	Residue-filterable (TDS)	TX	1955	10009208
EPA 160.2	Residue-nonfilterable (TSS)	TX	1960	10009606
EPA 160.3	Residue-total (total solids)	TX	1950	10010001
EPA 160.4	Residue-volatile	TX	1970	10010409
EPA 1613		AB	Analyte ID	Method ID



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**Matrix: Non-Potable Water**

1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

**Method EPA 1664**

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

**Method EPA 180.1**

Analyte	AB	Analyte ID	Method ID
Turbidity	TX	2055	10011606





# Texas Commission on Environmental Quality



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Expiration Date: 4/30/2019

Issue Date: 5/1/2018

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Matrix: *Non-Potable Water*

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605





# Texas Commission on Environmental Quality

## NELAP - Recognized Laboratory Fields of Accreditation



ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-18-21  
Expiration Date: 4/30/2019

Issue Date: 5/1/2018

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**Matrix: Non-Potable Water**

**Method** EPA 245.1

Analyte	AB	Analyte ID	Method ID
Mercury	TX	1095	10036609

**Method** EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

**Method** EPA 305.1

Analyte	AB	Analyte ID	Method ID
Acidity, as CaCO <sub>3</sub>	TX	1500	10276207

**Method** EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO <sub>3</sub>	TX	1505	10054805

**Method** EPA 325.1

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10056801

**Method** EPA 335.1

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10060001

**Method** EPA 335.2

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10278203

**Method** EPA 335.3

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061004



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**Matrix: Non-Potable Water**

Method	Analyte	AB	Analyte ID	Method ID
EPA 335.4	Total cyanide	TX	1645	10061402
EPA 350.3	Ammonia as N	TX	1515	10064401
EPA 351.3	Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	10065802
EPA 360.1	Oxygen, dissolved	TX	1880	10069008
EPA 365.3	Orthophosphate as P	TX	1870	10070801
	Phosphorus	TX	1910	10070801
EPA 375.4	Sulfate	TX	2000	10073800
EPA 376.1	Sulfide	TX	2005	10074201
	Biochemical oxygen demand (BOD)	TX	1530	10075602
EPA 405.1	Carbonaceous BOD, CBOD	TX	1555	10075602
	Chemical oxygen demand (COD)	TX	1565	10077404
EPA 415.1	Total Organic Carbon (TOC)	TX	2040	10078407



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**Matrix: Non-Potable Water**

**Method EPA 420.1**

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10079400

**Method EPA 420.4**

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

**Method EPA 425.1**

Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	TX	2025	10080601

**Method EPA 602**

Analyte	AB	Analyte ID	Method ID
Benzene	TX	4375	10102202
Ethylbenzene	TX	4765	10102202
m+p-xylene	TX	5240	10102202
Methyl tert-butyl ether (MTBE)	TX	5000	10102202
o-Xylene	TX	5250	10102202
Toluene	TX	5140	10102202
Xylene (total)	TX	5260	10102202

**Method EPA 6020**

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419



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**Matrix: Non-Potable Water**

Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

**Method EPA 608**

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603



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**Matrix: Non-Potable Water**

Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

**Method EPA 624**

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207



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**Matrix: *Non-Potable Water***

1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207





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**Matrix: Non-Potable Water**

Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

**Method EPA 625**

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401
2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401



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**Matrix: Non-Potable Water**

Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401
Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401





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**Matrix: Non-Potable Water**

n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401
<b>Method EPA 7196</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Chromium (VI)	TX	1045	10162206
<b>Method EPA 7470</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Mercury	TX	1095	10165603
<b>Method EPA 8011</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009
<b>Method EPA 8015</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203



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**Matrix: Non-Potable Water**

Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203
<b>Method EPA 8021</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400
<b>Method EPA 8081</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402



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**Matrix: Non-Potable Water**

Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

**Method EPA 8082**

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

**Method EPA 8151**

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichloroprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

**Method EPA 8260**

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404



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**Matrix: Non-Potable Water**

1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404



# Texas Commission on Environmental Quality



## NELAP - Recognized Laboratory Fields of Accreditation

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-18-21  
Expiration Date: 4/30/2019  
Issue Date: 5/1/2018

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**Matrix: Non-Potable Water**

4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404



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**Matrix: *Non-Potable Water***

Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404





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**Matrix: Non-Potable Water**

T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

**Method EPA 8270**

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203





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**Matrix: Non-Potable Water**

2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203



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**Matrix: Non-Potable Water**

4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203



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**Matrix: *Non-Potable Water***

Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203



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**Matrix: *Non-Potable Water***

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203



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**Matrix: *Non-Potable Water***

n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203



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### Matrix: *Non-Potable Water*

Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

### Method EPA 8280

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10186808
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10186808
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10186808
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10186808
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10186808
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10186808
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10186808
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10186808
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10186808
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10186808
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10186808
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10186808
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10186808
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10186808
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	TX	9549	10186808
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10186808
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10186808
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10186808
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10186808
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10186808
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10186808
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10186808
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10186808
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10186808
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10186808

### Method EPA 8290

Analyte	AB	Analyte ID	Method ID
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# Texas Commission on Environmental Quality



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**Matrix: Non-Potable Water**

1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

**Method EPA 8315**

**Analyte**

Formaldehyde

**AB**

TX

**Analyte ID**

4815

**Method ID**

10187801

**Method EPA 8316**

**Analyte**

Acrylamide

**AB**

TX

**Analyte ID**

4330

**Method ID**

10188202





# Texas Commission on Environmental Quality



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**Matrix: Non-Potable Water**

**Method EPA 8330**

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

**Method EPA 9012**

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10243206
Total cyanide	TX	1645	10243206

**Method EPA 9014**

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

**Method EPA 9038**

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10196608

**Method EPA 9040**

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	10196802



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**Matrix: Non-Potable Water**

**Method EPA 9050**

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10198604

**Method EPA 9056**

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

**Method EPA 9060**

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10200201

**Method EPA 9065**

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

**Method EPA 9066**

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200609

**Method EPA 9250**

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

**Method EPA RSK 175**

Analyte	AB	Analyte ID	Method ID
2-methylpropane (Isobutane)	TX	4942	10212905
Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905



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**Matrix: Non-Potable Water**

n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905
<b>Method</b> HACH 8000			
<b>Analyte</b> Chemical oxygen demand (COD)	<b>AB</b> TX	<b>Analyte ID</b> 1565	<b>Method ID</b> 60003001
<b>Method</b> SM 2120 B			
<b>Analyte</b> Color	<b>AB</b> TX	<b>Analyte ID</b> 1605	<b>Method ID</b> 20223807
<b>Method</b> SM 2310 B (4a)			
<b>Analyte</b> Acidity, as CaCO <sub>3</sub>	<b>AB</b> TX	<b>Analyte ID</b> 1500	<b>Method ID</b> 20002806
<b>Method</b> SM 2320 B			
<b>Analyte</b> Alkalinity as CaCO <sub>3</sub>	<b>AB</b> TX	<b>Analyte ID</b> 1505	<b>Method ID</b> 20045005
<b>Method</b> SM 2340 B			
<b>Analyte</b> Total hardness as CaCO <sub>3</sub>	<b>AB</b> TX	<b>Analyte ID</b> 1755	<b>Method ID</b> 20046008
<b>Method</b> SM 2510 B			
<b>Analyte</b> Conductivity	<b>AB</b> TX	<b>Analyte ID</b> 1610	<b>Method ID</b> 20048004
<b>Method</b> SM 2540 B			
<b>Analyte</b> Residue-total (total solids)	<b>AB</b> TX	<b>Analyte ID</b> 1950	<b>Method ID</b> 20004608
<b>Method</b> SM 2540 C			
<b>Analyte</b> Residue-filterable (TDS)	<b>AB</b> TX	<b>Analyte ID</b> 1955	<b>Method ID</b> 20049803
<b>Method</b> SM 2540 D			
<b>Analyte</b> Residue-nonfilterable (TSS)	<b>AB</b> TX	<b>Analyte ID</b> 1960	<b>Method ID</b> 20004802
<b>Method</b> SM 3500-Cr B			
<b>Analyte</b> Chromium (VI)	<b>AB</b> TX	<b>Analyte ID</b> 1045	<b>Method ID</b> 20065809



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**Matrix: Non-Potable Water**

Method	Analyte	AB	Analyte ID	Method ID
SM 4500-Cl <sup>-</sup> F	Total residual chlorine	TX	1940	20080482
SM 4500-Cl <sup>-</sup> E	Chloride	TX	1575	20019209
SM 4500-CN <sup>-</sup> C	Total cyanide	TX	1645	20020808
SM 4500-CN <sup>-</sup> E	Total cyanide	TX	1645	20021209
SM 4500-CN <sup>-</sup> G	Amenable cyanide	TX	1510	20021607
SM 4500-H <sup>+</sup> B	pH	TX	1900	20104603
SM 4500-NH <sub>3</sub> D	Ammonia as N	TX	1515	20108809
	Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809
SM 4500-NH <sub>3</sub> F	Ammonia as N	TX	1515	20023001
SM 4500-O G	Oxygen, dissolved	TX	1880	20025405
SM 4500-P E	Orthophosphate as P	TX	1870	20025803
	Phosphorus	TX	1910	20025803



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**Matrix: Non-Potable Water**

Method	AB	Analyte ID	Method ID
Method SM 4500-S2 <sup>-</sup> F Analyte Sulfide	TX	2005	20126209
Method SM 4500-SiO <sub>2</sub> D Analyte Silica as SiO <sub>2</sub>	TX	1990	20127202
Method SM 4500-SO <sub>3</sub> <sup>-</sup> B Analyte Sulfite	TX	2015	20026806
Method SM 5210 B Analyte Biochemical oxygen demand (BOD) Carbonaceous BOD, CBOD	TX TX	1530 1555	20027401 20027401
Method SM 5310 B Analyte Total Organic Carbon (TOC)	TX	2040	20137206
Method SM 5310 C Analyte Total Organic Carbon (TOC)	TX	2040	20138209
Method SM 5540 C Analyte Surfactants - MBAS	TX	2025	20144405
Method TCEQ 1005 Analyte Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208



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**Matrix: Solid & Chemical Materials**

**Method** ASTM D2216

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Moisture	TX	10337	ASTM D2216-05

**Method** EPA 1010

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Ignitability	TX	1780	10116606

**Method** EPA 1030

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Ignitability	TX	1780	10117201

**Method** EPA 1311

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
TCLP	TX	849	10118806

**Method** EPA 1312

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
SPLP	TX	850	10119003

**Method** EPA 1668

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Decachlorobiphenyls	TX	10332	10262007
Dichlorobiphenyls	TX	464	10262007
Heptachlorobiphenyls	TX	486	10262007
Hexachlorobiphenyls	TX	487	10262007
Monochlorobiphenyls	TX	501	10262007
Nonachlorobiphenyls	TX	507	10262007
Octachlorobiphenyls	TX	508	10262007
Pentachlorobiphenyls	TX	515	10262007
Tetrachlorobiphenyls	TX	528	10262007
Trichlorobiphenyls	TX	541	10262007

**Method** EPA 200.8

<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Uranium	TX	3035	10014605





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**Matrix: Solid & Chemical Materials**

**Method EPA 300.0**

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

**Method EPA 310.1**

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

**Method EPA 350.3**

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

**Method EPA 365.3**

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

**Method EPA 6020**

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204





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**Matrix: Solid & Chemical Materials**

Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204
Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204
<b>Method EPA 7196</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Chromium (VI)	TX	1045	10162206
<b>Method EPA 7470</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Mercury	TX	1095	10165603
<b>Method EPA 7471</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Mercury	TX	1095	10166004
<b>Method EPA 8015</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Diesel range organics (DRO)	TX	9369	10173203



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**Matrix: Solid & Chemical Materials**

Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

**Method EPA 8021**

Analyte	AB	Analyte ID	Method ID
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

**Method EPA 8081**

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402



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**Matrix: Solid & Chemical Materials**

Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

**Method EPA 8082**

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

**Method EPA 8151**

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichloroprop, Weedone)	TX	8605	10183003



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**Matrix: Solid & Chemical Materials**

MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

**Method EPA 8260**

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404



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**Matrix: Solid & Chemical Materials**

2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404



# Texas Commission on Environmental Quality



## NELAP - Recognized Laboratory Fields of Accreditation

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-18-21  
Expiration Date: 4/30/2019  
Issue Date: 5/1/2018

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**Matrix: Solid & Chemical Materials**

Diethyl ether	TX	4725	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404





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**Matrix: Solid & Chemical Materials**

sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

**Method EPA 8270**

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203





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**Matrix: Solid & Chemical Materials**

1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylamino fluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203



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**Matrix: Solid & Chemical Materials**

4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203



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**Matrix: Solid & Chemical Materials**

Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203
Fluoranthene	TX	6265	10185203



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**Matrix: Solid & Chemical Materials**

Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203



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**Matrix: Solid & Chemical Materials**

Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

**Method EPA 8280**

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10186808
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10186808
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10186808
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10186808
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10186808
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10186808
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10186808
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10186808
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10186808





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**Matrix: Solid & Chemical Materials**

1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10186808
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10186808
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10186808
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10186808
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10186808
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	TX	9549	10186808
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10186808
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10186808
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10186808
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10186808
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10186808
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10186808
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10186808
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10186808
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10186808
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10186808

**Method EPA 8290**

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209



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### Matrix: Solid & Chemical Materials

1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209
<b>Method EPA 8315</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Formaldehyde	TX	4815	10187801
<b>Method EPA 8316</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Acrylamide	TX	4330	10188202
<b>Method EPA 8330</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807





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**Matrix: Solid & Chemical Materials**

Methyl-2,4,6-trinitrophenylNitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807
<b>Method EPA 9014</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803
<b>Method EPA 9038</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Sulfate	TX	2000	10196608
<b>Method EPA 9040</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802
<b>Method EPA 9045</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805
<b>Method EPA 9050</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Conductivity	TX	1610	10198604
<b>Method EPA 9056</b>			
<b>Analyte</b>	<b>AB</b>	<b>Analyte ID</b>	<b>Method ID</b>
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209



# Texas Commission on Environmental Quality



## NELAP - Recognized Laboratory Fields of Accreditation

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-18-21  
Expiration Date: 4/30/2019  
Issue Date: 5/1/2018

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

**Matrix: Solid & Chemical Materials**

Sulfate	TX	2000	10199209
<b>Method</b> EPA 9060			
<b>Analyte</b> Total Organic Carbon (TOC)	<b>AB</b> TX	<b>Analyte ID</b> 2040	<b>Method ID</b> 10200201
<b>Method</b> EPA 9065			
<b>Analyte</b> Total phenolics	<b>AB</b> TX	<b>Analyte ID</b> 1905	<b>Method ID</b> 10200405
<b>Method</b> EPA 9071			
<b>Analyte</b> n-Hexane Extractable Material (HEM) (O&G)	<b>AB</b> TX	<b>Analyte ID</b> 1803	<b>Method ID</b> 10201204
<b>Method</b> EPA 9095			
<b>Analyte</b> Paint Filter Liquids Test	<b>AB</b> TX	<b>Analyte ID</b> 10312	<b>Method ID</b> 10204009
<b>Method</b> EPA 9250			
<b>Analyte</b> Chloride	<b>AB</b> TX	<b>Analyte ID</b> 1575	<b>Method ID</b> 10207202
<b>Method</b> SM 2320 B			
<b>Analyte</b> Alkalinity as CaCO <sub>3</sub>	<b>AB</b> TX	<b>Analyte ID</b> 1505	<b>Method ID</b> 20045005
<b>Method</b> SM 2510 B			
<b>Analyte</b> Conductivity	<b>AB</b> TX	<b>Analyte ID</b> 1610	<b>Method ID</b> 20048004
<b>Method</b> SM 2540 G			
<b>Analyte</b> Residue-total (total solids)	<b>AB</b> TX	<b>Analyte ID</b> 1950	<b>Method ID</b> 20005203
<b>Method</b> SSA/ASA Part 3:34			
<b>Analyte</b> Carbon, organic (Walkley-Black)	<b>AB</b> TX	<b>Analyte ID</b> 10340	<b>Method ID</b> SSA/ASA Pt 3:34
<b>Method</b> TCEQ 1005			
<b>Analyte</b> Total Petroleum Hydrocarbons (TPH)	<b>AB</b> TX	<b>Analyte ID</b> 2050	<b>Method ID</b> 90019208



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10450 Stancliff Rd. Suite 210  
Houston, TX 77099  
T: +1 281 530 5656  
F: +1 281 530 5887

January 24, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19010437**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 14 sample(s) on Jan 10, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL  
Dane J. Wacasey

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

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**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey

Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 01/24/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19010437			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 136572,136574,136587,R331023,R331030			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		X			1
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?		X			2
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?		X			3
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			4
		Were MS/MSD RPDs within laboratory QC limits?	X				
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

<b>Laboratory Review Checklist: Supporting Data</b>							
Laboratory Name: ALS Laboratory Group				LRC Date: 01/24/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19010437			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 136572,136574,136587,R331023,R331030			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data</b> (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?			X		
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods</b> (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).



**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group		LRC Date: 01/24/2019
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19010437
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136572,136574,136587,R331023,R331030
ER# <sup>5</sup>	Description	
1	Semivolatile Organics Method SW8270, samples WG-1620-MW15A-20190108, WG-1620-MW20A-20190108, WG-1620-MW40B-20190108; the surrogate recoveries could not be determined due to dilution below the calibration range.	
2	Batch 136673, Texas TPH by TX1005, LCS/LCSD RPD was above the RPD limit for surrogates 2-Fluorobiphenyl and Trifluoromethyl benzene. The individual recoveries were in control.	
3	Batches 136572 and 136574, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for the batches.	
4	Batch R331030, Volatile Organics Method SW8260, sample HS19010488-02, MS and MSD were performed on unrelated sample.	
<p>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);          NA = Not Applicable;          NR = Not Reviewed;          R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19010437

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010437-01	WG-1620-MW13-20190108	Groundwater		08-Jan-2019 09:45	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-02	WG-1620-MW14-20190108	Groundwater		08-Jan-2019 10:40	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-03	WG-1620-MW15A-20190108	Groundwater		08-Jan-2019 11:30	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-04	WG-1620-MW15C-20190108	Groundwater		08-Jan-2019 12:20	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-05	WG-1620-MW15B-20190108	Groundwater		08-Jan-2019 13:05	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-06	WG-1620-MW20A-20190108	Groundwater		08-Jan-2019 15:00	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-07	WG-1620-MW88C-20190108	Groundwater		08-Jan-2019 16:00	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-08	WG-1620-MW42B-20190108	Groundwater		08-Jan-2019 16:55	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-09	WG-1620-MW40B-20190108	Groundwater		08-Jan-2019 17:45	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-10	WG-1620-MW39B-20190108	Groundwater		08-Jan-2019 18:45	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-11	WG-1620-MW12A-20190109	Groundwater		09-Jan-2019 07:35	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-12	WG-1620-MW12C-20190109	Groundwater		09-Jan-2019 08:25	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-13	WQ-1620-FB01-20190108	Water		08-Jan-2019 19:00	10-Jan-2019 09:05	<input type="checkbox"/>
HS19010437-14	WQ-1620-TB01-20190108	Water	ALS- 121118-63	09-Jan-2019 00:00	10-Jan-2019 09:05	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW13-20190108  
 Collection Date: 08-Jan-2019 09:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 15:27
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 15:27
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 15:27
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 15:27
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 15:27
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 15:27
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 15:27
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 15:27</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>92.9</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 15:27</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 15:27</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 15:27</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW13-20190108  
 Collection Date: 08-Jan-2019 09:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 13:45
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 13:45
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 13:45
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 13:45
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 13:45
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 13:45
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 13:45
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 13:45
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 13:45
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 13:45
<b>Anthracene</b>	<b>0.00039</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 13:45
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 13:45
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 13:45
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 13:45
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 13:45
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 13:45
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 13:45
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 13:45
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 13:45
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 13:45
<b>Naphthalene</b>	<b>0.00022</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 13:45
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 13:45
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 13:45
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 13:45
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 13:45
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 13:45
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 13:45
<i>Surr: 2,4,6-Tribromophenol</i>	<i>58.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<i>Surr: 2-Fluorophenol</i>	<i>40.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>62.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<i>Surr: Nitrobenzene-d5</i>	<i>45.3</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<i>Surr: Phenol-d6</i>	<i>54.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 13:45</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.0602</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	18-Jan-2019 23:42
<b>Lead</b>	<b>0.00133</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	21-Jan-2019 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW14-20190108  
 Collection Date: 08-Jan-2019 10:40

**ANALYTICAL REPORT**

WorkOrder:HS19010437  
 Lab ID:HS19010437-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 16:39
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 16:39
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 16:39
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 16:39
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 16:39
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 16:39
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 16:39
<i>Surr: 1,2-Dichloroethane-d4</i>	96.9			70-126	%REC	1	14-Jan-2019 16:39
<i>Surr: 4-Bromofluorobenzene</i>	96.1			81-113	%REC	1	14-Jan-2019 16:39
<i>Surr: Dibromofluoromethane</i>	104			77-123	%REC	1	14-Jan-2019 16:39
<i>Surr: Toluene-d8</i>	99.5			82-127	%REC	1	14-Jan-2019 16:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW14-20190108  
 Collection Date: 08-Jan-2019 10:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:04
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 14:04
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 14:04
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 14:04
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:04
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 14:04
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 14:04
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 14:04
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 14:04
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 14:04
<b>Anthracene</b>	<b>0.000052</b>	<b>J</b>	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>22-Jan-2019 14:04</b>
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 14:04
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 14:04
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 14:04
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 14:04
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 14:04
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 14:04
<b>Di-n-butyl phthalate</b>	<b>0.000022</b>	<b>J</b>	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>22-Jan-2019 14:04</b>
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 14:04
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 14:04
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 14:04
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 14:04
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 14:04
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 14:04
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 14:04
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 14:04
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 14:04
<i>Surr: 2,4,6-Tribromophenol</i>	<i>57.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>59.0</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<i>Surr: 2-Fluorophenol</i>	<i>56.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>60.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<i>Surr: Nitrobenzene-d5</i>	<i>60.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<i>Surr: Phenol-d6</i>	<i>64.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:04</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.000752</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>18-Jan-2019 23:44</b>
Lead	U		0.000600	0.00200	mg/L	1	21-Jan-2019 15:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15A-20190108  
 Collection Date: 08-Jan-2019 11:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:02
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:02
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:02
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:02
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 17:02
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:02
<b>Xylenes, Total</b>	<b>0.00080</b>	<b>J</b>	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	<b>1</b>	<b>14-Jan-2019 17:02</b>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:02</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:02</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:02</i>
<i>Surr: Toluene-d8</i>	<i>99.1</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:02</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15A-20190108  
 Collection Date: 08-Jan-2019 11:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:23
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 14:23
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 14:23
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 14:23
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:23
<b>2-Methylnaphthalene</b>	<b>0.0098</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 14:23
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 14:23
<b>Acenaphthene</b>	<b>0.10</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 15:16
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 14:23
<b>Anthracene</b>	<b>0.0025</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 14:23
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 14:23
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 14:23
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 14:23
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 14:23
<b>Dibenzofuran</b>	<b>0.023</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 15:05
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 14:23
<b>Fluoranthene</b>	<b>0.0012</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
<b>Fluorene</b>	<b>0.038</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 15:05
<b>Naphthalene</b>	<b>0.00032</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 14:23
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 14:23
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 14:23
<b>Phenanthrene</b>	<b>0.0090</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 14:23
<b>Pyrene</b>	<b>0.00051</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:23
Surr: 2,4,6-Tribromophenol	62.1			34-129	%REC	10	23-Jan-2019 15:05
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	100	24-Jan-2019 15:16
Surr: 2,4,6-Tribromophenol	47.6			34-129	%REC	1	22-Jan-2019 14:23
Surr: 2-Fluorobiphenyl	45.3			40-125	%REC	1	22-Jan-2019 14:23
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	100	24-Jan-2019 15:16
Surr: 2-Fluorobiphenyl	60.9			40-125	%REC	10	23-Jan-2019 15:05
Surr: 2-Fluorophenol	57.7			20-120	%REC	10	23-Jan-2019 15:05
Surr: 2-Fluorophenol	0	JS		20-120	%REC	100	24-Jan-2019 15:16
Surr: 2-Fluorophenol	47.6			20-120	%REC	1	22-Jan-2019 14:23
Surr: 4-Terphenyl-d14	60.3			40-135	%REC	1	22-Jan-2019 14:23
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	24-Jan-2019 15:16
Surr: 4-Terphenyl-d14	67.5			40-135	%REC	10	23-Jan-2019 15:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15A-20190108  
 Collection Date: 08-Jan-2019 11:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
Surr: Nitrobenzene-d5	59.8			41-120	%REC	10	23-Jan-2019 15:05
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	24-Jan-2019 15:16
Surr: Nitrobenzene-d5	53.1			41-120	%REC	1	22-Jan-2019 14:23
Surr: Phenol-d6	56.1			20-120	%REC	1	22-Jan-2019 14:23
Surr: Phenol-d6	0	JS		20-120	%REC	100	24-Jan-2019 15:16
Surr: Phenol-d6	58.6			20-120	%REC	10	23-Jan-2019 15:05
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Arsenic	0.0270		0.000400	0.00200	mg/L	1	18-Jan-2019 23:46
Lead	0.000722	J	0.000600	0.00200	mg/L	1	21-Jan-2019 15:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15C-20190108  
 Collection Date: 08-Jan-2019 12:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:26
<b>Benzene</b>	<b>0.00058</b>	J	<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 17:26
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:26
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:26
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 17:26
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:26
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:26
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>96.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:26</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:26</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:26</i>
<i>Surr: Toluene-d8</i>	<i>98.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:26</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15C-20190108  
 Collection Date: 08-Jan-2019 12:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:43
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 14:43
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 14:43
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 14:43
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 14:43
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 14:43
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 14:43
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 14:43
<b>Acenaphthene</b>	<b>0.020</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 15:25
<b>Acenaphthylene</b>	<b>0.0014</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
<b>Anthracene</b>	<b>0.00031</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 14:43
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 14:43
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 14:43
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 14:43
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 14:43
<b>Dibenzofuran</b>	<b>0.0053</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 14:43
<b>Fluoranthene</b>	<b>0.00075</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
<b>Fluorene</b>	<b>0.00056</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
<b>Naphthalene</b>	<b>0.00032</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 14:43
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 14:43
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 14:43
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 14:43
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 14:43
<b>Pyrene</b>	<b>0.00041</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 14:43
<i>Surr: 2,4,6-Tribromophenol</i>	<i>46.7</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>51.4</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>48.6</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: 2-Fluorophenol</i>	<i>43.2</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: 2-Fluorophenol</i>	<i>40.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>61.4</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>68.2</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: Nitrobenzene-d5</i>	<i>48.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>
<i>Surr: Nitrobenzene-d5</i>	<i>52.9</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: Phenol-d6</i>	<i>49.0</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>23-Jan-2019 15:25</i>
<i>Surr: Phenol-d6</i>	<i>46.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 14:43</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15C-20190108  
 Collection Date: 08-Jan-2019 12:20

**ANALYTICAL REPORT**

WorkOrder:HS19010437  
 Lab ID:HS19010437-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
Arsenic	0.000629	J	0.000400	0.00200	mg/L	1	18-Jan-2019 23:48
Lead		U	0.000600	0.00200	mg/L	1	21-Jan-2019 15:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15B-20190108  
 Collection Date: 08-Jan-2019 13:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:50
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:50
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:50
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:50
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 17:50
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 17:50
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 17:50
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:50</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:50</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:50</i>
<i>Surr: Toluene-d8</i>	<i>99.4</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 17:50</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW15B-20190108  
 Collection Date: 08-Jan-2019 13:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:02
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 15:02
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	22-Jan-2019 15:02
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 15:02
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:02
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 15:02
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 15:02
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 15:02
<b>Acenaphthene</b>	<b>0.0026</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<b>Acenaphthylene</b>	<b>0.00015</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<b>Anthracene</b>	<b>0.00023</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	22-Jan-2019 15:02
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 15:02
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 15:02
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 15:02
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 15:02
<b>Dibenzofuran</b>	<b>0.00014</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<b>Di-n-butyl phthalate</b>	<b>0.000022</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<b>Fluoranthene</b>	<b>0.00045</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<b>Fluorene</b>	<b>0.000055</b>	J	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 15:02
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 15:02
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 15:02
Pentachlorophenol	U		0.000080	0.00020	mg/L	1	22-Jan-2019 15:02
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 15:02
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 15:02
<b>Pyrene</b>	<b>0.00027</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:02
<i>Surr: 2,4,6-Tribromophenol</i>	59.1			34-129	%REC	1	22-Jan-2019 15:02
<i>Surr: 2-Fluorobiphenyl</i>	55.9			40-125	%REC	1	22-Jan-2019 15:02
<i>Surr: 2-Fluorophenol</i>	53.6			20-120	%REC	1	22-Jan-2019 15:02
<i>Surr: 4-Terphenyl-d14</i>	63.0			40-135	%REC	1	22-Jan-2019 15:02
<i>Surr: Nitrobenzene-d5</i>	57.7			41-120	%REC	1	22-Jan-2019 15:02
<i>Surr: Phenol-d6</i>	58.9			20-120	%REC	1	22-Jan-2019 15:02
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00244</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	18-Jan-2019 23:54
Lead	U		0.000600	0.00200	mg/L	1	18-Jan-2019 23:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW20A-20190108  
 Collection Date: 08-Jan-2019 15:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 18:14
<b>Benzene</b>	<b>0.024</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 18:14
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 18:14
<b>Ethylbenzene</b>	<b>0.024</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 18:14
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 18:14
<b>Toluene</b>	<b>0.00077</b>	J	<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 18:14
<b>Xylenes, Total</b>	<b>0.022</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 18:14
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 18:14</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 18:14</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 18:14</i>
<i>Surr: Toluene-d8</i>	<i>97.2</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 18:14</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW20A-20190108  
 Collection Date: 08-Jan-2019 15:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:21
<b>2,4-Dimethylphenol</b>	<b>0.0076</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	22-Jan-2019 15:21
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 15:21
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 15:21
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:21
<b>2-Methylnaphthalene</b>	<b>0.069</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 21:28
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 15:21
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 15:21
<b>Acenaphthene</b>	<b>0.10</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	23-Jan-2019 16:22
<b>Acenaphthylene</b>	<b>0.00057</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:21
<b>Anthracene</b>	<b>0.0058</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:21
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 15:21
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 15:21
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 15:21
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 15:21
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 15:21
<b>Dibenzofuran</b>	<b>0.067</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 21:28
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 15:21
<b>Fluoranthene</b>	<b>0.00041</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:21
<b>Fluorene</b>	<b>0.062</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 21:28
<b>Naphthalene</b>	<b>1.4</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	23-Jan-2019 16:41
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 15:21
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 15:21
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 15:21
<b>Phenanthrene</b>	<b>0.025</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 21:28
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 15:21
<b>Pyrene</b>	<b>0.00025</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	22-Jan-2019 15:21
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	23-Jan-2019 16:41
Surr: 2,4,6-Tribromophenol	60.2			34-129	%REC	10	23-Jan-2019 21:28
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	100	23-Jan-2019 16:22
Surr: 2,4,6-Tribromophenol	44.2			34-129	%REC	1	22-Jan-2019 15:21
Surr: 2-Fluorobiphenyl	40.7			40-125	%REC	1	22-Jan-2019 15:21
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	100	23-Jan-2019 16:22
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	23-Jan-2019 16:41
Surr: 2-Fluorobiphenyl	59.2			40-125	%REC	10	23-Jan-2019 21:28
Surr: 2-Fluorophenol	0	JS		20-120	%REC	100	23-Jan-2019 16:22
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	23-Jan-2019 16:41
Surr: 2-Fluorophenol	57.4			20-120	%REC	10	23-Jan-2019 21:28
Surr: 2-Fluorophenol	60.4			20-120	%REC	1	22-Jan-2019 15:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW20A-20190108  
 Collection Date: 08-Jan-2019 15:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
Surr: 4-Terphenyl-d14	59.9			40-135	%REC	1	22-Jan-2019 15:21
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	23-Jan-2019 16:22
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	23-Jan-2019 16:41
Surr: 4-Terphenyl-d14	72.1			40-135	%REC	10	23-Jan-2019 21:28
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	23-Jan-2019 16:22
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	23-Jan-2019 16:41
Surr: Nitrobenzene-d5	61.4			41-120	%REC	10	23-Jan-2019 21:28
Surr: Nitrobenzene-d5	60.5			41-120	%REC	1	22-Jan-2019 15:21
Surr: Phenol-d6	56.6			20-120	%REC	1	22-Jan-2019 15:21
Surr: Phenol-d6	0	JS		20-120	%REC	1000	23-Jan-2019 16:41
Surr: Phenol-d6	60.1			20-120	%REC	10	23-Jan-2019 21:28
Surr: Phenol-d6	0	JS		20-120	%REC	100	23-Jan-2019 16:22
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
Arsenic	0.00788		0.000400	0.00200	mg/L	1	18-Jan-2019 23:56
Lead	U		0.000600	0.00200	mg/L	1	18-Jan-2019 23:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW88C-20190108  
 Collection Date: 08-Jan-2019 16:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 18:38
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 18:38
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 18:38
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 18:38
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 18:38
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 18:38
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 18:38
<i>Surr: 1,2-Dichloroethane-d4</i>		96.8		70-126	%REC	1	14-Jan-2019 18:38
<i>Surr: 4-Bromofluorobenzene</i>		97.8		81-113	%REC	1	14-Jan-2019 18:38
<i>Surr: Dibromofluoromethane</i>		101		77-123	%REC	1	14-Jan-2019 18:38
<i>Surr: Toluene-d8</i>		98.2		82-127	%REC	1	14-Jan-2019 18:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW88C-20190108  
 Collection Date: 08-Jan-2019 16:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:40
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 15:40
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 15:40
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 15:40
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 15:40
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 15:40
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 15:40
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 15:40
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 15:40
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 15:40
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jan-2019 15:40
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 15:40
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 15:40
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 15:40
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 15:40
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 15:40
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 15:40
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 15:40
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 15:40
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 15:40
<b>Naphthalene</b>	<b>0.000059</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>22-Jan-2019 15:40</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 15:40
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 15:40
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 15:40
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 15:40
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 15:40
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 15:40
<i>Surr: 2,4,6-Tribromophenol</i>	<i>47.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>40.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<i>Surr: 2-Fluorophenol</i>	<i>37.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>55.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<i>Surr: Phenol-d6</i>	<i>41.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 15:40</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000864</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>18-Jan-2019 23:58</b>
Lead	U		0.000600	0.00200	mg/L	1	18-Jan-2019 23:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW42B-20190108  
 Collection Date: 08-Jan-2019 16:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:02
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:02
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:02
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:02
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 19:02
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:02
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:02
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>97.3</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:02</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.7</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:02</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:02</i>
<i>Surr: Toluene-d8</i>	<i>98.6</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:02</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW42B-20190108  
 Collection Date: 08-Jan-2019 16:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:03
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 18:03
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 18:03
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 18:03
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:03
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 18:03
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:03
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 18:03
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 18:03
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 18:03
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 18:03
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 18:03
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:03
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 18:03
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000061</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 18:03
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 18:03
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:03
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:03
<b>Fluoranthene</b>	<b>0.00011</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:03
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 18:03
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:03
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 18:03
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 18:03
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 18:03
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 18:03
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 18:03
<b>Pyrene</b>	<b>0.00010</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:03
<i>Surr: 2,4,6-Tribromophenol</i>	<i>58.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>43.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<i>Surr: 2-Fluorophenol</i>	<i>34.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>69.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<i>Surr: Nitrobenzene-d5</i>	<i>41.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<i>Surr: Phenol-d6</i>	<i>47.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:03</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00216</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	19-Jan-2019 00:00
<b>Lead</b>	<b>0.00412</b>		<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	19-Jan-2019 00:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW40B-20190108  
 Collection Date: 08-Jan-2019 17:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:26
<b>Benzene</b>	<b>0.0063</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 19:26
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:26
<b>Ethylbenzene</b>	<b>0.041</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 19:26
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 19:26
<b>Toluene</b>	<b>0.0048</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 19:26
<b>Xylenes, Total</b>	<b>0.052</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	14-Jan-2019 19:26
Surr: 1,2-Dichloroethane-d4	95.6			70-126	%REC	1	14-Jan-2019 19:26
Surr: 4-Bromofluorobenzene	101			81-113	%REC	1	14-Jan-2019 19:26
Surr: Dibromofluoromethane	102			77-123	%REC	1	14-Jan-2019 19:26
Surr: Toluene-d8	97.1			82-127	%REC	1	14-Jan-2019 19:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW40B-20190108  
 Collection Date: 08-Jan-2019 17:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:23
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 18:23
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 18:23
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 18:23
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:23
<b>2-Methylnaphthalene</b>	<b>0.077</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 16:07
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:23
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 18:23
<b>Acenaphthene</b>	<b>0.12</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	21-Jan-2019 16:27
<b>Acenaphthylene</b>	<b>0.00083</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
<b>Anthracene</b>	<b>0.0070</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 18:23
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:23
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 18:23
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000079</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
<b>Chrysene</b>	<b>0.000045</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
<b>Dibenzofuran</b>	<b>0.069</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 16:07
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:23
<b>Fluoranthene</b>	<b>0.0041</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
<b>Fluorene</b>	<b>0.087</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 16:07
<b>Naphthalene</b>	<b>1.3</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	24-Jan-2019 14:56
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 18:23
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 18:23
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 18:23
<b>Phenanthrene</b>	<b>0.068</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 16:07
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 18:23
<b>Pyrene</b>	<b>0.0020</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:23
<i>Surr: 2,4,6-Tribromophenol</i>	<i>74.0</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 16:07</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>100</i>	<i>21-Jan-2019 16:27</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 14:56</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>57.7</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:23</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>45.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:23</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>69.3</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 16:07</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>100</i>	<i>21-Jan-2019 16:27</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 14:56</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 14:56</i>
<i>Surr: 2-Fluorophenol</i>	<i>63.6</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 16:07</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>100</i>	<i>21-Jan-2019 16:27</i>
<i>Surr: 2-Fluorophenol</i>	<i>63.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 18:23</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW40B-20190108  
 Collection Date: 08-Jan-2019 17:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
Surr: 4-Terphenyl-d14	96.8			40-135	%REC	10	21-Jan-2019 16:07
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	21-Jan-2019 16:27
Surr: 4-Terphenyl-d14	69.3			40-135	%REC	1	18-Jan-2019 18:23
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	24-Jan-2019 14:56
Surr: Nitrobenzene-d5	42.0			41-120	%REC	1	18-Jan-2019 18:23
Surr: Nitrobenzene-d5	60.5			41-120	%REC	10	21-Jan-2019 16:07
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	21-Jan-2019 16:27
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	24-Jan-2019 14:56
Surr: Phenol-d6	0	JS		20-120	%REC	1000	24-Jan-2019 14:56
Surr: Phenol-d6	62.7			20-120	%REC	10	21-Jan-2019 16:07
Surr: Phenol-d6	0	JS		20-120	%REC	100	21-Jan-2019 16:27
Surr: Phenol-d6	50.3			20-120	%REC	1	18-Jan-2019 18:23
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 16-Jan-2019		Analyst: JHD
Arsenic	0.0850		0.000400	0.00200	mg/L	1	19-Jan-2019 00:02
Lead		U	0.000600	0.00200	mg/L	1	19-Jan-2019 00:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW39B-20190108  
 Collection Date: 08-Jan-2019 18:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-10  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:50
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:50
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:50
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:50
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 19:50
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 19:50
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 19:50
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:50</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:50</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:50</i>
<i>Surr: Toluene-d8</i>	<i>98.6</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 19:50</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW39B-20190108  
 Collection Date: 08-Jan-2019 18:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-10  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:42
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 18:42
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 18:42
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 18:42
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 18:42
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 18:42
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:42
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 18:42
<b>Acenaphthene</b>	<b>0.00062</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 18:42
<b>Anthracene</b>	<b>0.00016</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 18:42
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:42
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 18:42
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	18-Jan-2019 18:42
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 18:42
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 18:42
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 18:42
<b>Fluoranthene</b>	<b>0.000067</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 18:42
<b>Naphthalene</b>	<b>0.000092</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 18:42
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 18:42
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 18:42
<b>Phenanthrene</b>	<b>0.000039</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 18:42
<b>Pyrene</b>	<b>0.000052</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 18:42
Surr: 2,4,6-Tribromophenol	70.2			34-129	%REC	1	18-Jan-2019 18:42
Surr: 2-Fluorobiphenyl	67.6			40-125	%REC	1	18-Jan-2019 18:42
Surr: 2-Fluorophenol	60.3			20-120	%REC	1	18-Jan-2019 18:42
Surr: 4-Terphenyl-d14	73.1			40-135	%REC	1	18-Jan-2019 18:42
Surr: Nitrobenzene-d5	62.9			41-120	%REC	1	18-Jan-2019 18:42
Surr: Phenol-d6	64.3			20-120	%REC	1	18-Jan-2019 18:42
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00365</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	19-Jan-2019 00:04
Lead	U		0.000600	0.00200	mg/L	1	19-Jan-2019 00:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW12A-20190109  
 Collection Date: 09-Jan-2019 07:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:14
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:14
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:14
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:14
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 20:14
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:14
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:14
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.7</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 20:14</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.0</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 20:14</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 20:14</i>
<i>Surr: Toluene-d8</i>	<i>99.3</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 20:14</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW12A-20190109  
 Collection Date: 09-Jan-2019 07:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 19:02
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 19:02
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 19:02
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 19:02
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 19:02
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 19:02
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 19:02
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 19:02
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 19:02
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 19:02
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 19:02
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 19:02
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 19:02
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 19:02
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	18-Jan-2019 19:02
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 19:02
<b>Dibenzofuran</b>	<b>0.000031</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>18-Jan-2019 19:02</b>
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 19:02
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 19:02
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 19:02
<b>Naphthalene</b>	<b>0.00026</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>18-Jan-2019 19:02</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 19:02
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 19:02
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 19:02
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 19:02
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 19:02
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 19:02
<i>Surr: 2,4,6-Tribromophenol</i>	<i>59.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>54.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<i>Surr: 2-Fluorophenol</i>	<i>52.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>77.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<i>Surr: Nitrobenzene-d5</i>	<i>48.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<i>Surr: Phenol-d6</i>	<i>52.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:02</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00192</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>19-Jan-2019 00:06</b>
Lead	U		0.000600	0.00200	mg/L	1	19-Jan-2019 00:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW12C-20190109  
 Collection Date: 09-Jan-2019 08:25

**ANALYTICAL REPORT**

WorkOrder:HS19010437  
 Lab ID:HS19010437-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:38
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:38
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:38
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:38
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 20:38
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 20:38
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 20:38
<i>Surr: 1,2-Dichloroethane-d4</i>		96.1		70-126	%REC	1	14-Jan-2019 20:38
<i>Surr: 4-Bromofluorobenzene</i>		99.1		81-113	%REC	1	14-Jan-2019 20:38
<i>Surr: Dibromofluoromethane</i>		103		77-123	%REC	1	14-Jan-2019 20:38
<i>Surr: Toluene-d8</i>		98.4		82-127	%REC	1	14-Jan-2019 20:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW12C-20190109  
 Collection Date: 09-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 19:22
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 19:22
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 19:22
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 19:22
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 19:22
<b>2-Methylnaphthalene</b>	<b>0.00039</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 19:22
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 19:22
<b>Acenaphthene</b>	<b>0.093</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 18:25
<b>Acenaphthylene</b>	<b>0.00082</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Anthracene</b>	<b>0.0084</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Benz(a)anthracene</b>	<b>0.00014</b>		<b>0.000050</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Benzo(a)pyrene</b>	<b>0.000041</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 19:22
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00011</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Chrysene</b>	<b>0.00013</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Dibenzofuran</b>	<b>0.067</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 18:25
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 19:22
<b>Fluoranthene</b>	<b>0.0071</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<b>Fluorene</b>	<b>0.085</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 18:25
<b>Naphthalene</b>	<b>0.00017</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 19:22
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 19:22
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 19:22
<b>Phenanthrene</b>	<b>0.052</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	21-Jan-2019 18:25
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 19:22
<b>Pyrene</b>	<b>0.0031</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 19:22
<i>Surr: 2,4,6-Tribromophenol</i>	<i>67.7</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>53.9</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>46.8</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>42.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>
<i>Surr: 2-Fluorophenol</i>	<i>39.0</i>	<i>J</i>		<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: 2-Fluorophenol</i>	<i>45.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>71.6</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>75.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>
<i>Surr: Nitrobenzene-d5</i>	<i>41.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>
<i>Surr: Nitrobenzene-d5</i>	<i>44.5</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: Phenol-d6</i>	<i>36.7</i>	<i>J</i>		<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>21-Jan-2019 18:25</i>
<i>Surr: Phenol-d6</i>	<i>39.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 19:22</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW12C-20190109  
 Collection Date: 09-Jan-2019 08:25

**ANALYTICAL REPORT**

WorkOrder:HS19010437  
 Lab ID:HS19010437-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
Arsenic	0.000796	J	0.000400	0.00200	mg/L	1	19-Jan-2019 00:08
Lead		U	0.000600	0.00200	mg/L	1	19-Jan-2019 00:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB01-20190108  
 Collection Date: 08-Jan-2019 19:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-13  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:14
Benzene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:14
Chlorobenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:14
Ethylbenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:14
Methylene chloride	U		0.0010	0.0020	mg/L	1	15-Jan-2019 00:14
Toluene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:14
Xylenes, Total	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:14
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 00:14</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 00:14</i>
<i>Surr: Dibromofluoromethane</i>	<i>104</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 00:14</i>
<i>Surr: Toluene-d8</i>	<i>98.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 00:14</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB01-20190108  
 Collection Date: 08-Jan-2019 19:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-13  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	21-Jan-2019 15:48
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	21-Jan-2019 15:48
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	21-Jan-2019 15:48
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	21-Jan-2019 15:48
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	21-Jan-2019 15:48
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	21-Jan-2019 15:48
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	21-Jan-2019 15:48
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	21-Jan-2019 15:48
Acenaphthene	U		0.000027	0.00010	mg/L	1	21-Jan-2019 15:48
Acenaphthylene	U		0.000015	0.00010	mg/L	1	21-Jan-2019 15:48
Anthracene	U		0.000014	0.00010	mg/L	1	21-Jan-2019 15:48
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	21-Jan-2019 15:48
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	21-Jan-2019 15:48
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	21-Jan-2019 15:48
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	21-Jan-2019 15:48
Chrysene	U		0.000021	0.00010	mg/L	1	21-Jan-2019 15:48
Dibenzofuran	U		0.000020	0.00010	mg/L	1	21-Jan-2019 15:48
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	21-Jan-2019 15:48
Fluoranthene	U		0.000010	0.00010	mg/L	1	21-Jan-2019 15:48
Fluorene	U		0.000030	0.00010	mg/L	1	21-Jan-2019 15:48
<b>Naphthalene</b>	<b>0.000096</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>21-Jan-2019 15:48</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	21-Jan-2019 15:48
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	21-Jan-2019 15:48
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	21-Jan-2019 15:48
Phenanthrene	U		0.000021	0.00010	mg/L	1	21-Jan-2019 15:48
Phenol	U		0.000035	0.00020	mg/L	1	21-Jan-2019 15:48
Pyrene	U		0.000019	0.00010	mg/L	1	21-Jan-2019 15:48
<i>Surr: 2,4,6-Tribromophenol</i>	<i>61.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>65.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<i>Surr: 2-Fluorophenol</i>	<i>59.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>81.4</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<i>Surr: Nitrobenzene-d5</i>	<i>61.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<i>Surr: Phenol-d6</i>	<i>68.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2019 15:48</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 16-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	19-Jan-2019 00:10
Lead	U		0.000600	0.00200	mg/L	1	19-Jan-2019 00:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB01-20190108  
 Collection Date: 09-Jan-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010437  
 Lab ID:HS19010437-14  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:50
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:50
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:50
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:50
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 23:50
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:50
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:50
<i>Surr: 1,2-Dichloroethane-d4</i>	93.9			70-126	%REC	1	14-Jan-2019 23:50
<i>Surr: 4-Bromofluorobenzene</i>	95.9			81-113	%REC	1	14-Jan-2019 23:50
<i>Surr: Dibromofluoromethane</i>	102			77-123	%REC	1	14-Jan-2019 23:50
<i>Surr: Toluene-d8</i>	99.8			82-127	%REC	1	14-Jan-2019 23:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**Batch ID:** 136572      **Method:** LOW-LEVEL SEMIVOLATILES      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010437-01	1	1000	1 (mL)	0.001
HS19010437-02	1	1000	1 (mL)	0.001
HS19010437-03	1	1000	1 (mL)	0.001
HS19010437-04	1	1000	1 (mL)	0.001
HS19010437-05	1	990	1 (mL)	0.00101
HS19010437-06	1	1000	1 (mL)	0.001
HS19010437-07	1	1000	1 (mL)	0.001

**Batch ID:** 136574      **Method:** LOW-LEVEL SEMIVOLATILES      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010437-08	1	1000	1 (mL)	0.001
HS19010437-09	1	1000	1 (mL)	0.001
HS19010437-10	1	1000	1 (mL)	0.001
HS19010437-11	1	1000	1 (mL)	0.001
HS19010437-12	1	1000	1 (mL)	0.001
HS19010437-13	1	1000	1 (mL)	0.001

**Batch ID:** 136687      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010437-01	1	10	10 (mL)	1
HS19010437-02	1	10	10 (mL)	1
HS19010437-03	1	10	10 (mL)	1
HS19010437-04	1	10	10 (mL)	1
HS19010437-05	1	10	10 (mL)	1
HS19010437-06	1	10	10 (mL)	1
HS19010437-07	1	10	10 (mL)	1
HS19010437-08	1	10	10 (mL)	1
HS19010437-09	1	10	10 (mL)	1
HS19010437-10	1	10	10 (mL)	1
HS19010437-11	1	10	10 (mL)	1
HS19010437-12	1	10	10 (mL)	1
HS19010437-13	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 136572	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES			<b>Matrix:</b> Groundwater		
HS19010437-01	WG-1620-MW13-20190108	08 Jan 2019 09:45		14 Jan 2019 11:18	22 Jan 2019 13:45	1
HS19010437-02	WG-1620-MW14-20190108	08 Jan 2019 10:40		14 Jan 2019 11:18	22 Jan 2019 14:04	1
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30		14 Jan 2019 11:18	24 Jan 2019 15:16	100
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30		14 Jan 2019 11:18	23 Jan 2019 15:05	10
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30		14 Jan 2019 11:18	22 Jan 2019 14:23	1
HS19010437-04	WG-1620-MW15C-20190108	08 Jan 2019 12:20		14 Jan 2019 11:18	23 Jan 2019 15:25	10
HS19010437-04	WG-1620-MW15C-20190108	08 Jan 2019 12:20		14 Jan 2019 11:18	22 Jan 2019 14:43	1
HS19010437-05	WG-1620-MW15B-20190108	08 Jan 2019 13:05		14 Jan 2019 11:18	22 Jan 2019 15:02	1
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00		14 Jan 2019 11:18	23 Jan 2019 21:28	10
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00		14 Jan 2019 11:18	23 Jan 2019 16:41	1000
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00		14 Jan 2019 11:18	23 Jan 2019 16:22	100
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00		14 Jan 2019 11:18	22 Jan 2019 15:21	1
HS19010437-07	WG-1620-MW88C-20190108	08 Jan 2019 16:00		14 Jan 2019 11:18	22 Jan 2019 15:40	1
<b>Batch ID</b> 136574	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES			<b>Matrix:</b> Water		
HS19010437-13	WQ-1620-FB01-20190108	08 Jan 2019 19:00		14 Jan 2019 11:18	21 Jan 2019 15:48	1
<b>Batch ID</b> 136574	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES			<b>Matrix:</b> Groundwater		
HS19010437-08	WG-1620-MW42B-20190108	08 Jan 2019 16:55		14 Jan 2019 11:18	18 Jan 2019 18:03	1
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45		14 Jan 2019 11:18	24 Jan 2019 14:56	1000
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45		14 Jan 2019 11:18	21 Jan 2019 16:27	100
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45		14 Jan 2019 11:18	21 Jan 2019 16:07	10
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45		14 Jan 2019 11:18	18 Jan 2019 18:23	1
HS19010437-10	WG-1620-MW39B-20190108	08 Jan 2019 18:45		14 Jan 2019 11:18	18 Jan 2019 18:42	1
HS19010437-11	WG-1620-MW12A-20190109	09 Jan 2019 07:35		14 Jan 2019 11:18	18 Jan 2019 19:02	1
HS19010437-12	WG-1620-MW12C-20190109	09 Jan 2019 08:25		14 Jan 2019 11:18	21 Jan 2019 18:25	10
HS19010437-12	WG-1620-MW12C-20190109	09 Jan 2019 08:25		14 Jan 2019 11:18	18 Jan 2019 19:22	1
<b>Batch ID</b> 136687	<b>Test Name :</b> ICP-MS METALS BY SW6020A			<b>Matrix:</b> Water		
HS19010437-13	WQ-1620-FB01-20190108	08 Jan 2019 19:00		16 Jan 2019 13:30	19 Jan 2019 00:10	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID 136687 Test Name : ICP-MS METALS BY SW6020A Matrix: Groundwater</b>						
HS19010437-01	WG-1620-MW13-20190108	08 Jan 2019 09:45		16 Jan 2019 13:30	21 Jan 2019 15:32	1
HS19010437-01	WG-1620-MW13-20190108	08 Jan 2019 09:45		16 Jan 2019 13:30	18 Jan 2019 23:42	1
HS19010437-02	WG-1620-MW14-20190108	08 Jan 2019 10:40		16 Jan 2019 13:30	21 Jan 2019 15:34	1
HS19010437-02	WG-1620-MW14-20190108	08 Jan 2019 10:40		16 Jan 2019 13:30	18 Jan 2019 23:44	1
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30		16 Jan 2019 13:30	21 Jan 2019 15:36	1
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30		16 Jan 2019 13:30	18 Jan 2019 23:46	1
HS19010437-04	WG-1620-MW15C-20190108	08 Jan 2019 12:20		16 Jan 2019 13:30	21 Jan 2019 15:38	1
HS19010437-04	WG-1620-MW15C-20190108	08 Jan 2019 12:20		16 Jan 2019 13:30	18 Jan 2019 23:48	1
HS19010437-05	WG-1620-MW15B-20190108	08 Jan 2019 13:05		16 Jan 2019 13:30	18 Jan 2019 23:54	1
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00		16 Jan 2019 13:30	18 Jan 2019 23:56	1
HS19010437-07	WG-1620-MW88C-20190108	08 Jan 2019 16:00		16 Jan 2019 13:30	18 Jan 2019 23:58	1
HS19010437-08	WG-1620-MW42B-20190108	08 Jan 2019 16:55		16 Jan 2019 13:30	19 Jan 2019 00:00	1
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45		16 Jan 2019 13:30	19 Jan 2019 00:02	1
HS19010437-10	WG-1620-MW39B-20190108	08 Jan 2019 18:45		16 Jan 2019 13:30	19 Jan 2019 00:04	1
HS19010437-11	WG-1620-MW12A-20190109	09 Jan 2019 07:35		16 Jan 2019 13:30	19 Jan 2019 00:06	1
HS19010437-12	WG-1620-MW12C-20190109	09 Jan 2019 08:25		16 Jan 2019 13:30	19 Jan 2019 00:08	1
<b>Batch ID R331023 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19010437-01	WG-1620-MW13-20190108	08 Jan 2019 09:45			14 Jan 2019 15:27	1
HS19010437-02	WG-1620-MW14-20190108	08 Jan 2019 10:40			14 Jan 2019 16:39	1
HS19010437-03	WG-1620-MW15A-20190108	08 Jan 2019 11:30			14 Jan 2019 17:02	1
HS19010437-04	WG-1620-MW15C-20190108	08 Jan 2019 12:20			14 Jan 2019 17:26	1
HS19010437-05	WG-1620-MW15B-20190108	08 Jan 2019 13:05			14 Jan 2019 17:50	1
HS19010437-06	WG-1620-MW20A-20190108	08 Jan 2019 15:00			14 Jan 2019 18:14	1
HS19010437-07	WG-1620-MW88C-20190108	08 Jan 2019 16:00			14 Jan 2019 18:38	1
HS19010437-08	WG-1620-MW42B-20190108	08 Jan 2019 16:55			14 Jan 2019 19:02	1
HS19010437-09	WG-1620-MW40B-20190108	08 Jan 2019 17:45			14 Jan 2019 19:26	1
HS19010437-10	WG-1620-MW39B-20190108	08 Jan 2019 18:45			14 Jan 2019 19:50	1
HS19010437-11	WG-1620-MW12A-20190109	09 Jan 2019 07:35			14 Jan 2019 20:14	1
HS19010437-12	WG-1620-MW12C-20190109	09 Jan 2019 08:25			14 Jan 2019 20:38	1
<b>Batch ID R331030 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water</b>						
HS19010437-13	WQ-1620-FB01-20190108	08 Jan 2019 19:00			15 Jan 2019 00:14	1
HS19010437-14	WQ-1620-TB01-20190108	09 Jan 2019 00:00			14 Jan 2019 23:50	1

WorkOrder: HS19010437  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200



WorkOrder: HS19010437  
 InstrumentID: SV-7  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000068	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000065	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000062	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000081	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000072	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000041	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000036	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000053	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000036	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000056	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000051	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000067	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000076	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000077	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.00010	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000070	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000047	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000094	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000061	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000052	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000045	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000064	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000065	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.000082	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000051	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000078	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000066	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19010437  
 InstrumentID: SV-6  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles

**METHOD DETECTION /  
 REPORTING LIMITS**

Matrix: Aqueous

Units: mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000070	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000041	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000052	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000052	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000061	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000056	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000022	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00020	0.00019	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000066	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000072	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000074	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000074	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000066	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000069	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000083	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000082	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000060	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000080	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000074	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000073	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000065	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000083	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000068	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.00016	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000066	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000074	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19010437  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136687		Instrument: ICPMS05		Method: SW6020					
<b>MBLK</b>	Sample ID: <b>MBLK-136687</b>	Units: <b>mg/L</b>		Analysis Date: <b>18-Jan-2019 23:12</b>					
Client ID:		Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916084</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Arsenic	U	0.00200							
<b>MBLK</b>	Sample ID: <b>MBLK-136687</b>	Units: <b>mg/L</b>		Analysis Date: <b>21-Jan-2019 12:35</b>					
Client ID:		Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916877</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Lead	U	0.00200							
<b>LCS</b>	Sample ID: <b>LCS-136687</b>	Units: <b>mg/L</b>		Analysis Date: <b>18-Jan-2019 23:14</b>					
Client ID:		Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916085</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Arsenic	0.05083	0.00200	0.05	0	102	80 - 120			
<b>LCS</b>	Sample ID: <b>LCS-136687</b>	Units: <b>mg/L</b>		Analysis Date: <b>21-Jan-2019 12:37</b>					
Client ID:		Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916878</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Lead	0.04843	0.00200	0.05	0	96.9	80 - 120			
<b>MS</b>	Sample ID: <b>HS19010555-01MS</b>	Units: <b>mg/L</b>		Analysis Date: <b>18-Jan-2019 23:20</b>					
Client ID:		Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916088</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Arsenic	0.05243	0.00200	0.05	0.000065	105	80 - 120			
<b>MS</b>	Sample ID: <b>HS19010555-01MS</b>	Units: <b>mg/L</b>		Analysis Date: <b>21-Jan-2019 12:44</b>					
Client ID:		Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916881</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Lead	0.04854	0.00200	0.05	0.000012	97.1	80 - 120			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136687		Instrument: ICPMS05			Method: SW6020					
<b>MSD</b>	Sample ID: <b>HS19010555-01MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>18-Jan-2019 23:22</b>					
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916089</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.05203	0.00200	0.05	0.000065	104	80 - 120	0.05243	0.77	20	
<b>MSD</b>	Sample ID: <b>HS19010555-01MSD</b>	Units: <b>mg/L</b>			Analysis Date: <b>21-Jan-2019 12:46</b>					
Client ID:	Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916882</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Lead	0.04827	0.00200	0.05	0.000012	96.5	80 - 120	0.04854	0.564	20	
<b>PDS</b>	Sample ID: <b>HS19010555-01PDS</b>	Units: <b>mg/L</b>			Analysis Date: <b>18-Jan-2019 23:24</b>					
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916090</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.1068	0.00200	0.1	0.000065	107	75 - 125				
<b>PDS</b>	Sample ID: <b>HS19010555-01PDS</b>	Units: <b>mg/L</b>			Analysis Date: <b>21-Jan-2019 12:49</b>					
Client ID:	Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916883</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>1</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Lead	0.09723	0.00200	0.1	0.000012	97.2	75 - 125				
<b>SD</b>	Sample ID: <b>HS19010555-01SD</b>	Units: <b>mg/L</b>			Analysis Date: <b>18-Jan-2019 23:18</b>					
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4916087</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>5</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.0100					0.000065	0	10	
<b>SD</b>	Sample ID: <b>HS19010555-01SD</b>	Units: <b>mg/L</b>			Analysis Date: <b>21-Jan-2019 12:42</b>					
Client ID:	Run ID: <b>ICPMS04_331384</b>	SeqNo: <b>4916880</b>	PrepDate: <b>16-Jan-2019</b>	DF: <b>5</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	U	0.0100					0.000012	0	10	

<b>The following samples were analyzed in this batch:</b>	HS19010437-01	HS19010437-02	HS19010437-03	HS19010437-04
	HS19010437-05	HS19010437-06	HS19010437-07	HS19010437-08
	HS19010437-09	HS19010437-10	HS19010437-11	HS19010437-12
	HS19010437-13			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136572		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-136572	Units: ug/L			Analysis Date: 22-Jan-2019 12:09					
Client ID:	Run ID: SV-7_331539	SeqNo: 4921851	PrepDate: 14-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	3.111	0.20	5	0	62.2	34 - 129				
<i>Surr: 2-Fluorobiphenyl</i>	3.579	0.20	5	0	71.6	40 - 125				
<i>Surr: 2-Fluorophenol</i>	3.29	0.20	5	0	65.8	20 - 120				
<i>Surr: 4-Terphenyl-d14</i>	3.791	0.20	5	0	75.8	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.544	0.20	5	0	70.9	41 - 120				
<i>Surr: Phenol-d6</i>	3.571	0.20	5	0	71.4	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136572		Instrument: SV-7		Method: SW8270						
LCS	Sample ID: LCS-136572	Units: ug/L			Analysis Date: 22-Jan-2019 12:28					
Client ID:	Run ID: SV-7_331539	SeqNo: 4921852		PrepDate: 14-Jan-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.25	0.20	5	0	65.0	39 - 127				
2,4-Dimethylphenol	2.654	0.20	5	0	53.1	35 - 120				
2,4-Dinitrotoluene	2.946	0.20	5	0	58.9	50 - 122				
2,6-Dinitrotoluene	2.813	0.20	5	0	56.3	50 - 120				
2-Chloronaphthalene	2.834	0.20	5	0	56.7	50 - 120				
2-Methylnaphthalene	2.863	0.10	5	0	57.3	50 - 120				
4,6-Dinitro-2-methylphenol	2.928	0.20	5	0	58.6	25 - 121				
4-Nitrophenol	3.083	1.0	5	0	61.7	30 - 130				
Acenaphthene	2.566	0.10	5	0	51.3	45 - 120				
Acenaphthylene	2.772	0.10	5	0	55.4	47 - 120				
Anthracene	2.947	0.10	5	0	58.9	45 - 120				
Benz(a)anthracene	2.971	0.10	5	0	59.4	40 - 120				
Benzo(a)pyrene	3.115	0.10	5	0	62.3	45 - 120				
Bis(2-chloroethoxy)methane	2.916	0.20	5	0	58.3	45 - 120				
Bis(2-ethylhexyl)phthalate	3.205	0.20	5	0	64.1	40 - 139				
Chrysene	2.906	0.10	5	0	58.1	43 - 120				
Dibenzofuran	2.848	0.10	5	0	57.0	50 - 120				
Di-n-butyl phthalate	3.195	0.20	5	0	63.9	45 - 123				
Fluoranthene	3.091	0.10	5	0	61.8	45 - 125				
Fluorene	2.956	0.10	5	0	59.1	49 - 120				
Naphthalene	2.834	0.10	5	0	56.7	45 - 120				
Nitrobenzene	3.097	0.20	5	0	61.9	44 - 120				
N-Nitrosodiphenylamine	2.761	0.20	5	0	55.2	40 - 125				
Pentachlorophenol	2.15	0.20	5	0	43.0	19 - 121				
Phenanthrene	2.871	0.10	5	0	57.4	45 - 121				
Phenol	2.818	0.20	5	0	56.4	20 - 124				
Pyrene	3.018	0.10	5	0	60.4	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.845</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>56.9</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.873</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.5</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.831</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>56.6</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>2.997</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>59.9</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.066</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.3</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.129</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.6</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

**Batch ID:** 136572      **Instrument:** SV-7      **Method:** SW8270

LCSD	Sample ID: LCSD-136572	Units: ug/L			Analysis Date: 22-Jan-2019 12:48					
Client ID:	Run ID: SV-7_331539	SeqNo: 4921853	PrepDate: 14-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.261	0.20	5	0	65.2	39 - 127	3.25	0.342	20	
2,4-Dimethylphenol	2.585	0.20	5	0	51.7	35 - 120	2.654	2.62	20	
2,4-Dinitrotoluene	2.853	0.20	5	0	57.1	50 - 122	2.946	3.2	20	
2,6-Dinitrotoluene	2.835	0.20	5	0	56.7	50 - 120	2.813	0.779	20	
2-Chloronaphthalene	2.883	0.20	5	0	57.7	50 - 120	2.834	1.69	20	
2-Methylnaphthalene	2.781	0.10	5	0	55.6	50 - 120	2.863	2.92	20	
4,6-Dinitro-2-methylphenol	2.849	0.20	5	0	57.0	25 - 121	2.928	2.72	30	
4-Nitrophenol	2.819	1.0	5	0	56.4	30 - 130	3.083	8.94	20	
Acenaphthene	2.539	0.10	5	0	50.8	45 - 120	2.566	1.06	20	
Acenaphthylene	2.725	0.10	5	0	54.5	47 - 120	2.772	1.69	20	
Anthracene	2.807	0.10	5	0	56.1	45 - 120	2.947	4.86	20	
Benz(a)anthracene	3.013	0.10	5	0	60.3	40 - 120	2.971	1.4	20	
Benzo(a)pyrene	3.05	0.10	5	0	61.0	45 - 120	3.115	2.11	20	
Bis(2-chloroethoxy)methane	2.77	0.20	5	0	55.4	45 - 120	2.916	5.17	20	
Bis(2-ethylhexyl)phthalate	3.301	0.20	5	0	66.0	40 - 139	3.205	2.96	20	
Chrysene	2.992	0.10	5	0	59.8	43 - 120	2.906	2.94	20	
Dibenzofuran	2.816	0.10	5	0	56.3	50 - 120	2.848	1.14	20	
Di-n-butyl phthalate	3.144	0.20	5	0	62.9	45 - 123	3.195	1.58	20	
Fluoranthene	2.91	0.10	5	0	58.2	45 - 125	3.091	6.04	20	
Fluorene	2.867	0.10	5	0	57.3	49 - 120	2.956	3.06	20	
Naphthalene	2.818	0.10	5	0	56.4	45 - 120	2.834	0.569	20	
Nitrobenzene	2.964	0.20	5	0	59.3	44 - 120	3.097	4.41	20	
N-Nitrosodiphenylamine	2.798	0.20	5	0	56.0	40 - 125	2.761	1.34	20	
Pentachlorophenol	2.022	0.20	5	0	40.4	19 - 121	2.15	6.16	20	
Phenanthrene	2.853	0.10	5	0	57.1	45 - 121	2.871	0.657	20	
Phenol	3.092	0.20	5	0	61.8	20 - 124	2.818	9.26	20	
Pyrene	3.078	0.10	5	0	61.6	40 - 130	3.018	1.95	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.638</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>52.8</i>	<i>34 - 129</i>	<i>2.845</i>	<i>7.55</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.882</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.6</i>	<i>40 - 125</i>	<i>2.873</i>	<i>0.327</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>2.881</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.6</i>	<i>20 - 120</i>	<i>2.831</i>	<i>1.74</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.126</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.5</i>	<i>40 - 135</i>	<i>2.997</i>	<i>4.2</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>2.929</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>58.6</i>	<i>41 - 120</i>	<i>3.066</i>	<i>4.58</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.065</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.3</i>	<i>20 - 120</i>	<i>3.129</i>	<i>2.08</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010437-01    HS19010437-02    HS19010437-03    HS19010437-04  
 HS19010437-05    HS19010437-06    HS19010437-07



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-136574	Units: ug/L			Analysis Date: 21-Jan-2019 16:47					
Client ID:	Run ID: SV-6_331448	SeqNo: 4923243	PrepDate: 14-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.108</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.2</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.184</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.7</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.135</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.7</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.842</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.8</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.149</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.0</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.133</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-136574	Units: ug/L			Analysis Date: 21-Jan-2019 17:06					
Client ID:	Run ID: SV-6_331448	SeqNo: 4923244	PrepDate: 14-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.425	0.20	5	0	68.5	39 - 127				
2,4-Dimethylphenol	2.909	0.20	5	0	58.2	35 - 120				
2,4-Dinitrotoluene	3.257	0.20	5	0	65.1	50 - 122				
2,6-Dinitrotoluene	3.348	0.20	5	0	67.0	50 - 120				
2-Chloronaphthalene	3.311	0.20	5	0	66.2	50 - 120				
2-Methylnaphthalene	3.319	0.10	5	0	66.4	50 - 120				
4,6-Dinitro-2-methylphenol	2.839	0.20	5	0	56.8	25 - 121				
4-Nitrophenol	3.667	1.0	5	0	73.3	30 - 130				
Acenaphthene	2.962	0.10	5	0	59.2	45 - 120				
Acenaphthylene	3.213	0.10	5	0	64.3	47 - 120				
Anthracene	3.335	0.10	5	0	66.7	45 - 120				
Benz(a)anthracene	3.534	0.10	5	0	70.7	40 - 120				
Benzo(a)pyrene	3.583	0.10	5	0	71.7	45 - 120				
Bis(2-chloroethoxy)methane	3.193	0.20	5	0	63.9	45 - 120				
Bis(2-ethylhexyl)phthalate	3.532	0.20	5	0	70.6	40 - 139				
Chrysene	3.656	0.10	5	0	73.1	43 - 120				
Dibenzofuran	3.153	0.10	5	0	63.1	50 - 120				
Di-n-butyl phthalate	3.53	0.20	5	0	70.6	45 - 123				
Fluoranthene	3.345	0.10	5	0	66.9	45 - 125				
Fluorene	3.258	0.10	5	0	65.2	49 - 120				
Naphthalene	3.154	0.10	5	0	63.1	45 - 120				
Nitrobenzene	3.125	0.20	5	0	62.5	44 - 120				
N-Nitrosodiphenylamine	3.485	0.20	5	0	69.7	40 - 125				
Pentachlorophenol	1.947	0.20	5	0	38.9	19 - 121				
Phenanthrene	3.258	0.10	5	0	65.2	45 - 121				
Phenol	3.007	0.20	5	0	60.1	20 - 124				
Pyrene	3.499	0.10	5	0	70.0	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.918</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>78.4</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.542</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>70.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.197</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.9</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.935</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>78.7</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.356</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>67.1</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.433</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>68.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6			Method: SW8270					
LCSD		Sample ID: LCSD-136574			Units: ug/L		Analysis Date: 21-Jan-2019 17:26			
Client ID:		Run ID: SV-6_331448			SeqNo: 4923245		PrepDate: 14-Jan-2019		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.542	0.20	5	0	70.8	39 - 127	3.425	3.38	20	
2,4-Dimethylphenol	2.885	0.20	5	0	57.7	35 - 120	2.909	0.836	20	
2,4-Dinitrotoluene	3.412	0.20	5	0	68.2	50 - 122	3.257	4.64	20	
2,6-Dinitrotoluene	3.653	0.20	5	0	73.1	50 - 120	3.348	8.71	20	
2-Chloronaphthalene	3.275	0.20	5	0	65.5	50 - 120	3.311	1.08	20	
2-Methylnaphthalene	3.455	0.10	5	0	69.1	50 - 120	3.319	4.01	20	
4,6-Dinitro-2-methylphenol	2.502	0.20	5	0	50.0	25 - 121	2.839	12.6	30	
4-Nitrophenol	3.099	1.0	5	0	62.0	30 - 130	3.667	16.8	20	
Acenaphthene	3.033	0.10	5	0	60.7	45 - 120	2.962	2.37	20	
Acenaphthylene	3.372	0.10	5	0	67.4	47 - 120	3.213	4.84	20	
Anthracene	3.326	0.10	5	0	66.5	45 - 120	3.335	0.279	20	
Benz(a)anthracene	3.597	0.10	5	0	71.9	40 - 120	3.534	1.77	20	
Benzo(a)pyrene	3.783	0.10	5	0	75.7	45 - 120	3.583	5.42	20	
Bis(2-chloroethoxy)methane	3.321	0.20	5	0	66.4	45 - 120	3.193	3.94	20	
Bis(2-ethylhexyl)phthalate	3.63	0.20	5	0	72.6	40 - 139	3.532	2.72	20	
Chrysene	3.715	0.10	5	0	74.3	43 - 120	3.656	1.6	20	
Dibenzofuran	3.225	0.10	5	0	64.5	50 - 120	3.153	2.28	20	
Di-n-butyl phthalate	3.561	0.20	5	0	71.2	45 - 123	3.53	0.865	20	
Fluoranthene	3.507	0.10	5	0	70.1	45 - 125	3.345	4.74	20	
Fluorene	3.396	0.10	5	0	67.9	49 - 120	3.258	4.13	20	
Naphthalene	3.137	0.10	5	0	62.7	45 - 120	3.154	0.533	20	
Nitrobenzene	3.302	0.20	5	0	66.0	44 - 120	3.125	5.5	20	
N-Nitrosodiphenylamine	3.648	0.20	5	0	73.0	40 - 125	3.485	4.59	20	
Pentachlorophenol	1.865	0.20	5	0	37.3	19 - 121	1.947	4.33	20	
Phenanthrene	3.466	0.10	5	0	69.3	45 - 121	3.258	6.17	20	
Phenol	2.767	0.20	5	0	55.3	20 - 124	3.007	8.3	20	
Pyrene	3.583	0.10	5	0	71.7	40 - 130	3.499	2.37	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.67</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>73.4</i>	<i>34 - 129</i>	<i>3.918</i>	<i>6.54</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.491</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.8</i>	<i>40 - 125</i>	<i>3.542</i>	<i>1.44</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>2.782</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>55.6</i>	<i>20 - 120</i>	<i>3.197</i>	<i>13.9</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.868</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.4</i>	<i>40 - 135</i>	<i>3.935</i>	<i>1.72</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>3.24</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.8</i>	<i>41 - 120</i>	<i>3.356</i>	<i>3.51</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.045</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>60.9</i>	<i>20 - 120</i>	<i>3.433</i>	<i>12</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010437-08 HS19010437-09 HS19010437-10 HS19010437-11  
 HS19010437-12 HS19010437-13

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

**Batch ID:** R331023      **Instrument:** VOA2      **Method:** SW8260

<b>MBLK</b>		Sample ID: <b>VBLKW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 11:44</b>			
Client ID:		Run ID: <b>VOA2_331023</b>			SeqNo: <b>4908196</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.11</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.2</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.66</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.3</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.4</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.79</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 10:56</b>			
Client ID:		Run ID: <b>VOA2_331023</b>			SeqNo: <b>4908195</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	18.48	1.0	20	0	92.4	70 - 124				
Benzene	18.31	1.0	20	0	91.5	74 - 120				
Chlorobenzene	19.85	1.0	20	0	99.2	76 - 113				
Ethylbenzene	19.67	1.0	20	0	98.3	77 - 117				
Methylene chloride	18.97	2.0	20	0	94.9	70 - 127				
Toluene	19.01	1.0	20	0	95.0	77 - 118				
Xylenes, Total	58.55	1.0	60	0	97.6	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.7</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.17</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.3</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.29</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.06</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

**Batch ID:** R331023      **Instrument:** VOA2      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19010437-01MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 15:51</b>			
Client ID: <b>WG-1620-MW13-20190108</b>		Run ID: <b>VOA2_331023</b>			SeqNo: <b>4908205</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.74	1.0	20	0	78.7	70 - 127				
Benzene	16.25	1.0	20	0	81.2	70 - 127				
Chlorobenzene	17.48	1.0	20	0	87.4	70 - 114				
Ethylbenzene	18.16	1.0	20	0	90.8	70 - 124				
Methylene chloride	15.39	2.0	20	0	76.9	70 - 128				
Toluene	17.05	1.0	20	0	85.3	70 - 123				
Xylenes, Total	52.77	1.0	60	0	88.0	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.06</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.4</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.0</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19010437-01MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 16:15</b>			
Client ID: <b>WG-1620-MW13-20190108</b>		Run ID: <b>VOA2_331023</b>			SeqNo: <b>4908206</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.54	1.0	20	0	82.7	70 - 127	15.74	4.96	20	
Benzene	16.74	1.0	20	0	83.7	70 - 127	16.25	2.99	20	
Chlorobenzene	18.07	1.0	20	0	90.3	70 - 114	17.48	3.32	20	
Ethylbenzene	19.07	1.0	20	0	95.4	70 - 124	18.16	4.88	20	
Methylene chloride	16.41	2.0	20	0	82.1	70 - 128	15.39	6.45	20	
Toluene	17.79	1.0	20	0	89.0	70 - 123	17.05	4.23	20	
Xylenes, Total	55.22	1.0	60	0	92.0	70 - 130	52.77	4.54	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>70 - 126</i>	<i>50.06</i>	<i>1.19</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.97</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.9</i>	<i>81 - 113</i>	<i>49.03</i>	<i>0.12</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>50.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>77 - 123</i>	<i>50.4</i>	<i>0.594</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.98</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.0</i>	<i>82 - 127</i>	<i>48.48</i>	<i>1.02</i>	<i>20</i>	

The following samples were analyzed in this batch:

HS19010437-01	HS19010437-02	HS19010437-03	HS19010437-04
HS19010437-05	HS19010437-06	HS19010437-07	HS19010437-08
HS19010437-09	HS19010437-10	HS19010437-11	HS19010437-12

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

**Batch ID:** R331030      **Instrument:** VOA2      **Method:** SW8260

<b>MBLK</b>		Sample ID: <b>VBLKW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 23:26</b>			
Client ID:		Run ID: <b>VOA2_331030</b>			SeqNo: <b>4908344</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.0</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.6</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.08</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.07</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 22:38</b>			
Client ID:		Run ID: <b>VOA2_331030</b>			SeqNo: <b>4908367</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	19.25	1.0	20	0	96.3	70 - 124				
Benzene	18.74	1.0	20	0	93.7	74 - 120				
Chlorobenzene	20.42	1.0	20	0	102	76 - 113				
Ethylbenzene	20.53	1.0	20	0	103	77 - 117				
Methylene chloride	19.15	2.0	20	0	95.7	70 - 127				
Toluene	19.5	1.0	20	0	97.5	77 - 118				
Xylenes, Total	61.55	1.0	60	0	103	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.25</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.3</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.6</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.3</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>48.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QC BATCH REPORT**

Batch ID: R331030		Instrument: VOA2		Method: SW8260						
<b>MS</b>	Sample ID: <b>HS19010488-02MS</b>	Units: <b>ug/L</b>			Analysis Date: <b>15-Jan-2019 01:28</b>					
Client ID:	Run ID: <b>VOA2_331030</b>	SeqNo: <b>4908349</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	22.83	1.0	20	0	114	70 - 127				
Benzene	22.47	1.0	20	0	112	70 - 127				
Chlorobenzene	24.15	1.0	20	0	121	70 - 114				S
Ethylbenzene	24.94	1.0	20	0	125	70 - 124				S
Methylene chloride	22.3	2.0	20	0	112	70 - 128				
Toluene	23.63	1.0	20	0	118	70 - 123				
Xylenes, Total	72.41	1.0	60	0	121	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.43</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.9</i>	<i>82 - 127</i>				

<b>MSD</b>	Sample ID: <b>HS19010488-02MSD</b>	Units: <b>ug/L</b>			Analysis Date: <b>15-Jan-2019 01:52</b>					
Client ID:	Run ID: <b>VOA2_331030</b>	SeqNo: <b>4908350</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	22.17	1.0	20	0	111	70 - 127	22.83	2.94	20	
Benzene	22.05	1.0	20	0	110	70 - 127	22.47	1.87	20	
Chlorobenzene	24.13	1.0	20	0	121	70 - 114	24.15	0.0925	20	S
Ethylbenzene	24.35	1.0	20	0	122	70 - 124	24.94	2.38	20	
Methylene chloride	21.15	2.0	20	0	106	70 - 128	22.3	5.27	20	
Toluene	23.48	1.0	20	0	117	70 - 123	23.63	0.623	20	
Xylenes, Total	72.09	1.0	60	0	120	70 - 130	72.41	0.437	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>70 - 126</i>	<i>51.71</i>	<i>2.75</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>81 - 113</i>	<i>49.81</i>	<i>0.0761</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>50.75</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>77 - 123</i>	<i>50.81</i>	<i>0.117</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.58</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.2</i>	<i>82 - 127</i>	<i>48.43</i>	<i>0.305</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010437-13      HS19010437-14

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010437

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter



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**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

**Sample Receipt Checklist**

Client Name: PBW  
 Work Order: HS19010437

Date/Time Received: **10-Jan-2019 09:05**  
 Received by: **PJM**

Checklist completed by: Pablo Martinez 10-Jan-2019  
 eSignature Date

Reviewed by: Dane J. Wacasey 16-Jan-2019  
 eSignature Date

Matrices: **WATER**

Carrier name: **Client**

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- TX1005 solids received in hermetically sealed vials? Yes  No  N/A
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No

Temperature(s)/Thermometer(s): 2.8C/3.2C, 2.3C/2.7C, 2.7C/3.1C, 2.2C/2.6C UC/C IR # 11  
 Cooler(s)/Kit(s): 44417, 25283, 43015, 24932  
 Date/Time sample(s) sent to storage: 1/10/19 20:30

- Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted
- Water - pH acceptable upon receipt? Yes  No  N/A
- pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



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Holland, MI  
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# Chain of Custody Form

Page 1 of 2

COC ID: 194315

## HS19010437

WV

Golder Associates Inc.

Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E	
	Suite 4004		Stop 0750	F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	<del>WG-1620-TBO-20190108</del> WG-1620-MW13-20190108	1-8-19	0945	Water	1	6	X		X	X							
2	WG-1620-MW14-20190108	1-8-19	1040	W		6	X		X	X							
3	WG-1620-MW15A-20190108		1130	W		6	X		X	X							
4	WG-1620-MW15C-20190108		1220	W		6	X		X	X							
5	WG-1620-MW15B-20190108		1305	W		6	X		X	X							
6	WG-1620-MW20A-20190108		1500	W		6	X		X	X							
7	WG-1620-MW88C-20190108		1600	W		6	X		X	X							
8	WG-1620-MW42B-20190108		1655	W		6	X		X	X							
9	WG-1620-MW40B-20190108		1745	W		6	X		X	X							
10	WG-1620-MW39B-20190108		1845	W		6	X		X	X							

Sampler(s) Please Print & Sign <b>JOHN BRAYTON</b> <i>John Br</i>		Shipment Method <b>HAND DELIVERED</b>	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour		Results Due Date:
Relinquished by: <i>John Br</i>	Date: 1-10-19 Time: 9:05	Received by:	Notes: UPRR Houston MWPW		
Relinquished by:	Date: 1-10-19 Time: 9:05	Received by (Laboratory): <b>PM</b>	Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)
Logged by (Laboratory):	Date:	Checked by (Laboratory):	25283	2.3C	<input type="checkbox"/> Level II Std QC <input checked="" type="checkbox"/> TRRP Checklist
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035			24932	2.2C	<input type="checkbox"/> Level III Std QC/Rst Date <input type="checkbox"/> TRRP Level IV
			43015	2.7C	<input type="checkbox"/> Level IV SW846/CLP
			44417	2.8C	<input type="checkbox"/> Other

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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# Chain of Custody Form

Page 2 of 2

COC ID: 194308

HS19010437

1, WV

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92686	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals- As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E	
	Suite 4004		Stop 0750	F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TBO-201861			Water	+	3											
2	WG-1620-MW12A-20190109	1-9-19	0735	W		6	X		X	X							
3	WG-1620-MW12C-20190109	1-9-19	0825	W		6	X		X	X							
4	WG-1620-FB01-20190108	1-8-19	1900	W		6	X		X	X							
5	WG-1620-TB01-20190108	-	-	-		2	X										
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>John Graydon</i>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:					
Relinquished by: <i>John Graydon</i>		Date: 1-10-19	Time: 9:05	Received by:		Notes: UPRR Houston MWPW							
Relinquisher by: <i>John Graydon</i>		Date: 1-10-19	Time: 9:05	Received by (Laboratory): PM		Cooler ID		Cooler Temp.		QC Package: (Check One Box Below)			
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):						<input type="checkbox"/> Level II Std QC <input type="checkbox"/> Level III Std OC/Raw Data <input type="checkbox"/> Level IV SWM/CLP <input checked="" type="checkbox"/> TRRP Checklist <input type="checkbox"/> TRRF Level IV			
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035													

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
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January 25, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19010488**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 25 sample(s) on Jan 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER  
Dane J. Wacasey

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey

**Laboratory Review Checklist: Reportable Data**

Laboratory Name: ALS Laboratory Group			LRC Date: 01/25/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19010488				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 136574, 136614, 136717, 136742, R331030, R331042, R331088, R331375				
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?	X				
		Were % moisture (or solids) reported for all soil and sediment samples?	X				
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		X			1
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?		X			2
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			3
		Were MS/MSD RPDs within laboratory QC limits?	X				
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				4
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				



**Laboratory Review Checklist: Supporting Data**

Laboratory Name: ALS Laboratory Group		LRC Date: 01/25/2019					
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19010488					
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136574, 136614, 136717, 136742, R331030, R331042, R331088, R331375					
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?			X		
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section</b>					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?			X		
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)</b>					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group	LRC Date: 01/25/2019
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS19010488
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 136574, 136614, 136717, 136742, R331030, R331042, R331088, R331375

ER# <sup>5</sup>	Description
1	Semivolatile Organics Method SW8270, samples WG-1620-MW17-20190109, WG-1620-MW17C-20190110, WG-1620-MW18C-20190110, WG-1620-MW18A-20190110, the surrogate recoveries could not be determined due to dilution below the calibration range.
2	Batch 136574, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch. Batch 136614, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch.
3	Batch R331030, Volatile Organics Method SW8260, sample WG-1620-MW05-20190109, MS and or MSD recovered outside the control limits due to suspect matrix effect.
4	Batch 136574, Semivolatile Organics Method SW8270, samples WG-1620-MW17-20190109, WG-1620-MW18C-20190110, WG-1620-MW18A-20190110; GCMS semi-volatile extract of these samples were run at a dilution due to a high level of matrix interference. Volatile Organics Method SW8260, samples WG-1620-TW41B-20190109, WG-1620-MW17-20190109, WG-1620-MW18C-20190110, WG-1620-MW18A-20190110: Lowest practical dilution performed o these samples due to high concentration of non-target analyte(s).

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.  
 O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);  
 NA = Not Applicable;  
 NR = Not Reviewed;  
 R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19010488

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010488-01	WG-1620-TW41B-20190109	Groundwater		09-Jan-2019 10:35	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-02	WG-1620-MW05-20190109	Groundwater		09-Jan-2019 11:25	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-03	WG-1620-P11-20190109	Groundwater		09-Jan-2019 12:25	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-04	WG-1620-MW03-20190109	Groundwater		09-Jan-2019 13:15	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-05	WG-1620-MW09-20190109	Groundwater		09-Jan-2019 14:05	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-06	WG-1620-MW04-20190109	Groundwater		09-Jan-2019 15:05	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-07	WG-1620-MW21C-20190109	Groundwater		09-Jan-2019 16:20	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-08	WG-1620-FD01-20190109	Groundwater		09-Jan-2019 16:20	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-09	WG-1620-MW17-20190109	Groundwater		09-Jan-2019 17:20	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-10	WQ-1620-FB02-20190109	Water		09-Jan-2019 17:35	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-11	WG-1620-MW17C-20190110	Groundwater		10-Jan-2019 07:25	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-12	WG-1620-MW18C-20190110	Groundwater		10-Jan-2019 08:20	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-13	WG-1620-MW18A-20190110	Groundwater		10-Jan-2019 10:45	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-14	WG-1620-MW48C-20190110	Groundwater		10-Jan-2019 11:45	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-15	WG-1620-MW69A-20190110	Groundwater		10-Jan-2019 12:45	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-16	WQ-1620-TB02-20190110	Water	ALS-121118-61	10-Jan-2019 00:00	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-17	WG-1620-MW80B-20190110	Groundwater		10-Jan-2019 13:50	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-18	WG-1620-MW50A-20190110	Groundwater		10-Jan-2019 14:40	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-19	WG-1620-MW81B-20190110	Groundwater		10-Jan-2019 15:30	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-20	WG-1620-MW51A-20190110	Groundwater		10-Jan-2019 16:40	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-21	WG-1620-MW51C-20190110	Groundwater		10-Jan-2019 17:30	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-22	WG-1620-MW86C-20190111	Groundwater		11-Jan-2019 08:25	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-23	WG-1620-FD02-20190111	Groundwater		11-Jan-2019 08:25	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-24	WQ-1620-FB03-20190111	Water		11-Jan-2019 11:15	11-Jan-2019 14:00	<input type="checkbox"/>
HS19010488-25	WG-1620-MW60A-20190111	Groundwater		11-Jan-2019 10:15	11-Jan-2019 14:00	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-TW41B-20190109  
 Collection Date: 09-Jan-2019 10:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.0020	0.010	mg/L	10	15-Jan-2019 01:04
Benzene	U		0.0020	0.010	mg/L	10	15-Jan-2019 01:04
Chlorobenzene	U		0.0030	0.010	mg/L	10	15-Jan-2019 01:04
Ethylbenzene	U		0.0030	0.010	mg/L	10	15-Jan-2019 01:04
Methylene chloride	U		0.010	0.020	mg/L	10	15-Jan-2019 01:04
Toluene	U		0.0020	0.010	mg/L	10	15-Jan-2019 01:04
Xylenes, Total	U		0.0030	0.010	mg/L	10	15-Jan-2019 01:04
<i>Surr: 1,2-Dichloroethane-d4</i>		96.2		70-126	%REC	10	15-Jan-2019 01:04
<i>Surr: 4-Bromofluorobenzene</i>		97.9		81-113	%REC	10	15-Jan-2019 01:04
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	10	15-Jan-2019 01:04
<i>Surr: Toluene-d8</i>		98.4		82-127	%REC	10	15-Jan-2019 01:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-TW41B-20190109  
 Collection Date: 09-Jan-2019 10:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	21-Jan-2019 23:41
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	21-Jan-2019 23:41
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	21-Jan-2019 23:41
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	21-Jan-2019 23:41
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	21-Jan-2019 23:41
<b>2-Methylnaphthalene</b>	<b>0.0098</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	21-Jan-2019 23:41
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	21-Jan-2019 23:41
<b>Acenaphthene</b>	<b>0.058</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 17:26
<b>Acenaphthylene</b>	<b>0.00091</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
<b>Anthracene</b>	<b>0.0023</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	21-Jan-2019 23:41
<b>Benzo(a)pyrene</b>	<b>0.000097</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	21-Jan-2019 23:41
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	21-Jan-2019 23:41
Chrysene	U		0.000021	0.00010	mg/L	1	21-Jan-2019 23:41
<b>Dibenzofuran</b>	<b>0.026</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 17:26
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	21-Jan-2019 23:41
<b>Fluoranthene</b>	<b>0.0014</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
<b>Fluorene</b>	<b>0.035</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 17:26
<b>Naphthalene</b>	<b>0.061</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	23-Jan-2019 17:26
Nitrobenzene	U		0.000024	0.00020	mg/L	1	21-Jan-2019 23:41
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	21-Jan-2019 23:41
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	21-Jan-2019 23:41
<b>Phenanthrene</b>	<b>0.0035</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
Phenol	U		0.000035	0.00020	mg/L	1	21-Jan-2019 23:41
<b>Pyrene</b>	<b>0.00056</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	21-Jan-2019 23:41
<i>Surr: 2,4,6-Tribromophenol</i>	70.2			34-129	%REC	10	23-Jan-2019 17:26
<i>Surr: 2,4,6-Tribromophenol</i>	73.2			34-129	%REC	1	21-Jan-2019 23:41
<i>Surr: 2-Fluorobiphenyl</i>	57.7			40-125	%REC	1	21-Jan-2019 23:41
<i>Surr: 2-Fluorobiphenyl</i>	47.1			40-125	%REC	10	23-Jan-2019 17:26
<i>Surr: 2-Fluorophenol</i>	46.3			20-120	%REC	10	23-Jan-2019 17:26
<i>Surr: 2-Fluorophenol</i>	55.4			20-120	%REC	1	21-Jan-2019 23:41
<i>Surr: 4-Terphenyl-d14</i>	71.2			40-135	%REC	1	21-Jan-2019 23:41
<i>Surr: 4-Terphenyl-d14</i>	74.2			40-135	%REC	10	23-Jan-2019 17:26
<i>Surr: Nitrobenzene-d5</i>	52.3			41-120	%REC	10	23-Jan-2019 17:26
<i>Surr: Nitrobenzene-d5</i>	54.5			41-120	%REC	1	21-Jan-2019 23:41
<i>Surr: Phenol-d6</i>	56.0			20-120	%REC	1	21-Jan-2019 23:41
<i>Surr: Phenol-d6</i>	49.9			20-120	%REC	10	23-Jan-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-TW41B-20190109  
 Collection Date: 09-Jan-2019 10:35

**ANALYTICAL REPORT**

WorkOrder:HS19010488  
 Lab ID:HS19010488-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JCJ	
Arsenic	0.125		0.000400	0.00200	mg/L	1	23-Jan-2019 20:04
Lead	U		0.000600	0.00200	mg/L	1	23-Jan-2019 20:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW05-20190109  
 Collection Date: 09-Jan-2019 11:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:37
Benzene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:37
Chlorobenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:37
Ethylbenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:37
Methylene chloride	U		0.0010	0.0020	mg/L	1	15-Jan-2019 00:37
Toluene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 00:37
Xylenes, Total	U		0.00030	0.0010	mg/L	1	15-Jan-2019 00:37
<i>Surr: 1,2-Dichloroethane-d4</i>		93.7		70-126	%REC	1	15-Jan-2019 00:37
<i>Surr: 4-Bromofluorobenzene</i>		95.4		81-113	%REC	1	15-Jan-2019 00:37
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	15-Jan-2019 00:37
<i>Surr: Toluene-d8</i>		99.2		82-127	%REC	1	15-Jan-2019 00:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW05-20190109  
 Collection Date: 09-Jan-2019 11:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: ACN
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:01
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 00:01
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 00:01
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 00:01
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:01
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:01
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:01
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 00:01
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 00:01
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 00:01
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jan-2019 00:01
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 00:01
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:01
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 00:01
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 00:01
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:01
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:01
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:01
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 00:01
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 00:01
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:01
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 00:01
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 00:01
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 00:01
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:01
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 00:01
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:01
<i>Surr: 2,4,6-Tribromophenol</i>	68.8			34-129	%REC	1	22-Jan-2019 00:01
<i>Surr: 2-Fluorobiphenyl</i>	65.1			40-125	%REC	1	22-Jan-2019 00:01
<i>Surr: 2-Fluorophenol</i>	53.4			20-120	%REC	1	22-Jan-2019 00:01
<i>Surr: 4-Terphenyl-d14</i>	71.4			40-135	%REC	1	22-Jan-2019 00:01
<i>Surr: Nitrobenzene-d5</i>	55.5			41-120	%REC	1	22-Jan-2019 00:01
<i>Surr: Phenol-d6</i>	59.8			20-120	%REC	1	22-Jan-2019 00:01
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.00387</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	23-Jan-2019 20:06
<b>Lead</b>	<b>0.00149</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	23-Jan-2019 20:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-P11-20190109  
 Collection Date: 09-Jan-2019 12:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	15-Jan-2019 05:52
Benzene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 05:52
Chlorobenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 05:52
Ethylbenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 05:52
Methylene chloride	U		0.0010	0.0020	mg/L	1	15-Jan-2019 05:52
Toluene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 05:52
Xylenes, Total	U		0.00030	0.0010	mg/L	1	15-Jan-2019 05:52
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 05:52</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 05:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 05:52</i>
<i>Surr: Toluene-d8</i>	<i>99.4</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 05:52</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-P11-20190109  
 Collection Date: 09-Jan-2019 12:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: ACN
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:20
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 00:20
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 00:20
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 00:20
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:20
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:20
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:20
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 00:20
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 00:20
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 00:20
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jan-2019 00:20
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 00:20
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:20
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 00:20
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 00:20
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:20
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:20
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:20
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 00:20
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 00:20
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:20
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 00:20
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 00:20
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 00:20
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:20
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 00:20
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:20
<i>Surr: 2,4,6-Tribromophenol</i>	65.2			34-129	%REC	1	22-Jan-2019 00:20
<i>Surr: 2-Fluorobiphenyl</i>	59.8			40-125	%REC	1	22-Jan-2019 00:20
<i>Surr: 2-Fluorophenol</i>	48.8			20-120	%REC	1	22-Jan-2019 00:20
<i>Surr: 4-Terphenyl-d14</i>	69.7			40-135	%REC	1	22-Jan-2019 00:20
<i>Surr: Nitrobenzene-d5</i>	48.9			41-120	%REC	1	22-Jan-2019 00:20
<i>Surr: Phenol-d6</i>	50.1			20-120	%REC	1	22-Jan-2019 00:20
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.0183</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	23-Jan-2019 20:08
<b>Lead</b>	<b>0.00192</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	23-Jan-2019 20:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW03-20190109  
 Collection Date: 09-Jan-2019 13:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:16
Benzene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:16
Chlorobenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 06:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 06:16
Methylene chloride	U		0.0010	0.0020	mg/L	1	15-Jan-2019 06:16
Toluene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:16
Xylenes, Total	U		0.00030	0.0010	mg/L	1	15-Jan-2019 06:16
<i>Surr: 1,2-Dichloroethane-d4</i>		96.2		70-126	%REC	1	15-Jan-2019 06:16
<i>Surr: 4-Bromofluorobenzene</i>		96.8		81-113	%REC	1	15-Jan-2019 06:16
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	15-Jan-2019 06:16
<i>Surr: Toluene-d8</i>		99.1		82-127	%REC	1	15-Jan-2019 06:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW03-20190109  
 Collection Date: 09-Jan-2019 13:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: ACN
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:40
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	22-Jan-2019 00:40
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	22-Jan-2019 00:40
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	22-Jan-2019 00:40
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	22-Jan-2019 00:40
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:40
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:40
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	22-Jan-2019 00:40
Acenaphthene	U		0.000027	0.00010	mg/L	1	22-Jan-2019 00:40
Acenaphthylene	U		0.000015	0.00010	mg/L	1	22-Jan-2019 00:40
Anthracene	U		0.000014	0.00010	mg/L	1	22-Jan-2019 00:40
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	22-Jan-2019 00:40
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:40
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	22-Jan-2019 00:40
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	22-Jan-2019 00:40
Chrysene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:40
Dibenzofuran	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:40
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	22-Jan-2019 00:40
Fluoranthene	U		0.000010	0.00010	mg/L	1	22-Jan-2019 00:40
Fluorene	U		0.000030	0.00010	mg/L	1	22-Jan-2019 00:40
Naphthalene	U		0.000020	0.00010	mg/L	1	22-Jan-2019 00:40
Nitrobenzene	U		0.000024	0.00020	mg/L	1	22-Jan-2019 00:40
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	22-Jan-2019 00:40
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	22-Jan-2019 00:40
Phenanthrene	U		0.000021	0.00010	mg/L	1	22-Jan-2019 00:40
Phenol	U		0.000035	0.00020	mg/L	1	22-Jan-2019 00:40
Pyrene	U		0.000019	0.00010	mg/L	1	22-Jan-2019 00:40
<i>Surr: 2,4,6-Tribromophenol</i>	<i>67.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>61.3</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<i>Surr: 2-Fluorophenol</i>	<i>48.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>77.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<i>Surr: Nitrobenzene-d5</i>	<i>54.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<i>Surr: Phenol-d6</i>	<i>55.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2019 00:40</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.0191</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:10</b>
<b>Lead</b>	<b>0.00131</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:10</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW09-20190109  
 Collection Date: 09-Jan-2019 14:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:42
Benzene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:42
<b>Chlorobenzene</b>	<b>0.0041</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	15-Jan-2019 06:42
Ethylbenzene	U		0.00030	0.0010	mg/L	1	15-Jan-2019 06:42
Methylene chloride	U		0.0010	0.0020	mg/L	1	15-Jan-2019 06:42
Toluene	U		0.00020	0.0010	mg/L	1	15-Jan-2019 06:42
Xylenes, Total	U		0.00030	0.0010	mg/L	1	15-Jan-2019 06:42
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.4</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 06:42</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.5</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 06:42</i>
<i>Surr: Dibromofluoromethane</i>	<i>99.2</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 06:42</i>
<i>Surr: Toluene-d8</i>	<i>99.4</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>15-Jan-2019 06:42</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW09-20190109  
 Collection Date: 09-Jan-2019 14:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 17:46
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	23-Jan-2019 17:46
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	23-Jan-2019 17:46
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 17:46
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 17:46
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 17:46
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 17:46
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 17:46
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jan-2019 17:46
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 17:46
<b>Anthracene</b>	<b>0.000093</b>	<b>J</b>	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 17:46</b>
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	23-Jan-2019 17:46
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 17:46
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 17:46
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 17:46
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 17:46
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 17:46
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 17:46
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 17:46
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 17:46
Naphthalene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 17:46
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 17:46
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 17:46
Pentachlorophenol	U		0.000080	0.00020	mg/L	1	23-Jan-2019 17:46
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 17:46
Phenol	U		0.000035	0.00020	mg/L	1	23-Jan-2019 17:46
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 17:46
<i>Surr: 2,4,6-Tribromophenol</i>	<i>64.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>62.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<i>Surr: 2-Fluorophenol</i>	<i>37.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>81.3</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<i>Surr: Nitrobenzene-d5</i>	<i>45.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<i>Surr: Phenol-d6</i>	<i>45.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 17:46</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00202</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:13</b>
<b>Lead</b>	<b>0.000931</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:13</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW04-20190109  
 Collection Date: 09-Jan-2019 15:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 01:09
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 01:09
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 01:09
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 01:09
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 01:09
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 01:09
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 01:09
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 01:09</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 01:09</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 01:09</i>
<i>Surr: Toluene-d8</i>	<i>98.4</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 01:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW04-20190109  
 Collection Date: 09-Jan-2019 15:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:05
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	23-Jan-2019 18:05
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 18:05
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 18:05
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:05
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:05
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:05
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 18:05
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jan-2019 18:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 18:05
<b>Anthracene</b>	<b>0.000079</b>	<b>J</b>	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 18:05</b>
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	23-Jan-2019 18:05
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:05
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 18:05
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 18:05
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:05
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:05
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:05
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 18:05
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 18:05
Naphthalene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:05
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 18:05
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 18:05
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 18:05
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:05
Phenol	U		0.000035	0.00020	mg/L	1	23-Jan-2019 18:05
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:05
<i>Surr: 2,4,6-Tribromophenol</i>	<i>59.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<i>Surr: 2-Fluorophenol</i>	<i>41.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>62.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<i>Surr: Nitrobenzene-d5</i>	<i>48.8</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<i>Surr: Phenol-d6</i>	<i>49.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:05</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.000963</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:15</b>
Lead	U		0.000600	0.00200	mg/L	1	23-Jan-2019 20:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW21C-20190109  
 Collection Date: 09-Jan-2019 16:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 02:45
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 02:45
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 02:45
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 02:45
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 02:45
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 02:45
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 02:45
<i>Surr: 1,2-Dichloroethane-d4</i>		94.6		70-126	%REC	1	16-Jan-2019 02:45
<i>Surr: 4-Bromofluorobenzene</i>		96.4		81-113	%REC	1	16-Jan-2019 02:45
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	16-Jan-2019 02:45
<i>Surr: Toluene-d8</i>		98.9		82-127	%REC	1	16-Jan-2019 02:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW21C-20190109  
 Collection Date: 09-Jan-2019 16:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:25
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	23-Jan-2019 18:25
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 18:25
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 18:25
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:25
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:25
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:25
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 18:25
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jan-2019 18:25
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 18:25
Anthracene	U		0.000014	0.00010	mg/L	1	23-Jan-2019 18:25
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	23-Jan-2019 18:25
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:25
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 18:25
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 18:25
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:25
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:25
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:25
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 18:25
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 18:25
Naphthalene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:25
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 18:25
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 18:25
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 18:25
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:25
Phenol	U		0.000035	0.00020	mg/L	1	23-Jan-2019 18:25
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:25
<i>Surr: 2,4,6-Tribromophenol</i>	<i>42.3</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>43.2</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<i>Surr: Nitrobenzene-d5</i>	<i>41.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<i>Surr: Phenol-d6</i>	<i>42.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 18:25</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.00187</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:17</b>
Lead	U		0.000600	0.00200	mg/L	1	23-Jan-2019 20:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD01-20190109  
 Collection Date: 09-Jan-2019 16:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:09
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:09
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:09
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:09
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 03:09
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:09
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:09
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>101</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:09</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>92.6</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:09</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:09</i>
<i>Surr: Toluene-d8</i>	<i>99.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD01-20190109  
 Collection Date: 09-Jan-2019 16:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:45
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	23-Jan-2019 18:45
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 18:45
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 18:45
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 18:45
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:45
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:45
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 18:45
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jan-2019 18:45
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 18:45
Anthracene	U		0.000014	0.00010	mg/L	1	23-Jan-2019 18:45
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	23-Jan-2019 18:45
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:45
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 18:45
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 18:45
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:45
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:45
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 18:45
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 18:45
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 18:45
Naphthalene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 18:45
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 18:45
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 18:45
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 18:45
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 18:45
Phenol	U		0.000035	0.00020	mg/L	1	23-Jan-2019 18:45
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 18:45
<i>Surr: 2,4,6-Tribromophenol</i>	35.2			34-129	%REC	1	23-Jan-2019 18:45
<i>Surr: 2-Fluorobiphenyl</i>	42.3			40-125	%REC	1	23-Jan-2019 18:45
<i>Surr: 2-Fluorophenol</i>	29.9			20-120	%REC	1	23-Jan-2019 18:45
<i>Surr: 4-Terphenyl-d14</i>	65.1			40-135	%REC	1	23-Jan-2019 18:45
<i>Surr: Nitrobenzene-d5</i>	41.6			41-120	%REC	1	23-Jan-2019 18:45
<i>Surr: Phenol-d6</i>	34.1			20-120	%REC	1	23-Jan-2019 18:45
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.00178</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>23-Jan-2019 20:19</b>
Lead	U		0.000600	0.00200	mg/L	1	23-Jan-2019 20:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17-20190109  
 Collection Date: 09-Jan-2019 17:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.0020	0.010	mg/L	10	16-Jan-2019 07:59
<b>Benzene</b>	<b>0.35</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 07:59
Chlorobenzene	U		0.0030	0.010	mg/L	10	16-Jan-2019 07:59
<b>Ethylbenzene</b>	<b>0.21</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 07:59
Methylene chloride	U		0.010	0.020	mg/L	10	16-Jan-2019 07:59
<b>Toluene</b>	<b>0.68</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 07:59
<b>Xylenes, Total</b>	<b>0.66</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 07:59
<i>Surr: 1,2-Dichloroethane-d4</i>	95.5			70-126	%REC	10	16-Jan-2019 07:59
<i>Surr: 4-Bromofluorobenzene</i>	102			81-113	%REC	10	16-Jan-2019 07:59
<i>Surr: Dibromofluoromethane</i>	99.8			77-123	%REC	10	16-Jan-2019 07:59
<i>Surr: Toluene-d8</i>	97.5			82-127	%REC	10	16-Jan-2019 07:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17-20190109  
 Collection Date: 09-Jan-2019 17:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	24-Jan-2019 17:10
<b>2,4-Dimethylphenol</b>	<b>1.9</b>		<b>0.040</b>	<b>0.20</b>	<b>mg/L</b>	1000	25-Jan-2019 11:27
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	24-Jan-2019 17:10
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	24-Jan-2019 17:10
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	24-Jan-2019 17:10
<b>2-Methylnaphthalene</b>	<b>0.23</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 17:29
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	24-Jan-2019 17:10
4-Nitrophenol	U		0.00047	0.010	mg/L	10	24-Jan-2019 17:10
<b>Acenaphthene</b>	<b>0.091</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<b>Acenaphthylene</b>	<b>0.0029</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<b>Anthracene</b>	<b>0.0057</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	24-Jan-2019 17:10
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	24-Jan-2019 17:10
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	24-Jan-2019 17:10
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	24-Jan-2019 17:10
Chrysene	U		0.00021	0.0010	mg/L	10	24-Jan-2019 17:10
<b>Dibenzofuran</b>	<b>0.072</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	24-Jan-2019 17:10
<b>Fluoranthene</b>	<b>0.0015</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<b>Fluorene</b>	<b>0.043</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<b>Naphthalene</b>	<b>5.5</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	25-Jan-2019 11:27
Nitrobenzene	U		0.00024	0.0020	mg/L	10	24-Jan-2019 17:10
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	24-Jan-2019 17:10
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	24-Jan-2019 17:10
<b>Phenanthrene</b>	<b>0.028</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<b>Phenol</b>	<b>2.2</b>		<b>0.035</b>	<b>0.20</b>	<b>mg/L</b>	1000	25-Jan-2019 11:27
<b>Pyrene</b>	<b>0.00081</b>	J	<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:10
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	1000	25-Jan-2019 11:27
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	100	24-Jan-2019 17:29
<i>Surr: 2,4,6-Tribromophenol</i>	76.5			34-129	%REC	10	24-Jan-2019 17:10
<i>Surr: 2-Fluorobiphenyl</i>	67.3			40-125	%REC	10	24-Jan-2019 17:10
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	100	24-Jan-2019 17:29
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	1000	25-Jan-2019 11:27
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	1000	25-Jan-2019 11:27
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	100	24-Jan-2019 17:29
<i>Surr: 2-Fluorophenol</i>	105			20-120	%REC	10	24-Jan-2019 17:10
<i>Surr: 4-Terphenyl-d14</i>	73.8			40-135	%REC	10	24-Jan-2019 17:10
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	100	24-Jan-2019 17:29
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	1000	25-Jan-2019 11:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17-20190109  
 Collection Date: 09-Jan-2019 17:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
Surr: Nitrobenzene-d5	60.3			41-120	%REC	10	24-Jan-2019 17:10
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	24-Jan-2019 17:29
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	25-Jan-2019 11:27
Surr: Phenol-d6	0	JS		20-120	%REC	1000	25-Jan-2019 11:27
Surr: Phenol-d6	90.5			20-120	%REC	10	24-Jan-2019 17:10
Surr: Phenol-d6	0	JS		20-120	%REC	100	24-Jan-2019 17:29
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Arsenic	0.0460		0.000400	0.00200	mg/L	1	24-Jan-2019 14:42
Lead		U	0.000600	0.00200	mg/L	1	24-Jan-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB02-20190109  
 Collection Date: 09-Jan-2019 17:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-10  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:31
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:31
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:31
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:31
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 23:31
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:31
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:31
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>107</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 23:31</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>99.1</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 23:31</i>
<i>Surr: Dibromofluoromethane</i>		<i>97.4</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 23:31</i>
<i>Surr: Toluene-d8</i>		<i>108</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>14-Jan-2019 23:31</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB02-20190109  
 Collection Date: 09-Jan-2019 17:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-10  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 19:24
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	23-Jan-2019 19:24
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 19:24
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 19:24
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 19:24
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 19:24
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 19:24
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 19:24
Acenaphthene	U		0.000027	0.00010	mg/L	1	23-Jan-2019 19:24
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 19:24
Anthracene	U		0.000014	0.00010	mg/L	1	23-Jan-2019 19:24
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	23-Jan-2019 19:24
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 19:24
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 19:24
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 19:24
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 19:24
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 19:24
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 19:24
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 19:24
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 19:24
<b>Naphthalene</b>	<b>0.00031</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:24
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 19:24
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 19:24
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 19:24
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 19:24
Phenol	U		0.000035	0.00020	mg/L	1	23-Jan-2019 19:24
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 19:24
<i>Surr: 2,4,6-Tribromophenol</i>	<i>53.6</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>59.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<i>Surr: 2-Fluorophenol</i>	<i>56.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>65.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<i>Surr: Nitrobenzene-d5</i>	<i>75.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<i>Surr: Phenol-d6</i>	<i>60.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:24</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Arsenic	U		0.000400	0.00200	mg/L	1	24-Jan-2019 14:44
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 14:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17C-20190110  
 Collection Date: 10-Jan-2019 07:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:33
<b>Benzene</b>	<b>0.012</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	16-Jan-2019 03:33
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:33
<b>Ethylbenzene</b>	<b>0.027</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	16-Jan-2019 03:33
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 03:33
<b>Toluene</b>	<b>0.0087</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	16-Jan-2019 03:33
<b>Xylenes, Total</b>	<b>0.050</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	16-Jan-2019 03:33
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:33</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:33</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:33</i>
<i>Surr: Toluene-d8</i>	<i>96.6</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 03:33</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17C-20190110  
 Collection Date: 10-Jan-2019 07:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 19:44
<b>2,4-Dimethylphenol</b>	<b>0.47</b>		<b>0.0040</b>	<b>0.020</b>	<b>mg/L</b>	100	24-Jan-2019 18:07
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 19:44
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 19:44
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 19:44
<b>2-Methylnaphthalene</b>	<b>0.025</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 19:44
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 19:44
<b>Acenaphthene</b>	<b>0.031</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
<b>Acenaphthylene</b>	<b>0.00047</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<b>Anthracene</b>	<b>0.0012</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<b>Benz(a)anthracene</b>	<b>0.000062</b>	J	<b>0.000050</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 19:44
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 19:44
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00062</b>		<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<b>Chrysene</b>	<b>0.000059</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<b>Dibenzofuran</b>	<b>0.027</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 19:44
<b>Fluoranthene</b>	<b>0.00078</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<b>Fluorene</b>	<b>0.012</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
<b>Naphthalene</b>	<b>1.1</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	24-Jan-2019 18:26
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 19:44
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 19:44
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 19:44
<b>Phenanthrene</b>	<b>0.010</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
<b>Phenol</b>	<b>0.033</b>		<b>0.00035</b>	<b>0.0020</b>	<b>mg/L</b>	10	24-Jan-2019 17:48
<b>Pyrene</b>	<b>0.00045</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 19:44
<i>Surr: 2,4,6-Tribromophenol</i>	<i>51.1</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>24-Jan-2019 17:48</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>100</i>	<i>24-Jan-2019 18:07</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 18:26</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>65.5</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:44</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>50.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:44</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>63.0</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>24-Jan-2019 17:48</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>100</i>	<i>24-Jan-2019 18:07</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 18:26</i>
<i>Surr: 2-Fluorophenol</i>	<i>64.2</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>24-Jan-2019 17:48</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>100</i>	<i>24-Jan-2019 18:07</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>24-Jan-2019 18:26</i>
<i>Surr: 2-Fluorophenol</i>	<i>60.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 19:44</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW17C-20190110  
 Collection Date: 10-Jan-2019 07:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
Surr: 4-Terphenyl-d14	62.4			40-135	%REC	1	23-Jan-2019 19:44
Surr: 4-Terphenyl-d14	70.3			40-135	%REC	10	24-Jan-2019 17:48
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	24-Jan-2019 18:07
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	24-Jan-2019 18:26
Surr: Nitrobenzene-d5	67.8			41-120	%REC	10	24-Jan-2019 17:48
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	24-Jan-2019 18:07
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	24-Jan-2019 18:26
Surr: Nitrobenzene-d5	79.0			41-120	%REC	1	23-Jan-2019 19:44
Surr: Phenol-d6	67.9			20-120	%REC	1	23-Jan-2019 19:44
Surr: Phenol-d6	63.7			20-120	%REC	10	24-Jan-2019 17:48
Surr: Phenol-d6	0	JS		20-120	%REC	100	24-Jan-2019 18:07
Surr: Phenol-d6	0	JS		20-120	%REC	1000	24-Jan-2019 18:26
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Arsenic	0.00130	J	0.000400	0.00200	mg/L	1	24-Jan-2019 14:46
Lead		U	0.000600	0.00200	mg/L	1	24-Jan-2019 14:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18C-20190110  
 Collection Date: 10-Jan-2019 08:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.0020	0.010	mg/L	10	16-Jan-2019 08:25
<b>Benzene</b>	<b>0.30</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 08:25
Chlorobenzene		U	0.0030	0.010	mg/L	10	16-Jan-2019 08:25
<b>Ethylbenzene</b>	<b>0.41</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 08:25
Methylene chloride		U	0.010	0.020	mg/L	10	16-Jan-2019 08:25
<b>Toluene</b>	<b>0.030</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 08:25
Vinyl chloride		U	0.0020	0.010	mg/L	10	16-Jan-2019 08:25
<b>Xylenes, Total</b>	<b>0.69</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	16-Jan-2019 08:25
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>96.4</i>			<i>70-126</i>	<i>%REC</i>	<i>10</i>	<i>16-Jan-2019 08:25</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.4</i>			<i>81-113</i>	<i>%REC</i>	<i>10</i>	<i>16-Jan-2019 08:25</i>
<i>Surr: Dibromofluoromethane</i>	<i>99.7</i>			<i>77-123</i>	<i>%REC</i>	<i>10</i>	<i>16-Jan-2019 08:25</i>
<i>Surr: Toluene-d8</i>	<i>97.1</i>			<i>82-127</i>	<i>%REC</i>	<i>10</i>	<i>16-Jan-2019 08:25</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18C-20190110  
 Collection Date: 10-Jan-2019 08:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	24-Jan-2019 18:45
<b>2,4-Dimethylphenol</b>	<b>0.29</b>		<b>0.0040</b>	<b>0.020</b>	<b>mg/L</b>	100	24-Jan-2019 19:04
2,4-Dinitrotoluene	U		0.00059	0.0020	mg/L	10	24-Jan-2019 18:45
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	24-Jan-2019 18:45
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	24-Jan-2019 18:45
<b>2-Methylnaphthalene</b>	<b>0.33</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 19:04
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	24-Jan-2019 18:45
4-Nitrophenol	U		0.00047	0.010	mg/L	10	24-Jan-2019 18:45
<b>Acenaphthene</b>	<b>0.21</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 19:04
<b>Acenaphthylene</b>	<b>0.0075</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
<b>Anthracene</b>	<b>0.0070</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
Benz(a)anthracene	U		0.00051	0.0010	mg/L	10	24-Jan-2019 18:45
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	24-Jan-2019 18:45
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	24-Jan-2019 18:45
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	24-Jan-2019 18:45
Chrysene	U		0.00021	0.0010	mg/L	10	24-Jan-2019 18:45
<b>Dibenzofuran</b>	<b>0.13</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 19:04
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	24-Jan-2019 18:45
<b>Fluoranthene</b>	<b>0.0023</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
<b>Fluorene</b>	<b>0.095</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
<b>Naphthalene</b>	<b>4.4</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	24-Jan-2019 19:23
Nitrobenzene	U		0.00024	0.0020	mg/L	10	24-Jan-2019 18:45
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	24-Jan-2019 18:45
Pentachlorophenol	U		0.00080	0.0020	mg/L	10	24-Jan-2019 18:45
<b>Phenanthrene</b>	<b>0.084</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
Phenol	U		0.00035	0.0020	mg/L	10	24-Jan-2019 18:45
<b>Pyrene</b>	<b>0.0012</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 18:45
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	24-Jan-2019 19:23
Surr: 2,4,6-Tribromophenol	57.2			34-129	%REC	10	24-Jan-2019 18:45
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	100	24-Jan-2019 19:04
Surr: 2-Fluorobiphenyl	59.3			40-125	%REC	10	24-Jan-2019 18:45
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	100	24-Jan-2019 19:04
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	24-Jan-2019 19:23
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	24-Jan-2019 19:23
Surr: 2-Fluorophenol	84.1			20-120	%REC	10	24-Jan-2019 18:45
Surr: 2-Fluorophenol	0	JS		20-120	%REC	100	24-Jan-2019 19:04
Surr: 4-Terphenyl-d14	65.3			40-135	%REC	10	24-Jan-2019 18:45
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	24-Jan-2019 19:04
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	24-Jan-2019 19:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18C-20190110  
 Collection Date: 10-Jan-2019 08:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 14-Jan-2019		Analyst: GEY	
Surr: Nitrobenzene-d5	67.5			41-120	%REC	10	24-Jan-2019 18:45
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	24-Jan-2019 19:04
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	24-Jan-2019 19:23
Surr: Phenol-d6	68.2			20-120	%REC	10	24-Jan-2019 18:45
Surr: Phenol-d6	0	JS		20-120	%REC	100	24-Jan-2019 19:04
Surr: Phenol-d6	0	JS		20-120	%REC	1000	24-Jan-2019 19:23
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JHD	
Arsenic	0.0257		0.000400	0.00200	mg/L	1	24-Jan-2019 14:48
Lead		U	0.000600	0.00200	mg/L	1	24-Jan-2019 14:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18A-20190110  
 Collection Date: 10-Jan-2019 10:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.0050	0.025	mg/L	25	16-Jan-2019 08:52
<b>Benzene</b>	<b>1.2</b>		<b>0.0050</b>	<b>0.025</b>	<b>mg/L</b>	25	16-Jan-2019 08:52
Chlorobenzene	U		0.0075	0.025	mg/L	25	16-Jan-2019 08:52
<b>Ethylbenzene</b>	<b>0.34</b>		<b>0.0075</b>	<b>0.025</b>	<b>mg/L</b>	25	16-Jan-2019 08:52
Methylene chloride	U		0.025	0.050	mg/L	25	16-Jan-2019 08:52
<b>Toluene</b>	<b>0.92</b>		<b>0.0050</b>	<b>0.025</b>	<b>mg/L</b>	25	16-Jan-2019 08:52
Vinyl chloride	U		0.0050	0.025	mg/L	25	16-Jan-2019 08:52
<b>Xylenes, Total</b>	<b>1.0</b>		<b>0.0075</b>	<b>0.025</b>	<b>mg/L</b>	25	16-Jan-2019 08:52
<i>Surr: 1,2-Dichloroethane-d4</i>	93.3			70-126	%REC	25	16-Jan-2019 08:52
<i>Surr: 4-Bromofluorobenzene</i>	99.2			81-113	%REC	25	16-Jan-2019 08:52
<i>Surr: Dibromofluoromethane</i>	99.6			77-123	%REC	25	16-Jan-2019 08:52
<i>Surr: Toluene-d8</i>	97.0			82-127	%REC	25	16-Jan-2019 08:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18A-20190110  
 Collection Date: 10-Jan-2019 10:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	24-Jan-2019 19:42
<b>2,4-Dimethylphenol</b>	<b>0.0054</b>		<b>0.00040</b>	<b>0.0020</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	24-Jan-2019 19:42
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	24-Jan-2019 19:42
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	24-Jan-2019 19:42
<b>2-Methylnaphthalene</b>	<b>0.10</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	24-Jan-2019 20:01
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	24-Jan-2019 19:42
4-Nitrophenol	U		0.00047	0.010	mg/L	10	24-Jan-2019 19:42
<b>Acenaphthene</b>	<b>0.048</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Acenaphthylene</b>	<b>0.0016</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Anthracene</b>	<b>0.0064</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	24-Jan-2019 19:42
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	24-Jan-2019 19:42
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	24-Jan-2019 19:42
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	24-Jan-2019 19:42
Chrysene	U		0.00021	0.0010	mg/L	10	24-Jan-2019 19:42
<b>Dibenzofuran</b>	<b>0.047</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	24-Jan-2019 19:42
<b>Fluoranthene</b>	<b>0.0020</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Fluorene</b>	<b>0.021</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Naphthalene</b>	<b>3.2</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	24-Jan-2019 20:20
Nitrobenzene	U		0.00024	0.0020	mg/L	10	24-Jan-2019 19:42
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	24-Jan-2019 19:42
<b>Pentachlorophenol</b>	<b>0.014</b>		<b>0.00079</b>	<b>0.0020</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Phenanthrene</b>	<b>0.024</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Phenol</b>	<b>0.0032</b>		<b>0.00035</b>	<b>0.0020</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<b>Pyrene</b>	<b>0.0012</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	24-Jan-2019 19:42
<i>Surr: 2,4,6-Tribromophenol</i>	69.5			34-129	%REC	10	24-Jan-2019 19:42
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	100	24-Jan-2019 20:01
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	1000	24-Jan-2019 20:20
<i>Surr: 2-Fluorobiphenyl</i>	62.7			40-125	%REC	10	24-Jan-2019 19:42
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	100	24-Jan-2019 20:01
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	1000	24-Jan-2019 20:20
<i>Surr: 2-Fluorophenol</i>	116			20-120	%REC	10	24-Jan-2019 19:42
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	100	24-Jan-2019 20:01
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	1000	24-Jan-2019 20:20
<i>Surr: 4-Terphenyl-d14</i>	72.6			40-135	%REC	10	24-Jan-2019 19:42
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	100	24-Jan-2019 20:01
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	1000	24-Jan-2019 20:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW18A-20190110  
 Collection Date: 10-Jan-2019 10:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
Surr: Nitrobenzene-d5	53.7			41-120	%REC	10	24-Jan-2019 19:42
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	24-Jan-2019 20:01
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	24-Jan-2019 20:20
Surr: Phenol-d6	0	JS		20-120	%REC	1000	24-Jan-2019 20:20
Surr: Phenol-d6	68.1			20-120	%REC	10	24-Jan-2019 19:42
Surr: Phenol-d6	0	JS		20-120	%REC	100	24-Jan-2019 20:01
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Arsenic	0.00310		0.000400	0.00200	mg/L	1	24-Jan-2019 14:50
Lead		U	0.000600	0.00200	mg/L	1	24-Jan-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW48C-20190110  
 Collection Date: 10-Jan-2019 11:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:57
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:57
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:57
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:57
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 03:57
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 03:57
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 03:57
<i>Surr: 1,2-Dichloroethane-d4</i>		96.0		70-126	%REC	1	16-Jan-2019 03:57
<i>Surr: 4-Bromofluorobenzene</i>		99.3		81-113	%REC	1	16-Jan-2019 03:57
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	16-Jan-2019 03:57
<i>Surr: Toluene-d8</i>		98.7		82-127	%REC	1	16-Jan-2019 03:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW48C-20190110  
 Collection Date: 10-Jan-2019 11:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 14-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	23-Jan-2019 20:43
<b>2,4-Dimethylphenol</b>	<b>0.0010</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	23-Jan-2019 20:43
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	23-Jan-2019 20:43
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	23-Jan-2019 20:43
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	23-Jan-2019 20:43
<b>2-Methylnaphthalene</b>	<b>0.00038</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 20:43
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	23-Jan-2019 20:43
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	23-Jan-2019 20:43
<b>Acenaphthene</b>	<b>0.000098</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 20:43
Acenaphthylene	U		0.000015	0.00010	mg/L	1	23-Jan-2019 20:43
Anthracene	U		0.000014	0.00010	mg/L	1	23-Jan-2019 20:43
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	23-Jan-2019 20:43
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	23-Jan-2019 20:43
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	23-Jan-2019 20:43
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	23-Jan-2019 20:43
Chrysene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 20:43
Dibenzofuran	U		0.000020	0.00010	mg/L	1	23-Jan-2019 20:43
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	23-Jan-2019 20:43
Fluoranthene	U		0.000010	0.00010	mg/L	1	23-Jan-2019 20:43
Fluorene	U		0.000030	0.00010	mg/L	1	23-Jan-2019 20:43
<b>Naphthalene</b>	<b>0.0085</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	23-Jan-2019 20:43
Nitrobenzene	U		0.000024	0.00020	mg/L	1	23-Jan-2019 20:43
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	23-Jan-2019 20:43
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	23-Jan-2019 20:43
Phenanthrene	U		0.000021	0.00010	mg/L	1	23-Jan-2019 20:43
<b>Phenol</b>	<b>0.0020</b>		<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	23-Jan-2019 20:43
Pyrene	U		0.000019	0.00010	mg/L	1	23-Jan-2019 20:43
<i>Surr: 2,4,6-Tribromophenol</i>	<i>41.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>50.3</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<i>Surr: 2-Fluorophenol</i>	<i>49.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.4</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<i>Surr: Nitrobenzene-d5</i>	<i>51.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<i>Surr: Phenol-d6</i>	<i>55.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2019 20:43</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.000924</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 14:53
<b>Lead</b>	<b>0.00141</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 14:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW69A-20190110  
 Collection Date: 10-Jan-2019 12:45

**ANALYTICAL REPORT**

WorkOrder:HS19010488  
 Lab ID:HS19010488-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 04:21
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 04:21
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 04:21
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 04:21
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 04:21
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 04:21
Vinyl chloride	U		0.00020	0.0010	mg/L	1	16-Jan-2019 04:21
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 04:21
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.6</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 04:21</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>97.4</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 04:21</i>
<i>Surr: Dibromofluoromethane</i>		<i>102</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 04:21</i>
<i>Surr: Toluene-d8</i>		<i>98.5</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 04:21</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW69A-20190110  
 Collection Date: 10-Jan-2019 12:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 14:30
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 14:30
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 14:30
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 14:30
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 14:30
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 14:30
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 14:30
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 14:30
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 14:30
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 14:30
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 14:30
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 14:30
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 14:30
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 14:30
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	18-Jan-2019 14:30
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 14:30
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 14:30
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 14:30
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 14:30
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 14:30
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 14:30
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 14:30
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 14:30
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 14:30
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 14:30
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 14:30
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 14:30
<i>Surr: 2,4,6-Tribromophenol</i>	35.6			34-129	%REC	1	18-Jan-2019 14:30
<i>Surr: 2-Fluorobiphenyl</i>	40.4			40-125	%REC	1	18-Jan-2019 14:30
<i>Surr: 2-Fluorophenol</i>	40.6			20-120	%REC	1	18-Jan-2019 14:30
<i>Surr: 4-Terphenyl-d14</i>	55.0			40-135	%REC	1	18-Jan-2019 14:30
<i>Surr: Nitrobenzene-d5</i>	41.3			41-120	%REC	1	18-Jan-2019 14:30
<i>Surr: Phenol-d6</i>	41.7			20-120	%REC	1	18-Jan-2019 14:30
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.000717</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 14:55
<b>Lead</b>	<b>0.000712</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 14:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB02-20190110  
 Collection Date: 10-Jan-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-16  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:55
Benzene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:55
Chlorobenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:55
Ethylbenzene	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:55
Methylene chloride	U		0.0010	0.0020	mg/L	1	14-Jan-2019 23:55
Toluene	U		0.00020	0.0010	mg/L	1	14-Jan-2019 23:55
Xylenes, Total	U		0.00030	0.0010	mg/L	1	14-Jan-2019 23:55
<i>Surr: 1,2-Dichloroethane-d4</i>		106		70-126	%REC	1	14-Jan-2019 23:55
<i>Surr: 4-Bromofluorobenzene</i>		99.1		81-113	%REC	1	14-Jan-2019 23:55
<i>Surr: Dibromofluoromethane</i>		95.5		77-123	%REC	1	14-Jan-2019 23:55
<i>Surr: Toluene-d8</i>		106		82-127	%REC	1	14-Jan-2019 23:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW80B-20190110  
 Collection Date: 10-Jan-2019 13:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:09
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:09
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:09
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:09
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 05:09
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:09
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:09
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 05:09</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 05:09</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 05:09</i>
<i>Surr: Toluene-d8</i>	<i>98.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 05:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW80B-20190110  
 Collection Date: 10-Jan-2019 13:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 14:50
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 14:50
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 14:50
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 14:50
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 14:50
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 14:50
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 14:50
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 14:50
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 14:50
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 14:50
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 14:50
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 14:50
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 14:50
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 14:50
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	18-Jan-2019 14:50
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 14:50
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 14:50
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 14:50
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 14:50
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 14:50
<b>Naphthalene</b>	<b>0.000068</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>18-Jan-2019 14:50</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 14:50
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 14:50
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 14:50
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 14:50
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 14:50
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 14:50
<i>Surr: 2,4,6-Tribromophenol</i>	<i>43.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>42.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>56.1</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<i>Surr: Phenol-d6</i>	<i>41.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 14:50</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00180</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>24-Jan-2019 14:57</b>
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 14:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW50A-20190110  
 Collection Date: 10-Jan-2019 14:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:33
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:33
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:33
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:33
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 05:33
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:33
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:33
<i>Surr: 1,2-Dichloroethane-d4</i>		93.8		70-126	%REC	1	16-Jan-2019 05:33
<i>Surr: 4-Bromofluorobenzene</i>		96.8		81-113	%REC	1	16-Jan-2019 05:33
<i>Surr: Dibromofluoromethane</i>		99.1		77-123	%REC	1	16-Jan-2019 05:33
<i>Surr: Toluene-d8</i>		99.0		82-127	%REC	1	16-Jan-2019 05:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW50A-20190110  
 Collection Date: 10-Jan-2019 14:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:09
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 15:09
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 15:09
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 15:09
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:09
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:09
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:09
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 15:09
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 15:09
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 15:09
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 15:09
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 15:09
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:09
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 15:09
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	18-Jan-2019 15:09
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:09
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:09
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:09
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 15:09
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 15:09
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:09
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 15:09
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 15:09
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 15:09
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:09
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 15:09
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:09
<i>Surr: 2,4,6-Tribromophenol</i>	<i>41.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<i>Surr: 2-Fluorophenol</i>	<i>38.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>57.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<i>Surr: Phenol-d6</i>	<i>41.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:09</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00134</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>24-Jan-2019 15:00</b>
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW81B-20190110  
 Collection Date: 10-Jan-2019 15:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:57
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:57
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:57
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:57
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 05:57
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 05:57
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 05:57
<i>Surr: 1,2-Dichloroethane-d4</i>		94.9		70-126	%REC	1	16-Jan-2019 05:57
<i>Surr: 4-Bromofluorobenzene</i>		96.3		81-113	%REC	1	16-Jan-2019 05:57
<i>Surr: Dibromofluoromethane</i>		101		77-123	%REC	1	16-Jan-2019 05:57
<i>Surr: Toluene-d8</i>		99.2		82-127	%REC	1	16-Jan-2019 05:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW81B-20190110  
 Collection Date: 10-Jan-2019 15:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 15-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:29
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 15:29
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 15:29
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 15:29
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:29
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:29
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:29
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 15:29
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 15:29
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 15:29
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 15:29
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 15:29
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:29
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 15:29
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000058</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 15:29
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:29
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:29
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:29
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 15:29
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 15:29
<b>Naphthalene</b>	<b>0.00016</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 15:29
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 15:29
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 15:29
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 15:29
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:29
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 15:29
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:29
<i>Surr: 2,4,6-Tribromophenol</i>	35.9			34-129	%REC	1	18-Jan-2019 15:29
<i>Surr: 2-Fluorobiphenyl</i>	45.4			40-125	%REC	1	18-Jan-2019 15:29
<i>Surr: 2-Fluorophenol</i>	44.9			20-120	%REC	1	18-Jan-2019 15:29
<i>Surr: 4-Terphenyl-d14</i>	53.4			40-135	%REC	1	18-Jan-2019 15:29
<i>Surr: Nitrobenzene-d5</i>	50.6			41-120	%REC	1	18-Jan-2019 15:29
<i>Surr: Phenol-d6</i>	50.6			20-120	%REC	1	18-Jan-2019 15:29
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00116</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 15:15
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW51A-20190110  
 Collection Date: 10-Jan-2019 16:40

**ANALYTICAL REPORT**

WorkOrder:HS19010488  
 Lab ID:HS19010488-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:20
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:20
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:20
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:20
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 06:20
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:20
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:20
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:20</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:20</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:20</i>
<i>Surr: Toluene-d8</i>	<i>99.1</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:20</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW51A-20190110  
 Collection Date: 10-Jan-2019 16:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 15-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:49
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 15:49
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 15:49
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 15:49
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 15:49
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:49
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:49
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 15:49
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 15:49
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 15:49
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 15:49
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 15:49
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:49
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 15:49
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000078</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 15:49
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:49
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 15:49
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 15:49
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 15:49
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 15:49
<b>Naphthalene</b>	<b>0.00012</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 15:49
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 15:49
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 15:49
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 15:49
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 15:49
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 15:49
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 15:49
<i>Surr: 2,4,6-Tribromophenol</i>	<i>42.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>51.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<i>Surr: 2-Fluorophenol</i>	<i>52.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>54.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<i>Surr: Nitrobenzene-d5</i>	<i>55.3</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<i>Surr: Phenol-d6</i>	<i>55.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 15:49</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	24-Jan-2019 15:18
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW51C-20190110  
 Collection Date: 10-Jan-2019 17:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-21  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:44
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:44
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:44
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:44
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 06:44
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 06:44
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 06:44
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:44</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:44</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:44</i>
<i>Surr: Toluene-d8</i>	<i>99.7</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 06:44</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW51C-20190110  
 Collection Date: 10-Jan-2019 17:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-21  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 15-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:08
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 16:08
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 16:08
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 16:08
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:08
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:08
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 16:08
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 16:08
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 16:08
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 16:08
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 16:08
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 16:08
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:08
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 16:08
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00013</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 16:08
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:08
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:08
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 16:08
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 16:08
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 16:08
<b>Naphthalene</b>	<b>0.00017</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 16:08
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 16:08
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 16:08
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 16:08
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:08
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 16:08
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:08
<i>Surr: 2,4,6-Tribromophenol</i>	<i>47.3</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>53.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>61.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>55.4</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<i>Surr: Nitrobenzene-d5</i>	<i>57.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<i>Surr: Phenol-d6</i>	<i>62.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:08</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	24-Jan-2019 15:20
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW86C-20190111  
 Collection Date: 11-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-22  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:08
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:08
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:08
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:08
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 07:08
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:08
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:08
<i>Surr: 1,2-Dichloroethane-d4</i>		96.9		70-126	%REC	1	16-Jan-2019 07:08
<i>Surr: 4-Bromofluorobenzene</i>		98.2		81-113	%REC	1	16-Jan-2019 07:08
<i>Surr: Dibromofluoromethane</i>		101		77-123	%REC	1	16-Jan-2019 07:08
<i>Surr: Toluene-d8</i>		99.0		82-127	%REC	1	16-Jan-2019 07:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW86C-20190111  
 Collection Date: 11-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-22  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>		Prep:SW3510 / 15-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:28
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 16:28
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 16:28
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 16:28
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:28
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:28
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 16:28
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 16:28
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 16:28
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 16:28
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 16:28
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 16:28
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:28
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 16:28
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000057</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 16:28
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:28
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:28
<b>Di-n-butyl phthalate</b>	<b>0.000072</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 16:28
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 16:28
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 16:28
<b>Naphthalene</b>	<b>0.000079</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	18-Jan-2019 16:28
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 16:28
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 16:28
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 16:28
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:28
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 16:28
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:28
<i>Surr: 2,4,6-Tribromophenol</i>	<i>34.7</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<i>Surr: 2-Fluorophenol</i>	<i>33.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>53.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<i>Surr: Phenol-d6</i>	<i>36.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:28</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 17-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00402</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 15:22
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD02-20190111  
 Collection Date: 11-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-23  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:32
Benzene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:32
Chlorobenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:32
Ethylbenzene	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:32
Methylene chloride	U		0.0010	0.0020	mg/L	1	16-Jan-2019 07:32
Toluene	U		0.00020	0.0010	mg/L	1	16-Jan-2019 07:32
Xylenes, Total	U		0.00030	0.0010	mg/L	1	16-Jan-2019 07:32
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.1</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 07:32</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>97.5</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 07:32</i>
<i>Surr: Dibromofluoromethane</i>		<i>101</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 07:32</i>
<i>Surr: Toluene-d8</i>		<i>98.7</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>16-Jan-2019 07:32</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD02-20190111  
 Collection Date: 11-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-23  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:48
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 16:48
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 16:48
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 16:48
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 16:48
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:48
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 16:48
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 16:48
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 16:48
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 16:48
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 16:48
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 16:48
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:48
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 16:48
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00010</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 16:48
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:48
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:48
<b>Di-n-butyl phthalate</b>	<b>0.00011</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 16:48
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 16:48
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 16:48
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 16:48
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 16:48
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 16:48
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 16:48
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 16:48
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 16:48
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 16:48
<i>Surr: 2,4,6-Tribromophenol</i>	<i>36.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>42.0</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>49.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<i>Surr: Nitrobenzene-d5</i>	<i>41.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<i>Surr: Phenol-d6</i>	<i>40.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 16:48</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00405</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 15:25
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB03-20190111  
 Collection Date: 11-Jan-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-24  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	19-Jan-2019 07:36
Benzene	U		0.00020	0.0010	mg/L	1	19-Jan-2019 07:36
Chlorobenzene	U		0.00030	0.0010	mg/L	1	19-Jan-2019 07:36
Ethylbenzene	U		0.00030	0.0010	mg/L	1	19-Jan-2019 07:36
Methylene chloride	U		0.0010	0.0020	mg/L	1	19-Jan-2019 07:36
Toluene	U		0.00020	0.0010	mg/L	1	19-Jan-2019 07:36
Xylenes, Total	U		0.00030	0.0010	mg/L	1	19-Jan-2019 07:36
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 07:36</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.9</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 07:36</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 07:36</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 07:36</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB03-20190111  
 Collection Date: 11-Jan-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-24  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 17:07
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 17:07
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 17:07
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 17:07
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 17:07
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 17:07
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 17:07
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 17:07
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 17:07
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 17:07
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 17:07
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 17:07
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:07
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 17:07
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000058</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 17:07
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 17:07
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:07
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	18-Jan-2019 17:07
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 17:07
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 17:07
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:07
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 17:07
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 17:07
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 17:07
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 17:07
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 17:07
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 17:07
<i>Surr: 2,4,6-Tribromophenol</i>	<i>41.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.2</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<i>Surr: 2-Fluorophenol</i>	<i>53.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>60.2</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<i>Surr: Nitrobenzene-d5</i>	<i>57.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<i>Surr: Phenol-d6</i>	<i>59.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>18-Jan-2019 17:07</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
Arsenic	U		0.000400	0.00200	mg/L	1	24-Jan-2019 15:27
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW60A-20190111  
 Collection Date: 11-Jan-2019 10:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-25  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	19-Jan-2019 14:49
Benzene	U		0.00020	0.0010	mg/L	1	19-Jan-2019 14:49
Chlorobenzene	U		0.00030	0.0010	mg/L	1	19-Jan-2019 14:49
Ethylbenzene	U		0.00030	0.0010	mg/L	1	19-Jan-2019 14:49
Methylene chloride	U		0.0010	0.0020	mg/L	1	19-Jan-2019 14:49
Toluene	U		0.00020	0.0010	mg/L	1	19-Jan-2019 14:49
Vinyl chloride	U		0.00020	0.0010	mg/L	1	19-Jan-2019 14:49
Xylenes, Total	U		0.00030	0.0010	mg/L	1	19-Jan-2019 14:49
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.3</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 14:49</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>99.0</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 14:49</i>
<i>Surr: Dibromofluoromethane</i>		<i>104</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 14:49</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>19-Jan-2019 14:49</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW60A-20190111  
 Collection Date: 11-Jan-2019 10:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010488  
 Lab ID:HS19010488-25  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES</b>		<b>Method:SW8270</b>			Prep:SW3510 / 15-Jan-2019		Analyst: GEY
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	18-Jan-2019 17:27
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	18-Jan-2019 17:27
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	18-Jan-2019 17:27
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	18-Jan-2019 17:27
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	18-Jan-2019 17:27
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 17:27
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	18-Jan-2019 17:27
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	18-Jan-2019 17:27
Acenaphthene	U		0.000027	0.00010	mg/L	1	18-Jan-2019 17:27
Acenaphthylene	U		0.000015	0.00010	mg/L	1	18-Jan-2019 17:27
Anthracene	U		0.000014	0.00010	mg/L	1	18-Jan-2019 17:27
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	18-Jan-2019 17:27
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:27
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	18-Jan-2019 17:27
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000092</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 17:27
Chrysene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 17:27
Dibenzofuran	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:27
<b>Di-n-butyl phthalate</b>	<b>0.000064</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	18-Jan-2019 17:27
Fluoranthene	U		0.000010	0.00010	mg/L	1	18-Jan-2019 17:27
Fluorene	U		0.000030	0.00010	mg/L	1	18-Jan-2019 17:27
Naphthalene	U		0.000020	0.00010	mg/L	1	18-Jan-2019 17:27
Nitrobenzene	U		0.000024	0.00020	mg/L	1	18-Jan-2019 17:27
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	18-Jan-2019 17:27
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	18-Jan-2019 17:27
Phenanthrene	U		0.000021	0.00010	mg/L	1	18-Jan-2019 17:27
Phenol	U		0.000035	0.00020	mg/L	1	18-Jan-2019 17:27
Pyrene	U		0.000019	0.00010	mg/L	1	18-Jan-2019 17:27
<i>Surr: 2,4,6-Tribromophenol</i>	36.6			34-129	%REC	1	18-Jan-2019 17:27
<i>Surr: 2-Fluorobiphenyl</i>	40.2			40-125	%REC	1	18-Jan-2019 17:27
<i>Surr: 2-Fluorophenol</i>	39.8			20-120	%REC	1	18-Jan-2019 17:27
<i>Surr: 4-Terphenyl-d14</i>	53.2			40-135	%REC	1	18-Jan-2019 17:27
<i>Surr: Nitrobenzene-d5</i>	41.5			41-120	%REC	1	18-Jan-2019 17:27
<i>Surr: Phenol-d6</i>	43.7			20-120	%REC	1	18-Jan-2019 17:27
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 17-Jan-2019		Analyst: JHD
<b>Arsenic</b>	<b>0.00453</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	24-Jan-2019 15:29
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 15:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**Batch ID:** 136574      **Method:** LOW-LEVEL SEMIVOLATILES      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010488-01	1	1000	1 (mL)	0.001
HS19010488-02	1	1000	1 (mL)	0.001
HS19010488-03	1	1000	1 (mL)	0.001
HS19010488-04	1	1000	1 (mL)	0.001
HS19010488-05	1	990	1 (mL)	0.00101
HS19010488-06	1	1000	1 (mL)	0.001
HS19010488-07	1	1000	1 (mL)	0.001
HS19010488-08	1	1000	1 (mL)	0.001
HS19010488-09	1	1000	1 (mL)	0.001
HS19010488-10	1	1000	1 (mL)	0.001
HS19010488-11	1	1000	1 (mL)	0.001
HS19010488-12	1	990	1 (mL)	0.00101
HS19010488-13	1	1000	1 (mL)	0.001
HS19010488-14	1	1000	1 (mL)	0.001

**Batch ID:** 136614      **Method:** LOW-LEVEL SEMIVOLATILES      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010488-15	1	1000	1 (mL)	0.001
HS19010488-17	1	1000	1 (mL)	0.001
HS19010488-18	1	1000	1 (mL)	0.001
HS19010488-19	1	1000	1 (mL)	0.001
HS19010488-20	1	1000	1 (mL)	0.001
HS19010488-21	1	1000	1 (mL)	0.001
HS19010488-22	1	1000	1 (mL)	0.001
HS19010488-23	1	1000	1 (mL)	0.001
HS19010488-24	1	1000	1 (mL)	0.001
HS19010488-25	1	1000	1 (mL)	0.001

**Batch ID:** 136717      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010488-01	1	10	10 (mL)	1
HS19010488-02	1	10	10 (mL)	1
HS19010488-03	1	10	10 (mL)	1
HS19010488-04	1	10	10 (mL)	1
HS19010488-05	1	10	10 (mL)	1
HS19010488-06	1	10	10 (mL)	1
HS19010488-07	1	10	10 (mL)	1
HS19010488-08	1	10	10 (mL)	1

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**Batch ID:** 136742      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010488-09	1	10	10 (mL)	1
HS19010488-10	1	10	10 (mL)	1
HS19010488-11	1	10	10 (mL)	1
HS19010488-12	1	10	10 (mL)	1
HS19010488-13	1	10	10 (mL)	1
HS19010488-14	1	10	10 (mL)	1
HS19010488-15	1	10	10 (mL)	1
HS19010488-17	1	10	10 (mL)	1
HS19010488-18	1	10	10 (mL)	1
HS19010488-19	1	10	10 (mL)	1
HS19010488-20	1	10	10 (mL)	1
HS19010488-21	1	10	10 (mL)	1
HS19010488-22	1	10	10 (mL)	1
HS19010488-23	1	10	10 (mL)	1
HS19010488-24	1	10	10 (mL)	1
HS19010488-25	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 136574		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES		<b>Matrix:</b> Water		
HS19010488-10	WQ-1620-FB02-20190109	09 Jan 2019 17:35		14 Jan 2019 11:18	23 Jan 2019 19:24	1
<b>Batch ID</b> 136574		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES		<b>Matrix:</b> Groundwater		
HS19010488-01	WG-1620-TW41B-20190109	09 Jan 2019 10:35		14 Jan 2019 11:18	23 Jan 2019 17:26	10
HS19010488-01	WG-1620-TW41B-20190109	09 Jan 2019 10:35		14 Jan 2019 11:18	21 Jan 2019 23:41	1
HS19010488-02	WG-1620-MW05-20190109	09 Jan 2019 11:25		14 Jan 2019 11:18	22 Jan 2019 00:01	1
HS19010488-03	WG-1620-P11-20190109	09 Jan 2019 12:25		14 Jan 2019 11:18	22 Jan 2019 00:20	1
HS19010488-04	WG-1620-MW03-20190109	09 Jan 2019 13:15		14 Jan 2019 11:18	22 Jan 2019 00:40	1
HS19010488-05	WG-1620-MW09-20190109	09 Jan 2019 14:05		14 Jan 2019 11:18	23 Jan 2019 17:46	1
HS19010488-06	WG-1620-MW04-20190109	09 Jan 2019 15:05		14 Jan 2019 11:18	23 Jan 2019 18:05	1
HS19010488-07	WG-1620-MW21C-20190109	09 Jan 2019 16:20		14 Jan 2019 11:18	23 Jan 2019 18:25	1
HS19010488-08	WG-1620-FD01-20190109	09 Jan 2019 16:20		14 Jan 2019 11:18	23 Jan 2019 18:45	1
HS19010488-09	WG-1620-MW17-20190109	09 Jan 2019 17:20		14 Jan 2019 11:18	25 Jan 2019 11:27	1000
HS19010488-09	WG-1620-MW17-20190109	09 Jan 2019 17:20		14 Jan 2019 11:18	24 Jan 2019 17:29	100
HS19010488-09	WG-1620-MW17-20190109	09 Jan 2019 17:20		14 Jan 2019 11:18	24 Jan 2019 17:10	10
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25		14 Jan 2019 11:18	24 Jan 2019 18:26	1000
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25		14 Jan 2019 11:18	24 Jan 2019 18:07	100
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25		14 Jan 2019 11:18	24 Jan 2019 17:48	10
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25		14 Jan 2019 11:18	23 Jan 2019 19:44	1
HS19010488-12	WG-1620-MW18C-20190110	10 Jan 2019 08:20		14 Jan 2019 11:18	24 Jan 2019 19:23	1000
HS19010488-12	WG-1620-MW18C-20190110	10 Jan 2019 08:20		14 Jan 2019 11:18	24 Jan 2019 19:04	100
HS19010488-12	WG-1620-MW18C-20190110	10 Jan 2019 08:20		14 Jan 2019 11:18	24 Jan 2019 18:45	10
HS19010488-13	WG-1620-MW18A-20190110	10 Jan 2019 10:45		14 Jan 2019 11:18	24 Jan 2019 20:20	1000
HS19010488-13	WG-1620-MW18A-20190110	10 Jan 2019 10:45		14 Jan 2019 11:18	24 Jan 2019 20:01	100
HS19010488-13	WG-1620-MW18A-20190110	10 Jan 2019 10:45		14 Jan 2019 11:18	24 Jan 2019 19:42	10
HS19010488-14	WG-1620-MW48C-20190110	10 Jan 2019 11:45		14 Jan 2019 11:18	23 Jan 2019 20:43	1
<b>Batch ID</b> 136614		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES		<b>Matrix:</b> Water		
HS19010488-24	WQ-1620-FB03-20190111	11 Jan 2019 11:15		15 Jan 2019 10:05	18 Jan 2019 17:07	1
<b>Batch ID</b> 136614		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES		<b>Matrix:</b> Groundwater		
HS19010488-15	WG-1620-MW69A-20190110	10 Jan 2019 12:45		15 Jan 2019 10:05	18 Jan 2019 14:30	1
HS19010488-17	WG-1620-MW80B-20190110	10 Jan 2019 13:50		15 Jan 2019 10:05	18 Jan 2019 14:50	1
HS19010488-18	WG-1620-MW50A-20190110	10 Jan 2019 14:40		15 Jan 2019 10:05	18 Jan 2019 15:09	1
HS19010488-19	WG-1620-MW81B-20190110	10 Jan 2019 15:30		15 Jan 2019 10:05	18 Jan 2019 15:29	1
HS19010488-20	WG-1620-MW51A-20190110	10 Jan 2019 16:40		15 Jan 2019 10:05	18 Jan 2019 15:49	1
HS19010488-21	WG-1620-MW51C-20190110	10 Jan 2019 17:30		15 Jan 2019 10:05	18 Jan 2019 16:08	1
HS19010488-22	WG-1620-MW86C-20190111	11 Jan 2019 08:25		15 Jan 2019 10:05	18 Jan 2019 16:28	1
HS19010488-23	WG-1620-FD02-20190111	11 Jan 2019 08:25		15 Jan 2019 10:05	18 Jan 2019 16:48	1
HS19010488-25	WG-1620-MW60A-20190111	11 Jan 2019 10:15		15 Jan 2019 10:05	18 Jan 2019 17:27	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID 136717 Test Name : ICP-MS METALS BY SW6020A Matrix: Groundwater</b>						
HS19010488-01	WG-1620-TW41B-20190109	09 Jan 2019 10:35		17 Jan 2019 08:30	23 Jan 2019 20:04	1
HS19010488-02	WG-1620-MW05-20190109	09 Jan 2019 11:25		17 Jan 2019 08:30	23 Jan 2019 20:06	1
HS19010488-03	WG-1620-P11-20190109	09 Jan 2019 12:25		17 Jan 2019 08:30	23 Jan 2019 20:08	1
HS19010488-04	WG-1620-MW03-20190109	09 Jan 2019 13:15		17 Jan 2019 08:30	23 Jan 2019 20:10	1
HS19010488-05	WG-1620-MW09-20190109	09 Jan 2019 14:05		17 Jan 2019 08:30	23 Jan 2019 20:13	1
HS19010488-06	WG-1620-MW04-20190109	09 Jan 2019 15:05		17 Jan 2019 08:30	23 Jan 2019 20:15	1
HS19010488-07	WG-1620-MW21C-20190109	09 Jan 2019 16:20		17 Jan 2019 08:30	23 Jan 2019 20:17	1
HS19010488-08	WG-1620-FD01-20190109	09 Jan 2019 16:20		17 Jan 2019 08:30	23 Jan 2019 20:19	1
<b>Batch ID 136742 Test Name : ICP-MS METALS BY SW6020A Matrix: Water</b>						
HS19010488-10	WQ-1620-FB02-20190109	09 Jan 2019 17:35		17 Jan 2019 13:00	24 Jan 2019 14:44	1
HS19010488-24	WQ-1620-FB03-20190111	11 Jan 2019 11:15		17 Jan 2019 13:00	24 Jan 2019 15:27	1
<b>Batch ID 136742 Test Name : ICP-MS METALS BY SW6020A Matrix: Groundwater</b>						
HS19010488-09	WG-1620-MW17-20190109	09 Jan 2019 17:20		17 Jan 2019 13:00	24 Jan 2019 14:42	1
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25		17 Jan 2019 13:00	24 Jan 2019 14:46	1
HS19010488-12	WG-1620-MW18C-20190110	10 Jan 2019 08:20		17 Jan 2019 13:00	24 Jan 2019 14:48	1
HS19010488-13	WG-1620-MW18A-20190110	10 Jan 2019 10:45		17 Jan 2019 13:00	24 Jan 2019 14:50	1
HS19010488-14	WG-1620-MW48C-20190110	10 Jan 2019 11:45		17 Jan 2019 13:00	24 Jan 2019 14:53	1
HS19010488-15	WG-1620-MW69A-20190110	10 Jan 2019 12:45		17 Jan 2019 13:00	24 Jan 2019 14:55	1
HS19010488-17	WG-1620-MW80B-20190110	10 Jan 2019 13:50		17 Jan 2019 13:00	24 Jan 2019 14:57	1
HS19010488-18	WG-1620-MW50A-20190110	10 Jan 2019 14:40		17 Jan 2019 13:00	24 Jan 2019 15:00	1
HS19010488-19	WG-1620-MW81B-20190110	10 Jan 2019 15:30		17 Jan 2019 13:00	24 Jan 2019 15:15	1
HS19010488-20	WG-1620-MW51A-20190110	10 Jan 2019 16:40		17 Jan 2019 13:00	24 Jan 2019 15:18	1
HS19010488-21	WG-1620-MW51C-20190110	10 Jan 2019 17:30		17 Jan 2019 13:00	24 Jan 2019 15:20	1
HS19010488-22	WG-1620-MW86C-20190111	11 Jan 2019 08:25		17 Jan 2019 13:00	24 Jan 2019 15:22	1
HS19010488-23	WG-1620-FD02-20190111	11 Jan 2019 08:25		17 Jan 2019 13:00	24 Jan 2019 15:25	1
HS19010488-25	WG-1620-MW60A-20190111	11 Jan 2019 10:15		17 Jan 2019 13:00	24 Jan 2019 15:29	1
<b>Batch ID R331030 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19010488-01	WG-1620-TW41B-20190109	09 Jan 2019 10:35			15 Jan 2019 01:04	10
HS19010488-02	WG-1620-MW05-20190109	09 Jan 2019 11:25			15 Jan 2019 00:37	1
HS19010488-03	WG-1620-P11-20190109	09 Jan 2019 12:25			15 Jan 2019 05:52	1
HS19010488-04	WG-1620-MW03-20190109	09 Jan 2019 13:15			15 Jan 2019 06:16	1
HS19010488-05	WG-1620-MW09-20190109	09 Jan 2019 14:05			15 Jan 2019 06:42	1
<b>Batch ID R331042 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water</b>						
HS19010488-10	WQ-1620-FB02-20190109	09 Jan 2019 17:35			14 Jan 2019 23:31	1
HS19010488-16	WQ-1620-TB02-20190110	10 Jan 2019 00:00			14 Jan 2019 23:55	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> R331088		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater	
HS19010488-06	WG-1620-MW04-20190109	09 Jan 2019 15:05			16 Jan 2019 01:09	1
HS19010488-07	WG-1620-MW21C-20190109	09 Jan 2019 16:20			16 Jan 2019 02:45	1
HS19010488-08	WG-1620-FD01-20190109	09 Jan 2019 16:20			16 Jan 2019 03:09	1
HS19010488-09	WG-1620-MW17-20190109	09 Jan 2019 17:20			16 Jan 2019 07:59	10
HS19010488-11	WG-1620-MW17C-20190110	10 Jan 2019 07:25			16 Jan 2019 03:33	1
HS19010488-12	WG-1620-MW18C-20190110	10 Jan 2019 08:20			16 Jan 2019 08:25	10
HS19010488-13	WG-1620-MW18A-20190110	10 Jan 2019 10:45			16 Jan 2019 08:52	25
HS19010488-14	WG-1620-MW48C-20190110	10 Jan 2019 11:45			16 Jan 2019 03:57	1
HS19010488-15	WG-1620-MW69A-20190110	10 Jan 2019 12:45			16 Jan 2019 04:21	1
HS19010488-17	WG-1620-MW80B-20190110	10 Jan 2019 13:50			16 Jan 2019 05:09	1
HS19010488-18	WG-1620-MW50A-20190110	10 Jan 2019 14:40			16 Jan 2019 05:33	1
HS19010488-19	WG-1620-MW81B-20190110	10 Jan 2019 15:30			16 Jan 2019 05:57	1
HS19010488-20	WG-1620-MW51A-20190110	10 Jan 2019 16:40			16 Jan 2019 06:20	1
HS19010488-21	WG-1620-MW51C-20190110	10 Jan 2019 17:30			16 Jan 2019 06:44	1
HS19010488-22	WG-1620-MW86C-20190111	11 Jan 2019 08:25			16 Jan 2019 07:08	1
HS19010488-23	WG-1620-FD02-20190111	11 Jan 2019 08:25			16 Jan 2019 07:32	1
<b>Batch ID</b> R331375		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater	
HS19010488-25	WG-1620-MW60A-20190111	11 Jan 2019 10:15			19 Jan 2019 14:49	1
<b>Batch ID</b> R331375		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS19010488-24	WQ-1620-FB03-20190111	11 Jan 2019 11:15			19 Jan 2019 07:36	1

WorkOrder: HS19010488  
 InstrumentID: ICPMS04  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

WorkOrder: HS19010488  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200



WorkOrder: HS19010488  
 InstrumentID: SV-6  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000070	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000041	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000052	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000052	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000061	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000056	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000022	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00020	0.00019	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000066	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000072	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000074	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000074	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000066	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000069	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000083	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000082	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000060	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000080	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000074	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000073	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000065	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000083	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000068	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.00016	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000066	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000074	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19010488  
 InstrumentID: SV-7  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles

**METHOD DETECTION /  
 REPORTING LIMITS**

Matrix: Aqueous

Units: mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000068	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000065	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000062	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000081	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000072	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000041	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000036	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000053	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000036	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000056	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000051	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000067	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000076	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000077	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.00010	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000070	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000047	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000094	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000061	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000052	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000045	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000064	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000065	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.000082	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000051	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000078	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000066	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19010488  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00054	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

WorkOrder: HS19010488  
 InstrumentID: VOA9  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00062	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00052	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00055	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00052	0.00030	0.0010
A	Methylene chloride	75-09-2	0.0010	0.0012	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00057	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00050	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** 136717      **Instrument:** ICPMS05      **Method:** SW6020

<b>MBLK</b>		Sample ID: <b>MBLK-136717</b>			Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:33</b>			
Client ID:		Run ID: <b>ICPMS05_331472</b>			SeqNo: <b>4920121</b>		PrepDate: <b>17-Jan-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>		Sample ID: <b>LCS-136717</b>			Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:35</b>			
Client ID:		Run ID: <b>ICPMS05_331472</b>			SeqNo: <b>4920122</b>		PrepDate: <b>17-Jan-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05211	0.00200	0.05	0	104	80 - 120				
Lead	0.05367	0.00200	0.05	0	107	80 - 120				

<b>MS</b>		Sample ID: <b>HS19010627-01MS</b>			Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:41</b>			
Client ID:		Run ID: <b>ICPMS05_331472</b>			SeqNo: <b>4920125</b>		PrepDate: <b>17-Jan-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05757	0.00200	0.05	0.003203	109	80 - 120				
Lead	0.04375	0.00200	0.05	0	87.5	80 - 120				

<b>MSD</b>		Sample ID: <b>HS19010627-01MSD</b>			Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:42</b>			
Client ID:		Run ID: <b>ICPMS05_331472</b>			SeqNo: <b>4920126</b>		PrepDate: <b>17-Jan-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.0581	0.00200	0.05	0.003203	110	80 - 120	0.05757	0.92	20	
Lead	0.04683	0.00200	0.05	0	93.7	80 - 120	0.04375	6.81	20	

<b>PDS</b>		Sample ID: <b>HS19010627-01PDS</b>			Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:44</b>			
Client ID:		Run ID: <b>ICPMS05_331472</b>			SeqNo: <b>4920127</b>		PrepDate: <b>17-Jan-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1073	0.00200	0.1	0.003203	104	75 - 125				
Lead	0.08872	0.00200	0.1	0.000038	88.7	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** 136717      **Instrument:** ICPMS05      **Method:** SW6020

<b>SD</b>	Sample ID: <b>HS19010627-01SD</b>	Units: <b>mg/L</b>		Analysis Date: <b>22-Jan-2019 16:39</b>						
Client ID:	Run ID: <b>ICPMS05_331472</b>	SeqNo: <b>4920124</b>	PrepDate: <b>17-Jan-2019</b>	DF: <b>5</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual
Arsenic	0.003007	0.0100					0.003203	0	10	J
Lead	U	0.0100					0.000038	0	10	

**The following samples were analyzed in this batch:**

HS19010488-01	HS19010488-02	HS19010488-03	HS19010488-04
HS19010488-05	HS19010488-06	HS19010488-07	HS19010488-08

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

<b>Batch ID:</b> 136742	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-136742</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jan-2019 16:37</b>							
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915229</b>	PrepDate: <b>17-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-136742</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jan-2019 16:39</b>							
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915230</b>	PrepDate: <b>17-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.05049	0.00200	0.05	0	101	80 - 120				
Lead	0.05272	0.00200	0.05	0	105	80 - 120				

<b>MS</b>	Sample ID: <b>HS19010531-01MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jan-2019 16:45</b>							
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915233</b>	PrepDate: <b>17-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.053	0.00200	0.05	0.000277	105	80 - 120				
Lead	0.04919	0.00200	0.05	0.000038	98.3	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19010531-01MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jan-2019 16:47</b>							
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915234</b>	PrepDate: <b>17-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.0533	0.00200	0.05	0.000277	106	80 - 120	0.053	0.566	20	
Lead	0.04072	0.00200	0.05	0.000038	81.4	80 - 120	0.04919	18.9	20	

<b>PDS</b>	Sample ID: <b>HS19010531-01PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>18-Jan-2019 16:49</b>							
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915235</b>	PrepDate: <b>17-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.09869	0.00200	0.1	0.000277	98.4	75 - 125				
Lead	0.08084	0.00200	0.1	0.000038	80.8	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

<b>Batch ID: 136742</b>		<b>Instrument: ICPMS05</b>		<b>Method: SW6020</b>						
<b>SD</b>	Sample ID: <b>HS19010531-01SD</b>	Units: <b>mg/L</b>		Analysis Date: <b>18-Jan-2019 16:43</b>						
Client ID:	Run ID: <b>ICPMS05_331295</b>	SeqNo: <b>4915232</b>	PrepDate: <b>17-Jan-2019</b>	DF: <b>5</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual

Arsenic	U	0.0100					-0.000909	0	10	
Lead	U	0.0100					0.000118	0	10	

**The following samples were analyzed in this batch:**

HS19010488-09	HS19010488-10	HS19010488-11	HS19010488-12
HS19010488-13	HS19010488-14	HS19010488-15	HS19010488-17
HS19010488-18	HS19010488-19	HS19010488-20	HS19010488-21
HS19010488-22	HS19010488-23	HS19010488-24	HS19010488-25



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-136574	Units: ug/L			Analysis Date: 21-Jan-2019 16:47					
Client ID:	Run ID: SV-6_331448	SeqNo: 4923243		PrepDate: 14-Jan-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.108</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.2</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.184</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.7</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.135</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.7</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.842</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.8</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.149</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.0</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.133</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-136574	Units: ug/L			Analysis Date: 21-Jan-2019 17:06					
Client ID:	Run ID: SV-6_331448	SeqNo: 4923244		PrepDate: 14-Jan-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.425	0.20	5	0	68.5	39 - 127				
2,4-Dimethylphenol	2.909	0.20	5	0	58.2	35 - 120				
2,4-Dinitrotoluene	3.257	0.20	5	0	65.1	50 - 122				
2,6-Dinitrotoluene	3.348	0.20	5	0	67.0	50 - 120				
2-Chloronaphthalene	3.311	0.20	5	0	66.2	50 - 120				
2-Methylnaphthalene	3.319	0.10	5	0	66.4	50 - 120				
4,6-Dinitro-2-methylphenol	2.839	0.20	5	0	56.8	25 - 121				
4-Nitrophenol	3.667	1.0	5	0	73.3	30 - 130				
Acenaphthene	2.962	0.10	5	0	59.2	45 - 120				
Acenaphthylene	3.213	0.10	5	0	64.3	47 - 120				
Anthracene	3.335	0.10	5	0	66.7	45 - 120				
Benz(a)anthracene	3.534	0.10	5	0	70.7	40 - 120				
Benzo(a)pyrene	3.583	0.10	5	0	71.7	45 - 120				
Bis(2-chloroethoxy)methane	3.193	0.20	5	0	63.9	45 - 120				
Bis(2-ethylhexyl)phthalate	3.532	0.20	5	0	70.6	40 - 139				
Chrysene	3.656	0.10	5	0	73.1	43 - 120				
Dibenzofuran	3.153	0.10	5	0	63.1	50 - 120				
Di-n-butyl phthalate	3.53	0.20	5	0	70.6	45 - 123				
Fluoranthene	3.345	0.10	5	0	66.9	45 - 125				
Fluorene	3.258	0.10	5	0	65.2	49 - 120				
Naphthalene	3.154	0.10	5	0	63.1	45 - 120				
Nitrobenzene	3.125	0.20	5	0	62.5	44 - 120				
N-Nitrosodiphenylamine	3.485	0.20	5	0	69.7	40 - 125				
Pentachlorophenol	1.947	0.20	5	0	38.9	19 - 121				
Phenanthrene	3.258	0.10	5	0	65.2	45 - 121				
Phenol	3.007	0.20	5	0	60.1	20 - 124				
Pyrene	3.499	0.10	5	0	70.0	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.918</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>78.4</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.542</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>70.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.197</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>63.9</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.935</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>78.7</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.356</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>67.1</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.433</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>68.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136574		Instrument: SV-6			Method: SW8270					
LCSD		Sample ID: LCSD-136574			Units: ug/L		Analysis Date: 21-Jan-2019 17:26			
Client ID:		Run ID: SV-6_331448			SeqNo: 4923245		PrepDate: 14-Jan-2019		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.542	0.20	5	0	70.8	39 - 127	3.425	3.38	20	
2,4-Dimethylphenol	2.885	0.20	5	0	57.7	35 - 120	2.909	0.836	20	
2,4-Dinitrotoluene	3.412	0.20	5	0	68.2	50 - 122	3.257	4.64	20	
2,6-Dinitrotoluene	3.653	0.20	5	0	73.1	50 - 120	3.348	8.71	20	
2-Chloronaphthalene	3.275	0.20	5	0	65.5	50 - 120	3.311	1.08	20	
2-Methylnaphthalene	3.455	0.10	5	0	69.1	50 - 120	3.319	4.01	20	
4,6-Dinitro-2-methylphenol	2.502	0.20	5	0	50.0	25 - 121	2.839	12.6	30	
4-Nitrophenol	3.099	1.0	5	0	62.0	30 - 130	3.667	16.8	20	
Acenaphthene	3.033	0.10	5	0	60.7	45 - 120	2.962	2.37	20	
Acenaphthylene	3.372	0.10	5	0	67.4	47 - 120	3.213	4.84	20	
Anthracene	3.326	0.10	5	0	66.5	45 - 120	3.335	0.279	20	
Benz(a)anthracene	3.597	0.10	5	0	71.9	40 - 120	3.534	1.77	20	
Benzo(a)pyrene	3.783	0.10	5	0	75.7	45 - 120	3.583	5.42	20	
Bis(2-chloroethoxy)methane	3.321	0.20	5	0	66.4	45 - 120	3.193	3.94	20	
Bis(2-ethylhexyl)phthalate	3.63	0.20	5	0	72.6	40 - 139	3.532	2.72	20	
Chrysene	3.715	0.10	5	0	74.3	43 - 120	3.656	1.6	20	
Dibenzofuran	3.225	0.10	5	0	64.5	50 - 120	3.153	2.28	20	
Di-n-butyl phthalate	3.561	0.20	5	0	71.2	45 - 123	3.53	0.865	20	
Fluoranthene	3.507	0.10	5	0	70.1	45 - 125	3.345	4.74	20	
Fluorene	3.396	0.10	5	0	67.9	49 - 120	3.258	4.13	20	
Naphthalene	3.137	0.10	5	0	62.7	45 - 120	3.154	0.533	20	
Nitrobenzene	3.302	0.20	5	0	66.0	44 - 120	3.125	5.5	20	
N-Nitrosodiphenylamine	3.648	0.20	5	0	73.0	40 - 125	3.485	4.59	20	
Pentachlorophenol	1.865	0.20	5	0	37.3	19 - 121	1.947	4.33	20	
Phenanthrene	3.466	0.10	5	0	69.3	45 - 121	3.258	6.17	20	
Phenol	2.767	0.20	5	0	55.3	20 - 124	3.007	8.3	20	
Pyrene	3.583	0.10	5	0	71.7	40 - 130	3.499	2.37	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.67</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>73.4</i>	<i>34 - 129</i>	<i>3.918</i>	<i>6.54</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.491</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.8</i>	<i>40 - 125</i>	<i>3.542</i>	<i>1.44</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>2.782</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>55.6</i>	<i>20 - 120</i>	<i>3.197</i>	<i>13.9</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.868</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.4</i>	<i>40 - 135</i>	<i>3.935</i>	<i>1.72</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>3.24</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.8</i>	<i>41 - 120</i>	<i>3.356</i>	<i>3.51</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.045</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>60.9</i>	<i>20 - 120</i>	<i>3.433</i>	<i>12</i>	<i>20</i>	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

<b>Batch ID:</b> 136574	<b>Instrument:</b> SV-6	<b>Method:</b> SW8270
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The following samples were analyzed in this batch:

HS19010488-01	HS19010488-02	HS19010488-03	HS19010488-04
HS19010488-05	HS19010488-06	HS19010488-07	HS19010488-08
HS19010488-09	HS19010488-10	HS19010488-11	HS19010488-12
HS19010488-13	HS19010488-14		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136614		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-136614	Units: ug/L			Analysis Date: 17-Jan-2019 19:01					
Client ID:	Run ID: SV-7_331241	SeqNo: 4915155	PrepDate: 15-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	3.152	0.20	5	0	63.0	34 - 129				
<i>Surr: 2-Fluorobiphenyl</i>	3.863	0.20	5	0	77.3	40 - 125				
<i>Surr: 2-Fluorophenol</i>	3.919	0.20	5	0	78.4	20 - 120				
<i>Surr: 4-Terphenyl-d14</i>	4.214	0.20	5	0	84.3	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.915	0.20	5	0	78.3	41 - 120				
<i>Surr: Phenol-d6</i>	4.189	0.20	5	0	83.8	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136614		Instrument: SV-7			Method: SW8270					
LCS	Sample ID: LCS-136614	Units: ug/L			Analysis Date: 17-Jan-2019 16:40					
Client ID:	Run ID: SV-7_331241	SeqNo: 4915153			PrepDate: 15-Jan-2019		DF: 1			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	4.99	0.20	5	0	99.8	39 - 127				
2,4-Dimethylphenol	3.683	0.20	5	0	73.7	35 - 120				
2,4-Dinitrotoluene	3.944	0.20	5	0	78.9	50 - 122				
2,6-Dinitrotoluene	3.842	0.20	5	0	76.8	50 - 120				
2-Chloronaphthalene	4.065	0.20	5	0	81.3	50 - 120				
2-Methylnaphthalene	3.843	0.10	5	0	76.9	50 - 120				
4,6-Dinitro-2-methylphenol	3.213	0.20	5	0	64.3	25 - 121				
4-Nitrophenol	3.837	1.0	5	0	76.7	30 - 130				
Acenaphthene	3.79	0.10	5	0	75.8	45 - 120				
Acenaphthylene	4.016	0.10	5	0	80.3	47 - 120				
Anthracene	4.161	0.10	5	0	83.2	45 - 120				
Benz(a)anthracene	4.224	0.10	5	0	84.5	40 - 120				
Benzo(a)pyrene	4.464	0.10	5	0	89.3	45 - 120				
Bis(2-chloroethoxy)methane	4.216	0.20	5	0	84.3	45 - 120				
Bis(2-ethylhexyl)phthalate	4.92	0.20	5	0	98.4	40 - 139				
Chrysene	4.291	0.10	5	0	85.8	43 - 120				
Dibenzofuran	3.906	0.10	5	0	78.1	50 - 120				
Di-n-butyl phthalate	4.49	0.20	5	0	89.8	45 - 123				
Fluoranthene	4.015	0.10	5	0	80.3	45 - 125				
Fluorene	3.871	0.10	5	0	77.4	49 - 120				
Naphthalene	4.004	0.10	5	0	80.1	45 - 120				
Nitrobenzene	4.219	0.20	5	0	84.4	44 - 120				
N-Nitrosodiphenylamine	4.239	0.20	5	0	84.8	40 - 125				
Pentachlorophenol	1.934	0.20	5	0	38.7	19 - 121				
Phenanthrene	4.082	0.10	5	0	81.6	45 - 121				
Phenol	4.413	0.20	5	0	88.3	20 - 124				
Pyrene	4.499	0.10	5	0	90.0	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.432</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>68.6</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>4.042</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>80.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>4.43</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>88.6</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>4.443</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>88.9</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>4.201</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>84.0</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>4.753</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>95.1</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: 136614		Instrument: SV-7		Method: SW8270						
LCSD		Sample ID: LCSD-136614		Units: ug/L		Analysis Date: 17-Jan-2019 17:00				
Client ID:		Run ID: SV-7_331241		SeqNo: 4915154		PrepDate: 15-Jan-2019		DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	4.972	0.20	5	0	99.4	39 - 127	4.99	0.356	20	
2,4-Dimethylphenol	4.037	0.20	5	0	80.7	35 - 120	3.683	9.15	20	
2,4-Dinitrotoluene	4.066	0.20	5	0	81.3	50 - 122	3.944	3.05	20	
2,6-Dinitrotoluene	4.093	0.20	5	0	81.9	50 - 120	3.842	6.35	20	
2-Chloronaphthalene	4.608	0.20	5	0	92.2	50 - 120	4.065	12.5	20	
2-Methylnaphthalene	4.041	0.10	5	0	80.8	50 - 120	3.843	5.03	20	
4,6-Dinitro-2-methylphenol	3.691	0.20	5	0	73.8	25 - 121	3.213	13.8	30	
4-Nitrophenol	4.013	1.0	5	0	80.3	30 - 130	3.837	4.49	20	
Acenaphthene	4.047	0.10	5	0	80.9	45 - 120	3.79	6.55	20	
Acenaphthylene	4.205	0.10	5	0	84.1	47 - 120	4.016	4.61	20	
Anthracene	4.086	0.10	5	0	81.7	45 - 120	4.161	1.83	20	
Benz(a)anthracene	4.252	0.10	5	0	85.0	40 - 120	4.224	0.65	20	
Benzo(a)pyrene	4.455	0.10	5	0	89.1	45 - 120	4.464	0.216	20	
Bis(2-chloroethoxy)methane	4.269	0.20	5	0	85.4	45 - 120	4.216	1.27	20	
Bis(2-ethylhexyl)phthalate	4.966	0.20	5	0	99.3	40 - 139	4.92	0.929	20	
Chrysene	4.279	0.10	5	0	85.6	43 - 120	4.291	0.268	20	
Dibenzofuran	4.031	0.10	5	0	80.6	50 - 120	3.906	3.15	20	
Di-n-butyl phthalate	4.433	0.20	5	0	88.7	45 - 123	4.49	1.28	20	
Fluoranthene	4.049	0.10	5	0	81.0	45 - 125	4.015	0.841	20	
Fluorene	4.017	0.10	5	0	80.3	49 - 120	3.871	3.7	20	
Naphthalene	4.287	0.10	5	0	85.7	45 - 120	4.004	6.82	20	
Nitrobenzene	4.559	0.20	5	0	91.2	44 - 120	4.219	7.75	20	
N-Nitrosodiphenylamine	4.288	0.20	5	0	85.8	40 - 125	4.239	1.15	20	
Pentachlorophenol	2.003	0.20	5	0	40.1	19 - 121	1.934	3.51	20	
Phenanthrene	4.101	0.10	5	0	82.0	45 - 121	4.082	0.45	20	
Phenol	4.418	0.20	5	0	88.4	20 - 124	4.413	0.108	20	
Pyrene	4.407	0.10	5	0	88.1	40 - 130	4.499	2.08	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.49</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.8</i>	<i>34 - 129</i>	<i>3.432</i>	<i>1.67</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>4.292</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>85.8</i>	<i>40 - 125</i>	<i>4.042</i>	<i>5.99</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>4.447</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>88.9</i>	<i>20 - 120</i>	<i>4.43</i>	<i>0.376</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>4.457</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>89.1</i>	<i>40 - 135</i>	<i>4.443</i>	<i>0.312</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>4.464</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>89.3</i>	<i>41 - 120</i>	<i>4.201</i>	<i>6.07</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>4.808</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>96.2</i>	<i>20 - 120</i>	<i>4.753</i>	<i>1.14</i>	<i>20</i>	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** 136614      **Instrument:** SV-7      **Method:** SW8270

The following samples were analyzed in this batch:

HS19010488-15	HS19010488-17	HS19010488-18	HS19010488-19
HS19010488-20	HS19010488-21	HS19010488-22	HS19010488-23
HS19010488-24	HS19010488-25		



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** R331030      **Instrument:** VOA2      **Method:** SW8260

<b>MBLK</b>		Sample ID: <b>VBLKW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 23:26</b>			
Client ID:		Run ID: <b>VOA2_331030</b>			SeqNo: <b>4908344</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.0</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.6</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.08</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.07</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 22:38</b>			
Client ID:		Run ID: <b>VOA2_331030</b>			SeqNo: <b>4908367</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	19.25	1.0	20	0	96.3	70 - 124				
Benzene	18.74	1.0	20	0	93.7	74 - 120				
Chlorobenzene	20.42	1.0	20	0	102	76 - 113				
Ethylbenzene	20.53	1.0	20	0	103	77 - 117				
Methylene chloride	19.15	2.0	20	0	95.7	70 - 127				
Toluene	19.5	1.0	20	0	97.5	77 - 118				
Xylenes, Total	61.55	1.0	60	0	103	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.25</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.3</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.6</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.3</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>48.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

Batch ID: R331030		Instrument: VOA2		Method: SW8260						
<b>MS</b>		Sample ID: <b>HS19010488-02MS</b>		Units: <b>ug/L</b>		Analysis Date: <b>15-Jan-2019 01:28</b>				
Client ID: <b>WG-1620-MW05-20190109</b>		Run ID: <b>VOA2_331030</b>		SeqNo: <b>4908349</b>		PrepDate:		DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,2-Dichloroethane	22.83	1.0	20	0	114	70 - 127				
Benzene	22.47	1.0	20	0	112	70 - 127				
Chlorobenzene	24.15	1.0	20	0	121	70 - 114			S	
Ethylbenzene	24.94	1.0	20	0	125	70 - 124			S	
Methylene chloride	22.3	2.0	20	0	112	70 - 128				
Toluene	23.63	1.0	20	0	118	70 - 123				
Xylenes, Total	72.41	1.0	60	0	121	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.43</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.9</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19010488-02MSD</b>		Units: <b>ug/L</b>		Analysis Date: <b>15-Jan-2019 01:52</b>			
Client ID: <b>WG-1620-MW05-20190109</b>		Run ID: <b>VOA2_331030</b>		SeqNo: <b>4908350</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2-Dichloroethane	22.17	1.0	20	0	111	70 - 127	22.83	2.94	20
Benzene	22.05	1.0	20	0	110	70 - 127	22.47	1.87	20
Chlorobenzene	24.13	1.0	20	0	121	70 - 114	24.15	0.0925	20 S
Ethylbenzene	24.35	1.0	20	0	122	70 - 124	24.94	2.38	20
Methylene chloride	21.15	2.0	20	0	106	70 - 128	22.3	5.27	20
Toluene	23.48	1.0	20	0	117	70 - 123	23.63	0.623	20
Xylenes, Total	72.09	1.0	60	0	120	70 - 130	72.41	0.437	20
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>70 - 126</i>	<i>51.71</i>	<i>2.75</i>	<i>20</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>81 - 113</i>	<i>49.81</i>	<i>0.0761</i>	<i>20</i>
<i>Surr: Dibromofluoromethane</i>	<i>50.75</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>77 - 123</i>	<i>50.81</i>	<i>0.117</i>	<i>20</i>
<i>Surr: Toluene-d8</i>	<i>48.58</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.2</i>	<i>82 - 127</i>	<i>48.43</i>	<i>0.305</i>	<i>20</i>

The following samples were analyzed in this batch: HS19010488-01 HS19010488-02 HS19010488-03 HS19010488-04  
 HS19010488-05

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** R331042      **Instrument:** VOA9      **Method:** SW8260

<b>MBLK</b>		Sample ID: <b>VBLKW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 16:03</b>			
Client ID:		Run ID: <b>VOA9_331042</b>			SeqNo: <b>4908590</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>52.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>46.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.7</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>53.74</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>107</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190114</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 14:49</b>			
Client ID:		Run ID: <b>VOA9_331042</b>			SeqNo: <b>4908589</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	22.08	1.0	20	0	110	70 - 124				
Benzene	21.79	1.0	20	0	109	74 - 120				
Chlorobenzene	20.68	1.0	20	0	103	76 - 113				
Ethylbenzene	21.73	1.0	20	0	109	77 - 117				
Methylene chloride	22.78	2.0	20	0	114	70 - 127				
Toluene	22.03	1.0	20	0	110	77 - 118				
Xylenes, Total	66.56	1.0	60	0	111	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>51.04</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>54.12</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>108</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.98</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100.0</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.7</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** R331042      **Instrument:** VOA9      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19010467-02MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 18:36</b>			
Client ID:		Run ID: <b>VOA9_331042</b>			SeqNo: <b>4908596</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	21.71	1.0	20	0	109	70 - 127				
Benzene	21.8	1.0	20	0	109	70 - 127				
Chlorobenzene	20.27	1.0	20	0	101	70 - 114				
Ethylbenzene	21.99	1.0	20	0	110	70 - 124				
Methylene chloride	21.99	2.0	20	0	110	70 - 128				
Toluene	21.85	1.0	20	0	109	70 - 123				
Xylenes, Total	66.02	1.0	60	0	110	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>52.54</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>52.06</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.09</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>49.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.3</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19010467-02MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>14-Jan-2019 19:00</b>			
Client ID:		Run ID: <b>VOA9_331042</b>			SeqNo: <b>4908597</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	20.61	1.0	20	0	103	70 - 127	21.71	5.2	20	
Benzene	19.71	1.0	20	0	98.6	70 - 127	21.8	10.1	20	
Chlorobenzene	20.38	1.0	20	0	102	70 - 114	20.27	0.52	20	
Ethylbenzene	21.86	1.0	20	0	109	70 - 124	21.99	0.553	20	
Methylene chloride	21.1	2.0	20	0	106	70 - 128	21.99	4.11	20	
Toluene	21.9	1.0	20	0	110	70 - 123	21.85	0.227	20	
Xylenes, Total	66.02	1.0	60	0	110	70 - 130	66.02	0.00586	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>52.8</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>106</i>	<i>70 - 126</i>	<i>52.54</i>	<i>0.482</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>52.25</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>81 - 113</i>	<i>52.06</i>	<i>0.372</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>77 - 123</i>	<i>50.09</i>	<i>0.477</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>49.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.2</i>	<i>82 - 127</i>	<i>49.13</i>	<i>0.0609</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010488-10      HS19010488-16

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

<b>Batch ID: R331088</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190115</b>	Units: <b>ug/L</b>			Analysis Date: <b>16-Jan-2019 00:45</b>				
Client ID:	Run ID: <b>VOA2_331088</b>	SeqNo: <b>4909708</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.9</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.8</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.7</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>49.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.4</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190115</b>	Units: <b>ug/L</b>			Analysis Date: <b>15-Jan-2019 23:57</b>				
Client ID:	Run ID: <b>VOA2_331088</b>	SeqNo: <b>4909707</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	19.81	1.0	20	0	99.0	70 - 124			
Benzene	19.09	1.0	20	0	95.4	74 - 120			
Chlorobenzene	20.75	1.0	20	0	104	76 - 113			
Ethylbenzene	21.28	1.0	20	0	106	77 - 117			
Methylene chloride	18.35	2.0	20	0	91.8	70 - 127			
Toluene	20.36	1.0	20	0	102	77 - 118			
Vinyl chloride	19.58	1.0	20	0	97.9	70 - 130			
Xylenes, Total	62.79	1.0	60	0	105	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.91</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>48.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** R331088      **Instrument:** VOA2      **Method:** SW8260

MS		Sample ID: HS19010488-06MS			Units: ug/L		Analysis Date: 16-Jan-2019 01:33			
Client ID: WG-1620-MW04-20190109		Run ID: VOA2_331088			SeqNo: 4909710		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.95	1.0	20	0	84.7	70 - 127				
Benzene	17.86	1.0	20	0	89.3	70 - 127				
Chlorobenzene	19.02	1.0	20	0	95.1	70 - 114				
Ethylbenzene	19.54	1.0	20	0	97.7	70 - 124				
Methylene chloride	16.69	2.0	20	0	83.4	70 - 128				
Toluene	18.79	1.0	20	0	93.9	70 - 123				
Vinyl chloride	17.28	1.0	20	0	86.4	70 - 130				
Xylenes, Total	57.26	1.0	60	0	95.4	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.2</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.54</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.1</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19010488-06MSD			Units: ug/L		Analysis Date: 16-Jan-2019 01:57			
Client ID: WG-1620-MW04-20190109		Run ID: VOA2_331088			SeqNo: 4909711		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	17.52	1.0	20	0	87.6	70 - 127	16.95	3.31	20	
Benzene	17.44	1.0	20	0	87.2	70 - 127	17.86	2.42	20	
Chlorobenzene	19.05	1.0	20	0	95.3	70 - 114	19.02	0.135	20	
Ethylbenzene	19.44	1.0	20	0	97.2	70 - 124	19.54	0.474	20	
Methylene chloride	16.64	2.0	20	0	83.2	70 - 128	16.69	0.246	20	
Toluene	18.45	1.0	20	0	92.2	70 - 123	18.79	1.83	20	
Vinyl chloride	16.89	1.0	20	0	84.4	70 - 130	17.28	2.28	20	
Xylenes, Total	57.03	1.0	60	0	95.0	70 - 130	57.26	0.409	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.91</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.8</i>	<i>70 - 126</i>	<i>50.2</i>	<i>2.61</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.89</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.8</i>	<i>81 - 113</i>	<i>49.41</i>	<i>1.07</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>50.28</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>	<i>50.42</i>	<i>0.279</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.8</i>	<i>82 - 127</i>	<i>48.54</i>	<i>0.251</i>	<i>20</i>	

The following samples were analyzed in this batch:

HS19010488-06	HS19010488-07	HS19010488-08	HS19010488-09
HS19010488-11	HS19010488-12	HS19010488-13	HS19010488-14
HS19010488-15	HS19010488-17	HS19010488-18	HS19010488-19
HS19010488-20	HS19010488-21	HS19010488-22	HS19010488-23

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

<b>Batch ID: R331375</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190119</b>	Units: <b>ug/L</b>			Analysis Date: <b>19-Jan-2019 06:48</b>				
Client ID:	Run ID: <b>VOA2_331375</b>	SeqNo: <b>4916449</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.02</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.0</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.55</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.1</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>51.36</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.2</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190119</b>	Units: <b>ug/L</b>			Analysis Date: <b>19-Jan-2019 06:00</b>				
Client ID:	Run ID: <b>VOA2_331375</b>	SeqNo: <b>4916448</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	18.42	1.0	20	0	92.1	70 - 124			
Benzene	21.42	1.0	20	0	107	74 - 120			
Chlorobenzene	20.64	1.0	20	0	103	76 - 113			
Ethylbenzene	20.92	1.0	20	0	105	77 - 117			
Methylene chloride	20.7	2.0	20	0	103	70 - 127			
Toluene	20.48	1.0	20	0	102	77 - 118			
Vinyl chloride	22.22	1.0	20	0	111	70 - 130			
Xylenes, Total	64.7	1.0	60	0	108	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.5</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.33</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.75</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QC BATCH REPORT**

**Batch ID:** R331375      **Instrument:** VOA2      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19010732-02MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>19-Jan-2019 08:24</b>			
Client ID:		Run ID: <b>VOA2_331375</b>			SeqNo: <b>4916453</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.89	1.0	20	0	74.5	70 - 127				
Benzene	18.1	1.0	20	0	90.5	70 - 127				
Chlorobenzene	17.84	1.0	20	0	89.2	70 - 114				
Ethylbenzene	18.19	1.0	20	0	90.9	70 - 124				
Methylene chloride	17.53	2.0	20	0	87.7	70 - 128				
Toluene	18.23	1.0	20	0	91.2	70 - 123				
Vinyl chloride	20.06	1.0	20	0	100	70 - 130				
Xylenes, Total	54.51	1.0	60	0	90.9	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.24</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.32</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.6</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19010732-02MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>19-Jan-2019 08:49</b>			
Client ID:		Run ID: <b>VOA2_331375</b>			SeqNo: <b>4916454</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.77	1.0	20	0	73.8	70 - 127	14.89	0.821	20	
Benzene	17.86	1.0	20	0	89.3	70 - 127	18.1	1.33	20	
Chlorobenzene	17.56	1.0	20	0	87.8	70 - 114	17.84	1.56	20	
Ethylbenzene	18.02	1.0	20	0	90.1	70 - 124	18.19	0.904	20	
Methylene chloride	15.93	2.0	20	0	79.7	70 - 128	17.53	9.57	20	
Toluene	18.04	1.0	20	0	90.2	70 - 123	18.23	1.1	20	
Vinyl chloride	19.35	1.0	20	0	96.7	70 - 130	20.06	3.63	20	
Xylenes, Total	54.72	1.0	60	0	91.2	70 - 130	54.51	0.387	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>70 - 126</i>	<i>50.24</i>	<i>1.01</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.29</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 113</i>	<i>49.32</i>	<i>1.94</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>50.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>77 - 123</i>	<i>51.47</i>	<i>2.83</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>50</i>	<i>1.26</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010488-24      HS19010488-25



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010488

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

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**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

**Sample Receipt Checklist**

Client Name: PBW  
 Work Order: HS19010488

Date/Time Received: **11-Jan-2019 14:00**  
 Received by: **PJM**

Checklist completed by: Pablo Martinez 11-Jan-2019 Reviewed by: Dane J. Wacasey 16-Jan-2019  
 eSignature Date eSignature Date

Matrices: **WATER** Carrier name: **Client**

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- TX1005 solids received in hermetically sealed vials? Yes  No  N/A
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No

Temperature(s)/Thermometer(s): 0.8C/1.1C, 1.0C/1.3C, 1.3C/1.6C, 1.4C/1.7C, 1.5C/1.8C, 0.9C/1.2C UC/C IR # 25

Cooler(s)/Kit(s): 25701, 5678, 44264, 44416, 25009, 43599

Date/Time sample(s) sent to storage: 1/11/19 18:00

Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted

Water - pH acceptable upon receipt? Yes  No  N/A

pH adjusted? Yes  No  N/A

pH adjusted by:

Login Notes: WG-1620-TW41B-20190109 & WG-1620-MW05-20190109 - Collection Time does not match, logged per CoC  
 TW41B - CoC = 10:35 Label = 9:35  
 MW05 - CoC = 11:25 Label = 10:10  
 WG-1620-FB02-20190109 - Sample Label missing Collection Date/Time, log per CoC (1-9-19 17:35)

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



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# Chain of Custody Form

Page 1 of 2

COC ID: 194325

HS19010488

Golder Associates Inc.  
Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-16-Rev0 SR 02588
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive	Address	1400 ... Street
	Suite 4004		Stop ...
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Oma... 68 790750
Phone	(512) 871-3434	Phone	
Fax	(512) 871-3446	Fax	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	<del>WG-1620-TBO-201801</del>																
2	WG-1620-TW41B-20190109	1-9-19	1035	W		6	X		X	X							
3	WG-1620-MW05-20190109	1-9-19	1125	W		6	X		X	X							
4	WG-1620-P11-20190109	1-9-19	1225	W		6	X		X	X							
5	WG-1620-MW03-20190109	1-9-19	1315	W		6	X		X	X							
6	WG-1620-MW09-20190109	1-9-19	1405	W		6	X		X	X							
7	WG-1620-MW04-20190109	1-9-19	1505	W		6	X		X	X							
8	WG-1620-MW21C-20190109	1-9-19	1620	W		6	X		X	X							
9	WG-1620-FD01-20190109	1-9-19	1620	W		6	X		X	X							
10	WG-1620-MW17-20190109	1-9-19	1720	W		6	X		X	X							

Sampler(s) Please Print & Sign <b>JOHN BRAYSON</b>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input type="checkbox"/> 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:	
Relinquished by: <b>John Br</b>		Date: 1-11-19	Time: 14:00	Received by:		Notes: UPRR Houston MWPW			
Relinquished by: <b>John Br</b>		Date: 1-11-19	Time: 14:00	Received by (Laboratory): <b>PM</b>		Cooler ID: 25701		Cooler Temp. <b>UC</b>	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Cooler ID: 5678		Cooler Temp. <b>1.0C</b>	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035						Cooler ID: IR25		Cooler Temp. <b>1.3C</b>	
						QC Package: (Check One Box Below)		Level II Std OC <input checked="" type="checkbox"/> TRRF Checklist	
						Level III Std OC/Raw Data <input type="checkbox"/>		TRRF Level IV <input type="checkbox"/>	
						Level IV SW846/CLP <input type="checkbox"/>		Other <input type="checkbox"/>	

note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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 44264 1.3C  
 25009 1.5C



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# Chain of Custody Form

Page 2 of 2

COC ID: 194309

HS19010488

wv

Golder Associates Inc.  
Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-06-Rev0 SR 92688
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive	Address	1400 Douglas Street
	Suite 4004		Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	<del>WG-1620-TB0-20190109</del>			Water	↑	2											
2	WG-1620-FB02-20190109	1-9-19	1735	W		6	X		X	X							
3	WG-1620-MW17C-20190110	1-10-19	0725	W		6	X		X	X							
4	WG-1620-MW18C-20190110	1-10-19	0820	W		6		X	X	X							
5	WG-1620-MW18A-20190110	1-10-19	1045	W		6		X	X	X							
6	WG-1620-MW48C-20190110	1-10-19	1145	W		6	X		X	X							
7	WG-1620-MW69A-20190110	1-10-19	1245	W		6		X	X	X							
8	WG-1620-TB02-20190110			W		2	X										
9	WG-1620-MW80B-20190110	1-10-19	1350	W		6	X		X	X							
10	WG-1620-MW50A-20190110	1-10-19	1440	W		6	X		X	X							

Sampler(s) Please Print & Sign <b>John Beaton</b>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:			
Relinquished by: <b>John Beaton</b>	Date: <b>1-11-19</b>	Time: <b>14:00</b>	Received by:	Notes: UPRR Houston MWPW							
Relinquished by:	Date:	Time:	Received by (Laboratory): <b>PM</b>	Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)					
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):			<input type="checkbox"/> Level II Std QC	<input checked="" type="checkbox"/> TRRP Checklist				
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035						<input type="checkbox"/> Level III Std QC/Paw Data	<input type="checkbox"/> TRRP Level IV				
						<input type="checkbox"/> Level IV SWB46/CLP					
						<input type="checkbox"/> Other					

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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# Chain of Custody Form

Page 3 of 3

COC ID: 194318

## HS19010488

L.WV

Golder Associates Inc.

Houston TX-Wood Preserving Works

ALS Project Manager:



Customer Information		Project Information	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works
Work Order		Project Number	1620-08-Rev0 SR 92688
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Ornaha NE 681790750
Phone	(512) 671-3434	Phone	
Fax	(512) 671-3446	Fax	
e-Mail Address	eric.matzner@pbwilc.com	e-Mail Address	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TB0_-201801			Water		2											
2	WG-1620-MW81B-20190110	1-10-19	1530	W		6	X		X	X							
3	WG-1620-MWS1A-20190110	1-10-19	1640	W		6	X		X	X							
4	WG-1620-MWS1C-20190110	1-10-19	1730	W		6	X		X	X							
5	WG-1620-MW86C-20190111	1-11-19	0825	W		6	X		X	X							
6	WG-1620-PD02-20190111	1-11-19	0825	W		6	X		X	X							
7	WG-1620-FB03-20190111	1-11-19	1115	W		6	X		X	X							
8	WG-1620-MW60A-20190111	1-11-19	1015	W		6		X	X	X							
9																	
10																	

Sampler(s) Please Print & Sign <i>John C. Brauer</i>	Shipment Method HAND DELIVERED	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	Other _____	Results Due Date:
Relinquished by: <i>John C. Brauer</i>	Date: 1-11-19 Time: 14:00	Received by:	Notes: UPRR Houston MWPW	
Relinquished by: <i>John C. Brauer</i>	Date: 1-11-19 Time: 14:00	Received by (Laboratory): <i>PM</i>	Cooler ID	Cooler Temp.
Logged by (Laboratory):	Date:	Time:	QC Package: (Check One Box Below)	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035			<input type="checkbox"/> Level II Std OC	<input checked="" type="checkbox"/> TRRP Checklist
			<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV
			<input type="checkbox"/> Level IV SW846/DLP	
			<input type="checkbox"/> Other	

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
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 3. The Chain of Custody is a legal document. All information must be completed accurately.

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Houston, TX 77099  
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February 14, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19010754**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 22 sample(s) on Jan 17, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

---

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

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**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.



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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey

**Laboratory Review Checklist: Reportable Data**

Laboratory Name: ALS Laboratory Group		LRC Date: 02/14/2019					
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19010754					
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136788,136815,136946,136947,R331619,R331648,R331734,R331781					
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?		X			1
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?		X			2
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			3
		Were MS/MSD RPDs within laboratory QC limits?		X			4
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				5
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 02/14/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19010754			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 136788,136815,136946,136947,R331619,R331648,R331734,R331781			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			6
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data</b> (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods</b> (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.  
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);  
NA = Not Applicable;  
NR = Not Reviewed;  
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group		LRC Date: 02/14/2019
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19010754
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 136788,136815,136946,136947,R331619,R331648,R331734,R331781
ER# <sup>5</sup>	Description	
1	Semivolatile Organics Method SW8270, samples WG-1620-MW63B-20190114, WG-1620-MW68B-20190115, WG-1620-FD03-20190115, WG-1620-MW83B-20190115, WG-1620-MW35A-20190115, WG-1620-MW25C-20190115, the surrogate recoveries could not be determined due to dilution below the calibration range.	
2	Batch 136788, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch.	
3	Batch R331648, Volatile Organics Method SW8260, sample HS19011106-02, MS was performed on unrelated sample.	
4	Batch R331648, Volatile Organics Method SW8260, sample HS19011106-02, MS/MSD RPD is for an unrelated sample.	
5	Batch 136815, Semivolatile Organics Method SW8270, sample WG-1620-MW68B-20190115, the GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.	
6	See Run Log and CCB Exceptions Report.	
<p>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);          NA = Not Applicable;          NR = Not Reviewed;          R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>		

## FORM 13 - ANALYSIS RUN LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754  
**Start Date:** 23-Jan-2019      **End Date:** 24-Jan-2019

**Run ID:** ICPMS05\_331608  
**Instrument:** ICPMS05  
**Method:** SW6020

Sample No.	D/F	Time	FileID	Analyses
ICV	1	23-Jan-2019 19:14	016_ICV.d	AS PB
LLICV2	1	23-Jan-2019 19:16	017SMPL.d	AS PB
LLICV5	1	23-Jan-2019 19:18	018LICV.d	AS PB
ICB	1	23-Jan-2019 19:21	019_ICB.d	AS PB
ICSA	1	23-Jan-2019 19:25	021ICSA.d	AS PB
ICSAB	1	23-Jan-2019 19:41	025ICSB.d	AS PB
CCV 1	1	23-Jan-2019 20:01	032_CCV.d	AS PB
CCB 1	1	23-Jan-2019 20:04	033_CCB.d	AS PB
CCV 2	1	23-Jan-2019 20:29	044_CCV.d	AS PB
CCB 2	1	23-Jan-2019 20:31	045_CCB.d	AS PB
ICCV 3	1	23-Jan-2019 21:18	058_ICV.d	AS PB
LLCCV2	1	23-Jan-2019 21:20	059SMPL.d	AS PB
LLCCV5	1	23-Jan-2019 21:22	060LICV.d	AS PB
ICCB 3	1	23-Jan-2019 21:25	061_ICB.d	AS PB
CCB 4	1	23-Jan-2019 21:43	069_CCB.d	AS PB
CCV 4	1	23-Jan-2019 21:45	070_CCV.d	AS PB
CCV 5	1	23-Jan-2019 22:05	079_CCV.d	AS PB
CCB 5	1	23-Jan-2019 22:07	080_CCB.d	AS PB
CCB 6	1	23-Jan-2019 22:34	092_CCB.d	AS PB
CCV 6	1	23-Jan-2019 22:37	093_CCV.d	AS PB
ICSA	1	23-Jan-2019 22:39	094ICSA.d	AS PB
ICSAB	1	23-Jan-2019 22:41	095ICSB.d	AS PB
CCB 7	1	23-Jan-2019 22:56	100_CCB.d	AS PB
CCV 7	1	23-Jan-2019 22:58	101_CCV.d	AS PB
CCV 8	1	23-Jan-2019 23:16	109_CCV.d	AS PB
CCB 8	1	23-Jan-2019 23:18	110_CCB.d	AS PB
CCV 9	1	23-Jan-2019 23:43	121_CCV.d	AS PB
CCB 9	1	23-Jan-2019 23:45	122_CCB.d	AS PB
CCV 10	1	24-Jan-2019 00:03	130_CCV.d	AS PB
CCB 10	1	24-Jan-2019 00:05	131_CCB.d	AS PB
CCV 11	1	24-Jan-2019 00:30	142_CCV.d	AS PB
CCB 11	1	24-Jan-2019 00:32	143_CCB.d	AS PB
CCV 12	1	24-Jan-2019 00:57	154_CCV.d	AS PB
CCB 12	1	24-Jan-2019 00:59	155_CCB.d	AS PB
MBLK-136946	1	24-Jan-2019 01:01	156SMPL.d	AS PB
LCS-136946	1	24-Jan-2019 01:04	157SMPL.d	AS PB
ZZZZZSD	5	24-Jan-2019 01:08	159SMPL.d	AS PB
ZZZZZMS	1	24-Jan-2019 01:10	160SMPL.d	AS PB
ZZZZZMSD	1	24-Jan-2019 01:13	161SMPL.d	AS PB
ZZZZZPDS	1	24-Jan-2019 01:15	162SMPL.d	AS PB
CCV 13	1	24-Jan-2019 01:17	163_CCV.d	AS PB
CCB 13	1	24-Jan-2019 01:20	164_CCB.d	AS PB
WG-1620-MW53C-20190114	1	24-Jan-2019 01:29	168SMPL.d	AS PB
CCV 14	1	24-Jan-2019 01:44	175_CCV.d	AS PB
CCB 14	1	24-Jan-2019 01:47	176_CCB.d	AS PB
CCV 15	1	24-Jan-2019 02:11	187_CCV.d	AS PB
CCB 15	1	24-Jan-2019 02:14	188_CCB.d	AS PB
CCV 16	1	24-Jan-2019 02:18	190_CCV.d	AS PB
CCB 16	1	24-Jan-2019 02:20	191_CCB.d	AS PB
LLICV2	1	24-Jan-2019 02:23	192SMPL.d	AS PB
LLICV5	1	24-Jan-2019 02:25	193LICV.d	AS PB

**CCB EXCEPTIONS REPORT**

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

Run ID:ICPMS05\_331608  
 Instrument:ICPMS05  
 Method:SW6020

ICB	Date: 23-Jan-2019 19:21	Seq: 4922194	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.419	0.4	2
CCB 1	Date: 23-Jan-2019 20:04	Seq: 4922207	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-1.286	0.4	2
CCB 2	Date: 23-Jan-2019 20:31	Seq: 4922219	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-1.388	0.4	2
CCB 5	Date: 23-Jan-2019 22:07	Seq: 4922251	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.528	0.4	2
CCB 8	Date: 23-Jan-2019 23:18	Seq: 4922500	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.463	0.4	2
CCB 9	Date: 23-Jan-2019 23:45	Seq: 4922512	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.527	0.4	2
CCB 10	Date: 24-Jan-2019 00:05	Seq: 4922647	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.509	0.4	2
CCB 11	Date: 24-Jan-2019 00:32	Seq: 4922659	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.506	0.4	2
CCB 12	Date: 24-Jan-2019 00:59	Seq: 4922671	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.553	0.4	2
CCB 13	Date: 24-Jan-2019 01:20	Seq: 4922680	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.56	0.4	2
CCB 14	Date: 24-Jan-2019 01:47	Seq: 4922692	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.578	0.4	2
CCB 15	Date: 24-Jan-2019 02:14	Seq: 4922704	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.749	0.4	2
CCB 16	Date: 24-Jan-2019 02:20	Seq: 4922707	D/F: 1	Units: ug/L
<b>Analyte</b>		<b>Result</b>	<b>MDL</b>	<b>Report Limit</b>
	Arsenic	-0.785	0.4	2

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19010754

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010754-01	WG-1620-MW53C-20190114	Groundwater		14-Jan-2019 12:05	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-02	WG-1620-MW54C-20190114	Groundwater		14-Jan-2019 13:00	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-03	WG-1620-MW36B-20190114	Groundwater		14-Jan-2019 14:05	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-04	WG-1620-MW36A-20190114	Groundwater		14-Jan-2019 14:55	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-05	WG-1620-MW28A-20190114	Groundwater		14-Jan-2019 15:50	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-06	WG-1620-MW28C-20190114	Groundwater		14-Jan-2019 16:35	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-07	WG-1620-MW63B-20190114	Groundwater		14-Jan-2019 17:40	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-08	WG-1620-FB04-20190114	Water		14-Jan-2019 18:00	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-09	WG-1620-MW26A-20190115	Groundwater		15-Jan-2019 07:40	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-10	WG-1620-MW68B-20190115	Groundwater		15-Jan-2019 08:55	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-11	WG-1620-FD03-20190115	Groundwater		15-Jan-2019 08:55	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-12	WG-1620-MW68C-20190115	Groundwater		15-Jan-2019 09:45	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-13	WG-1620-MW83B-20190115	Groundwater		15-Jan-2019 10:40	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-14	WG-1620-MW83C-20190115	Groundwater		15-Jan-2019 11:15	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-15	WG-1620-MW35A-20190115	Groundwater		15-Jan-2019 12:45	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-16	WG-1620-MW35B-20190115	Groundwater		15-Jan-2019 13:25	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-17	WG-1620-MW25A-20190115	Groundwater		15-Jan-2019 14:25	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-18	WG-1620-MW25C-20190115	Groundwater		15-Jan-2019 15:10	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-19	WG-1620-MW34CR-20190115	Groundwater		15-Jan-2019 15:55	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-20	WG-1620-MW71B-20190115	Groundwater		15-Jan-2019 16:50	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-21	WG-1620-FB05-20190115	Water		15-Jan-2019 17:15	17-Jan-2019 08:27	<input type="checkbox"/>
HS19010754-22	WQ-1620-TB04-20190115	Water		15-Jan-2019 00:00	17-Jan-2019 08:27	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW53C-20190114  
 Collection Date: 14-Jan-2019 12:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:27
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:27
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:27
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:27
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 02:27
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:27
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:27
<i>Surr: 1,2-Dichloroethane-d4</i>		94.2		70-126	%REC	1	24-Jan-2019 02:27
<i>Surr: 4-Bromofluorobenzene</i>		97.0		81-113	%REC	1	24-Jan-2019 02:27
<i>Surr: Dibromofluoromethane</i>		103		77-123	%REC	1	24-Jan-2019 02:27
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	24-Jan-2019 02:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW53C-20190114  
 Collection Date: 14-Jan-2019 12:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 10:32
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 10:32
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 10:32
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 10:32
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 10:32
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 10:32
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 10:32
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 10:32
Acenaphthene	U		0.000027	0.00010	mg/L	1	01-Feb-2019 10:32
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 10:32
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 10:32
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 10:32
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 10:32
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 10:32
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 10:32
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 10:32
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Feb-2019 10:32
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 10:32
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 10:32
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 10:32
<b>Naphthalene</b>	<b>0.00025</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:32
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 10:32
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 10:32
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 10:32
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 10:32
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 10:32
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 10:32
<i>Surr: 2,4,6-Tribromophenol</i>	<i>46.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>43.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<i>Surr: 2-Fluorophenol</i>	<i>44.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>71.7</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<i>Surr: Nitrobenzene-d5</i>	<i>46.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<i>Surr: Phenol-d6</i>	<i>41.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:32</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	24-Jan-2019 01:29
Lead	U		0.000600	0.00200	mg/L	1	24-Jan-2019 01:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW54C-20190114  
 Collection Date: 14-Jan-2019 13:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:52
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:52
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:52
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:52
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 02:52
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 02:52
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 02:52
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 02:52</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.9</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 02:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 02:52</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 02:52</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW54C-20190114  
 Collection Date: 14-Jan-2019 13:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 10:52
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 10:52
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 10:52
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 10:52
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 10:52
<b>2-Methylnaphthalene</b>	<b>0.0014</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 10:52
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 10:52
<b>Acenaphthene</b>	<b>0.014</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	01-Feb-2019 17:10
<b>Acenaphthylene</b>	<b>0.00020</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Anthracene</b>	<b>0.0013</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 10:52
<b>Benzo(a)pyrene</b>	<b>0.000039</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Bis(2-chloroethoxy)methane</b>	<b>0.000056</b>	J	<b>0.000030</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000096</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Chrysene</b>	<b>0.000038</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Dibenzofuran</b>	<b>0.015</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	01-Feb-2019 17:10
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 10:52
<b>Fluoranthene</b>	<b>0.0020</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Fluorene</b>	<b>0.0085</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<b>Naphthalene</b>	<b>0.019</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	01-Feb-2019 17:10
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 10:52
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 10:52
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 10:52
<b>Phenanthrene</b>	<b>0.0052</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 10:52
<b>Pyrene</b>	<b>0.0010</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 10:52
<i>Surr: 2,4,6-Tribromophenol</i>	<i>52.5</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>56.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>47.7</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>45.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>
<i>Surr: 2-Fluorophenol</i>	<i>44.1</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>68.8</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>73.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.8</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>
<i>Surr: Nitrobenzene-d5</i>	<i>44.1</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: Phenol-d6</i>	<i>36.2</i>	J		<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 17:10</i>
<i>Surr: Phenol-d6</i>	<i>46.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 10:52</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW54C-20190114  
 Collection Date: 14-Jan-2019 13:00

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.00123	J	0.000400	0.00200	mg/L	1	25-Jan-2019 16:23
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 16:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36B-20190114  
 Collection Date: 14-Jan-2019 14:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 03:16
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 03:16
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 03:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 03:16
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 03:16
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 03:16
Vinyl chloride	U		0.00020	0.0010	mg/L	1	24-Jan-2019 03:16
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 03:16
<i>Surr: 1,2-Dichloroethane-d4</i>		95.6		70-126	%REC	1	24-Jan-2019 03:16
<i>Surr: 4-Bromofluorobenzene</i>		96.6		81-113	%REC	1	24-Jan-2019 03:16
<i>Surr: Dibromofluoromethane</i>		101		77-123	%REC	1	24-Jan-2019 03:16
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	24-Jan-2019 03:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36B-20190114  
 Collection Date: 14-Jan-2019 14:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:11
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 11:11
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 11:11
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 11:11
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:11
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 11:11
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:11
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 11:11
Acenaphthene	U		0.000027	0.00010	mg/L	1	01-Feb-2019 11:11
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 11:11
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 11:11
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 11:11
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:11
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 11:11
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00022</b>		<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 11:11
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:11
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:11
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:11
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 11:11
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 11:11
Naphthalene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:11
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 11:11
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 11:11
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 11:11
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:11
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 11:11
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 11:11
<i>Surr: 2,4,6-Tribromophenol</i>	<i>62.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>47.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<i>Surr: 2-Fluorophenol</i>	<i>43.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>81.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<i>Surr: Nitrobenzene-d5</i>	<i>47.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<i>Surr: Phenol-d6</i>	<i>50.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:11</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00118</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>25-Jan-2019 16:25</b>
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 16:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36A-20190114  
 Collection Date: 14-Jan-2019 14:55

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 16:19
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 16:19
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 16:19
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 16:19
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 16:19
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 16:19
Vinyl chloride	U		0.00020	0.0010	mg/L	1	25-Jan-2019 16:19
Xylenes, Total	U		0.00030	0.0010	mg/L	1	25-Jan-2019 16:19
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 16:19</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 16:19</i>
<i>Surr: Dibromofluoromethane</i>	<i>95.9</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 16:19</i>
<i>Surr: Toluene-d8</i>	<i>99.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 16:19</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36A-20190114  
 Collection Date: 14-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:31
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 11:31
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 11:31
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 11:31
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:31
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 11:31
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:31
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 11:31
Acenaphthene	U		0.000027	0.00010	mg/L	1	01-Feb-2019 11:31
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 11:31
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 11:31
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 11:31
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:31
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 11:31
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 11:31
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:31
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:31
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:31
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 11:31
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 11:31
<b>Naphthalene</b>	<b>0.000062</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 11:31</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 11:31
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 11:31
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 11:31
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:31
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 11:31
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 11:31
<i>Surr: 2,4,6-Tribromophenol</i>	<i>54.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<i>Surr: 2-Fluorophenol</i>	<i>42.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>73.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<i>Surr: Nitrobenzene-d5</i>	<i>44.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<i>Surr: Phenol-d6</i>	<i>47.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 11:31</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00107</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>25-Jan-2019 16:27</b>
<b>Lead</b>	<b>0.00108</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>25-Jan-2019 16:27</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW28A-20190114  
 Collection Date: 14-Jan-2019 15:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 08:55
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 08:55
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 08:55
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 08:55
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 08:55
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 08:55
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 08:55
<i>Surr: 1,2-Dichloroethane-d4</i>		91.6		70-126	%REC	1	24-Jan-2019 08:55
<i>Surr: 4-Bromofluorobenzene</i>		96.5		81-113	%REC	1	24-Jan-2019 08:55
<i>Surr: Dibromofluoromethane</i>		98.8		77-123	%REC	1	24-Jan-2019 08:55
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	24-Jan-2019 08:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW28A-20190114  
 Collection Date: 14-Jan-2019 15:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:51
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 11:51
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 11:51
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 11:51
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 11:51
<b>2-Methylnaphthalene</b>	<b>0.000055</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:51
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 11:51
<b>Acenaphthene</b>	<b>0.000092</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 11:51
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 11:51
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 11:51
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 11:51
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 11:51
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000061</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:51
<b>Dibenzofuran</b>	<b>0.00011</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 11:51
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 11:51
<b>Fluorene</b>	<b>0.000056</b>	J	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
<b>Naphthalene</b>	<b>0.0024</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 11:51
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 11:51
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 11:51
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 11:51
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 11:51
<b>Pyrene</b>	<b>0.000065</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 11:51
<i>Surr: 2,4,6-Tribromophenol</i>	63.8			34-129	%REC	1	01-Feb-2019 11:51
<i>Surr: 2-Fluorobiphenyl</i>	64.3			40-125	%REC	1	01-Feb-2019 11:51
<i>Surr: 2-Fluorophenol</i>	52.7			20-120	%REC	1	01-Feb-2019 11:51
<i>Surr: 4-Terphenyl-d14</i>	73.0			40-135	%REC	1	01-Feb-2019 11:51
<i>Surr: Nitrobenzene-d5</i>	59.4			41-120	%REC	1	01-Feb-2019 11:51
<i>Surr: Phenol-d6</i>	56.6			20-120	%REC	1	01-Feb-2019 11:51
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.0116</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 16:29
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 16:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW28C-20190114  
 Collection Date: 14-Jan-2019 16:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 00:51
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 00:51
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 00:51
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 00:51
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 00:51
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 00:51
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 00:51
<i>Surr: 1,2-Dichloroethane-d4</i>		95.3		70-126	%REC	1	24-Jan-2019 00:51
<i>Surr: 4-Bromofluorobenzene</i>		95.7		81-113	%REC	1	24-Jan-2019 00:51
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	24-Jan-2019 00:51
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	24-Jan-2019 00:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW28C-20190114  
 Collection Date: 14-Jan-2019 16:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 12:10
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 12:10
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 12:10
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 12:10
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 12:10
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 12:10
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 12:10
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 12:10
Acenaphthene	U		0.000027	0.00010	mg/L	1	01-Feb-2019 12:10
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 12:10
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 12:10
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 12:10
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 12:10
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 12:10
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 12:10
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 12:10
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Feb-2019 12:10
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 12:10
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 12:10
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 12:10
Naphthalene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 12:10
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 12:10
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 12:10
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 12:10
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 12:10
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 12:10
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 12:10
<i>Surr: 2,4,6-Tribromophenol</i>	75.2			34-129	%REC	1	01-Feb-2019 12:10
<i>Surr: 2-Fluorobiphenyl</i>	63.0			40-125	%REC	1	01-Feb-2019 12:10
<i>Surr: 2-Fluorophenol</i>	47.4			20-120	%REC	1	01-Feb-2019 12:10
<i>Surr: 4-Terphenyl-d14</i>	75.8			40-135	%REC	1	01-Feb-2019 12:10
<i>Surr: Nitrobenzene-d5</i>	54.3			41-120	%REC	1	01-Feb-2019 12:10
<i>Surr: Phenol-d6</i>	58.1			20-120	%REC	1	01-Feb-2019 12:10
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.000447</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>25-Jan-2019 16:32</b>
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 16:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW63B-20190114  
 Collection Date: 14-Jan-2019 17:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	24-Jan-2019 03:40
<b>Benzene</b>	<b>0.35</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	25-Jan-2019 06:35
<b>Chlorobenzene</b>	<b>0.00073</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 03:40
<b>Ethylbenzene</b>	<b>0.48</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	25-Jan-2019 06:35
Methylene chloride		U	0.0010	0.0020	mg/L	1	24-Jan-2019 03:40
<b>Toluene</b>	<b>0.0071</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 03:40
<b>Xylenes, Total</b>	<b>0.11</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 03:40
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.5</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 03:40</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.9</i>			<i>70-126</i>	<i>%REC</i>	<i>10</i>	<i>25-Jan-2019 06:35</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 03:40</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>10</i>	<i>25-Jan-2019 06:35</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 03:40</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>10</i>	<i>25-Jan-2019 06:35</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 03:40</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>10</i>	<i>25-Jan-2019 06:35</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW63B-20190114  
 Collection Date: 14-Jan-2019 17:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	07-Feb-2019 12:16
2,4-Dimethylphenol	U		0.00040	0.0020	mg/L	10	07-Feb-2019 12:16
2,4-Dinitrotoluene	U		0.00059	0.0020	mg/L	10	07-Feb-2019 12:16
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	07-Feb-2019 12:16
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	07-Feb-2019 12:16
<b>2-Methylnaphthalene</b>	<b>0.042</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	07-Feb-2019 12:16
4-Nitrophenol	U		0.00047	0.010	mg/L	10	07-Feb-2019 12:16
Acenaphthene	U		0.00027	0.0010	mg/L	10	07-Feb-2019 12:16
<b>Acenaphthylene</b>	<b>0.0029</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
<b>Anthracene</b>	<b>0.00017</b>	J	<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
Benz(a)anthracene	U		0.00051	0.0010	mg/L	10	07-Feb-2019 12:16
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	07-Feb-2019 12:16
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	07-Feb-2019 12:16
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	07-Feb-2019 12:16
Chrysene	U		0.00021	0.0010	mg/L	10	07-Feb-2019 12:16
<b>Dibenzofuran</b>	<b>0.0087</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	07-Feb-2019 12:16
Fluoranthene	U		0.00010	0.0010	mg/L	10	07-Feb-2019 12:16
<b>Fluorene</b>	<b>0.0029</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
<b>Naphthalene</b>	<b>2.1</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	12-Feb-2019 19:12
Nitrobenzene	U		0.00024	0.0020	mg/L	10	07-Feb-2019 12:16
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	07-Feb-2019 12:16
Pentachlorophenol	U		0.00080	0.0020	mg/L	10	07-Feb-2019 12:16
<b>Phenanthrene</b>	<b>0.00094</b>	J	<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 12:16
Phenol	U		0.00035	0.0020	mg/L	10	07-Feb-2019 12:16
Pyrene	U		0.00019	0.0010	mg/L	10	07-Feb-2019 12:16
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	12-Feb-2019 19:12
Surr: 2,4,6-Tribromophenol	61.9			34-129	%REC	10	07-Feb-2019 12:16
Surr: 2-Fluorobiphenyl	51.1			40-125	%REC	10	07-Feb-2019 12:16
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	12-Feb-2019 19:12
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	12-Feb-2019 19:12
Surr: 2-Fluorophenol	81.7			20-120	%REC	10	07-Feb-2019 12:16
Surr: 4-Terphenyl-d14	64.4			40-135	%REC	10	07-Feb-2019 12:16
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	12-Feb-2019 19:12
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	12-Feb-2019 19:12
Surr: Nitrobenzene-d5	44.8			41-120	%REC	10	07-Feb-2019 12:16
Surr: Phenol-d6	64.6			20-120	%REC	10	07-Feb-2019 12:16
Surr: Phenol-d6	0	JS		20-120	%REC	1000	12-Feb-2019 19:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW63B-20190114  
 Collection Date: 14-Jan-2019 17:40

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.00338		0.000400	0.00200	mg/L	1	25-Jan-2019 16:55
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 16:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FB04-20190114  
 Collection Date: 14-Jan-2019 18:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-08  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 18:26
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 18:26
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 18:26
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 18:26
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 18:26
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 18:26
Vinyl chloride	U		0.00020	0.0010	mg/L	1	24-Jan-2019 18:26
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 18:26
<i>Surr: 1,2-Dichloroethane-d4</i>		93.5		70-126	%REC	1	24-Jan-2019 18:26
<i>Surr: 4-Bromofluorobenzene</i>		96.8		81-113	%REC	1	24-Jan-2019 18:26
<i>Surr: Dibromofluoromethane</i>		102		77-123	%REC	1	24-Jan-2019 18:26
<i>Surr: Toluene-d8</i>		101		82-127	%REC	1	24-Jan-2019 18:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FB04-20190114  
 Collection Date: 14-Jan-2019 18:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-08  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 17:50
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 17:50
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 17:50
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 17:50
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 17:50
<b>2-Methylnaphthalene</b>	<b>0.00021</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 17:50
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 17:50
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 17:50
<b>Acenaphthene</b>	<b>0.000045</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 17:50
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 17:50
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 17:50
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 17:50
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 17:50
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 17:50
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 17:50
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 17:50
<b>Dibenzofuran</b>	<b>0.000026</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 17:50
<b>Di-n-butyl phthalate</b>	<b>0.000023</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 17:50
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 17:50
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 17:50
<b>Naphthalene</b>	<b>0.0031</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 17:50
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 17:50
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 17:50
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 17:50
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 17:50
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 17:50
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 17:50
<i>Surr: 2,4,6-Tribromophenol</i>	<i>66.2</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>72.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>64.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>83.1</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<i>Surr: Nitrobenzene-d5</i>	<i>65.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<i>Surr: Phenol-d6</i>	<i>67.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 17:50</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	U		0.000400	0.00200	mg/L	1	25-Jan-2019 16:57
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 16:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW26A-20190115  
 Collection Date: 15-Jan-2019 07:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 04:04
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 04:04
<b>Chlorobenzene</b>	<b>0.00056</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 04:04
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 01:38
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 04:04
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 04:04
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 04:04
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.5</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:04</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.4</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 01:38</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:04</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 01:38</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:04</i>
<i>Surr: Dibromofluoromethane</i>	<i>104</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 01:38</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:04</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 01:38</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW26A-20190115  
 Collection Date: 15-Jan-2019 07:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 18:09
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 18:09
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 18:09
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 18:09
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 18:09
<b>2-Methylnaphthalene</b>	<b>0.000090</b>	<b>J</b>	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 18:09
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 18:09
<b>Acenaphthene</b>	<b>0.042</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	<b>10</b>	<b>07-Feb-2019 13:15</b>
<b>Acenaphthylene</b>	<b>0.00027</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
<b>Anthracene</b>	<b>0.00087</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 18:09
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 18:09
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 18:09
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 18:09
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 18:09
<b>Dibenzofuran</b>	<b>0.00050</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 18:09
<b>Fluoranthene</b>	<b>0.0044</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
<b>Fluorene</b>	<b>0.0039</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
<b>Naphthalene</b>	<b>0.00049</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 18:09
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 18:09
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 18:09
<b>Phenanthrene</b>	<b>0.00012</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 18:09
<b>Pyrene</b>	<b>0.0025</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 18:09</b>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>79.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>61.4</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.5</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>59.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>
<i>Surr: 2-Fluorophenol</i>	<i>52.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>
<i>Surr: 2-Fluorophenol</i>	<i>46.4</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>65.9</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>73.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>
<i>Surr: Nitrobenzene-d5</i>	<i>56.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>
<i>Surr: Nitrobenzene-d5</i>	<i>47.7</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: Phenol-d6</i>	<i>53.6</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 13:15</i>
<i>Surr: Phenol-d6</i>	<i>58.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 18:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW26A-20190115  
 Collection Date: 15-Jan-2019 07:40

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.166		0.000400	0.00200	mg/L	1	25-Jan-2019 17:00
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 17:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68B-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-10  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	24-Jan-2019 04:28
<b>Benzene</b>	<b>2.0</b>		<b>0.010</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:01
<b>Chlorobenzene</b>	<b>0.00056</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 04:28
<b>Ethylbenzene</b>	<b>0.50</b>		<b>0.015</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:01
Methylene chloride		U	0.0010	0.0020	mg/L	1	24-Jan-2019 04:28
<b>Toluene</b>	<b>0.086</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 04:28
<b>Xylenes, Total</b>	<b>1.2</b>		<b>0.015</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:01
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>80.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:28</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.7</i>			<i>70-126</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:01</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:28</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:01</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:28</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:01</i>
<i>Surr: Toluene-d8</i>	<i>100.0</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:28</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:01</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68B-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-10  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	07-Feb-2019 13:35
<b>2,4-Dimethylphenol</b>	<b>0.050</b>		<b>0.00040</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	07-Feb-2019 13:35
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	07-Feb-2019 13:35
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	07-Feb-2019 13:35
<b>2-Methylnaphthalene</b>	<b>0.33</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	07-Feb-2019 13:55
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	07-Feb-2019 13:35
4-Nitrophenol	U		0.00047	0.010	mg/L	10	07-Feb-2019 13:35
<b>Acenaphthene</b>	<b>0.100</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	07-Feb-2019 13:55
<b>Acenaphthylene</b>	<b>0.0012</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
<b>Anthracene</b>	<b>0.0080</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	07-Feb-2019 13:35
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	07-Feb-2019 13:35
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	07-Feb-2019 13:35
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	07-Feb-2019 13:35
Chrysene	U		0.00021	0.0010	mg/L	10	07-Feb-2019 13:35
<b>Dibenzofuran</b>	<b>0.10</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	100	07-Feb-2019 13:55
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	07-Feb-2019 13:35
<b>Fluoranthene</b>	<b>0.0031</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
<b>Fluorene</b>	<b>0.057</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
<b>Naphthalene</b>	<b>5.0</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	07-Feb-2019 17:31
Nitrobenzene	U		0.00024	0.0020	mg/L	10	07-Feb-2019 13:35
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	07-Feb-2019 13:35
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	07-Feb-2019 13:35
<b>Phenanthrene</b>	<b>0.065</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
<b>Phenol</b>	<b>0.0019</b>	J	<b>0.00035</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
<b>Pyrene</b>	<b>0.0015</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 13:35
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	07-Feb-2019 17:31
Surr: 2,4,6-Tribromophenol	71.6			34-129	%REC	10	07-Feb-2019 13:35
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	100	07-Feb-2019 13:55
Surr: 2-Fluorobiphenyl	47.4			40-125	%REC	10	07-Feb-2019 13:35
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	100	07-Feb-2019 13:55
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	07-Feb-2019 17:31
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	07-Feb-2019 17:31
Surr: 2-Fluorophenol	80.2			20-120	%REC	10	07-Feb-2019 13:35
Surr: 2-Fluorophenol	0	JS		20-120	%REC	100	07-Feb-2019 13:55
Surr: 4-Terphenyl-d14	64.2			40-135	%REC	10	07-Feb-2019 13:35
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	07-Feb-2019 13:55
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	07-Feb-2019 17:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68B-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-10  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	07-Feb-2019 17:31
Surr: Nitrobenzene-d5	53.3			41-120	%REC	10	07-Feb-2019 13:35
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	07-Feb-2019 13:55
Surr: Phenol-d6	51.0			20-120	%REC	10	07-Feb-2019 13:35
Surr: Phenol-d6	0	JS		20-120	%REC	100	07-Feb-2019 13:55
Surr: Phenol-d6	0	JS		20-120	%REC	1000	07-Feb-2019 17:31
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.0123		0.000400	0.00200	mg/L	1	25-Jan-2019 17:02
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD03-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	24-Jan-2019 04:52
<b>Benzene</b>	<b>1.9</b>		<b>0.010</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:28
<b>Chlorobenzene</b>	<b>0.00056</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 04:52
<b>Ethylbenzene</b>	<b>0.49</b>		<b>0.015</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:28
Methylene chloride		U	0.0010	0.0020	mg/L	1	24-Jan-2019 04:52
<b>Toluene</b>	<b>0.084</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 04:52
<b>Xylenes, Total</b>	<b>1.2</b>		<b>0.015</b>	<b>0.050</b>	<b>mg/L</b>	50	25-Jan-2019 07:28
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>80.8</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:52</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.0</i>			<i>70-126</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:28</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.5</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:52</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			<i>81-113</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:28</i>
<i>Surr: Dibromofluoromethane</i>	<i>98.9</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:28</i>
<i>Surr: Toluene-d8</i>	<i>99.8</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 04:52</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>50</i>	<i>25-Jan-2019 07:28</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD03-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	07-Feb-2019 14:34
<b>2,4-Dimethylphenol</b>	<b>0.058</b>		<b>0.00040</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>2,4-Dinitrotoluene</b>	<b>0.0013</b>	J	<b>0.00058</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	07-Feb-2019 14:34
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	07-Feb-2019 14:34
<b>2-Methylnaphthalene</b>	<b>0.31</b>		<b>0.019</b>	<b>0.10</b>	<b>mg/L</b>	1000	07-Feb-2019 17:51
<b>4,6-Dinitro-2-methylphenol</b>	<b>0.0011</b>	J	<b>0.00020</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>4-Nitrophenol</b>	<b>0.0074</b>	J	<b>0.00047</b>	<b>0.010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Acenaphthene</b>	<b>0.13</b>		<b>0.027</b>	<b>0.10</b>	<b>mg/L</b>	1000	07-Feb-2019 17:51
<b>Acenaphthylene</b>	<b>0.0014</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Anthracene</b>	<b>0.0098</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	07-Feb-2019 14:34
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	07-Feb-2019 14:34
<b>Bis(2-chloroethoxy)methane</b>	<b>0.0036</b>		<b>0.00030</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	07-Feb-2019 14:34
Chrysene	U		0.00021	0.0010	mg/L	10	07-Feb-2019 14:34
<b>Dibenzofuran</b>	<b>0.12</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	07-Feb-2019 17:51
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	07-Feb-2019 14:34
<b>Fluoranthene</b>	<b>0.0039</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Fluorene</b>	<b>0.065</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Naphthalene</b>	<b>3.8</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	07-Feb-2019 17:51
Nitrobenzene	U		0.00024	0.0020	mg/L	10	07-Feb-2019 14:34
<b>N-Nitrosodiphenylamine</b>	<b>0.0051</b>		<b>0.00025</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	07-Feb-2019 14:34
<b>Phenanthrene</b>	<b>0.073</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Phenol</b>	<b>0.0015</b>	J	<b>0.00035</b>	<b>0.0020</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<b>Pyrene</b>	<b>0.0018</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 14:34
<i>Surr: 2,4,6-Tribromophenol</i>	<i>63.0</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.3</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>
<i>Surr: 2-Fluorophenol</i>	<i>80.1</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>59.4</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	<i>JS</i>		<i>40-135</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>
<i>Surr: Nitrobenzene-d5</i>	<i>44.9</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: Nitrobenzene-d5</i>	<i>0</i>	<i>JS</i>		<i>41-120</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>
<i>Surr: Phenol-d6</i>	<i>59.1</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>07-Feb-2019 14:34</i>
<i>Surr: Phenol-d6</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>07-Feb-2019 17:51</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD03-20190115  
 Collection Date: 15-Jan-2019 08:55

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.0125		0.000400	0.00200	mg/L	1	25-Jan-2019 17:04
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 17:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68C-20190115  
 Collection Date: 15-Jan-2019 09:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 05:16
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 02:02
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 05:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 02:02
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 05:16
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 05:16
<b>Xylenes, Total</b>	<b>0.0011</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	<b>1</b>	<b>24-Jan-2019 05:16</b>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:16</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.6</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 02:02</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.0</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:16</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.9</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 02:02</i>
<i>Surr: Dibromofluoromethane</i>	<i>100</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:16</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 02:02</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:16</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 02:02</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68C-20190115  
 Collection Date: 15-Jan-2019 09:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 19:09
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 19:09
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	01-Feb-2019 19:09
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 19:09
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 19:09
<b>2-Methylnaphthalene</b>	<b>0.000077</b>	<b>J</b>	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 19:09
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 19:09
Acenaphthene	U		0.000027	0.00010	mg/L	1	01-Feb-2019 19:09
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 19:09
Anthracene	U		0.000014	0.00010	mg/L	1	01-Feb-2019 19:09
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	01-Feb-2019 19:09
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 19:09
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 19:09
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000044</b>	<b>J</b>	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 19:09
<b>Dibenzofuran</b>	<b>0.000066</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 19:09
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Feb-2019 19:09
<b>Fluorene</b>	<b>0.000057</b>	<b>J</b>	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
<b>Naphthalene</b>	<b>0.00079</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 19:09
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 19:09
Pentachlorophenol	U		0.000080	0.00020	mg/L	1	01-Feb-2019 19:09
<b>Phenanthrene</b>	<b>0.000062</b>	<b>J</b>	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>01-Feb-2019 19:09</b>
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 19:09
Pyrene	U		0.000019	0.00010	mg/L	1	01-Feb-2019 19:09
<i>Surr: 2,4,6-Tribromophenol</i>	<i>56.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<i>Surr: 2-Fluorophenol</i>	<i>52.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>75.7</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<i>Surr: Nitrobenzene-d5</i>	<i>54.3</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<i>Surr: Phenol-d6</i>	<i>55.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 19:09</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	U		0.000400	0.00200	mg/L	1	25-Jan-2019 17:06
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW83B-20190115  
 Collection Date: 15-Jan-2019 10:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 05:40
<b>Benzene</b>	<b>0.032</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 05:40
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 05:40
<b>Ethylbenzene</b>	<b>0.091</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 05:40
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 05:40
<b>Toluene</b>	<b>0.0082</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 05:40
<b>Xylenes, Total</b>	<b>0.100</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 05:40
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:40</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:40</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:40</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 05:40</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW83B-20190115  
 Collection Date: 15-Jan-2019 10:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 19:28
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 19:28
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 19:28
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 19:28
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 19:28
<b>2-Methylnaphthalene</b>	<b>0.086</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 15:53
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 19:28
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 19:28
<b>Acenaphthene</b>	<b>0.026</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 15:53
<b>Acenaphthylene</b>	<b>0.00034</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
<b>Anthracene</b>	<b>0.0012</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 19:28
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 19:28
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 19:28
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000064</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 19:28
<b>Dibenzofuran</b>	<b>0.020</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 15:53
<b>Di-n-butyl phthalate</b>	<b>0.00015</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
<b>Fluoranthene</b>	<b>0.00051</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
<b>Fluorene</b>	<b>0.0099</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	07-Feb-2019 15:53
<b>Naphthalene</b>	<b>1.6</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	12-Feb-2019 19:32
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 19:28
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 19:28
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 19:28
<b>Phenanthrene</b>	<b>0.0074</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 19:28
<b>Pyrene</b>	<b>0.00030</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 19:28
Surr: 2,4,6-Tribromophenol	66.8			34-129	%REC	1	01-Feb-2019 19:28
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	12-Feb-2019 19:32
Surr: 2,4,6-Tribromophenol	53.8			34-129	%REC	10	07-Feb-2019 15:53
Surr: 2-Fluorobiphenyl	50.3			40-125	%REC	10	07-Feb-2019 15:53
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	12-Feb-2019 19:32
Surr: 2-Fluorobiphenyl	56.4			40-125	%REC	1	01-Feb-2019 19:28
Surr: 2-Fluorophenol	56.1			20-120	%REC	1	01-Feb-2019 19:28
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	12-Feb-2019 19:32
Surr: 2-Fluorophenol	56.2			20-120	%REC	10	07-Feb-2019 15:53
Surr: 4-Terphenyl-d14	48.3			40-135	%REC	10	07-Feb-2019 15:53
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	12-Feb-2019 19:32
Surr: 4-Terphenyl-d14	68.7			40-135	%REC	1	01-Feb-2019 19:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW83B-20190115  
 Collection Date: 15-Jan-2019 10:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
Surr: Nitrobenzene-d5	44.1			41-120	%REC	1	01-Feb-2019 19:28
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	12-Feb-2019 19:32
Surr: Nitrobenzene-d5	45.2			41-120	%REC	10	07-Feb-2019 15:53
Surr: Phenol-d6	47.4			20-120	%REC	10	07-Feb-2019 15:53
Surr: Phenol-d6	0	JS		20-120	%REC	1000	12-Feb-2019 19:32
Surr: Phenol-d6	55.3			20-120	%REC	1	01-Feb-2019 19:28
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.0916		0.000400	0.00200	mg/L	1	25-Jan-2019 17:09
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 17:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW83C-20190115  
 Collection Date: 15-Jan-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:04
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:04
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:04
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:04
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 06:04
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:04
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:04
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.8</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:04</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>98.7</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:04</i>
<i>Surr: Dibromofluoromethane</i>		<i>101</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:04</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:04</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW83C-20190115  
 Collection Date: 15-Jan-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>			<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN
<b>1,2-Diphenylhydrazine</b>	<b>0.000087</b>	J	<b>0.000021</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:35
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 18:35
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 18:35
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 18:35
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 18:35
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:35
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 18:35
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 18:35
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 18:35
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 18:35
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 18:35
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 18:35
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:35
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 18:35
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 18:35
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:35
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:35
<b>Di-n-butyl phthalate</b>	<b>0.000060</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:35
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 18:35
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 18:35
<b>Naphthalene</b>	<b>0.00036</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:35
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 18:35
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 18:35
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 18:35
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:35
<b>Phenol</b>	<b>0.000038</b>	J	<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:35
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:35
<i>Surr: 2,4,6-Tribromophenol</i>	<i>40.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>43.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<i>Surr: 2-Fluorophenol</i>	<i>39.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>64.3</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<i>Surr: Nitrobenzene-d5</i>	<i>45.3</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<i>Surr: Phenol-d6</i>	<i>45.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:35</i>
<b>ICP-MS METALS BY SW6020A</b>			<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ
<b>Arsenic</b>	<b>0.00616</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 17:11
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35A-20190115  
 Collection Date: 15-Jan-2019 12:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 15:31
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 15:31
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 15:31
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 15:31
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 15:31
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 15:31
Xylenes, Total	U		0.00030	0.0010	mg/L	1	25-Jan-2019 15:31
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.7</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 15:31</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 15:31</i>
<i>Surr: Dibromofluoromethane</i>	<i>95.1</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 15:31</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 15:31</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35A-20190115  
 Collection Date: 15-Jan-2019 12:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine		U	0.000021	0.00020	mg/L	1	01-Feb-2019 20:08
<b>2,4-Dimethylphenol</b>	<b>0.0021</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
2,4-Dinitrotoluene		U	0.000058	0.00020	mg/L	1	01-Feb-2019 20:08
2,6-Dinitrotoluene		U	0.000042	0.00020	mg/L	1	01-Feb-2019 20:08
2-Chloronaphthalene		U	0.000021	0.00020	mg/L	1	01-Feb-2019 20:08
<b>2-Methylnaphthalene</b>	<b>0.016</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:55
4,6-Dinitro-2-methylphenol		U	0.000020	0.00020	mg/L	1	01-Feb-2019 20:08
4-Nitrophenol		U	0.000047	0.0010	mg/L	1	01-Feb-2019 20:08
<b>Acenaphthene</b>	<b>0.0039</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
<b>Acenaphthylene</b>	<b>0.000068</b>	J	<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
<b>Anthracene</b>	<b>0.00044</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
Benz(a)anthracene		U	0.000050	0.00010	mg/L	1	01-Feb-2019 20:08
Benzo(a)pyrene		U	0.000020	0.00010	mg/L	1	01-Feb-2019 20:08
Bis(2-chloroethoxy)methane		U	0.000030	0.00020	mg/L	1	01-Feb-2019 20:08
Bis(2-ethylhexyl)phthalate		U	0.000037	0.00020	mg/L	1	01-Feb-2019 20:08
Chrysene		U	0.000021	0.00010	mg/L	1	01-Feb-2019 20:08
<b>Dibenzofuran</b>	<b>0.0041</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
Di-n-butyl phthalate		U	0.000020	0.00020	mg/L	1	01-Feb-2019 20:08
<b>Fluoranthene</b>	<b>0.00015</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
<b>Fluorene</b>	<b>0.0022</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
<b>Naphthalene</b>	<b>0.22</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	100	13-Feb-2019 19:15
Nitrobenzene		U	0.000024	0.00020	mg/L	1	01-Feb-2019 20:08
N-Nitrosodiphenylamine		U	0.000025	0.00020	mg/L	1	01-Feb-2019 20:08
Pentachlorophenol		U	0.000079	0.00020	mg/L	1	01-Feb-2019 20:08
<b>Phenanthrene</b>	<b>0.0025</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
Phenol		U	0.000035	0.00020	mg/L	1	01-Feb-2019 20:08
<b>Pyrene</b>	<b>0.000070</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:08
<i>Surr: 2,4,6-Tribromophenol</i>	<i>74.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:08</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>78.4</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:55</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>100</i>	<i>13-Feb-2019 19:15</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>58.7</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:55</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>100</i>	<i>13-Feb-2019 19:15</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>51.3</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>45.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>53.7</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:55</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>100</i>	<i>13-Feb-2019 19:15</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>82.0</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:55</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	<i>JS</i>		<i>40-135</i>	<i>%REC</i>	<i>100</i>	<i>13-Feb-2019 19:15</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.2</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:08</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35A-20190115  
 Collection Date: 15-Jan-2019 12:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
Surr: Nitrobenzene-d5	48.5			41-120	%REC	1	01-Feb-2019 20:08
Surr: Nitrobenzene-d5	63.8			41-120	%REC	10	13-Feb-2019 18:55
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	13-Feb-2019 19:15
Surr: Phenol-d6	63.3			20-120	%REC	10	13-Feb-2019 18:55
Surr: Phenol-d6	0	JS		20-120	%REC	100	13-Feb-2019 19:15
Surr: Phenol-d6	52.4			20-120	%REC	1	01-Feb-2019 20:08
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.0198		0.000400	0.00200	mg/L	1	25-Jan-2019 17:13
Lead	0.000654	J	0.000600	0.00200	mg/L	1	25-Jan-2019 17:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35B-20190115  
 Collection Date: 15-Jan-2019 13:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 15:55
<b>Benzene</b>	<b>0.0033</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 15:55
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 15:55
<b>Ethylbenzene</b>	<b>0.0094</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 15:55
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 15:55
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 15:55
<b>Xylenes, Total</b>	<b>0.0040</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 15:55
<i>Surr: 1,2-Dichloroethane-d4</i>	92.6			70-126	%REC	1	25-Jan-2019 15:55
<i>Surr: 4-Bromofluorobenzene</i>	99.1			81-113	%REC	1	25-Jan-2019 15:55
<i>Surr: Dibromofluoromethane</i>	95.4			77-123	%REC	1	25-Jan-2019 15:55
<i>Surr: Toluene-d8</i>	98.8			82-127	%REC	1	25-Jan-2019 15:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35B-20190115  
 Collection Date: 15-Jan-2019 13:25

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	12-Feb-2019 20:50
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	12-Feb-2019 20:50
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	12-Feb-2019 20:50
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	12-Feb-2019 20:50
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	12-Feb-2019 20:50
<b>2-Methylnaphthalene</b>	<b>0.011</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:10
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	12-Feb-2019 20:50
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	12-Feb-2019 20:50
<b>Acenaphthene</b>	<b>0.013</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:10
<b>Acenaphthylene</b>	<b>0.00018</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Anthracene</b>	<b>0.0011</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Benz(a)anthracene</b>	<b>0.000077</b>	J	<b>0.000050</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Benzo(a)pyrene</b>	<b>0.000058</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00014</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Chrysene</b>	<b>0.000098</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Dibenzofuran</b>	<b>0.015</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:10
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Fluoranthene</b>	<b>0.0013</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Fluorene</b>	<b>0.0066</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<b>Naphthalene</b>	<b>0.079</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:10
Nitrobenzene	U		0.000024	0.00020	mg/L	1	12-Feb-2019 20:50
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	12-Feb-2019 20:50
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Phenanthrene</b>	<b>0.0086</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Phenol	U		0.000035	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Pyrene</b>	<b>0.00075</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
<i>Surr: 2,4,6-Tribromophenol</i>	<i>40.8</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>50.1</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.1</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>
<i>Surr: 2-Fluorophenol</i>	<i>35.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>29.2</i>	J		<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>70.7</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.1</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>
<i>Surr: Nitrobenzene-d5</i>	<i>43.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: Nitrobenzene-d5</i>	<i>50.5</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>
<i>Surr: Phenol-d6</i>	<i>41.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: Phenol-d6</i>	<i>29.1</i>	J		<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:10</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW35B-20190115  
 Collection Date: 15-Jan-2019 13:25

**ANALYTICAL REPORT**

WorkOrder:HS19010754  
 Lab ID:HS19010754-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>	<b>Method:SW6020</b>			Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.00862		0.000400	0.00200	mg/L	1	25-Jan-2019 17:37
Lead	0.00165	J	0.000600	0.00200	mg/L	1	25-Jan-2019 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW25A-20190115  
 Collection Date: 15-Jan-2019 14:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:28
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:28
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:28
Ethylbenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:28
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 06:28
Toluene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:28
Vinyl chloride	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:28
Xylenes, Total	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:28
<i>Surr: 1,2-Dichloroethane-d4</i>		92.5		70-126	%REC	1	24-Jan-2019 06:28
<i>Surr: 4-Bromofluorobenzene</i>		96.6		81-113	%REC	1	24-Jan-2019 06:28
<i>Surr: Dibromofluoromethane</i>		101		77-123	%REC	1	24-Jan-2019 06:28
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	24-Jan-2019 06:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW25A-20190115  
 Collection Date: 15-Jan-2019 14:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 20:47
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 20:47
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 20:47
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 20:47
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 20:47
<b>2-Methylnaphthalene</b>	<b>0.000051</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 20:47
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 20:47
<b>Acenaphthene</b>	<b>0.000036</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Feb-2019 20:47
<b>Anthracene</b>	<b>0.000015</b>	J	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	01-Feb-2019 20:47
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Feb-2019 20:47
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 20:47
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000078</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Chrysene	U		0.000021	0.00010	mg/L	1	01-Feb-2019 20:47
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Feb-2019 20:47
<b>Di-n-butyl phthalate</b>	<b>0.000020</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
<b>Fluoranthene</b>	<b>0.000015</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Fluorene	U		0.000030	0.00010	mg/L	1	01-Feb-2019 20:47
<b>Naphthalene</b>	<b>0.00029</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 20:47
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 20:47
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 20:47
<b>Phenanthrene</b>	<b>0.000029</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 20:47
<b>Pyrene</b>	<b>0.000027</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 20:47
<i>Surr: 2,4,6-Tribromophenol</i>	<i>47.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>58.2</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<i>Surr: 2-Fluorophenol</i>	<i>46.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>71.7</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<i>Surr: Nitrobenzene-d5</i>	<i>57.9</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<i>Surr: Phenol-d6</i>	<i>54.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 20:47</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00216</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 17:39
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW25C-20190115  
 Collection Date: 15-Jan-2019 15:10

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:52
Benzene	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:52
Chlorobenzene	U		0.00030	0.0010	mg/L	1	24-Jan-2019 06:52
<b>Ethylbenzene</b>	<b>0.038</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 06:52
Methylene chloride	U		0.0010	0.0020	mg/L	1	24-Jan-2019 06:52
<b>Toluene</b>	<b>0.013</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 06:52
Vinyl chloride	U		0.00020	0.0010	mg/L	1	24-Jan-2019 06:52
<b>Xylenes, Total</b>	<b>0.27</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	24-Jan-2019 06:52
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.4</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:52</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:52</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2019 06:52</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW25C-20190115  
 Collection Date: 15-Jan-2019 15:10

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Feb-2019 21:07
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Feb-2019 21:07
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	01-Feb-2019 21:07
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Feb-2019 21:07
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Feb-2019 21:07
<b>2-Methylnaphthalene</b>	<b>0.40</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	12-Feb-2019 22:09
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Feb-2019 21:07
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Feb-2019 21:07
<b>Acenaphthene</b>	<b>0.13</b>		<b>0.0027</b>	<b>0.010</b>	<b>mg/L</b>	100	12-Feb-2019 22:09
<b>Acenaphthylene</b>	<b>0.0012</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
<b>Anthracene</b>	<b>0.011</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:50
<b>Benz(a)anthracene</b>	<b>0.00065</b>		<b>0.000050</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
<b>Benzo(a)pyrene</b>	<b>0.00021</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Feb-2019 21:07
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	01-Feb-2019 21:07
<b>Chrysene</b>	<b>0.00074</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
<b>Dibenzofuran</b>	<b>0.14</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	100	12-Feb-2019 22:09
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	01-Feb-2019 21:07
<b>Fluoranthene</b>	<b>0.0079</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
<b>Fluorene</b>	<b>0.062</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:50
<b>Naphthalene</b>	<b>3.5</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	12-Feb-2019 22:29
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Feb-2019 21:07
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Feb-2019 21:07
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	01-Feb-2019 21:07
<b>Phenanthrene</b>	<b>0.077</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 21:50
Phenol	U		0.000035	0.00020	mg/L	1	01-Feb-2019 21:07
<b>Pyrene</b>	<b>0.0052</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Feb-2019 21:07
<i>Surr: 2,4,6-Tribromophenol</i>	<i>67.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 21:07</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>84.4</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:50</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>100</i>	<i>12-Feb-2019 22:09</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>1000</i>	<i>12-Feb-2019 22:29</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.1</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>100</i>	<i>12-Feb-2019 22:09</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>1000</i>	<i>12-Feb-2019 22:29</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>43.0</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 21:07</i>
<i>Surr: 2-Fluorophenol</i>	<i>40.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 21:07</i>
<i>Surr: 2-Fluorophenol</i>	<i>50.2</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 21:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>100</i>	<i>12-Feb-2019 22:09</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>12-Feb-2019 22:29</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW25C-20190115  
 Collection Date: 15-Jan-2019 15:10

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: ACN	
Surr: 4-Terphenyl-d14	83.3			40-135	%REC	10	12-Feb-2019 21:50
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	12-Feb-2019 22:09
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	12-Feb-2019 22:29
Surr: 4-Terphenyl-d14	71.9			40-135	%REC	1	01-Feb-2019 21:07
Surr: Nitrobenzene-d5	48.3			41-120	%REC	1	01-Feb-2019 21:07
Surr: Nitrobenzene-d5	66.1			41-120	%REC	10	12-Feb-2019 21:50
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	12-Feb-2019 22:09
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	12-Feb-2019 22:29
Surr: Phenol-d6	60.2			20-120	%REC	10	12-Feb-2019 21:50
Surr: Phenol-d6	0	JS		20-120	%REC	100	12-Feb-2019 22:09
Surr: Phenol-d6	0	JS		20-120	%REC	1000	12-Feb-2019 22:29
Surr: Phenol-d6	50.5			20-120	%REC	1	01-Feb-2019 21:07
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	0.00359		0.000400	0.00200	mg/L	1	25-Jan-2019 17:41
Lead		U	0.000600	0.00200	mg/L	1	25-Jan-2019 17:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW34CR-20190115  
 Collection Date: 15-Jan-2019 15:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:44
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:44
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:44
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:44
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 22:44
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:44
Xylenes, Total	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:44
<i>Surr: 1,2-Dichloroethane-d4</i>		93.8		70-126	%REC	1	25-Jan-2019 22:44
<i>Surr: 4-Bromofluorobenzene</i>		97.8		81-113	%REC	1	25-Jan-2019 22:44
<i>Surr: Dibromofluoromethane</i>		95.7		77-123	%REC	1	25-Jan-2019 22:44
<i>Surr: Toluene-d8</i>		102		82-127	%REC	1	25-Jan-2019 22:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW34CR-20190115  
 Collection Date: 15-Jan-2019 15:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	05-Feb-2019 21:45
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	05-Feb-2019 21:45
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	05-Feb-2019 21:45
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	05-Feb-2019 21:45
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	05-Feb-2019 21:45
<b>2-Methylnaphthalene</b>	<b>0.000079</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	05-Feb-2019 21:45
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	05-Feb-2019 21:45
<b>Acenaphthene</b>	<b>0.000029</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
Acenaphthylene	U		0.000015	0.00010	mg/L	1	05-Feb-2019 21:45
Anthracene	U		0.000014	0.00010	mg/L	1	05-Feb-2019 21:45
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	05-Feb-2019 21:45
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	05-Feb-2019 21:45
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	05-Feb-2019 21:45
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	05-Feb-2019 21:45
Chrysene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 21:45
<b>Dibenzofuran</b>	<b>0.000027</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
<b>Di-n-butyl phthalate</b>	<b>0.000021</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
<b>Fluoranthene</b>	<b>0.000014</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
Fluorene	U		0.000030	0.00010	mg/L	1	05-Feb-2019 21:45
<b>Naphthalene</b>	<b>0.00069</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 21:45
Nitrobenzene	U		0.000024	0.00020	mg/L	1	05-Feb-2019 21:45
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	05-Feb-2019 21:45
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	05-Feb-2019 21:45
Phenanthrene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 21:45
Phenol	U		0.000035	0.00020	mg/L	1	05-Feb-2019 21:45
Pyrene	U		0.000019	0.00010	mg/L	1	05-Feb-2019 21:45
<i>Surr: 2,4,6-Tribromophenol</i>	58.3			34-129	%REC	1	05-Feb-2019 21:45
<i>Surr: 2-Fluorobiphenyl</i>	46.8			40-125	%REC	1	05-Feb-2019 21:45
<i>Surr: 2-Fluorophenol</i>	42.7			20-120	%REC	1	05-Feb-2019 21:45
<i>Surr: 4-Terphenyl-d14</i>	69.4			40-135	%REC	1	05-Feb-2019 21:45
<i>Surr: Nitrobenzene-d5</i>	41.3			41-120	%REC	1	05-Feb-2019 21:45
<i>Surr: Phenol-d6</i>	43.5			20-120	%REC	1	05-Feb-2019 21:45
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00132</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 17:44
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW71B-20190115  
 Collection Date: 15-Jan-2019 16:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	25-Jan-2019 23:08
<b>Benzene</b>	<b>0.0024</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 23:08
Chlorobenzene		U	0.00030	0.0010	mg/L	1	25-Jan-2019 23:08
<b>Ethylbenzene</b>	<b>0.00093</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 23:08
Methylene chloride		U	0.0010	0.0020	mg/L	1	25-Jan-2019 23:08
Toluene		U	0.00020	0.0010	mg/L	1	25-Jan-2019 23:08
<b>Xylenes, Total</b>	<b>0.00084</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	25-Jan-2019 23:08
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 23:08</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.6</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 23:08</i>
<i>Surr: Dibromofluoromethane</i>	<i>95.8</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 23:08</i>
<i>Surr: Toluene-d8</i>	<i>99.7</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 23:08</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW71B-20190115  
 Collection Date: 15-Jan-2019 16:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	05-Feb-2019 22:05
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	05-Feb-2019 22:05
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	05-Feb-2019 22:05
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	05-Feb-2019 22:05
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	05-Feb-2019 22:05
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	05-Feb-2019 22:05
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	05-Feb-2019 22:05
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	05-Feb-2019 22:05
Acenaphthene	U		0.000027	0.00010	mg/L	1	05-Feb-2019 22:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	05-Feb-2019 22:05
Anthracene	U		0.000014	0.00010	mg/L	1	05-Feb-2019 22:05
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	05-Feb-2019 22:05
<b>Benzo(a)pyrene</b>	<b>0.000021</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 22:05
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	05-Feb-2019 22:05
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	05-Feb-2019 22:05
Chrysene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 22:05
Dibenzofuran	U		0.000020	0.00010	mg/L	1	05-Feb-2019 22:05
<b>Di-n-butyl phthalate</b>	<b>0.000022</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	05-Feb-2019 22:05
<b>Fluoranthene</b>	<b>0.000039</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 22:05
Fluorene	U		0.000030	0.00010	mg/L	1	05-Feb-2019 22:05
Naphthalene	U		0.000020	0.00010	mg/L	1	05-Feb-2019 22:05
Nitrobenzene	U		0.000024	0.00020	mg/L	1	05-Feb-2019 22:05
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	05-Feb-2019 22:05
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	05-Feb-2019 22:05
Phenanthrene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 22:05
Phenol	U		0.000035	0.00020	mg/L	1	05-Feb-2019 22:05
<b>Pyrene</b>	<b>0.000037</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	05-Feb-2019 22:05
<i>Surr: 2,4,6-Tribromophenol</i>	<i>57.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>55.1</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<i>Surr: 2-Fluorophenol</i>	<i>55.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<i>Surr: Nitrobenzene-d5</i>	<i>50.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<i>Surr: Phenol-d6</i>	<i>54.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:05</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.00158</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 17:46
<b>Lead</b>	<b>0.000845</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	25-Jan-2019 17:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FB05-20190115  
 Collection Date: 15-Jan-2019 17:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-21  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 21:56
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 21:56
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 21:56
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 21:56
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 21:56
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 21:56
Vinyl chloride	U		0.00020	0.0010	mg/L	1	25-Jan-2019 21:56
Xylenes, Total	U		0.00030	0.0010	mg/L	1	25-Jan-2019 21:56
<i>Surr: 1,2-Dichloroethane-d4</i>		90.6		70-126	%REC	1	25-Jan-2019 21:56
<i>Surr: 4-Bromofluorobenzene</i>		96.2		81-113	%REC	1	25-Jan-2019 21:56
<i>Surr: Dibromofluoromethane</i>		95.5		77-123	%REC	1	25-Jan-2019 21:56
<i>Surr: Toluene-d8</i>		102		82-127	%REC	1	25-Jan-2019 21:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FB05-20190115  
 Collection Date: 15-Jan-2019 17:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-21  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 18-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	05-Feb-2019 22:25
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	05-Feb-2019 22:25
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	05-Feb-2019 22:25
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	05-Feb-2019 22:25
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	05-Feb-2019 22:25
<b>2-Methylnaphthalene</b>	<b>0.000046</b>	<b>J</b>	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>05-Feb-2019 22:25</b>
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	05-Feb-2019 22:25
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	05-Feb-2019 22:25
Acenaphthene	U		0.000027	0.00010	mg/L	1	05-Feb-2019 22:25
Acenaphthylene	U		0.000015	0.00010	mg/L	1	05-Feb-2019 22:25
Anthracene	U		0.000014	0.00010	mg/L	1	05-Feb-2019 22:25
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	05-Feb-2019 22:25
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	05-Feb-2019 22:25
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	05-Feb-2019 22:25
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000057</b>	<b>J</b>	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>05-Feb-2019 22:25</b>
Chrysene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 22:25
Dibenzofuran	U		0.000020	0.00010	mg/L	1	05-Feb-2019 22:25
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	05-Feb-2019 22:25
Fluoranthene	U		0.000010	0.00010	mg/L	1	05-Feb-2019 22:25
Fluorene	U		0.000030	0.00010	mg/L	1	05-Feb-2019 22:25
<b>Naphthalene</b>	<b>0.00056</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>05-Feb-2019 22:25</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	05-Feb-2019 22:25
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	05-Feb-2019 22:25
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	05-Feb-2019 22:25
Phenanthrene	U		0.000021	0.00010	mg/L	1	05-Feb-2019 22:25
Phenol	U		0.000035	0.00020	mg/L	1	05-Feb-2019 22:25
Pyrene	U		0.000019	0.00010	mg/L	1	05-Feb-2019 22:25
<i>Surr: 2,4,6-Tribromophenol</i>	<i>47.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.2</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<i>Surr: 2-Fluorophenol</i>	<i>44.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>61.3</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<i>Surr: Nitrobenzene-d5</i>	<i>47.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<i>Surr: Phenol-d6</i>	<i>53.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>05-Feb-2019 22:25</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 23-Jan-2019		Analyst: JCJ	
Arsenic	U		0.000400	0.00200	mg/L	1	25-Jan-2019 17:48
Lead	U		0.000600	0.00200	mg/L	1	25-Jan-2019 17:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB04-20190115  
 Collection Date: 15-Jan-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19010754  
 Lab ID:HS19010754-22  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:20
Benzene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:20
Chlorobenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:20
Ethylbenzene	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:20
Methylene chloride	U		0.0010	0.0020	mg/L	1	25-Jan-2019 22:20
Toluene	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:20
Vinyl chloride	U		0.00020	0.0010	mg/L	1	25-Jan-2019 22:20
Xylenes, Total	U		0.00030	0.0010	mg/L	1	25-Jan-2019 22:20
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 22:20</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.7</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 22:20</i>
<i>Surr: Dibromofluoromethane</i>	<i>95.5</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 22:20</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2019 22:20</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**Batch ID:** 136788      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010754-01	1	1000	1 (mL)	0.001
HS19010754-02	1	1000	1 (mL)	0.001

**Batch ID:** 136815      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010754-03	1	1000	1 (mL)	0.001
HS19010754-04	1	1000	1 (mL)	0.001
HS19010754-05	1	1000	1 (mL)	0.001
HS19010754-06	1	1000	1 (mL)	0.001
HS19010754-07	1	990	1 (mL)	0.00101
HS19010754-08	1	1000	1 (mL)	0.001
HS19010754-09	1	1000	1 (mL)	0.001
HS19010754-10	1	1000	1 (mL)	0.001
HS19010754-11	1	1000	1 (mL)	0.001
HS19010754-12	1	990	1 (mL)	0.00101
HS19010754-13	1	1000	1 (mL)	0.001
HS19010754-14	1	1000	1 (mL)	0.001
HS19010754-15	1	1000	1 (mL)	0.001
HS19010754-16	1	1000	1 (mL)	0.001
HS19010754-17	1	1000	1 (mL)	0.001
HS19010754-18	1	1000	1 (mL)	0.001
HS19010754-19	1	1000	1 (mL)	0.001
HS19010754-20	1	1000	1 (mL)	0.001
HS19010754-21	1	1000	1 (mL)	0.001

**Batch ID:** 136946      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010754-01	1	10	10 (mL)	1

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**Batch ID:** 136947      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19010754-02	1	10	10 (mL)	1
HS19010754-03	1	10	10 (mL)	1
HS19010754-04	1	10	10 (mL)	1
HS19010754-05	1	10	10 (mL)	1
HS19010754-06	1	10	10 (mL)	1
HS19010754-07	1	10	10 (mL)	1
HS19010754-08	1	10	10 (mL)	1
HS19010754-09	1	10	10 (mL)	1
HS19010754-10	1	10	10 (mL)	1
HS19010754-11	1	10	10 (mL)	1
HS19010754-12	1	10	10 (mL)	1
HS19010754-13	1	10	10 (mL)	1
HS19010754-14	1	10	10 (mL)	1
HS19010754-15	1	10	10 (mL)	1
HS19010754-16	1	10	10 (mL)	1
HS19010754-17	1	10	10 (mL)	1
HS19010754-18	1	10	10 (mL)	1
HS19010754-19	1	10	10 (mL)	1
HS19010754-20	1	10	10 (mL)	1
HS19010754-21	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 136788		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Groundwater		
HS19010754-01	WG-1620-MW53C-20190114	14 Jan 2019 12:05		18 Jan 2019 10:59	01 Feb 2019 10:32	1
HS19010754-02	WG-1620-MW54C-20190114	14 Jan 2019 13:00		18 Jan 2019 10:59	01 Feb 2019 17:10	10
HS19010754-02	WG-1620-MW54C-20190114	14 Jan 2019 13:00		18 Jan 2019 10:59	01 Feb 2019 10:52	1
<b>Batch ID</b> 136815		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Water		
HS19010754-08	WG-1620-FB04-20190114	14 Jan 2019 18:00		18 Jan 2019 17:15	01 Feb 2019 17:50	1
HS19010754-21	WG-1620-FB05-20190115	15 Jan 2019 17:15		18 Jan 2019 17:15	05 Feb 2019 22:25	1
<b>Batch ID</b> 136815		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Groundwater		
HS19010754-03	WG-1620-MW36B-20190114	14 Jan 2019 14:05		18 Jan 2019 17:15	01 Feb 2019 11:11	1
HS19010754-04	WG-1620-MW36A-20190114	14 Jan 2019 14:55		18 Jan 2019 17:15	01 Feb 2019 11:31	1
HS19010754-05	WG-1620-MW28A-20190114	14 Jan 2019 15:50		18 Jan 2019 17:15	01 Feb 2019 11:51	1
HS19010754-06	WG-1620-MW28C-20190114	14 Jan 2019 16:35		18 Jan 2019 17:15	01 Feb 2019 12:10	1
HS19010754-07	WG-1620-MW63B-20190114	14 Jan 2019 17:40		18 Jan 2019 17:15	12 Feb 2019 19:12	1000
HS19010754-07	WG-1620-MW63B-20190114	14 Jan 2019 17:40		18 Jan 2019 17:15	07 Feb 2019 12:16	10
HS19010754-09	WG-1620-MW26A-20190115	15 Jan 2019 07:40		18 Jan 2019 17:15	07 Feb 2019 13:15	10
HS19010754-09	WG-1620-MW26A-20190115	15 Jan 2019 07:40		18 Jan 2019 17:15	01 Feb 2019 18:09	1
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55		18 Jan 2019 17:15	07 Feb 2019 17:31	1000
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55		18 Jan 2019 17:15	07 Feb 2019 13:55	100
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55		18 Jan 2019 17:15	07 Feb 2019 13:35	10
HS19010754-11	WG-1620-FD03-20190115	15 Jan 2019 08:55		18 Jan 2019 17:15	07 Feb 2019 17:51	1000
HS19010754-11	WG-1620-FD03-20190115	15 Jan 2019 08:55		18 Jan 2019 17:15	07 Feb 2019 14:34	10
HS19010754-12	WG-1620-MW68C-20190115	15 Jan 2019 09:45		18 Jan 2019 17:15	01 Feb 2019 19:09	1
HS19010754-13	WG-1620-MW83B-20190115	15 Jan 2019 10:40		18 Jan 2019 17:15	12 Feb 2019 19:32	1000
HS19010754-13	WG-1620-MW83B-20190115	15 Jan 2019 10:40		18 Jan 2019 17:15	07 Feb 2019 15:53	10
HS19010754-13	WG-1620-MW83B-20190115	15 Jan 2019 10:40		18 Jan 2019 17:15	01 Feb 2019 19:28	1
HS19010754-14	WG-1620-MW83C-20190115	15 Jan 2019 11:15		18 Jan 2019 17:15	13 Feb 2019 18:35	1
HS19010754-15	WG-1620-MW35A-20190115	15 Jan 2019 12:45		18 Jan 2019 17:15	13 Feb 2019 19:15	100
HS19010754-15	WG-1620-MW35A-20190115	15 Jan 2019 12:45		18 Jan 2019 17:15	13 Feb 2019 18:55	10
HS19010754-15	WG-1620-MW35A-20190115	15 Jan 2019 12:45		18 Jan 2019 17:15	01 Feb 2019 20:08	1
HS19010754-16	WG-1620-MW35B-20190115	15 Jan 2019 13:25		18 Jan 2019 17:15	12 Feb 2019 21:10	10
HS19010754-16	WG-1620-MW35B-20190115	15 Jan 2019 13:25		18 Jan 2019 17:15	12 Feb 2019 20:50	1
HS19010754-17	WG-1620-MW25A-20190115	15 Jan 2019 14:25		18 Jan 2019 17:15	01 Feb 2019 20:47	1
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10		18 Jan 2019 17:15	12 Feb 2019 22:09	100
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10		18 Jan 2019 17:15	12 Feb 2019 22:29	1000
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10		18 Jan 2019 17:15	12 Feb 2019 21:50	10
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10		18 Jan 2019 17:15	01 Feb 2019 21:07	1
HS19010754-19	WG-1620-MW34CR-20190115	15 Jan 2019 15:55		18 Jan 2019 17:15	05 Feb 2019 21:45	1
HS19010754-20	WG-1620-MW71B-20190115	15 Jan 2019 16:50		18 Jan 2019 17:15	05 Feb 2019 22:05	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 136946		<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Groundwater		
HS19010754-01	WG-1620-MW53C-20190114	14 Jan 2019 12:05		23 Jan 2019 10:00	24 Jan 2019 01:29	1
<b>Batch ID</b> 136947		<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Water		
HS19010754-08	WG-1620-FB04-20190114	14 Jan 2019 18:00		23 Jan 2019 10:00	25 Jan 2019 16:57	1
HS19010754-21	WG-1620-FB05-20190115	15 Jan 2019 17:15		23 Jan 2019 10:00	25 Jan 2019 17:48	1
<b>Batch ID</b> 136947		<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Groundwater		
HS19010754-02	WG-1620-MW54C-20190114	14 Jan 2019 13:00		23 Jan 2019 10:00	25 Jan 2019 16:23	1
HS19010754-03	WG-1620-MW36B-20190114	14 Jan 2019 14:05		23 Jan 2019 10:00	25 Jan 2019 16:25	1
HS19010754-04	WG-1620-MW36A-20190114	14 Jan 2019 14:55		23 Jan 2019 10:00	25 Jan 2019 16:27	1
HS19010754-05	WG-1620-MW28A-20190114	14 Jan 2019 15:50		23 Jan 2019 10:00	25 Jan 2019 16:29	1
HS19010754-06	WG-1620-MW28C-20190114	14 Jan 2019 16:35		23 Jan 2019 10:00	25 Jan 2019 16:32	1
HS19010754-07	WG-1620-MW63B-20190114	14 Jan 2019 17:40		23 Jan 2019 10:00	25 Jan 2019 16:55	1
HS19010754-09	WG-1620-MW26A-20190115	15 Jan 2019 07:40		23 Jan 2019 10:00	25 Jan 2019 17:00	1
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55		23 Jan 2019 10:00	25 Jan 2019 17:02	1
HS19010754-11	WG-1620-FD03-20190115	15 Jan 2019 08:55		23 Jan 2019 10:00	25 Jan 2019 17:04	1
HS19010754-12	WG-1620-MW68C-20190115	15 Jan 2019 09:45		23 Jan 2019 10:00	25 Jan 2019 17:06	1
HS19010754-13	WG-1620-MW83B-20190115	15 Jan 2019 10:40		23 Jan 2019 10:00	25 Jan 2019 17:09	1
HS19010754-14	WG-1620-MW83C-20190115	15 Jan 2019 11:15		23 Jan 2019 10:00	25 Jan 2019 17:11	1
HS19010754-15	WG-1620-MW35A-20190115	15 Jan 2019 12:45		23 Jan 2019 10:00	25 Jan 2019 17:13	1
HS19010754-16	WG-1620-MW35B-20190115	15 Jan 2019 13:25		23 Jan 2019 10:00	25 Jan 2019 17:37	1
HS19010754-17	WG-1620-MW25A-20190115	15 Jan 2019 14:25		23 Jan 2019 10:00	25 Jan 2019 17:39	1
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10		23 Jan 2019 10:00	25 Jan 2019 17:41	1
HS19010754-19	WG-1620-MW34CR-20190115	15 Jan 2019 15:55		23 Jan 2019 10:00	25 Jan 2019 17:44	1
HS19010754-20	WG-1620-MW71B-20190115	15 Jan 2019 16:50		23 Jan 2019 10:00	25 Jan 2019 17:46	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID R331619 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19010754-01	WG-1620-MW53C-20190114	14 Jan 2019 12:05			24 Jan 2019 02:27	1
HS19010754-02	WG-1620-MW54C-20190114	14 Jan 2019 13:00			24 Jan 2019 02:52	1
HS19010754-03	WG-1620-MW36B-20190114	14 Jan 2019 14:05			24 Jan 2019 03:16	1
HS19010754-05	WG-1620-MW28A-20190114	14 Jan 2019 15:50			24 Jan 2019 08:55	1
HS19010754-06	WG-1620-MW28C-20190114	14 Jan 2019 16:35			24 Jan 2019 00:51	1
HS19010754-07	WG-1620-MW63B-20190114	14 Jan 2019 17:40			24 Jan 2019 03:40	1
HS19010754-09	WG-1620-MW26A-20190115	15 Jan 2019 07:40			24 Jan 2019 04:04	1
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55			24 Jan 2019 04:28	1
HS19010754-11	WG-1620-FD03-20190115	15 Jan 2019 08:55			24 Jan 2019 04:52	1
HS19010754-12	WG-1620-MW68C-20190115	15 Jan 2019 09:45			24 Jan 2019 05:16	1
HS19010754-13	WG-1620-MW83B-20190115	15 Jan 2019 10:40			24 Jan 2019 05:40	1
HS19010754-14	WG-1620-MW83C-20190115	15 Jan 2019 11:15			24 Jan 2019 06:04	1
HS19010754-17	WG-1620-MW25A-20190115	15 Jan 2019 14:25			24 Jan 2019 06:28	1
HS19010754-18	WG-1620-MW25C-20190115	15 Jan 2019 15:10			24 Jan 2019 06:52	1
<b>Batch ID R331648 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water</b>						
HS19010754-08	WG-1620-FB04-20190114	14 Jan 2019 18:00			24 Jan 2019 18:26	1
<b>Batch ID R331734 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19010754-07	WG-1620-MW63B-20190114	14 Jan 2019 17:40			25 Jan 2019 06:35	10
HS19010754-09	WG-1620-MW26A-20190115	15 Jan 2019 07:40			25 Jan 2019 01:38	1
HS19010754-10	WG-1620-MW68B-20190115	15 Jan 2019 08:55			25 Jan 2019 07:01	50
HS19010754-11	WG-1620-FD03-20190115	15 Jan 2019 08:55			25 Jan 2019 07:28	50
HS19010754-12	WG-1620-MW68C-20190115	15 Jan 2019 09:45			25 Jan 2019 02:02	1
<b>Batch ID R331781 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water</b>						
HS19010754-21	WG-1620-FB05-20190115	15 Jan 2019 17:15			25 Jan 2019 21:56	1
HS19010754-22	WQ-1620-TB04-20190115	15 Jan 2019 00:00			25 Jan 2019 22:20	1
<b>Batch ID R331781 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19010754-04	WG-1620-MW36A-20190114	14 Jan 2019 14:55			25 Jan 2019 16:19	1
HS19010754-15	WG-1620-MW35A-20190115	15 Jan 2019 12:45			25 Jan 2019 15:31	1
HS19010754-16	WG-1620-MW35B-20190115	15 Jan 2019 13:25			25 Jan 2019 15:55	1
HS19010754-19	WG-1620-MW34CR-20190115	15 Jan 2019 15:55			25 Jan 2019 22:44	1
HS19010754-20	WG-1620-MW71B-20190115	15 Jan 2019 16:50			25 Jan 2019 23:08	1



WorkOrder: HS19010754  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200

WorkOrder: HS19010754  
 InstrumentID: ICPMS04  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200

WorkOrder: HS19010754  
 InstrumentID: SV-6  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000070	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000041	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000052	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000052	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000061	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000056	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000022	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00020	0.00019	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000066	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000072	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000074	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000074	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000066	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000069	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000083	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000082	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000060	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000080	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000074	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000073	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000065	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000083	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000068	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.00016	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000066	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000074	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19010754  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00054	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

WorkOrder: HS19010754  
 InstrumentID: VOA6  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00072	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00062	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00062	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00061	0.00030	0.0010
A	Methylene chloride	75-09-2	0.0010	0.0011	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00060	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00059	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.0019	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID:</b> 136946	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-136946</b>	Units: <b>mg/L</b>	Analysis Date: <b>24-Jan-2019 01:01</b>							
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922672</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-136946</b>	Units: <b>mg/L</b>	Analysis Date: <b>24-Jan-2019 01:04</b>							
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922673</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.0499	0.00200	0.05	0	99.8	80 - 120				
Lead	0.0543	0.00200	0.05	0	109	80 - 120				

<b>MS</b>	Sample ID: <b>HS19010878-02MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>24-Jan-2019 01:10</b>							
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922676</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05	0.00200	0.05	0.000564	98.9	80 - 120				
Lead	0.04998	0.00200	0.05	0.000015	99.9	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19010878-02MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>24-Jan-2019 01:13</b>							
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922677</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.04906	0.00200	0.05	0.000564	97.0	80 - 120	0.05	1.9	20	
Lead	0.05394	0.00200	0.05	0.000015	108	80 - 120	0.04998	7.63	20	

<b>PDS</b>	Sample ID: <b>HS19010878-02PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>24-Jan-2019 01:15</b>							
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922678</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.0983	0.00200	0.1	0.000564	97.7	75 - 125				
Lead	0.1026	0.00200	0.1	0	103	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID: 136946</b>		<b>Instrument: ICPMS05</b>		<b>Method: SW6020</b>					
<b>SD</b>	Sample ID: <b>HS19010878-02SD</b>	Units: <b>mg/L</b>		Analysis Date: <b>24-Jan-2019 01:08</b>					
Client ID:	Run ID: <b>ICPMS05_331608</b>	SeqNo: <b>4922675</b>	PrepDate: <b>23-Jan-2019</b>	DF: <b>5</b>					
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit Qual

Arsenic	U	0.0100					0.000564	0	10
Lead	U	0.0100					0.000015	0	10

The following samples were analyzed in this batch: HS19010754-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID:</b> 136947	<b>Instrument:</b> ICPMS04	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-136947</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 15:25</b>							
Client ID:	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4925482</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-136947</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 15:28</b>							
Client ID:	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4925483</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05406	0.00200	0.05	0	108	80 - 120				
Lead	0.05565	0.00200	0.05	0	111	80 - 120				

<b>MS</b>	Sample ID: <b>HS19010754-06MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 16:36</b>							
Client ID: <b>WG-1620-MW28C-20190114</b>	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4926026</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05541	0.00200	0.05	0.000447	110	80 - 120				
Lead	0.05412	0.00200	0.05	0.000416	107	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19010754-06MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 16:38</b>							
Client ID: <b>WG-1620-MW28C-20190114</b>	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4926027</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05782	0.00200	0.05	0.000447	115	80 - 120	0.05541	4.25	20	
Lead	0.05466	0.00200	0.05	0.000416	108	80 - 120	0.05412	0.998	20	

<b>PDS</b>	Sample ID: <b>HS19010754-06PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 16:41</b>							
Client ID: <b>WG-1620-MW28C-20190114</b>	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4926028</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.1044	0.00200	0.1	0.000447	104	75 - 125				
Lead	0.1058	0.00200	0.1	0.000416	105	75 - 125				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID:</b> 136947	<b>Instrument:</b> ICPMS04	<b>Method:</b> SW6020
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<b>SD</b>	Sample ID: <b>HS19010754-06SD</b>	Units: <b>mg/L</b>	Analysis Date: <b>25-Jan-2019 16:34</b>							
Client ID: <b>WG-1620-MW28C-20190114</b>	Run ID: <b>ICPMS04_331709</b>	SeqNo: <b>4926025</b>	PrepDate: <b>23-Jan-2019</b> DF: <b>5</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual

Arsenic	U	0.0100					0.000447	0	10
Lead	U	0.0100					0.000416	0	10

**The following samples were analyzed in this batch:**

HS19010754-02	HS19010754-03	HS19010754-04	HS19010754-05
HS19010754-06	HS19010754-07	HS19010754-08	HS19010754-09
HS19010754-10	HS19010754-11	HS19010754-12	HS19010754-13
HS19010754-14	HS19010754-15	HS19010754-16	HS19010754-17
HS19010754-18	HS19010754-19	HS19010754-20	HS19010754-21

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136788		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-136788	Units: ug/L			Analysis Date: 21-Jan-2019 13:59					
Client ID:	Run ID: SV-7_331418	SeqNo: 4917420	PrepDate: 18-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.898</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>58.0</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.603</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>72.1</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.68</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>73.6</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.745</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>74.9</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.674</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>73.5</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.986</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>79.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136788		Instrument: SV-7			Method: SW8270					
LCS	Sample ID: LCS-136788	Units: ug/L			Analysis Date: 21-Jan-2019 11:49					
Client ID:	Run ID: SV-7_331418	SeqNo: 4917414		PrepDate: 18-Jan-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.422	0.20	5	0	68.4	39 - 127				
2,4-Dimethylphenol	2.686	0.20	5	0	53.7	35 - 120				
2,4-Dinitrotoluene	2.839	0.20	5	0	56.8	50 - 122				
2,6-Dinitrotoluene	2.657	0.20	5	0	53.1	50 - 120				
2-Chloronaphthalene	2.793	0.20	5	0	55.9	50 - 120				
2-Methylnaphthalene	2.701	0.10	5	0	54.0	50 - 120				
4,6-Dinitro-2-methylphenol	3.216	0.20	5	0	64.3	25 - 121				
4-Nitrophenol	2.876	1.0	5	0	57.5	30 - 130				
Acenaphthene	2.551	0.10	5	0	51.0	45 - 120				
Acenaphthylene	2.798	0.10	5	0	56.0	47 - 120				
Anthracene	2.879	0.10	5	0	57.6	45 - 120				
Benz(a)anthracene	3.118	0.10	5	0	62.4	40 - 120				
Benzo(a)pyrene	3.157	0.10	5	0	63.1	45 - 120				
Bis(2-chloroethoxy)methane	2.899	0.20	5	0	58.0	45 - 120				
Bis(2-ethylhexyl)phthalate	3.648	0.20	5	0	73.0	40 - 139				
Chrysene	3.084	0.10	5	0	61.7	43 - 120				
Dibenzofuran	2.76	0.10	5	0	55.2	50 - 120				
Di-n-butyl phthalate	3.227	0.20	5	0	64.5	45 - 123				
Fluoranthene	2.789	0.10	5	0	55.8	45 - 125				
Fluorene	2.693	0.10	5	0	53.9	49 - 120				
Naphthalene	2.829	0.10	5	0	56.6	45 - 120				
Nitrobenzene	3.005	0.20	5	0	60.1	44 - 120				
N-Nitrosodiphenylamine	2.991	0.20	5	0	59.8	40 - 125				
Pentachlorophenol	2.717	0.20	5	0	54.3	19 - 121				
Phenanthrene	2.842	0.10	5	0	56.8	45 - 121				
Phenol	2.879	0.20	5	0	57.6	20 - 124				
Pyrene	3.207	0.10	5	0	64.1	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.456</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>49.1</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.838</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>56.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.861</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.2</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.232</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.6</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.985</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>59.7</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.079</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.6</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136788		Instrument: SV-7		Method: SW8270						
LCSD		Sample ID: LCSD-136788		Units: ug/L		Analysis Date: 21-Jan-2019 12:41				
Client ID:		Run ID: SV-7_331418		SeqNo: 4917415		PrepDate: 18-Jan-2019		DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.353	0.20	5	0	67.1	39 - 127	3.422	2.01	20	
2,4-Dimethylphenol	2.758	0.20	5	0	55.2	35 - 120	2.686	2.63	20	
2,4-Dinitrotoluene	2.779	0.20	5	0	55.6	50 - 122	2.839	2.15	20	
2,6-Dinitrotoluene	2.714	0.20	5	0	54.3	50 - 120	2.657	2.11	20	
2-Chloronaphthalene	2.886	0.20	5	0	57.7	50 - 120	2.793	3.26	20	
2-Methylnaphthalene	2.737	0.10	5	0	54.7	50 - 120	2.701	1.33	20	
4,6-Dinitro-2-methylphenol	3.149	0.20	5	0	63.0	25 - 121	3.216	2.11	30	
4-Nitrophenol	2.947	1.0	5	0	58.9	30 - 130	2.876	2.45	20	
Acenaphthene	2.725	0.10	5	0	54.5	45 - 120	2.551	6.59	20	
Acenaphthylene	2.872	0.10	5	0	57.4	47 - 120	2.798	2.61	20	
Anthracene	2.867	0.10	5	0	57.3	45 - 120	2.879	0.413	20	
Benz(a)anthracene	3.041	0.10	5	0	60.8	40 - 120	3.118	2.51	20	
Benzo(a)pyrene	3.1	0.10	5	0	62.0	45 - 120	3.157	1.81	20	
Bis(2-chloroethoxy)methane	2.974	0.20	5	0	59.5	45 - 120	2.899	2.56	20	
Bis(2-ethylhexyl)phthalate	3.5	0.20	5	0	70.0	40 - 139	3.648	4.15	20	
Chrysene	3.064	0.10	5	0	61.3	43 - 120	3.084	0.64	20	
Dibenzofuran	2.795	0.10	5	0	55.9	50 - 120	2.76	1.25	20	
Di-n-butyl phthalate	3.2	0.20	5	0	64.0	45 - 123	3.227	0.834	20	
Fluoranthene	2.846	0.10	5	0	56.9	45 - 125	2.789	2.04	20	
Fluorene	2.746	0.10	5	0	54.9	49 - 120	2.693	1.97	20	
Naphthalene	2.877	0.10	5	0	57.5	45 - 120	2.829	1.68	20	
Nitrobenzene	3.082	0.20	5	0	61.6	44 - 120	3.005	2.52	20	
N-Nitrosodiphenylamine	2.98	0.20	5	0	59.6	40 - 125	2.991	0.372	20	
Pentachlorophenol	2.655	0.20	5	0	53.1	19 - 121	2.717	2.32	20	
Phenanthrene	2.915	0.10	5	0	58.3	45 - 121	2.842	2.52	20	
Phenol	2.994	0.20	5	0	59.9	20 - 124	2.879	3.92	20	
Pyrene	3.256	0.10	5	0	65.1	40 - 130	3.207	1.52	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.462</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>49.2</i>	<i>34 - 129</i>	<i>2.456</i>	<i>0.244</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.963</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>59.3</i>	<i>40 - 125</i>	<i>2.838</i>	<i>4.3</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>2.957</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>59.1</i>	<i>20 - 120</i>	<i>2.861</i>	<i>3.29</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.116</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.3</i>	<i>40 - 135</i>	<i>3.232</i>	<i>3.66</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>3.007</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>60.1</i>	<i>41 - 120</i>	<i>2.985</i>	<i>0.741</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.234</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.7</i>	<i>20 - 120</i>	<i>3.079</i>	<i>4.93</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010754-01      HS19010754-02

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136815		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-136815	Units: ug/L			Analysis Date: 30-Jan-2019 11:05					
Client ID:	Run ID: SV-6_331994	SeqNo: 4931051	PrepDate: 18-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	3.22	0.20	5	0	64.4	34 - 129				
<i>Surr: 2-Fluorobiphenyl</i>	3.703	0.20	5	0	74.1	40 - 125				
<i>Surr: 2-Fluorophenol</i>	3.586	0.20	5	0	71.7	20 - 120				
<i>Surr: 4-Terphenyl-d14</i>	4.062	0.20	5	0	81.2	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.583	0.20	5	0	71.7	41 - 120				
<i>Surr: Phenol-d6</i>	3.349	0.20	5	0	67.0	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136815		Instrument: SV-6			Method: SW8270					
LCS	Sample ID: LCS-136815	Units: ug/L			Analysis Date: 30-Jan-2019 11:24					
Client ID:	Run ID: SV-6_331994	SeqNo: 4931052			PrepDate: 18-Jan-2019		DF: 1			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	4.837	0.20	5	0	96.7	39 - 127				
2,4-Dimethylphenol	3.101	0.20	5	0	62.0	35 - 120				
2,4-Dinitrotoluene	3.397	0.20	5	0	67.9	50 - 122				
2,6-Dinitrotoluene	4.023	0.20	5	0	80.5	50 - 120				
2-Chloronaphthalene	3.701	0.20	5	0	74.0	50 - 120				
2-Methylnaphthalene	3.519	0.10	5	0	70.4	50 - 120				
4,6-Dinitro-2-methylphenol	3.778	0.20	5	0	75.6	25 - 121				
4-Nitrophenol	2.95	1.0	5	0	59.0	30 - 130				
Acenaphthene	3.491	0.10	5	0	69.8	45 - 120				
Acenaphthylene	3.708	0.10	5	0	74.2	47 - 120				
Anthracene	3.768	0.10	5	0	75.4	45 - 120				
Benz(a)anthracene	3.679	0.10	5	0	73.6	40 - 120				
Benzo(a)pyrene	3.778	0.10	5	0	75.6	45 - 120				
Bis(2-chloroethoxy)methane	3.388	0.20	5	0	67.8	45 - 120				
Bis(2-ethylhexyl)phthalate	4.069	0.20	5	0	81.4	40 - 139				
Chrysene	3.955	0.10	5	0	79.1	43 - 120				
Dibenzofuran	3.507	0.10	5	0	70.1	50 - 120				
Di-n-butyl phthalate	4.152	0.20	5	0	83.0	45 - 123				
Fluoranthene	3.807	0.10	5	0	76.1	45 - 125				
Fluorene	3.702	0.10	5	0	74.0	49 - 120				
Naphthalene	3.478	0.10	5	0	69.6	45 - 120				
Nitrobenzene	3.524	0.20	5	0	70.5	44 - 120				
N-Nitrosodiphenylamine	4.584	0.20	5	0	91.7	40 - 125				
Pentachlorophenol	2.858	0.20	5	0	57.2	19 - 121				
Phenanthrene	3.787	0.10	5	0	75.7	45 - 121				
Phenol	3.567	0.20	5	0	71.3	20 - 124				
Pyrene	3.651	0.10	5	0	73.0	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.846</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.9</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.827</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.5</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.616</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>72.3</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>4.004</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>80.1</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.595</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>71.9</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.866</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.3</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136815		Instrument: SV-6			Method: SW8270					
LCSD		Sample ID: LCSD-136815			Units: ug/L		Analysis Date: 30-Jan-2019 14:22			
Client ID:		Run ID: SV-6_331994			SeqNo: 4931060		PrepDate: 18-Jan-2019		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	4.285	0.20	5	0	85.7	39 - 127	4.837	12.1	20	
2,4-Dimethylphenol	2.952	0.20	5	0	59.0	35 - 120	3.101	4.93	20	
2,4-Dinitrotoluene	3.637	0.20	5	0	72.7	50 - 122	3.397	6.84	20	
2,6-Dinitrotoluene	4.215	0.20	5	0	84.3	50 - 120	4.023	4.65	20	
2-Chloronaphthalene	4.015	0.20	5	0	80.3	50 - 120	3.701	8.14	20	
2-Methylnaphthalene	3.784	0.10	5	0	75.7	50 - 120	3.519	7.26	20	
4,6-Dinitro-2-methylphenol	3.274	0.20	5	0	65.5	25 - 121	3.778	14.3	30	
4-Nitrophenol	3.045	1.0	5	0	60.9	30 - 130	2.95	3.19	20	
Acenaphthene	3.393	0.10	5	0	67.9	45 - 120	3.491	2.85	20	
Acenaphthylene	3.708	0.10	5	0	74.2	47 - 120	3.708	0.00804	20	
Anthracene	3.652	0.10	5	0	73.0	45 - 120	3.768	3.13	20	
Benz(a)anthracene	3.663	0.10	5	0	73.3	40 - 120	3.679	0.438	20	
Benzo(a)pyrene	3.898	0.10	5	0	78.0	45 - 120	3.778	3.12	20	
Bis(2-chloroethoxy)methane	3.616	0.20	5	0	72.3	45 - 120	3.388	6.51	20	
Bis(2-ethylhexyl)phthalate	3.661	0.20	5	0	73.2	40 - 139	4.069	10.6	20	
Chrysene	3.713	0.10	5	0	74.3	43 - 120	3.955	6.31	20	
Dibenzofuran	3.452	0.10	5	0	69.0	50 - 120	3.507	1.58	20	
Di-n-butyl phthalate	4.284	0.20	5	0	85.7	45 - 123	4.152	3.11	20	
Fluoranthene	3.693	0.10	5	0	73.9	45 - 125	3.807	3.04	20	
Fluorene	3.657	0.10	5	0	73.1	49 - 120	3.702	1.22	20	
Naphthalene	3.434	0.10	5	0	68.7	45 - 120	3.478	1.28	20	
Nitrobenzene	3.443	0.20	5	0	68.9	44 - 120	3.524	2.32	20	
N-Nitrosodiphenylamine	4.024	0.20	5	0	80.5	40 - 125	4.584	13	20	
Pentachlorophenol	2.961	0.20	5	0	59.2	19 - 121	2.858	3.54	20	
Phenanthrene	3.894	0.10	5	0	77.9	45 - 121	3.787	2.79	20	
Phenol	3.701	0.20	5	0	74.0	20 - 124	3.567	3.7	20	
Pyrene	3.005	0.10	5	0	60.1	40 - 130	3.651	19.4	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.706</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>74.1</i>	<i>34 - 129</i>	<i>3.846</i>	<i>3.69</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.868</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.4</i>	<i>40 - 125</i>	<i>3.827</i>	<i>1.07</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>3.885</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.7</i>	<i>20 - 120</i>	<i>3.616</i>	<i>7.19</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.9</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>78.0</i>	<i>40 - 135</i>	<i>4.004</i>	<i>2.65</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>3.734</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>74.7</i>	<i>41 - 120</i>	<i>3.595</i>	<i>3.81</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.742</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>74.8</i>	<i>20 - 120</i>	<i>3.866</i>	<i>3.26</i>	<i>20</i>	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136815		Instrument: SV-6		Method: SW8270						
MS		Sample ID: HS19010754-06MS		Units: ug/L		Analysis Date: 01-Feb-2019 12:30				
Client ID: WG-1620-MW28C-20190114		Run ID: SV-6_332191		SeqNo: 4938709		PrepDate: 18-Jan-2019		DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,2-Diphenylhydrazine	2.994	0.20	5.051	0	59.3	39 - 127				
2,4-Dimethylphenol	2.278	0.20	5.051	0	45.1	35 - 120				
2,4-Dinitrotoluene	3.249	0.20	5.051	0	64.3	50 - 122				
2,6-Dinitrotoluene	2.871	0.20	5.051	0	56.8	50 - 120				
2-Chloronaphthalene	2.634	0.20	5.051	0	52.1	50 - 120				
2-Methylnaphthalene	2.688	0.10	5.051	0	53.2	50 - 120				
4,6-Dinitro-2-methylphenol	3.52	0.20	5.051	0	69.7	25 - 121				
4-Nitrophenol	3.364	1.0	5.051	0	66.6	30 - 130				
Acenaphthene	2.372	0.10	5.051	0	47.0	45 - 120				
Acenaphthylene	2.412	0.10	5.051	0	47.8	47 - 120				
Anthracene	3.258	0.10	5.051	0	64.5	45 - 120				
Benz(a)anthracene	3.55	0.10	5.051	0	70.3	40 - 120				
Benzo(a)pyrene	3.494	0.10	5.051	0	69.2	45 - 120				
Bis(2-chloroethoxy)methane	2.382	0.20	5.051	0	47.2	45 - 120				
Bis(2-ethylhexyl)phthalate	3.943	0.20	5.051	0	78.1	40 - 139				
Chrysene	3.958	0.10	5.051	0	78.4	43 - 120				
Dibenzofuran	2.783	0.10	5.051	0	55.1	50 - 120				
Di-n-butyl phthalate	4.075	0.20	5.051	0	80.7	45 - 123				
Fluoranthene	3.869	0.10	5.051	0	76.6	45 - 125				
Fluorene	2.744	0.10	5.051	0	54.3	49 - 120				
Naphthalene	2.483	0.10	5.051	0	49.2	45 - 120				
Nitrobenzene	2.696	0.20	5.051	0	53.4	44 - 120				
N-Nitrosodiphenylamine	3.297	0.20	5.051	0	65.3	40 - 125				
Pentachlorophenol	3.211	0.20	5.051	0	63.6	19 - 121				
Phenanthrene	3.012	0.10	5.051	0	59.6	45 - 121				
Phenol	2.727	0.20	5.051	0	54.0	20 - 124				
Pyrene	4.055	0.10	5.051	0	80.3	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.898</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>77.2</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.64</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>52.3</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.237</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>44.3</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>4.361</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>86.3</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.762</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>54.7</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>2.751</i>	<i>0.20</i>	<i>5.051</i>	<i>0</i>	<i>54.5</i>	<i>20 - 120</i>				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: 136815		Instrument: SV-6		Method: SW8270						
MSD	Sample ID: HS19010754-06MSD	Units: ug/L			Analysis Date: 05-Feb-2019 15:49					
Client ID: WG-1620-MW28C-20190114	Run ID: SV-6_332348	SeqNo: 4938706	PrepDate: 18-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	2.841	0.20	5	0	56.8	39 - 127	2.994	5.25	20	
2,4-Dimethylphenol	2.186	0.20	5	0	43.7	35 - 120	2.278	4.11	20	
2,4-Dinitrotoluene	3.158	0.20	5	0	63.2	50 - 122	3.249	2.84	20	
2,6-Dinitrotoluene	2.858	0.20	5	0	57.2	50 - 120	2.871	0.46	20	
2-Chloronaphthalene	2.593	0.20	5	0	51.9	50 - 120	2.634	1.55	20	
2-Methylnaphthalene	2.636	0.10	5	0	52.7	50 - 120	2.688	1.93	20	
4,6-Dinitro-2-methylphenol	4.017	0.20	5	0	80.3	25 - 121	3.52	13.2	30	
4-Nitrophenol	3.524	1.0	5	0	70.5	30 - 130	3.364	4.65	20	
Acenaphthene	2.365	0.10	5	0	47.3	45 - 120	2.372	0.294	20	
Acenaphthylene	2.505	0.10	5	0	50.1	47 - 120	2.412	3.81	20	
Anthracene	3.275	0.10	5	0	65.5	45 - 120	3.258	0.54	20	
Benz(a)anthracene	3.62	0.10	5	0	72.4	40 - 120	3.55	1.95	20	
Benzo(a)pyrene	3.842	0.10	5	0	76.8	45 - 120	3.494	9.49	20	
Bis(2-chloroethoxy)methane	2.366	0.20	5	0	47.3	45 - 120	2.382	0.685	20	
Bis(2-ethylhexyl)phthalate	3.648	0.20	5	0	73.0	40 - 139	3.943	7.78	20	
Chrysene	3.884	0.10	5	0	77.7	43 - 120	3.958	1.88	20	
Dibenzofuran	2.683	0.10	5	0	53.7	50 - 120	2.783	3.66	20	
Di-n-butyl phthalate	3.639	0.20	5	0	72.8	45 - 123	4.075	11.3	20	
Fluoranthene	3.725	0.10	5	0	74.5	45 - 125	3.869	3.79	20	
Fluorene	2.786	0.10	5	0	55.7	49 - 120	2.744	1.52	20	
Naphthalene	2.466	0.10	5	0	49.3	45 - 120	2.483	0.718	20	
Nitrobenzene	2.369	0.20	5	0	47.4	44 - 120	2.696	12.9	20	
N-Nitrosodiphenylamine	3.226	0.20	5	0	64.5	40 - 125	3.297	2.17	20	
Pentachlorophenol	3.832	0.20	5	0	76.6	19 - 121	3.211	17.6	20	
Phenanthrene	3.289	0.10	5	0	65.8	45 - 121	3.012	8.78	20	
Phenol	2.657	0.20	5	0	53.1	20 - 124	2.727	2.59	20	
Pyrene	3.66	0.10	5	0	73.2	40 - 130	4.055	10.3	20	
Surr: 2,4,6-Tribromophenol	4.006	0.20	5	0	80.1	34 - 129	3.898	2.75	20	
Surr: 2-Fluorobiphenyl	2.613	0.20	5	0	52.3	40 - 125	2.64	1.01	20	
Surr: 2-Fluorophenol	2.056	0.20	5	0	41.1	20 - 120	2.237	8.44	20	
Surr: 4-Terphenyl-d14	3.907	0.20	5	0	78.1	40 - 135	4.361	11	20	
Surr: Nitrobenzene-d5	2.43	0.20	5	0	48.6	41 - 120	2.762	12.8	20	
Surr: Phenol-d6	2.639	0.20	5	0	52.8	20 - 120	2.751	4.14	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID:</b> 136815	<b>Instrument:</b> SV-6	<b>Method:</b> SW8270
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The following samples were analyzed in this batch:

HS19010754-03	HS19010754-04	HS19010754-05	HS19010754-06
HS19010754-07	HS19010754-08	HS19010754-09	HS19010754-10
HS19010754-11	HS19010754-12	HS19010754-13	HS19010754-14
HS19010754-15	HS19010754-16	HS19010754-17	HS19010754-18
HS19010754-19	HS19010754-20	HS19010754-21	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID: R331619</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190123</b>	Units: <b>ug/L</b>			Analysis Date: <b>24-Jan-2019 00:03</b>				
Client ID:	Run ID: <b>VOA2_331619</b>	SeqNo: <b>4922571</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.14</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.3</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.3</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>51.98</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190123</b>	Units: <b>ug/L</b>			Analysis Date: <b>23-Jan-2019 23:15</b>				
Client ID:	Run ID: <b>VOA2_331619</b>	SeqNo: <b>4922570</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	17.47	1.0	20	0	87.4	70 - 124			
Benzene	20.89	1.0	20	0	104	74 - 120			
Chlorobenzene	20.18	1.0	20	0	101	76 - 113			
Ethylbenzene	20.1	1.0	20	0	101	77 - 117			
Methylene chloride	20.15	2.0	20	0	101	70 - 127			
Toluene	20.02	1.0	20	0	100	77 - 118			
Vinyl chloride	20.51	1.0	20	0	103	70 - 130			
Xylenes, Total	62.08	1.0	60	0	103	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.98</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.05</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.59</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

**Batch ID:** R331619      **Instrument:** VOA2      **Method:** SW8260

MS		Sample ID: HS19010754-06MS			Units: ug/L		Analysis Date: 24-Jan-2019 01:15			
Client ID: WG-1620-MW28C-20190114		Run ID: VOA2_331619			SeqNo: 4922574		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.02	1.0	20	0	80.1	70 - 127				
Benzene	19.74	1.0	20	0	98.7	70 - 127				
Chlorobenzene	18.76	1.0	20	0	93.8	70 - 114				
Ethylbenzene	19.43	1.0	20	0	97.2	70 - 124				
Methylene chloride	18.53	2.0	20	0	92.6	70 - 128				
Toluene	19.08	1.0	20	0	95.4	70 - 123				
Vinyl chloride	21.45	1.0	20	0	107	70 - 130				
Xylenes, Total	57.82	1.0	60	0	96.4	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.46</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.66</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>49.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100.0</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19010754-06MSD			Units: ug/L		Analysis Date: 24-Jan-2019 01:39			
Client ID: WG-1620-MW28C-20190114		Run ID: VOA2_331619			SeqNo: 4922575		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.91	1.0	20	0	79.5	70 - 127	16.02	0.718	20	
Benzene	19.41	1.0	20	0	97.0	70 - 127	19.74	1.69	20	
Chlorobenzene	19.03	1.0	20	0	95.2	70 - 114	18.76	1.43	20	
Ethylbenzene	19.54	1.0	20	0	97.7	70 - 124	19.43	0.541	20	
Methylene chloride	17.63	2.0	20	0	88.1	70 - 128	18.53	4.98	20	
Toluene	19.17	1.0	20	0	95.9	70 - 123	19.08	0.457	20	
Vinyl chloride	21.64	1.0	20	0	108	70 - 130	21.45	0.849	20	
Xylenes, Total	58.8	1.0	60	0	98.0	70 - 130	57.82	1.67	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.5</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.0</i>	<i>70 - 126</i>	<i>50.26</i>	<i>3.57</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.5</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>81 - 113</i>	<i>49.46</i>	<i>0.0812</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>50.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>	<i>50.66</i>	<i>0.129</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.55</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>49.99</i>	<i>1.11</i>	<i>20</i>	

The following samples were analyzed in this batch:

HS19010754-01	HS19010754-02	HS19010754-03	HS19010754-05
HS19010754-06	HS19010754-07	HS19010754-09	HS19010754-10
HS19010754-11	HS19010754-12	HS19010754-13	HS19010754-14
HS19010754-17	HS19010754-18		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID: R331648</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190124</b>	Units: <b>ug/L</b>			Analysis Date: <b>24-Jan-2019 11:58</b>				
Client ID:	Run ID: <b>VOA2_331648</b>	SeqNo: <b>4923362</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.7</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.8</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.17</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190124</b>	Units: <b>ug/L</b>			Analysis Date: <b>24-Jan-2019 11:10</b>				
Client ID:	Run ID: <b>VOA2_331648</b>	SeqNo: <b>4923361</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	15.83	1.0	20	0	79.2	70 - 124			
Benzene	19.38	1.0	20	0	96.9	74 - 120			
Chlorobenzene	18.86	1.0	20	0	94.3	76 - 113			
Ethylbenzene	18.9	1.0	20	0	94.5	77 - 117			
Methylene chloride	18.98	2.0	20	0	94.9	70 - 127			
Toluene	18.88	1.0	20	0	94.4	77 - 118			
Vinyl chloride	20.57	1.0	20	0	103	70 - 130			
Xylenes, Total	58.3	1.0	60	0	97.2	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.88</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.05</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.16</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

Batch ID: R331648		Instrument: VOA2		Method: SW8260						
<b>MS</b>	Sample ID: <b>HS19011106-02MS</b>	Units: ug/L			Analysis Date: <b>24-Jan-2019 14:49</b>					
Client ID:	Run ID: <b>VOA2_331648</b>	SeqNo: <b>4923703</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	13.36	1.0	20	0	66.8	70 - 127				S
Benzene	17.38	1.0	20	0	86.9	70 - 127				
Chlorobenzene	15.01	1.0	20	0	75.0	70 - 114				
Ethylbenzene	15.92	1.0	20	1.296	73.1	70 - 124				
Methylene chloride	13.61	2.0	20	0	68.1	70 - 128				S
Toluene	19.61	1.0	20	5.484	70.7	70 - 123				
Vinyl chloride	15.52	1.0	20	0	77.6	70 - 130				
Xylenes, Total	50.34	1.0	60	1.99	80.6	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.7</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.4</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.32</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.6</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.83</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

<b>MSD</b>	Sample ID: <b>HS19011106-02MSD</b>	Units: ug/L			Analysis Date: <b>24-Jan-2019 15:13</b>					
Client ID:	Run ID: <b>VOA2_331648</b>	SeqNo: <b>4923704</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.21	1.0	20	0	81.1	70 - 127	13.36	19.3	20	
Benzene	21.85	1.0	20	0	109	70 - 127	17.38	22.8	20	R
Chlorobenzene	18.97	1.0	20	0	94.9	70 - 114	15.01	23.4	20	R
Ethylbenzene	20.8	1.0	20	1.296	97.5	70 - 124	15.92	26.6	20	R
Methylene chloride	18.01	2.0	20	0	90.0	70 - 128	13.61	27.8	20	R
Toluene	24.39	1.0	20	5.484	94.5	70 - 123	19.61	21.7	20	R
Vinyl chloride	20.56	1.0	20	0	103	70 - 130	15.52	27.9	20	R
Xylenes, Total	65.84	1.0	60	1.99	106	70 - 130	50.34	26.7	20	R
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.3</i>	<i>70 - 126</i>	<i>49.7</i>	<i>4.24</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 113</i>	<i>49.32</i>	<i>1.57</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>77 - 123</i>	<i>49.83</i>	<i>0.107</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.45</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>50.35</i>	<i>0.194</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010754-08

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID:</b> R331734	<b>Instrument:</b> VOA2	<b>Method:</b> SW8260
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<b>MBLK</b>		Sample ID: <b>VBLKW-190124</b>		Units: <b>ug/L</b>		Analysis Date: <b>24-Jan-2019 23:38</b>			
Client ID:		Run ID: <b>VOA2_331734</b>		SeqNo: <b>4925366</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	U	1.0							
Ethylbenzene	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	46.42	1.0	50	0	92.8	70 - 123			
<i>Surr: 4-Bromofluorobenzene</i>	48.86	1.0	50	0	97.7	82 - 115			
<i>Surr: Dibromofluoromethane</i>	50.18	1.0	50	0	100	73 - 126			
<i>Surr: Toluene-d8</i>	51.6	1.0	50	0	103	81 - 120			

<b>LCS</b>		Sample ID: <b>VLCSW-190124</b>		Units: <b>ug/L</b>		Analysis Date: <b>24-Jan-2019 22:50</b>			
Client ID:		Run ID: <b>VOA2_331734</b>		SeqNo: <b>4925365</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	19.91	1.0	20	0	99.5	74 - 120			
Ethylbenzene	19.69	1.0	20	0	98.5	77 - 117			
Xylenes, Total	60.58	1.0	60	0	101	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	50.4	1.0	50	0	101	70 - 130			
<i>Surr: 4-Bromofluorobenzene</i>	50.41	1.0	50	0	101	82 - 115			
<i>Surr: Dibromofluoromethane</i>	51.11	1.0	50	0	102	73 - 126			
<i>Surr: Toluene-d8</i>	50.39	1.0	50	0	101	81 - 120			

<b>MS</b>		Sample ID: <b>HS19011017-01MS</b>		Units: <b>ug/L</b>		Analysis Date: <b>25-Jan-2019 00:50</b>			
Client ID:		Run ID: <b>VOA2_331734</b>		SeqNo: <b>4925369</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.79	1.0	20	0	94.0	70 - 127			
Ethylbenzene	23.67	1.0	20	6.039	88.2	70 - 124			
Xylenes, Total	55.74	1.0	60	0	92.9	70 - 130			
<i>Surr: 1,2-Dichloroethane-d4</i>	47.2	1.0	50	0	94.4	70 - 126			
<i>Surr: 4-Bromofluorobenzene</i>	50.18	1.0	50	0	100	81 - 113			
<i>Surr: Dibromofluoromethane</i>	50.51	1.0	50	0	101	77 - 123			
<i>Surr: Toluene-d8</i>	50.61	1.0	50	0	101	82 - 127			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

**Batch ID:** R331734      **Instrument:** VOA2      **Method:** SW8260

<b>MSD</b>		Sample ID: <b>HS19011017-01MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>25-Jan-2019 01:14</b>			
Client ID:		Run ID: <b>VOA2_331734</b>			SeqNo: <b>4925370</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.29	1.0	20	0	96.5	70 - 127	18.79	2.64	20	
Ethylbenzene	24.2	1.0	20	6.039	90.8	70 - 124	23.67	2.2	20	
Xylenes, Total	58.46	1.0	60	0	97.4	70 - 130	55.74	4.77	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>70 - 126</i>	<i>47.2</i>	<i>4.7</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.81</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>81 - 113</i>	<i>50.18</i>	<i>0.741</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.6</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>77 - 123</i>	<i>50.51</i>	<i>1.82</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.36</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>50.61</i>	<i>0.492</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010754-07    HS19010754-09    HS19010754-10    HS19010754-11  
 HS19010754-12



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

<b>Batch ID: R331781</b>		<b>Instrument: VOA6</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190125</b>	Units: <b>ug/L</b>			Analysis Date: <b>25-Jan-2019 14:19</b>				
Client ID:	Run ID: <b>VOA6_331781</b>	SeqNo: <b>4926447</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.76</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.5</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.76</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>47.9</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.8</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190125</b>	Units: <b>ug/L</b>			Analysis Date: <b>25-Jan-2019 13:31</b>				
Client ID:	Run ID: <b>VOA6_331781</b>	SeqNo: <b>4926446</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	18.9	1.0	20	0	94.5	70 - 124			
Benzene	18.62	1.0	20	0	93.1	74 - 120			
Chlorobenzene	18.52	1.0	20	0	92.6	76 - 113			
Ethylbenzene	17.98	1.0	20	0	89.9	77 - 117			
Methylene chloride	18.65	2.0	20	0	93.2	70 - 127			
Toluene	18.15	1.0	20	0	90.8	77 - 118			
Vinyl chloride	16.31	1.0	20	0	81.5	70 - 130			
Xylenes, Total	53.3	1.0	60	0	88.8	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.68</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.4</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.09</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.2</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>48.06</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.1</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.92</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QC BATCH REPORT**

**Batch ID:** R331781      **Instrument:** VOA6      **Method:** SW8260

MS		Sample ID: HS19010884-01MS			Units: ug/L		Analysis Date: 25-Jan-2019 17:07			
Client ID:		Run ID: VOA6_331781			SeqNo: 4926454		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	18.56	1.0	20	0	92.8	70 - 127				
Benzene	19.34	1.0	20	0	96.7	70 - 127				
Chlorobenzene	21.3	1.0	20	1.276	100	70 - 114				
Ethylbenzene	20.37	1.0	20	0	102	70 - 124				
Methylene chloride	18.53	2.0	20	0	92.6	70 - 128				
Toluene	20.08	1.0	20	0	100	70 - 123				
Vinyl chloride	16	1.0	20	0	80.0	70 - 130				
Xylenes, Total	60.74	1.0	60	0	101	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.29</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.6</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.58</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.7</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.4</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19010884-01MSD			Units: ug/L		Analysis Date: 25-Jan-2019 17:31			
Client ID:		Run ID: VOA6_331781			SeqNo: 4926455		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	18.64	1.0	20	0	93.2	70 - 127	18.56	0.448	20	
Benzene	18.97	1.0	20	0	94.8	70 - 127	19.34	1.93	20	
Chlorobenzene	19.99	1.0	20	1.276	93.6	70 - 114	21.3	6.34	20	
Ethylbenzene	19.15	1.0	20	0	95.7	70 - 124	20.37	6.16	20	
Methylene chloride	18.04	2.0	20	0	90.2	70 - 128	18.53	2.69	20	
Toluene	18.73	1.0	20	0	93.6	70 - 123	20.08	7	20	
Vinyl chloride	15.27	1.0	20	0	76.4	70 - 130	16	4.62	20	
Xylenes, Total	57.68	1.0	60	0	96.1	70 - 130	60.74	5.17	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.6</i>	<i>70 - 126</i>	<i>46.29</i>	<i>4.28</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.24</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 113</i>	<i>49.58</i>	<i>1.32</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.15</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.3</i>	<i>77 - 123</i>	<i>48.7</i>	<i>0.934</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.79</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>82 - 127</i>	<i>50.64</i>	<i>3.71</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19010754-04    HS19010754-15    HS19010754-16    HS19010754-19  
 HS19010754-20    HS19010754-21    HS19010754-22

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19010754

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

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**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19010754

**SAMPLE TRACKING**

---

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19010754-01	WG-1620-MW53C-20190114	Login	1/17/2019 8:47:30 AM	JRM	EXT138
HS19010754-01	WG-1620-MW53C-20190114	Login	1/17/2019 8:47:30 AM	JRM	MET057
HS19010754-01	WG-1620-MW53C-20190114	Login	1/17/2019 8:47:30 AM	JRM	VOA105

Sample Receipt Checklist

Client Name: PBW
Work Order: HS19010754

Date/Time Received: 17-Jan-2019 08:27
Received by: NDD

Checklist completed by: Jared R. Makan
eSignature
Date: 17-Jan-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 23-Jan-2019

Matrices: Water

Carrier name: Client

- Shipping container/cooler in good condition?
Custody seals intact on shipping container/cooler?
Custody seals intact on sample bottles?
VOA/TX1005/TX1006 Solids in hermetically sealed vials?
Chain of custody present?
Chain of custody signed when relinquished and received?
Samplers name present on COC?
Chain of custody agrees with sample labels?
Samples in proper container/bottle?
Sample containers intact?
Sufficient sample volume for indicated test?
All samples received within holding time?
Container/Temp Blank temperature in compliance?

- Yes/No checkboxes for each item, including 'Not Present' options.

3 Page(s)
COC IDs:194310, 194320, 194324

Temperature(s)/Thermometer(s): 1.1c/1.5c, 1.6c/2.0c, 1.3c/1.7c, 1.4c/1.8c, 1.0c/1.4, 0.9c/1.3 UC/C IR11

Cooler(s)/Kit(s): 4077, 42775, 43015, 42625, 24932, 44439

Date/Time sample(s) sent to storage: 01/17/2019 10:15

Water - VOA vials have zero headspace? Yes/No checkboxes and 'No VOA vials submitted' checkbox.

Water - pH acceptable upon receipt? Yes/No checkboxes and 'N/A' checkbox.

pH adjusted? Yes/No checkboxes and 'N/A' checkbox.

pH adjusted by: [Empty text box]

Login Notes: Sample collection time not listed on any vials for sample WG-1620-MW71B-20190115, logged in per COC.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments: [Empty text box]

Corrective Action: [Empty text box]



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# Chain of Custody Form

## HS19010754

Page 1 of 2

COC ID: 194310

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	ms/msd
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	F	
Phone	(512) 671-3434	Phone		G	
Fax	(512) 671-3446	Fax		H	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-T80-201801			Water	1	2											
2	WG-1620-MW53C-20190114	1-14-19	1205	W		6	X		X	X							
3	WG-1620-MW54C-20190114		1300	W		6	X		X	X							
4	WG-1620-MW36B-20190114		1405	W		6		X	X	X							
5	WG-1620-MW36A-20190114		1455	W		6		X	X	X							
6	WG-1620-MW28A-20190114		1550	W		6	X		X	X							
7	WG-1620-MW28C-20190114		1635	W		6	X		X	X	X						
8	WG-1620-MW63B-20190114		1740	W		6	X		X	X							
9	WG-1620-FB04-20190114		1800	W		6		X	X	X							
10	WG-1620-MW26A-20190115	1-15-19	0740	W		6	X		X	X							

Sampler(s) Please Print & Sign <b>JOHN BRAYTON</b>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box)				Results Due Date:	
Relinquished by: <b>John</b>		Date: 1-17-19	Time: 08:27	Received by:		<input checked="" type="checkbox"/> STD 10 Wk Days		<input type="checkbox"/> 5 Wk Days	
Relinquished by:		Date: 01/17/19	Time: 08:27	Received by (Laboratory): <b>Nelson</b>		<input type="checkbox"/> 2 Wk Days		<input type="checkbox"/> 24 Hour	
Logged by (Laboratory):		Date:	Time:	Checked by (Laboratory):		Notes: UPRR Houston MWPW			
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035		Cooler ID: 412775		Cooler Temp: 4.6		QC Package: (Check One Box Below)			
		Cooler ID: 43015		Cooler Temp: 1.3		<input type="checkbox"/> Level II Std QC			
		Cooler ID: 412625		Cooler Temp: 1.4		<input type="checkbox"/> Level III Std QC/Raw Data			
		Cooler ID: 24932		Cooler Temp: 1.0		<input type="checkbox"/> Level IV SWB16/CLP			
		Cooler ID: 416429		Cooler Temp: 0.9		<input checked="" type="checkbox"/> TTRP Checklist			
						<input type="checkbox"/> TTRP Level IV			

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
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# Chain of Custody Form

Page 2 of 3

COC ID: 194320

## HS19010754

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	
				F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TR0-201007	1-15-19		Water	1	2											
2	WG-1620-MW68B-20190115	<del>0855</del>	0855	W		6	X		X	X							
3	WG-1620-PD03-20190115		0855	W		6	X		X	X							
4	WG-1620-MW68C-20190115		0945	W		6	X		X	X							
5	WG-1620-MW83B-20190115		1040	W		6	X		X	X							
6	WG-1620-MW83C-20190115		1115	W		6	X		X	X							
7	WG-1620-MW35A-20190115		1245	W		6	X		X	X							
8	WG-1620-MW35B-20190115		1325	W		6	X		X	X							
9	WG-1620-MW25A-20190115		1425	W		6		X	X	X							
10	WG-1620-MW25C-20190115		1510	W		6		X	X	X							

Sampler(s) Please Print & Sign <i>John Beaton</i>	Shipment Method HAND DELIVERED	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STB 10 Wk Onys <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour	Results Due Date:
Relinquished by: <i>John Beaton</i>	Date: 1-17-19 Time: 08:27	Received by:	Notes: UPRR Houston MWPPW
Relinquished by: <i>John Beaton</i>	Date: 01/17/19 Time: 08:27	Received by (Laboratory): <i>NOISE</i>	QC Package: (Check One Box Below) <input type="checkbox"/> Level II Std QC <input checked="" type="checkbox"/> TRRP Checklist <input type="checkbox"/> Level III Std QC/RAW Data <input type="checkbox"/> TRRP Level IV <input type="checkbox"/> Level IV SW846/CLP
Logged by (Laboratory):	Date:	Checked by (Laboratory):	Cooler ID: 42775 Cooler Temp: 1.6 43015 1.3 42625 1.4 24932 1.0 44639 0.8

Preservative Key: 1-HCl 2-HNO<sub>3</sub> 3-H<sub>2</sub>SO<sub>4</sub> 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO<sub>4</sub> 7-Other 8-4°C 9-5035

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# Chain of Custody Form

Page 5 of 5

COC ID: 194324

## HS19010754

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Presarving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Malzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E	
	Suite 4004		Stop 0750	F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.malzner@pbwllc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	<del>WG-1620-TB0-20190115</del>			Water	1	2											
2	WG-1620-MW34CR-20190115	1-15-19	1555	W		6	X		X	X							
3	WG-1620-MW71B-20190115	↓	1650	W		6	X		X	X							
4	WG-1620-FB05-20190115	↓	1715	W		6		X	X	X							
5	WG-1620-TB04-20190115			W		2	X										
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>John Peterson</i>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:			
Relinquished by: <i>John Peterson</i>	Date: 1-17-19	Time: 08:27	Received by:	Notes: UPRR Houston MWPW							
Relinquished by: <i>John Peterson</i>	Date: 01/17/19	Time: 08:27	Received by (Laboratory): <i>Nelson</i>	Cooler ID		Cooler Temp.		QC Package: (Check One Box Below)			
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):					<input type="checkbox"/> Level II Std QC <input type="checkbox"/> Level III Std QC/Raw Data <input type="checkbox"/> Level IV SW340/CLP <input type="checkbox"/> Other			
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035										<input checked="" type="checkbox"/> TRRP Checklist <input type="checkbox"/> TRRP Level IV	

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February 13, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19011117**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 19 sample(s) on Jan 23, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

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**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS1901117

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey

**Laboratory Review Checklist: Reportable Data**

Laboratory Name: ALS Laboratory Group		LRC Date: 02/13/2019					
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19011117					
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137036, 137135,137136,R331844,R331938,R331946,R332011					
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			1
		Were MS/MSD RPDs within laboratory QC limits?		X			2
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 02/13/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19011117			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 137036, 137135,137136,R331844,R331938,R331946,R332011			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?		X			3
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data</b> (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods</b> (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.  
O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);  
NA = Not Applicable;  
NR = Not Reviewed;  
R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group		LRC Date: 02/13/2019
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19011117
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137036, 137135,137136,R331844,R331938,R331946,R332011
<b>ER#<sup>5</sup></b>	<b>Description</b>	
1	Batch R331938, Volatile Organics Method SW8260, sample HS19011125-01, MS and MSD were performed on unrelated sample	
2	Batch 137036, Semivolatile Organics Method SW8270, sample WG-1620-MW82B-20190122, MS/MSD RPD recovered above the RPD limit for surrogate 2-Fluorophenol due to possible matrix effects.	
3	See Run Log and CCB Exceptions Report.	
<p>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.                      O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);                      NA = Not Applicable;                      NR = Not Reviewed;                      R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>		

## FORM 13 - ANALYSIS RUN LOG

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 WorkOrder: HS19011117  
 Start Date: 30-Jan-2019      End Date: 30-Jan-2019

Run ID:ICPMS05\_331929  
 Instrument:ICPMS05  
 Method:SW6020

Sample No.	D/F	Time	FileID	Analyses
ICV	1	30-Jan-2019 12:01	016_ICV.d	AS PB
LLICV2	1	30-Jan-2019 12:03	017SMPL.d	AS PB
LLICV5	1	30-Jan-2019 12:05	018LICV.d	AS PB
ICB	1	30-Jan-2019 12:07	019_ICB.d	AS PB
ICSA	1	30-Jan-2019 12:10	020ICSA.d	AS PB
ICSAB	1	30-Jan-2019 12:12	021ICSB.d	AS PB
CCV 1	1	30-Jan-2019 12:44	033_CCV.d	AS PB
CCB 1	1	30-Jan-2019 12:46	034_CCB.d	AS PB
CCV 2	1	30-Jan-2019 13:10	043_CCV.d	AS PB
CCB 2	1	30-Jan-2019 13:12	044_CCB.d	AS PB
WG-1620-MW82B-20190122	1	30-Jan-2019 13:17	046SMPL.d	AS PB
WG-1620-MW82B-20190122SD	5	30-Jan-2019 13:20	047SMPL.d	AS PB
WG-1620-MW82B-20190122MS	1	30-Jan-2019 13:22	048SMPL.d	AS PB
WG-1620-MW82B-20190122MSD	1	30-Jan-2019 13:24	049SMPL.d	AS PB
WG-1620-MW82B-20190122PDS	1	30-Jan-2019 13:26	050SMPL.d	AS PB
WG-1620-MW44A-20190122	1	30-Jan-2019 13:29	051SMPL.d	AS PB
WG-1620-MW87C-20190122	1	30-Jan-2019 13:31	052SMPL.d	AS PB
WG-1620-MW33BR-20190122	1	30-Jan-2019 13:33	053SMPL.d	AS PB
WG-1620-MW33A-20190122	1	30-Jan-2019 13:35	054SMPL.d	AS PB
CCV 3	1	30-Jan-2019 13:40	056_CCV.d	AS PB
CCB 3	1	30-Jan-2019 13:42	057_CCB.d	AS PB
WG-1620-FD04-20190122	1	30-Jan-2019 13:45	058SMPL.d	AS PB
WG-1620-MW38B-20190122	1	30-Jan-2019 13:47	059SMPL.d	AS PB
WG-1620-MW22AR-20190122	1	30-Jan-2019 13:49	060SMPL.d	AS PB
WG-1620-MW22BR-20190122	1	30-Jan-2019 13:52	061SMPL.d	AS PB
WG-1620-MW38A-20190122	1	30-Jan-2019 13:54	062SMPL.d	AS PB
WG-1620-MW90B-20190122	1	30-Jan-2019 13:56	063SMPL.d	AS PB
WG-1620-MW89B-20190122	1	30-Jan-2019 13:58	064SMPL.d	AS PB
WG-1620-MW27C-20190122	1	30-Jan-2019 14:01	065SMPL.d	AS PB
WQ-1620-FB06-20190122	1	30-Jan-2019 14:03	066SMPL.d	AS PB
CCV 4	1	30-Jan-2019 14:07	068_CCV.d	AS PB
CCB 4	1	30-Jan-2019 14:10	069_CCB.d	AS PB
WG-1620-MW62B-20190123	1	30-Jan-2019 14:27	072SMPL.d	AS PB
WG-1620-MW64A-20190123	1	30-Jan-2019 14:30	073SMPL.d	AS PB
WG-1620-MW47C-20190123	1	30-Jan-2019 14:32	074SMPL.d	AS PB
CCV 5	1	30-Jan-2019 14:43	079_CCV.d	AS PB
CCB 5	1	30-Jan-2019 14:45	080_CCB.d	AS PB
ICCV 6	1	30-Jan-2019 15:35	097_ICV.d	AS PB
LLCCV2	1	30-Jan-2019 15:38	098SMPL.d	AS PB
LLCCV5	1	30-Jan-2019 15:40	099LICV.d	AS PB
ICCB 6	1	30-Jan-2019 15:42	100_ICB.d	AS PB
CCV 7	1	30-Jan-2019 16:14	110_CCV.d	AS PB
CCB 7	1	30-Jan-2019 16:16	111_CCB.d	AS PB
CCV 8	1	30-Jan-2019 16:45	122_CCV.d	AS PB
CCB 8	1	30-Jan-2019 16:55	124_CCB.d	AS PB
CCV 9	1	30-Jan-2019 17:56	135_CCV.d	AS PB
CCB 9	1	30-Jan-2019 17:59	136_CCB.d	AS PB
CCV 10	1	30-Jan-2019 18:24	147_CCV.d	AS PB
CCB 10	1	30-Jan-2019 18:26	148_CCB.d	AS PB
CCV 11	1	30-Jan-2019 18:51	159_CCV.d	AS PB
CCB 11	1	30-Jan-2019 18:53	160_CCB.d	AS PB



**CCB EXCEPTIONS REPORT**

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

Run ID:ICPMS05\_331929  
Instrument:ICPMS05  
Method:SW6020

CCB 4	Date: 30-Jan-2019 14:10	Seq: 4930654	D/F: 1	Units: ug/L
Analyte		Result	MDL	Report Limit
Arsenic		0.414	0.4	2

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19011117

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19011117-01	WG-1620-MW44A-20190122	Groundwater		22-Jan-2019 07:25	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-02	WG-1620-MW87C-20190122	Groundwater		22-Jan-2019 08:15	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-03	WG-1620-MW33BR-20190122	Groundwater		22-Jan-2019 09:05	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-04	WG-1620-MW33A-20190122	Groundwater		22-Jan-2019 10:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-05	WG-1620-FD04-20190122	Groundwater		22-Jan-2019 10:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-06	WG-1620-MW38B-20190122	Groundwater		22-Jan-2019 11:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-07	WG-1620-MW22AR-20190122	Groundwater		22-Jan-2019 11:50	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-08	WG-1620-MW22BR-20190122	Groundwater		22-Jan-2019 12:35	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-09	WG-1620-MW38A-20190122	Groundwater		22-Jan-2019 13:40	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-10	WQ-1620-TB05-20190123	Water	ALS-121118-84	23-Jan-2019 00:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-11	WG-1620-MW82B-20190122	Groundwater		22-Jan-2019 14:55	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-12	WG-1620-MW90B-20190122	Groundwater		22-Jan-2019 16:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-13	WG-1620-MW89B-20190122	Groundwater		22-Jan-2019 16:50	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-14	WG-1620-MW27C-20190122	Groundwater		22-Jan-2019 17:45	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-15	WQ-1620-FB06-20190122	Water		22-Jan-2019 18:00	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-16	WG-1620-MW62B-20190123	Groundwater		23-Jan-2019 07:15	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-17	WG-1620-MW64A-20190123	Groundwater		23-Jan-2019 08:10	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-18	WG-1620-MW61A-20190123	Groundwater		23-Jan-2019 09:20	23-Jan-2019 17:40	<input type="checkbox"/>
HS19011117-19	WG-1620-MW47C-20190123	Groundwater		23-Jan-2019 10:15	23-Jan-2019 17:40	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW44A-20190122  
 Collection Date: 22-Jan-2019 07:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:30
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:30
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:30
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:30
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 06:30
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:30
Vinyl chloride	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:30
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:30
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.7</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:30</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>98.1</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:30</i>
<i>Surr: Dibromofluoromethane</i>		<i>101</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:30</i>
<i>Surr: Toluene-d8</i>		<i>102</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:30</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW44A-20190122  
 Collection Date: 22-Jan-2019 07:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 11:48
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 11:48
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 11:48
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 11:48
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 11:48
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 11:48
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 11:48
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 11:48
<b>Acenaphthene</b>	<b>0.037</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 15:16
<b>Acenaphthylene</b>	<b>0.00036</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
<b>Anthracene</b>	<b>0.00044</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 11:48
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 11:48
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 11:48
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 11:48
<b>Chrysene</b>	<b>0.000026</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 11:48
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 11:48
<b>Fluoranthene</b>	<b>0.0058</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
<b>Fluorene</b>	<b>0.0097</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
<b>Naphthalene</b>	<b>0.00011</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 11:48
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 11:48
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 11:48
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 11:48
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 11:48
<b>Pyrene</b>	<b>0.0033</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 11:48
<i>Surr: 2,4,6-Tribromophenol</i>	78.2			34-129	%REC	1	11-Feb-2019 11:48
<i>Surr: 2,4,6-Tribromophenol</i>	74.2			34-129	%REC	10	12-Feb-2019 15:16
<i>Surr: 2-Fluorobiphenyl</i>	57.0			40-125	%REC	10	12-Feb-2019 15:16
<i>Surr: 2-Fluorobiphenyl</i>	59.9			40-125	%REC	1	11-Feb-2019 11:48
<i>Surr: 2-Fluorophenol</i>	49.5			20-120	%REC	10	12-Feb-2019 15:16
<i>Surr: 2-Fluorophenol</i>	52.8			20-120	%REC	1	11-Feb-2019 11:48
<i>Surr: 4-Terphenyl-d14</i>	65.6			40-135	%REC	1	11-Feb-2019 11:48
<i>Surr: 4-Terphenyl-d14</i>	64.6			40-135	%REC	10	12-Feb-2019 15:16
<i>Surr: Nitrobenzene-d5</i>	54.9			41-120	%REC	10	12-Feb-2019 15:16
<i>Surr: Nitrobenzene-d5</i>	54.7			41-120	%REC	1	11-Feb-2019 11:48
<i>Surr: Phenol-d6</i>	55.6			20-120	%REC	1	11-Feb-2019 11:48
<i>Surr: Phenol-d6</i>	54.3			20-120	%REC	10	12-Feb-2019 15:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW44A-20190122  
 Collection Date: 22-Jan-2019 07:25

**ANALYTICAL REPORT**

WorkOrder:HS19011117  
 Lab ID:HS19011117-01  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 29-Jan-2019		Analyst: JHD
Arsenic	0.0101		0.000400	0.00200	mg/L	1	30-Jan-2019 13:29
Lead		U	0.000600	0.00200	mg/L	1	30-Jan-2019 13:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW87C-20190122  
 Collection Date: 22-Jan-2019 08:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:54
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:54
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:54
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:54
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 06:54
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 06:54
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 06:54
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>95.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:54</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:54</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:54</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 06:54</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW87C-20190122  
 Collection Date: 22-Jan-2019 08:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:08
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 12:08
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 12:08
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 12:08
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:08
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 12:08
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:08
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 12:08
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 12:08
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 12:08
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 12:08
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 12:08
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:08
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 12:08
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 12:08
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 12:08
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:08
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:08
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 12:08
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 12:08
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:08
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 12:08
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 12:08
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 12:08
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 12:08
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 12:08
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 12:08
<i>Surr: 2,4,6-Tribromophenol</i>	<i>51.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>42.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>43.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>65.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<i>Surr: Nitrobenzene-d5</i>	<i>41.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<i>Surr: Phenol-d6</i>	<i>49.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:08</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000587</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 13:31</b>
<b>Lead</b>	<b>0.00124</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 13:31</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW33BR-20190122  
 Collection Date: 22-Jan-2019 09:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	29-Jan-2019 07:18
<b>Benzene</b>	<b>0.0025</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	29-Jan-2019 07:18
Chlorobenzene		U	0.00030	0.0010	mg/L	1	29-Jan-2019 07:18
<b>Ethylbenzene</b>	<b>0.013</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	29-Jan-2019 07:18
Methylene chloride		U	0.0010	0.0020	mg/L	1	29-Jan-2019 07:18
Toluene		U	0.00020	0.0010	mg/L	1	29-Jan-2019 07:18
Vinyl chloride		U	0.00020	0.0010	mg/L	1	29-Jan-2019 07:18
Xylenes, Total		U	0.00030	0.0010	mg/L	1	29-Jan-2019 07:18
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>96.6</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 07:18</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 07:18</i>
<i>Surr: Dibromofluoromethane</i>	<i>103</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 07:18</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 07:18</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW33BR-20190122  
 Collection Date: 22-Jan-2019 09:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:28
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 12:28
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 12:28
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 12:28
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:28
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 12:28
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:28
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 12:28
<b>Acenaphthene</b>	<b>0.0013</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:28
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 12:28
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 12:28
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 12:28
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:28
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 12:28
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 12:28
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 12:28
<b>Dibenzofuran</b>	<b>0.000079</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:28
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:28
<b>Fluoranthene</b>	<b>0.000053</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:28
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 12:28
<b>Naphthalene</b>	<b>0.000040</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:28
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 12:28
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 12:28
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 12:28
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 12:28
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 12:28
<b>Pyrene</b>	<b>0.000030</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:28
<i>Surr: 2,4,6-Tribromophenol</i>	83.3			34-129	%REC	1	11-Feb-2019 12:28
<i>Surr: 2-Fluorobiphenyl</i>	62.8			40-125	%REC	1	11-Feb-2019 12:28
<i>Surr: 2-Fluorophenol</i>	58.7			20-120	%REC	1	11-Feb-2019 12:28
<i>Surr: 4-Terphenyl-d14</i>	77.1			40-135	%REC	1	11-Feb-2019 12:28
<i>Surr: Nitrobenzene-d5</i>	57.6			41-120	%REC	1	11-Feb-2019 12:28
<i>Surr: Phenol-d6</i>	64.8			20-120	%REC	1	11-Feb-2019 12:28
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00143</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:33
<b>Lead</b>	<b>0.000636</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW33A-20190122  
 Collection Date: 22-Jan-2019 10:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 07:42
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 07:42
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 07:42
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 07:42
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 07:42
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 07:42
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 07:42
<i>Surr: 1,2-Dichloroethane-d4</i>		94.9		70-126	%REC	1	29-Jan-2019 07:42
<i>Surr: 4-Bromofluorobenzene</i>		97.4		81-113	%REC	1	29-Jan-2019 07:42
<i>Surr: Dibromofluoromethane</i>		103		77-123	%REC	1	29-Jan-2019 07:42
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	29-Jan-2019 07:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW33A-20190122  
 Collection Date: 22-Jan-2019 10:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:48
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 12:48
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 12:48
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 12:48
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 12:48
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 12:48
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:48
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 12:48
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 12:48
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 12:48
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 12:48
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 12:48
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:48
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 12:48
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 12:48
<b>Chrysene</b>	<b>0.000025</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:48
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:48
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 12:48
<b>Fluoranthene</b>	<b>0.00033</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:48
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 12:48
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 12:48
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 12:48
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 12:48
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 12:48
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 12:48
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 12:48
<b>Pyrene</b>	<b>0.00015</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 12:48
<i>Surr: 2,4,6-Tribromophenol</i>	<i>80.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>64.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<i>Surr: 2-Fluorophenol</i>	<i>64.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<i>Surr: Nitrobenzene-d5</i>	<i>61.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<i>Surr: Phenol-d6</i>	<i>72.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 12:48</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.0100</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:35
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD04-20190122  
 Collection Date: 22-Jan-2019 10:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:06
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:06
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:06
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:06
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 08:06
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:06
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:06
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>94.0</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:06</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>96.0</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:06</i>
<i>Surr: Dibromofluoromethane</i>		<i>99.6</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:06</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:06</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD04-20190122  
 Collection Date: 22-Jan-2019 10:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:07
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 13:07
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 13:07
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 13:07
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:07
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 13:07
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 13:07
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 13:07
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 13:07
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 13:07
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 13:07
<b>Benz(a)anthracene</b>	<b>0.000062</b>	J	<b>0.000050</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:07
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:07
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 13:07
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 13:07
<b>Chrysene</b>	<b>0.000034</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:07
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:07
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 13:07
<b>Fluoranthene</b>	<b>0.00044</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:07
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 13:07
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:07
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 13:07
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 13:07
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 13:07
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 13:07
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 13:07
<b>Pyrene</b>	<b>0.00034</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:07
<i>Surr: 2,4,6-Tribromophenol</i>	81.6			34-129	%REC	1	11-Feb-2019 13:07
<i>Surr: 2-Fluorobiphenyl</i>	66.5			40-125	%REC	1	11-Feb-2019 13:07
<i>Surr: 2-Fluorophenol</i>	61.1			20-120	%REC	1	11-Feb-2019 13:07
<i>Surr: 4-Terphenyl-d14</i>	76.6			40-135	%REC	1	11-Feb-2019 13:07
<i>Surr: Nitrobenzene-d5</i>	59.4			41-120	%REC	1	11-Feb-2019 13:07
<i>Surr: Phenol-d6</i>	66.8			20-120	%REC	1	11-Feb-2019 13:07
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00995</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:45
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW38B-20190122  
 Collection Date: 22-Jan-2019 11:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:31
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:31
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:31
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:31
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 08:31
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 08:31
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 08:31
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.7</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:31</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:31</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:31</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 08:31</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW38B-20190122  
 Collection Date: 22-Jan-2019 11:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:27
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 13:27
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 13:27
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 13:27
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:27
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 13:27
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 13:27
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 13:27
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 13:27
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 13:27
<b>Anthracene</b>	<b>0.00010</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:27
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 13:27
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:27
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 13:27
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 13:27
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 13:27
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:27
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 13:27
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 13:27
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 13:27
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:27
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 13:27
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 13:27
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 13:27
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 13:27
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 13:27
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 13:27
<i>Surr: 2,4,6-Tribromophenol</i>	<i>72.8</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>46.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<i>Surr: 2-Fluorophenol</i>	<i>47.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>76.1</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<i>Surr: Phenol-d6</i>	<i>54.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 13:27</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	30-Jan-2019 13:47
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW22AR-20190122  
 Collection Date: 22-Jan-2019 11:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 21:20
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 21:20
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 21:20
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 21:20
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 21:20
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 21:20
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 21:20
<i>Surr: 1,2-Dichloroethane-d4</i>		86.5		70-126	%REC	1	29-Jan-2019 21:20
<i>Surr: 4-Bromofluorobenzene</i>		95.4		81-113	%REC	1	29-Jan-2019 21:20
<i>Surr: Dibromofluoromethane</i>		98.8		77-123	%REC	1	29-Jan-2019 21:20
<i>Surr: Toluene-d8</i>		104		82-127	%REC	1	29-Jan-2019 21:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW22AR-20190122  
 Collection Date: 22-Jan-2019 11:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:47
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 13:47
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 13:47
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 13:47
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 13:47
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 13:47
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 13:47
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 13:47
<b>Acenaphthene</b>	<b>0.00071</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 13:47
<b>Anthracene</b>	<b>0.000028</b>	J	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 13:47
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:47
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 13:47
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000065</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 13:47
<b>Dibenzofuran</b>	<b>0.000029</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
<b>Di-n-butyl phthalate</b>	<b>0.00051</b>		<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
<b>Fluoranthene</b>	<b>0.000079</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
<b>Fluorene</b>	<b>0.00014</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 13:47
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 13:47
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 13:47
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 13:47
<b>Phenanthrene</b>	<b>0.000068</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 13:47
<b>Pyrene</b>	<b>0.000084</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 13:47
<i>Surr: 2,4,6-Tribromophenol</i>	88.5			34-129	%REC	1	11-Feb-2019 13:47
<i>Surr: 2-Fluorobiphenyl</i>	58.3			40-125	%REC	1	11-Feb-2019 13:47
<i>Surr: 2-Fluorophenol</i>	48.6			20-120	%REC	1	11-Feb-2019 13:47
<i>Surr: 4-Terphenyl-d14</i>	79.0			40-135	%REC	1	11-Feb-2019 13:47
<i>Surr: Nitrobenzene-d5</i>	54.0			41-120	%REC	1	11-Feb-2019 13:47
<i>Surr: Phenol-d6</i>	56.7			20-120	%REC	1	11-Feb-2019 13:47
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00488</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:49
<b>Lead</b>	<b>0.00526</b>		<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 13:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW22BR-20190122  
 Collection Date: 22-Jan-2019 12:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 22:45
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 22:45
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 22:45
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 22:45
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 22:45
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 22:45
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 22:45
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.3</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 22:45</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 22:45</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 22:45</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 22:45</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW22BR-20190122  
 Collection Date: 22-Jan-2019 12:35

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:07
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 14:07
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 14:07
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 14:07
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:07
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 14:07
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 14:07
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 14:07
<b>Acenaphthene</b>	<b>0.022</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	12-Feb-2019 15:36
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 14:07
<b>Anthracene</b>	<b>0.00048</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 14:07
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 14:07
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 14:07
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 14:07
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 14:07
<b>Dibenzofuran</b>	<b>0.00029</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 14:07
<b>Fluoranthene</b>	<b>0.0011</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
<b>Fluorene</b>	<b>0.0025</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
<b>Naphthalene</b>	<b>0.00017</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 14:07
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 14:07
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 14:07
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 14:07
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 14:07
<b>Pyrene</b>	<b>0.00046</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 14:07
<i>Surr: 2,4,6-Tribromophenol</i>	76.5			34-129	%REC	1	11-Feb-2019 14:07
<i>Surr: 2,4,6-Tribromophenol</i>	80.6			34-129	%REC	10	12-Feb-2019 15:36
<i>Surr: 2-Fluorobiphenyl</i>	64.7			40-125	%REC	10	12-Feb-2019 15:36
<i>Surr: 2-Fluorobiphenyl</i>	63.5			40-125	%REC	1	11-Feb-2019 14:07
<i>Surr: 2-Fluorophenol</i>	61.4			20-120	%REC	1	11-Feb-2019 14:07
<i>Surr: 2-Fluorophenol</i>	50.2			20-120	%REC	10	12-Feb-2019 15:36
<i>Surr: 4-Terphenyl-d14</i>	68.7			40-135	%REC	10	12-Feb-2019 15:36
<i>Surr: 4-Terphenyl-d14</i>	70.7			40-135	%REC	1	11-Feb-2019 14:07
<i>Surr: Nitrobenzene-d5</i>	62.7			41-120	%REC	1	11-Feb-2019 14:07
<i>Surr: Nitrobenzene-d5</i>	56.2			41-120	%REC	10	12-Feb-2019 15:36
<i>Surr: Phenol-d6</i>	64.5			20-120	%REC	10	12-Feb-2019 15:36
<i>Surr: Phenol-d6</i>	67.3			20-120	%REC	1	11-Feb-2019 14:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW22BR-20190122  
 Collection Date: 22-Jan-2019 12:35

**ANALYTICAL REPORT**

WorkOrder:HS19011117  
 Lab ID:HS19011117-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	0.0535		0.000400	0.00200	mg/L	1	30-Jan-2019 13:52
Lead		U	0.000600	0.00200	mg/L	1	30-Jan-2019 13:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW38A-20190122  
 Collection Date: 22-Jan-2019 13:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 03:44
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 03:44
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 03:44
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 03:44
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 03:44
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 03:44
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 03:44
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>87.6</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 03:44</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>97.6</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 03:44</i>
<i>Surr: Dibromofluoromethane</i>		<i>98.6</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 03:44</i>
<i>Surr: Toluene-d8</i>		<i>102</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 03:44</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW38A-20190122  
 Collection Date: 22-Jan-2019 13:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:27
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 14:27
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 14:27
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 14:27
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:27
<b>2-Methylnaphthalene</b>	<b>0.000055</b>	<b>J</b>	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 14:27
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 14:27
<b>Acenaphthene</b>	<b>0.014</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	<b>10</b>	<b>12-Feb-2019 15:56</b>
<b>Acenaphthylene</b>	<b>0.00020</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<b>Anthracene</b>	<b>0.00017</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 14:27
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 14:27
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 14:27
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 14:27
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 14:27
<b>Dibenzofuran</b>	<b>0.00014</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<b>Di-n-butyl phthalate</b>	<b>0.000068</b>	<b>J</b>	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<b>Fluoranthene</b>	<b>0.0013</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<b>Fluorene</b>	<b>0.0024</b>		<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<b>Naphthalene</b>	<b>0.00015</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 14:27
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 14:27
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 14:27
<b>Phenanthrene</b>	<b>0.00058</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 14:27
<b>Pyrene</b>	<b>0.0011</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:27</b>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>81.0</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>76.2</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>54.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>58.2</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>
<i>Surr: 2-Fluorophenol</i>	<i>58.2</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>
<i>Surr: 2-Fluorophenol</i>	<i>52.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>75.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>72.7</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>
<i>Surr: Nitrobenzene-d5</i>	<i>56.7</i>			<i>41-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>
<i>Surr: Nitrobenzene-d5</i>	<i>51.8</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: Phenol-d6</i>	<i>56.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:27</i>
<i>Surr: Phenol-d6</i>	<i>60.0</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>12-Feb-2019 15:56</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW38A-20190122  
 Collection Date: 22-Jan-2019 13:40

**ANALYTICAL REPORT**

WorkOrder:HS19011117  
 Lab ID:HS19011117-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>			Prep:SW3010A / 29-Jan-2019		Analyst: JHD
Arsenic	0.0186		0.000400	0.00200	mg/L	1	30-Jan-2019 13:54
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB05-20190123  
 Collection Date: 23-Jan-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-10  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 00:56
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 00:56
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 00:56
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 00:56
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 00:56
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 00:56
Vinyl chloride	U		0.00020	0.0010	mg/L	1	30-Jan-2019 00:56
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 00:56
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>87.2</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 00:56</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>95.9</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 00:56</i>
<i>Surr: Dibromofluoromethane</i>		<i>98.6</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 00:56</i>
<i>Surr: Toluene-d8</i>		<i>104</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 00:56</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW82B-20190122  
 Collection Date: 22-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-Jan-2019 00:05
Benzene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 00:05
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 00:05
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-Jan-2019 00:05
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-Jan-2019 00:05
Toluene	U		0.00020	0.0010	mg/L	1	29-Jan-2019 00:05
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-Jan-2019 00:05
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 00:05</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.1</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 00:05</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 00:05</i>
<i>Surr: Toluene-d8</i>	<i>104</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 00:05</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW82B-20190122  
 Collection Date: 22-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-11  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	29-Jan-2019 16:28
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	29-Jan-2019 16:28
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	29-Jan-2019 16:28
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	29-Jan-2019 16:28
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	29-Jan-2019 16:28
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	29-Jan-2019 16:28
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	29-Jan-2019 16:28
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	29-Jan-2019 16:28
Acenaphthene	U		0.000027	0.00010	mg/L	1	29-Jan-2019 16:28
Acenaphthylene	U		0.000015	0.00010	mg/L	1	29-Jan-2019 16:28
<b>Anthracene</b>	<b>0.000042</b>	<b>J</b>	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>29-Jan-2019 16:28</b>
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	29-Jan-2019 16:28
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	29-Jan-2019 16:28
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	29-Jan-2019 16:28
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	29-Jan-2019 16:28
Chrysene	U		0.000021	0.00010	mg/L	1	29-Jan-2019 16:28
Dibenzofuran	U		0.000020	0.00010	mg/L	1	29-Jan-2019 16:28
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	29-Jan-2019 16:28
Fluoranthene	U		0.000010	0.00010	mg/L	1	29-Jan-2019 16:28
Fluorene	U		0.000030	0.00010	mg/L	1	29-Jan-2019 16:28
Naphthalene	U		0.000020	0.00010	mg/L	1	29-Jan-2019 16:28
Nitrobenzene	U		0.000024	0.00020	mg/L	1	29-Jan-2019 16:28
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	29-Jan-2019 16:28
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	29-Jan-2019 16:28
Phenanthrene	U		0.000021	0.00010	mg/L	1	29-Jan-2019 16:28
Phenol	U		0.000035	0.00020	mg/L	1	29-Jan-2019 16:28
Pyrene	U		0.000019	0.00010	mg/L	1	29-Jan-2019 16:28
<i>Surr: 2,4,6-Tribromophenol</i>	<i>72.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>57.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<i>Surr: 2-Fluorophenol</i>	<i>50.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>81.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<i>Surr: Nitrobenzene-d5</i>	<i>54.4</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<i>Surr: Phenol-d6</i>	<i>62.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2019 16:28</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00838</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 13:17</b>
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW90B-20190122  
 Collection Date: 22-Jan-2019 16:00

**ANALYTICAL REPORT**

WorkOrder:HS19011117  
 Lab ID:HS19011117-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:09
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:09
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:09
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:09
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 04:09
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:09
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:09
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>84.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:09</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:09</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:09</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW90B-20190122  
 Collection Date: 22-Jan-2019 16:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:46
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 14:46
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 14:46
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 14:46
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 14:46
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 14:46
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 14:46
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 14:46
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 14:46
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 14:46
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 14:46
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 14:46
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 14:46
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 14:46
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 14:46
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 14:46
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 14:46
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 14:46
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 14:46
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 14:46
<b>Naphthalene</b>	<b>0.000045</b>	<b>J</b>	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	<b>1</b>	<b>11-Feb-2019 14:46</b>
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 14:46
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 14:46
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 14:46
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 14:46
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 14:46
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 14:46
<i>Surr: 2,4,6-Tribromophenol</i>	<i>84.3</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>68.1</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<i>Surr: 2-Fluorophenol</i>	<i>56.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>76.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<i>Surr: Nitrobenzene-d5</i>	<i>60.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<i>Surr: Phenol-d6</i>	<i>64.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 14:46</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00346</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 13:56</b>
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW89B-20190122  
 Collection Date: 22-Jan-2019 16:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:32
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:32
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:32
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:32
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 04:32
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:32
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:32
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>87.6</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:32</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>95.9</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:32</i>
<i>Surr: Dibromofluoromethane</i>		<i>99.0</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:32</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:32</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW89B-20190122  
 Collection Date: 22-Jan-2019 16:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:06
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 15:06
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	11-Feb-2019 15:06
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 15:06
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:06
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:06
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:06
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 15:06
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 15:06
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 15:06
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 15:06
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	11-Feb-2019 15:06
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:06
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 15:06
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 15:06
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:06
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:06
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:06
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 15:06
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 15:06
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:06
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 15:06
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 15:06
Pentachlorophenol	U		0.000080	0.00020	mg/L	1	11-Feb-2019 15:06
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:06
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 15:06
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:06
<i>Surr: 2,4,6-Tribromophenol</i>	<i>81.7</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>62.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<i>Surr: 2-Fluorophenol</i>	<i>60.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>78.7</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<i>Surr: Nitrobenzene-d5</i>	<i>56.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<i>Surr: Phenol-d6</i>	<i>64.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 15:06</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000683</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 13:58</b>
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 13:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW27C-20190122  
 Collection Date: 22-Jan-2019 17:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:57
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:57
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:57
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:57
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 04:57
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 04:57
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 04:57
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.7</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:57</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.8</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:57</i>
<i>Surr: Dibromofluoromethane</i>	<i>98.4</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:57</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 04:57</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW27C-20190122  
 Collection Date: 22-Jan-2019 17:45

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:26
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 15:26
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 15:26
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 15:26
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:26
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:26
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:26
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 15:26
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 15:26
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 15:26
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 15:26
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 15:26
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:26
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 15:26
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 15:26
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:26
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:26
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:26
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 15:26
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 15:26
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:26
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 15:26
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 15:26
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 15:26
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:26
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 15:26
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:26
<i>Surr: 2,4,6-Tribromophenol</i>	69.6			34-129	%REC	1	11-Feb-2019 15:26
<i>Surr: 2-Fluorobiphenyl</i>	62.6			40-125	%REC	1	11-Feb-2019 15:26
<i>Surr: 2-Fluorophenol</i>	49.5			20-120	%REC	1	11-Feb-2019 15:26
<i>Surr: 4-Terphenyl-d14</i>	76.5			40-135	%REC	1	11-Feb-2019 15:26
<i>Surr: Nitrobenzene-d5</i>	54.8			41-120	%REC	1	11-Feb-2019 15:26
<i>Surr: Phenol-d6</i>	56.9			20-120	%REC	1	11-Feb-2019 15:26
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000786</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 14:01
<b>Lead</b>	<b>0.000831</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB06-20190122  
 Collection Date: 22-Jan-2019 18:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-15  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 01:20
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 01:20
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 01:20
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 01:20
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 01:20
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 01:20
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 01:20
<i>Surr: 1,2-Dichloroethane-d4</i>		86.9		70-126	%REC	1	30-Jan-2019 01:20
<i>Surr: 4-Bromofluorobenzene</i>		96.3		81-113	%REC	1	30-Jan-2019 01:20
<i>Surr: Dibromofluoromethane</i>		98.0		77-123	%REC	1	30-Jan-2019 01:20
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	30-Jan-2019 01:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB06-20190122  
 Collection Date: 22-Jan-2019 18:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-15  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:46
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 15:46
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 15:46
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 15:46
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 15:46
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:46
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:46
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 15:46
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 15:46
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 15:46
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 15:46
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 15:46
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:46
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 15:46
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 15:46
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:46
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:46
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 15:46
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 15:46
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 15:46
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 15:46
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 15:46
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 15:46
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 15:46
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 15:46
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 15:46
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 15:46
<i>Surr: 2,4,6-Tribromophenol</i>		85.5		34-129	%REC	1	11-Feb-2019 15:46
<i>Surr: 2-Fluorobiphenyl</i>		69.5		40-125	%REC	1	11-Feb-2019 15:46
<i>Surr: 2-Fluorophenol</i>		62.7		20-120	%REC	1	11-Feb-2019 15:46
<i>Surr: 4-Terphenyl-d14</i>		80.9		40-135	%REC	1	11-Feb-2019 15:46
<i>Surr: Nitrobenzene-d5</i>		65.8		41-120	%REC	1	11-Feb-2019 15:46
<i>Surr: Phenol-d6</i>		73.3		20-120	%REC	1	11-Feb-2019 15:46
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	30-Jan-2019 14:03
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 14:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW62B-20190123  
 Collection Date: 23-Jan-2019 07:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:21
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:21
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:21
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:21
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 05:21
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:21
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:21
<i>Surr: 1,2-Dichloroethane-d4</i>		85.6		70-126	%REC	1	30-Jan-2019 05:21
<i>Surr: 4-Bromofluorobenzene</i>		94.6		81-113	%REC	1	30-Jan-2019 05:21
<i>Surr: Dibromofluoromethane</i>		99.5		77-123	%REC	1	30-Jan-2019 05:21
<i>Surr: Toluene-d8</i>		102		82-127	%REC	1	30-Jan-2019 05:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW62B-20190123  
 Collection Date: 23-Jan-2019 07:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:05
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 16:05
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 16:05
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 16:05
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:05
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:05
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:05
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 16:05
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 16:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 16:05
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 16:05
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 16:05
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:05
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 16:05
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 16:05
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:05
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:05
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:05
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 16:05
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 16:05
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:05
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 16:05
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 16:05
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 16:05
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:05
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 16:05
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:05
<i>Surr: 2,4,6-Tribromophenol</i>		60.7		34-129	%REC	1	11-Feb-2019 16:05
<i>Surr: 2-Fluorobiphenyl</i>		60.7		40-125	%REC	1	11-Feb-2019 16:05
<i>Surr: 2-Fluorophenol</i>		55.2		20-120	%REC	1	11-Feb-2019 16:05
<i>Surr: 4-Terphenyl-d14</i>		76.6		40-135	%REC	1	11-Feb-2019 16:05
<i>Surr: Nitrobenzene-d5</i>		54.9		41-120	%REC	1	11-Feb-2019 16:05
<i>Surr: Phenol-d6</i>		58.9		20-120	%REC	1	11-Feb-2019 16:05
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	30-Jan-2019 14:27
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 14:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW64A-20190123  
 Collection Date: 23-Jan-2019 08:10

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:45
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:45
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:45
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:45
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 05:45
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 05:45
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 05:45
<i>Surr: 1,2-Dichloroethane-d4</i>		86.6		70-126	%REC	1	30-Jan-2019 05:45
<i>Surr: 4-Bromofluorobenzene</i>		96.6		81-113	%REC	1	30-Jan-2019 05:45
<i>Surr: Dibromofluoromethane</i>		98.5		77-123	%REC	1	30-Jan-2019 05:45
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	30-Jan-2019 05:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW64A-20190123  
 Collection Date: 23-Jan-2019 08:10

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:25
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 16:25
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 16:25
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 16:25
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:25
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:25
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:25
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 16:25
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 16:25
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 16:25
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 16:25
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 16:25
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:25
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 16:25
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 16:25
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:25
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:25
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:25
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 16:25
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 16:25
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:25
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 16:25
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 16:25
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 16:25
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:25
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 16:25
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:25
<i>Surr: 2,4,6-Tribromophenol</i>		63.8		34-129	%REC	1	11-Feb-2019 16:25
<i>Surr: 2-Fluorobiphenyl</i>		54.1		40-125	%REC	1	11-Feb-2019 16:25
<i>Surr: 2-Fluorophenol</i>		49.6		20-120	%REC	1	11-Feb-2019 16:25
<i>Surr: 4-Terphenyl-d14</i>		76.8		40-135	%REC	1	11-Feb-2019 16:25
<i>Surr: Nitrobenzene-d5</i>		51.3		41-120	%REC	1	11-Feb-2019 16:25
<i>Surr: Phenol-d6</i>		54.5		20-120	%REC	1	11-Feb-2019 16:25
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	30-Jan-2019 14:30
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 14:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW61A-20190123  
 Collection Date: 23-Jan-2019 09:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 02:32
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 02:32
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 02:32
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 02:32
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 02:32
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 02:32
Vinyl chloride	U		0.00020	0.0010	mg/L	1	30-Jan-2019 02:32
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 02:32
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>85.8</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 02:32</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>96.3</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 02:32</i>
<i>Surr: Dibromofluoromethane</i>		<i>98.6</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 02:32</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 02:32</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW61A-20190123  
 Collection Date: 23-Jan-2019 09:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:45
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	11-Feb-2019 16:45
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 16:45
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 16:45
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 16:45
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:45
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:45
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 16:45
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 16:45
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 16:45
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 16:45
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 16:45
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:45
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 16:45
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	11-Feb-2019 16:45
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:45
Dibenzofuran	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:45
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 16:45
Fluoranthene	U		0.000010	0.00010	mg/L	1	11-Feb-2019 16:45
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 16:45
Naphthalene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 16:45
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 16:45
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 16:45
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 16:45
Phenanthrene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 16:45
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 16:45
Pyrene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 16:45
<i>Surr: 2,4,6-Tribromophenol</i>	<i>65.9</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.8</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<i>Surr: 2-Fluorophenol</i>	<i>45.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>76.1</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<i>Surr: Nitrobenzene-d5</i>	<i>48.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<i>Surr: Phenol-d6</i>	<i>51.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 16:45</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JCJ	
<b>Arsenic</b>	<b>0.000690</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>30-Jan-2019 19:52</b>
Lead	U		0.000600	0.00200	mg/L	1	30-Jan-2019 19:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW47C-20190123  
 Collection Date: 23-Jan-2019 10:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-Jan-2019 06:09
Benzene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 06:09
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 06:09
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-Jan-2019 06:09
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-Jan-2019 06:09
Toluene	U		0.00020	0.0010	mg/L	1	30-Jan-2019 06:09
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-Jan-2019 06:09
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.3</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 06:09</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>95.5</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 06:09</i>
<i>Surr: Dibromofluoromethane</i>	<i>100</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 06:09</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-Jan-2019 06:09</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW47C-20190123  
 Collection Date: 23-Jan-2019 10:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011117  
 Lab ID:HS19011117-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 25-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	11-Feb-2019 17:05
<b>2,4-Dimethylphenol</b>	<b>0.000095</b>	J	<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	11-Feb-2019 17:05
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	11-Feb-2019 17:05
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	11-Feb-2019 17:05
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	11-Feb-2019 17:05
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	11-Feb-2019 17:05
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	11-Feb-2019 17:05
Acenaphthene	U		0.000027	0.00010	mg/L	1	11-Feb-2019 17:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	11-Feb-2019 17:05
Anthracene	U		0.000014	0.00010	mg/L	1	11-Feb-2019 17:05
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	11-Feb-2019 17:05
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	11-Feb-2019 17:05
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	11-Feb-2019 17:05
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000056</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
Chrysene	U		0.000021	0.00010	mg/L	1	11-Feb-2019 17:05
<b>Dibenzofuran</b>	<b>0.000034</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	11-Feb-2019 17:05
<b>Fluoranthene</b>	<b>0.000028</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
Fluorene	U		0.000030	0.00010	mg/L	1	11-Feb-2019 17:05
<b>Naphthalene</b>	<b>0.00083</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
Nitrobenzene	U		0.000024	0.00020	mg/L	1	11-Feb-2019 17:05
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	11-Feb-2019 17:05
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	11-Feb-2019 17:05
<b>Phenanthrene</b>	<b>0.000052</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
Phenol	U		0.000035	0.00020	mg/L	1	11-Feb-2019 17:05
<b>Pyrene</b>	<b>0.000021</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	11-Feb-2019 17:05
<i>Surr: 2,4,6-Tribromophenol</i>	<i>91.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>69.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<i>Surr: 2-Fluorophenol</i>	<i>65.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.8</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<i>Surr: Nitrobenzene-d5</i>	<i>67.4</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<i>Surr: Phenol-d6</i>	<i>76.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:05</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 29-Jan-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	30-Jan-2019 14:32
<b>Lead</b>	<b>0.000859</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	30-Jan-2019 14:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**Batch ID:** 137036      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011117-01	1	1000	1 (mL)	0.001
HS19011117-02	1	1000	1 (mL)	0.001
HS19011117-03	1	1000	1 (mL)	0.001
HS19011117-04	1	1000	1 (mL)	0.001
HS19011117-05	1	1000	1 (mL)	0.001
HS19011117-06	1	1000	1 (mL)	0.001
HS19011117-07	1	1000	1 (mL)	0.001
HS19011117-08	1	1000	1 (mL)	0.001
HS19011117-09	1	1000	1 (mL)	0.001
HS19011117-11	1	1000	1 (mL)	0.001
HS19011117-12	1	1000	1 (mL)	0.001
HS19011117-13	1	990	1 (mL)	0.00101
HS19011117-14	1	1000	1 (mL)	0.001
HS19011117-15	1	1000	1 (mL)	0.001
HS19011117-16	1	1000	1 (mL)	0.001
HS19011117-17	1	1000	1 (mL)	0.001
HS19011117-18	1	1000	1 (mL)	0.001
HS19011117-19	1	1000	1 (mL)	0.001

**Batch ID:** 137135      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011117-01	1	10	10 (mL)	1
HS19011117-02	1	10	10 (mL)	1
HS19011117-03	1	10	10 (mL)	1
HS19011117-04	1	10	10 (mL)	1
HS19011117-05	1	10	10 (mL)	1
HS19011117-06	1	10	10 (mL)	1
HS19011117-07	1	10	10 (mL)	1
HS19011117-08	1	10	10 (mL)	1
HS19011117-09	1	10	10 (mL)	1
HS19011117-11	1	10	10 (mL)	1
HS19011117-12	1	10	10 (mL)	1
HS19011117-13	1	10	10 (mL)	1
HS19011117-14	1	10	10 (mL)	1
HS19011117-15	1	10	10 (mL)	1
HS19011117-16	1	10	10 (mL)	1
HS19011117-17	1	10	10 (mL)	1
HS19011117-19	1	10	10 (mL)	1

**Batch ID:** 137136      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011117-18	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 137036		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Water		
HS19011117-15	WQ-1620-FB06-20190122	22 Jan 2019 18:00		25 Jan 2019 11:27	11 Feb 2019 15:46	1
<b>Batch ID</b> 137036		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Groundwater		
HS19011117-01	WG-1620-MW44A-20190122	22 Jan 2019 07:25		25 Jan 2019 11:27	12 Feb 2019 15:16	10
HS19011117-01	WG-1620-MW44A-20190122	22 Jan 2019 07:25		25 Jan 2019 11:27	11 Feb 2019 11:48	1
HS19011117-02	WG-1620-MW87C-20190122	22 Jan 2019 08:15		25 Jan 2019 11:27	11 Feb 2019 12:08	1
HS19011117-03	WG-1620-MW33BR-20190122	22 Jan 2019 09:05		25 Jan 2019 11:27	11 Feb 2019 12:28	1
HS19011117-04	WG-1620-MW33A-20190122	22 Jan 2019 10:00		25 Jan 2019 11:27	11 Feb 2019 12:48	1
HS19011117-05	WG-1620-FD04-20190122	22 Jan 2019 10:00		25 Jan 2019 11:27	11 Feb 2019 13:07	1
HS19011117-06	WG-1620-MW38B-20190122	22 Jan 2019 11:00		25 Jan 2019 11:27	11 Feb 2019 13:27	1
HS19011117-07	WG-1620-MW22AR-20190122	22 Jan 2019 11:50		25 Jan 2019 11:27	11 Feb 2019 13:47	1
HS19011117-08	WG-1620-MW22BR-20190122	22 Jan 2019 12:35		25 Jan 2019 11:27	12 Feb 2019 15:36	10
HS19011117-08	WG-1620-MW22BR-20190122	22 Jan 2019 12:35		25 Jan 2019 11:27	11 Feb 2019 14:07	1
HS19011117-09	WG-1620-MW38A-20190122	22 Jan 2019 13:40		25 Jan 2019 11:27	12 Feb 2019 15:56	10
HS19011117-09	WG-1620-MW38A-20190122	22 Jan 2019 13:40		25 Jan 2019 11:27	11 Feb 2019 14:27	1
HS19011117-11	WG-1620-MW82B-20190122	22 Jan 2019 14:55		25 Jan 2019 11:27	29 Jan 2019 16:28	1
HS19011117-12	WG-1620-MW90B-20190122	22 Jan 2019 16:00		25 Jan 2019 11:27	11 Feb 2019 14:46	1
HS19011117-13	WG-1620-MW89B-20190122	22 Jan 2019 16:50		25 Jan 2019 11:27	11 Feb 2019 15:06	1
HS19011117-14	WG-1620-MW27C-20190122	22 Jan 2019 17:45		25 Jan 2019 11:27	11 Feb 2019 15:26	1
HS19011117-16	WG-1620-MW62B-20190123	23 Jan 2019 07:15		25 Jan 2019 11:27	11 Feb 2019 16:05	1
HS19011117-17	WG-1620-MW64A-20190123	23 Jan 2019 08:10		25 Jan 2019 11:27	11 Feb 2019 16:25	1
HS19011117-18	WG-1620-MW61A-20190123	23 Jan 2019 09:20		25 Jan 2019 11:27	11 Feb 2019 16:45	1
HS19011117-19	WG-1620-MW47C-20190123	23 Jan 2019 10:15		25 Jan 2019 11:27	11 Feb 2019 17:05	1
<b>Batch ID</b> 137135		<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Water		
HS19011117-15	WQ-1620-FB06-20190122	22 Jan 2019 18:00		29 Jan 2019 10:30	30 Jan 2019 14:03	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID 137135 Test Name : ICP-MS METALS BY SW6020A Matrix: Groundwater</b>						
HS19011117-01	WG-1620-MW44A-20190122	22 Jan 2019 07:25		29 Jan 2019 10:30	30 Jan 2019 13:29	1
HS19011117-02	WG-1620-MW87C-20190122	22 Jan 2019 08:15		29 Jan 2019 10:30	30 Jan 2019 13:31	1
HS19011117-03	WG-1620-MW33BR-20190122	22 Jan 2019 09:05		29 Jan 2019 10:30	30 Jan 2019 13:33	1
HS19011117-04	WG-1620-MW33A-20190122	22 Jan 2019 10:00		29 Jan 2019 10:30	30 Jan 2019 13:35	1
HS19011117-05	WG-1620-FD04-20190122	22 Jan 2019 10:00		29 Jan 2019 10:30	30 Jan 2019 13:45	1
HS19011117-06	WG-1620-MW38B-20190122	22 Jan 2019 11:00		29 Jan 2019 10:30	30 Jan 2019 13:47	1
HS19011117-07	WG-1620-MW22AR-20190122	22 Jan 2019 11:50		29 Jan 2019 10:30	30 Jan 2019 13:49	1
HS19011117-08	WG-1620-MW22BR-20190122	22 Jan 2019 12:35		29 Jan 2019 10:30	30 Jan 2019 13:52	1
HS19011117-09	WG-1620-MW38A-20190122	22 Jan 2019 13:40		29 Jan 2019 10:30	30 Jan 2019 13:54	1
HS19011117-11	WG-1620-MW82B-20190122	22 Jan 2019 14:55		29 Jan 2019 10:30	30 Jan 2019 13:17	1
HS19011117-12	WG-1620-MW90B-20190122	22 Jan 2019 16:00		29 Jan 2019 10:30	30 Jan 2019 13:56	1
HS19011117-13	WG-1620-MW89B-20190122	22 Jan 2019 16:50		29 Jan 2019 10:30	30 Jan 2019 13:58	1
HS19011117-14	WG-1620-MW27C-20190122	22 Jan 2019 17:45		29 Jan 2019 10:30	30 Jan 2019 14:01	1
HS19011117-16	WG-1620-MW62B-20190123	23 Jan 2019 07:15		29 Jan 2019 10:30	30 Jan 2019 14:27	1
HS19011117-17	WG-1620-MW64A-20190123	23 Jan 2019 08:10		29 Jan 2019 10:30	30 Jan 2019 14:30	1
HS19011117-19	WG-1620-MW47C-20190123	23 Jan 2019 10:15		29 Jan 2019 10:30	30 Jan 2019 14:32	1
<b>Batch ID 137136 Test Name : ICP-MS METALS BY SW6020A Matrix: Groundwater</b>						
HS19011117-18	WG-1620-MW61A-20190123	23 Jan 2019 09:20		29 Jan 2019 10:30	30 Jan 2019 19:52	1
<b>Batch ID R331844 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19011117-01	WG-1620-MW44A-20190122	22 Jan 2019 07:25			29 Jan 2019 06:30	1
HS19011117-02	WG-1620-MW87C-20190122	22 Jan 2019 08:15			29 Jan 2019 06:54	1
HS19011117-03	WG-1620-MW33BR-20190122	22 Jan 2019 09:05			29 Jan 2019 07:18	1
HS19011117-04	WG-1620-MW33A-20190122	22 Jan 2019 10:00			29 Jan 2019 07:42	1
HS19011117-05	WG-1620-FD04-20190122	22 Jan 2019 10:00			29 Jan 2019 08:06	1
HS19011117-06	WG-1620-MW38B-20190122	22 Jan 2019 11:00			29 Jan 2019 08:31	1
HS19011117-11	WG-1620-MW82B-20190122	22 Jan 2019 14:55			29 Jan 2019 00:05	1
<b>Batch ID R331938 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater</b>						
HS19011117-07	WG-1620-MW22AR-20190122	22 Jan 2019 11:50			29 Jan 2019 21:20	1
<b>Batch ID R331946 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water</b>						
HS19011117-10	WQ-1620-TB05-20190123	23 Jan 2019 00:00			30 Jan 2019 00:56	1
HS19011117-15	WQ-1620-FB06-20190122	22 Jan 2019 18:00			30 Jan 2019 01:20	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> R331946	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater		
HS19011117-09	WG-1620-MW38A-20190122	22 Jan 2019 13:40			30 Jan 2019 03:44	1
HS19011117-12	WG-1620-MW90B-20190122	22 Jan 2019 16:00			30 Jan 2019 04:09	1
HS19011117-13	WG-1620-MW89B-20190122	22 Jan 2019 16:50			30 Jan 2019 04:32	1
HS19011117-14	WG-1620-MW27C-20190122	22 Jan 2019 17:45			30 Jan 2019 04:57	1
HS19011117-16	WG-1620-MW62B-20190123	23 Jan 2019 07:15			30 Jan 2019 05:21	1
HS19011117-17	WG-1620-MW64A-20190123	23 Jan 2019 08:10			30 Jan 2019 05:45	1
HS19011117-18	WG-1620-MW61A-20190123	23 Jan 2019 09:20			30 Jan 2019 02:32	1
HS19011117-19	WG-1620-MW47C-20190123	23 Jan 2019 10:15			30 Jan 2019 06:09	1
<b>Batch ID</b> R332011	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater		
HS19011117-08	WG-1620-MW22BR-20190122	22 Jan 2019 12:35			30 Jan 2019 22:45	1

WorkOrder: HS19011117  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200

WorkOrder: HS19011117  
 InstrumentID: ICPMS04  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000340	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.000916	0.000600	0.00200



WorkOrder: HS19011117  
 InstrumentID: SV-7  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000082	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000034	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000039	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000062	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000072	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000058	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000024	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000024	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000067	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000062	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000069	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000068	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000070	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000070	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000063	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000085	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000058	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000070	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000073	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000067	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000073	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000088	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000071	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.000072	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000075	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000079	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19011117  
 InstrumentID: SV-6  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000070	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000041	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000052	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000052	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000061	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000056	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000022	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00020	0.00019	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000066	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000072	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000074	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000074	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000066	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000069	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000083	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000082	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000060	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000080	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000074	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000073	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000065	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000083	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000068	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.00016	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000066	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000074	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19011117  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00054	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> 137135	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-137135</b>	Units: <b>mg/L</b>	Analysis Date: <b>29-Jan-2019 21:57</b>							
Client ID:	Run ID: <b>ICPMS05_331852</b>	SeqNo: <b>4929419</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-137135</b>	Units: <b>mg/L</b>	Analysis Date: <b>29-Jan-2019 21:59</b>							
Client ID:	Run ID: <b>ICPMS05_331852</b>	SeqNo: <b>4929420</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.04988	0.00200	0.05	0	99.8	80 - 120				
Lead	0.04872	0.00200	0.05	0	97.4	80 - 120				

<b>MS</b>	Sample ID: <b>HS19011117-11MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 13:22</b>							
Client ID: <b>WG-1620-MW82B-20190122</b>	Run ID: <b>ICPMS05_331929</b>	SeqNo: <b>4930633</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05965	0.00200	0.05	0.00838	103	80 - 120				
Lead	0.04978	0.00200	0.05	0.000016	99.5	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19011117-11MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 13:24</b>							
Client ID: <b>WG-1620-MW82B-20190122</b>	Run ID: <b>ICPMS05_331929</b>	SeqNo: <b>4930634</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05924	0.00200	0.05	0.00838	102	80 - 120	0.05965	0.681	20	
Lead	0.05038	0.00200	0.05	0.000016	101	80 - 120	0.04978	1.19	20	

<b>PDS</b>	Sample ID: <b>HS19011117-11PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 13:26</b>							
Client ID: <b>WG-1620-MW82B-20190122</b>	Run ID: <b>ICPMS05_331929</b>	SeqNo: <b>4930635</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.1234	0.00200	0.1	0.00838	115	75 - 125				
Lead	0.1133	0.00200	0.1	0.000016	113	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> 137135	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>SD</b>	Sample ID: <b>HS19011117-11SD</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 13:20</b>							
Client ID: <b>WG-1620-MW82B-20190122</b>	Run ID: <b>ICPMS05_331929</b>	SeqNo: <b>4930632</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>5</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual
Arsenic	0.009162	0.0100					0.00838	0	10	J
Lead	U	0.0100					0.000016	0	10	

**The following samples were analyzed in this batch:**

HS19011117-01	HS19011117-02	HS19011117-03	HS19011117-04
HS19011117-05	HS19011117-06	HS19011117-07	HS19011117-08
HS19011117-09	HS19011117-11	HS19011117-12	HS19011117-13
HS19011117-14	HS19011117-15	HS19011117-16	HS19011117-17
HS19011117-19			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> 137136	<b>Instrument:</b> ICPMS04	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-137136</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 19:43</b>							
Client ID:	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931362</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-137136</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 19:45</b>							
Client ID:	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931363</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.04983	0.00200	0.05	0	99.7	80 - 120				
Lead	0.04872	0.00200	0.05	0	97.4	80 - 120				

<b>MS</b>	Sample ID: <b>HS19011117-18MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 19:56</b>							
Client ID: <b>WG-1620-MW61A-20190123</b>	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931368</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.04787	0.00200	0.05	0.000637	94.5	80 - 120				
Lead	0.04626	0.00200	0.05	0.000333	91.8	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19011117-18MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 19:58</b>							
Client ID: <b>WG-1620-MW61A-20190123</b>	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931369</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05016	0.00200	0.05	0.000637	99.1	80 - 120	0.04886	2.63	20	
Lead	0.04683	0.00200	0.05	0.000333	93.0	80 - 120	0.04625	1.23	20	

<b>PDS</b>	Sample ID: <b>HS19011117-18PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>30-Jan-2019 20:01</b>							
Client ID: <b>WG-1620-MW61A-20190123</b>	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931370</b>	PrepDate: <b>29-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.09624	0.00200	0.1	0.000637	95.6	75 - 125				
Lead	0.09092	0.00200	0.1	0.000333	90.6	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> 137136		<b>Instrument:</b> ICPMS04		<b>Method:</b> SW6020						
<b>SD</b>	Sample ID: <b>HS19011117-18SD</b>	Units: <b>mg/L</b>		Analysis Date: <b>30-Jan-2019 19:54</b>						
Client ID: <b>WG-1620-MW61A-20190123</b>	Run ID: <b>ICPMS04_331931</b>	SeqNo: <b>4931367</b>	PrepDate: <b>29-Jan-2019</b>	DF: <b>5</b>						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual

Arsenic	U	0.0100					0.000637	0	10
Lead	U	0.0100					0.000333	0	10

The following samples were analyzed in this batch: HS19011117-18

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-137036	Units: ug/L			Analysis Date: 29-Jan-2019 13:31					
Client ID:	Run ID: SV-6_331877	SeqNo: 4928544	PrepDate: 25-Jan-2019	DF: 1						
Analyte	Result	SQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.566</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>51.3</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.084</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.7</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.075</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.5</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.366</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>67.3</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.806</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>56.1</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.304</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>66.1</i>	<i>20 - 120</i>				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-137036	Units: ug/L			Analysis Date: 29-Jan-2019 13:51					
Client ID:	Run ID: SV-6_331877	SeqNo: 4928545		PrepDate: 25-Jan-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.025	0.20	5	0	60.5	39 - 127				
2,4-Dimethylphenol	3.058	0.20	5	0	61.2	35 - 120				
2,4-Dinitrotoluene	2.802	0.20	5	0	56.0	50 - 122				
2,6-Dinitrotoluene	3.198	0.20	5	0	64.0	50 - 120				
2-Chloronaphthalene	3.134	0.20	5	0	62.7	50 - 120				
2-Methylnaphthalene	3.239	0.10	5	0	64.8	50 - 120				
4,6-Dinitro-2-methylphenol	2.587	0.20	5	0	51.7	25 - 121				
4-Nitrophenol	2.785	1.0	5	0	55.7	30 - 130				
Acenaphthene	2.887	0.10	5	0	57.7	45 - 120				
Acenaphthylene	2.896	0.10	5	0	57.9	47 - 120				
Anthracene	3.132	0.10	5	0	62.6	45 - 120				
Benz(a)anthracene	3.255	0.10	5	0	65.1	40 - 120				
Benzo(a)pyrene	3.467	0.10	5	0	69.3	45 - 120				
Bis(2-chloroethoxy)methane	2.977	0.20	5	0	59.5	45 - 120				
Bis(2-ethylhexyl)phthalate	3.273	0.20	5	0	65.5	40 - 139				
Chrysene	3.356	0.10	5	0	67.1	43 - 120				
Dibenzofuran	2.866	0.10	5	0	57.3	50 - 120				
Di-n-butyl phthalate	3.281	0.20	5	0	65.6	45 - 123				
Fluoranthene	3.315	0.10	5	0	66.3	45 - 125				
Fluorene	2.97	0.10	5	0	59.4	49 - 120				
Naphthalene	3.019	0.10	5	0	60.4	45 - 120				
Nitrobenzene	2.956	0.20	5	0	59.1	44 - 120				
N-Nitrosodiphenylamine	3.241	0.20	5	0	64.8	40 - 125				
Pentachlorophenol	2.696	0.20	5	0	53.9	19 - 121				
Phenanthrene	3.135	0.10	5	0	62.7	45 - 121				
Phenol	2.792	0.20	5	0	55.8	20 - 124				
Pyrene	3.312	0.10	5	0	66.2	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.334</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>66.7</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.379</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>67.6</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.418</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>68.4</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.859</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>77.2</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.215</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.3</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.579</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>71.6</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270				
MS		Sample ID: HS19011117-18MS		Units: ug/L		Analysis Date: 11-Feb-2019 17:24		
Client ID: WG-1620-MW61A-20190123		Run ID: SV-7_332624		SeqNo: 4945822		PrepDate: 25-Jan-2019 DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
1,2-Diphenylhydrazine	2.423	0.20	5	0	48.5	39 - 127		
2,4-Dimethylphenol	2.608	0.20	5	0	52.2	35 - 120		
2,4-Dinitrotoluene	3.083	0.20	5	0	61.7	50 - 122		
2,6-Dinitrotoluene	2.903	0.20	5	0	58.1	50 - 120		
2-Chloronaphthalene	2.904	0.20	5	0	58.1	50 - 120		
2-Methylnaphthalene	2.802	0.10	5	0	56.0	50 - 120		
4,6-Dinitro-2-methylphenol	3.635	0.20	5	0	72.7	25 - 121		
4-Nitrophenol	3.16	1.0	5	0	63.2	30 - 130		
Acenaphthene	2.443	0.10	5	0	48.9	45 - 120		
Acenaphthylene	2.633	0.10	5	0	52.7	47 - 120		
Anthracene	3.124	0.10	5	0	62.5	45 - 120		
Benz(a)anthracene	3.743	0.10	5	0	74.9	40 - 120		
Benzo(a)pyrene	3.604	0.10	5	0	72.1	45 - 120		
Bis(2-chloroethoxy)methane	2.432	0.20	5	0	48.6	45 - 120		
Bis(2-ethylhexyl)phthalate	3.271	0.20	5	0	65.4	40 - 139		
Chrysene	3.747	0.10	5	0	74.9	43 - 120		
Dibenzofuran	2.735	0.10	5	0	54.7	50 - 120		
Di-n-butyl phthalate	3.134	0.20	5	0	62.7	45 - 123		
Fluoranthene	3.418	0.10	5	0	68.4	45 - 125		
Fluorene	2.833	0.10	5	0	56.7	49 - 120		
Naphthalene	2.722	0.10	5	0	54.4	45 - 120		
Nitrobenzene	2.529	0.20	5	0	50.6	44 - 120		
N-Nitrosodiphenylamine	3.022	0.20	5	0	60.4	40 - 125		
Pentachlorophenol	3.933	0.20	5	0	78.7	19 - 121		
Phenanthrene	3.023	0.10	5	0	60.5	45 - 121		
Phenol	2.451	0.20	5	0	49.0	20 - 124		
Pyrene	3.657	0.10	5	0	73.1	40 - 130		
Surr: 2,4,6-Tribromophenol	4.275	0.20	5	0	85.5	34 - 129		
Surr: 2-Fluorobiphenyl	2.906	0.20	5	0	58.1	40 - 125		
Surr: 2-Fluorophenol	2.421	0.20	5	0	48.4	20 - 120		
Surr: 4-Terphenyl-d14	4.132	0.20	5	0	82.6	40 - 135		
Surr: Nitrobenzene-d5	2.624	0.20	5	0	52.5	41 - 120		
Surr: Phenol-d6	2.817	0.20	5	0	56.3	20 - 120		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270						
MS		Sample ID: HS19011117-11MS		Units: ug/L		Analysis Date: 29-Jan-2019 16:48				
Client ID: WG-1620-MW82B-20190122		Run ID: SV-6_331877		SeqNo: 4930593		PrepDate: 25-Jan-2019 DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.355	0.20	5	0	67.1	39 - 127				
2,4-Dimethylphenol	3.096	0.20	5	0	61.9	35 - 120				
2,4-Dinitrotoluene	3.243	0.20	5	0	64.9	50 - 122				
2,6-Dinitrotoluene	3.269	0.20	5	0	65.4	50 - 120				
2-Chloronaphthalene	3.161	0.20	5	0	63.2	50 - 120				
2-Methylnaphthalene	3.11	0.10	5	0	62.2	50 - 120				
4,6-Dinitro-2-methylphenol	3.299	0.20	5	0	66.0	25 - 121				
4-Nitrophenol	2.827	1.0	5	0	56.5	30 - 130				
Acenaphthene	2.902	0.10	5	0	58.0	45 - 120				
Acenaphthylene	3.039	0.10	5	0	60.8	47 - 120				
Anthracene	3.565	0.10	5	0.04179	70.5	45 - 120				
Benz(a)anthracene	3.756	0.10	5	0	75.1	40 - 120				
Benzo(a)pyrene	3.63	0.10	5	0	72.6	45 - 120				
Bis(2-chloroethoxy)methane	3.027	0.20	5	0	60.5	45 - 120				
Bis(2-ethylhexyl)phthalate	3.57	0.20	5	0	71.4	40 - 139				
Chrysene	3.767	0.10	5	0	75.3	43 - 120				
Dibenzofuran	3.004	0.10	5	0	60.1	50 - 120				
Di-n-butyl phthalate	3.787	0.20	5	0	75.7	45 - 123				
Fluoranthene	3.896	0.10	5	0	77.9	45 - 125				
Fluorene	3.24	0.10	5	0	64.8	49 - 120				
Naphthalene	2.922	0.10	5	0	58.4	45 - 120				
Nitrobenzene	2.874	0.20	5	0	57.5	44 - 120				
N-Nitrosodiphenylamine	3.63	0.20	5	0	72.6	40 - 125				
Pentachlorophenol	3.463	0.20	5	0	69.3	19 - 121				
Phenanthrene	3.492	0.10	5	0	69.8	45 - 121				
Phenol	2.755	0.20	5	0	55.1	20 - 124				
Pyrene	3.62	0.10	5	0	72.4	40 - 130				
Surr: 2,4,6-Tribromophenol	3.91	0.20	5	0	78.2	34 - 129				
Surr: 2-Fluorobiphenyl	3.186	0.20	5	0	63.7	40 - 125				
Surr: 2-Fluorophenol	3.276	0.20	5	0	65.5	20 - 120				
Surr: 4-Terphenyl-d14	4.085	0.20	5	0	81.7	40 - 135				
Surr: Nitrobenzene-d5	3.082	0.20	5	0	61.6	41 - 120				
Surr: Phenol-d6	3.253	0.20	5	0	65.1	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270					
MSD		Sample ID: HS19011117-18MSD		Units: ug/L		Analysis Date: 11-Feb-2019 17:44			
Client ID: WG-1620-MW61A-20190123		Run ID: SV-7_332624		SeqNo: 4945823		PrepDate: 25-Jan-2019		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2-Diphenylhydrazine	2.36	0.20	5	0	47.2	39 - 127	2.423	2.63	20
2,4-Dimethylphenol	2.419	0.20	5	0	48.4	35 - 120	2.608	7.5	20
2,4-Dinitrotoluene	2.741	0.20	5	0	54.8	50 - 122	3.083	11.7	20
2,6-Dinitrotoluene	2.704	0.20	5	0	54.1	50 - 120	2.903	7.11	20
2-Chloronaphthalene	2.861	0.20	5	0	57.2	50 - 120	2.904	1.49	20
2-Methylnaphthalene	2.658	0.10	5	0	53.2	50 - 120	2.802	5.29	20
4,6-Dinitro-2-methylphenol	3.279	0.20	5	0	65.6	25 - 121	3.635	10.3	30
4-Nitrophenol	3.306	1.0	5	0	66.1	30 - 130	3.16	4.52	20
Acenaphthene	2.469	0.10	5	0	49.4	45 - 120	2.443	1.06	20
Acenaphthylene	2.478	0.10	5	0	49.6	47 - 120	2.633	6.09	20
Anthracene	2.898	0.10	5	0	58.0	45 - 120	3.124	7.5	20
Benz(a)anthracene	3.703	0.10	5	0	74.1	40 - 120	3.743	1.08	20
Benzo(a)pyrene	3.625	0.10	5	0	72.5	45 - 120	3.604	0.583	20
Bis(2-chloroethoxy)methane	2.271	0.20	5	0	45.4	45 - 120	2.432	6.86	20
Bis(2-ethylhexyl)phthalate	3.228	0.20	5	0	64.6	40 - 139	3.271	1.32	20
Chrysene	3.634	0.10	5	0	72.7	43 - 120	3.747	3.06	20
Dibenzofuran	2.586	0.10	5	0	51.7	50 - 120	2.735	5.58	20
Di-n-butyl phthalate	3.137	0.20	5	0	62.7	45 - 123	3.134	0.113	20
Fluoranthene	3.488	0.10	5	0	69.8	45 - 125	3.418	2.02	20
Fluorene	2.612	0.10	5	0	52.2	49 - 120	2.833	8.12	20
Naphthalene	2.676	0.10	5	0	53.5	45 - 120	2.722	1.69	20
Nitrobenzene	2.487	0.20	5	0	49.7	44 - 120	2.529	1.68	20
N-Nitrosodiphenylamine	2.85	0.20	5	0	57.0	40 - 125	3.022	5.89	20
Pentachlorophenol	3.636	0.20	5	0	72.7	19 - 121	3.933	7.85	20
Phenanthrene	2.86	0.10	5	0	57.2	45 - 121	3.023	5.51	20
Phenol	2.423	0.20	5	0	48.5	20 - 124	2.451	1.15	20
Pyrene	3.646	0.10	5	0	72.9	40 - 130	3.657	0.292	20
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.832</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.6</i>	<i>34 - 129</i>	<i>4.275</i>	<i>10.9</i>	<i>20</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.73</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>54.6</i>	<i>40 - 125</i>	<i>2.906</i>	<i>6.26</i>	<i>20</i>
<i>Surr: 2-Fluorophenol</i>	<i>2.409</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>48.2</i>	<i>20 - 120</i>	<i>2.421</i>	<i>0.515</i>	<i>20</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>4.017</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>80.3</i>	<i>40 - 135</i>	<i>4.132</i>	<i>2.82</i>	<i>20</i>
<i>Surr: Nitrobenzene-d5</i>	<i>2.443</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>48.9</i>	<i>41 - 120</i>	<i>2.624</i>	<i>7.14</i>	<i>20</i>
<i>Surr: Phenol-d6</i>	<i>2.739</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>54.8</i>	<i>20 - 120</i>	<i>2.817</i>	<i>2.79</i>	<i>20</i>

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: 137036		Instrument: SV-6		Method: SW8270						
MSD	Sample ID: HS19011117-11MSD	Units: ug/L			Analysis Date: 29-Jan-2019 17:08					
Client ID: WG-1620-MW82B-20190122	Run ID: SV-6_331877	SeqNo: 4930594	PrepDate: 25-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	2.985	0.20	5	0	59.7	39 - 127	3.355	11.7	20	
2,4-Dimethylphenol	2.891	0.20	5	0	57.8	35 - 120	3.096	6.86	20	
2,4-Dinitrotoluene	2.904	0.20	5	0	58.1	50 - 122	3.243	11	20	
2,6-Dinitrotoluene	3.139	0.20	5	0	62.8	50 - 120	3.269	4.06	20	
2-Chloronaphthalene	3.074	0.20	5	0	61.5	50 - 120	3.161	2.79	20	
2-Methylnaphthalene	3.355	0.10	5	0	67.1	50 - 120	3.11	7.59	20	
4,6-Dinitro-2-methylphenol	2.776	0.20	5	0	55.5	25 - 121	3.299	17.2	30	
4-Nitrophenol	2.645	1.0	5	0	52.9	30 - 130	2.827	6.64	20	
Acenaphthene	2.807	0.10	5	0	56.1	45 - 120	2.902	3.34	20	
Acenaphthylene	2.867	0.10	5	0	57.3	47 - 120	3.039	5.85	20	
Anthracene	3.277	0.10	5	0.04179	64.7	45 - 120	3.565	8.41	20	
Benz(a)anthracene	3.593	0.10	5	0	71.9	40 - 120	3.756	4.42	20	
Benzo(a)pyrene	3.768	0.10	5	0	75.4	45 - 120	3.63	3.73	20	
Bis(2-chloroethoxy)methane	3.085	0.20	5	0	61.7	45 - 120	3.027	1.9	20	
Bis(2-ethylhexyl)phthalate	3.647	0.20	5	0	72.9	40 - 139	3.57	2.12	20	
Chrysene	3.695	0.10	5	0	73.9	43 - 120	3.767	1.92	20	
Dibenzofuran	2.842	0.10	5	0	56.8	50 - 120	3.004	5.54	20	
Di-n-butyl phthalate	3.683	0.20	5	0	73.7	45 - 123	3.787	2.78	20	
Fluoranthene	3.617	0.10	5	0	72.3	45 - 125	3.896	7.42	20	
Fluorene	2.948	0.10	5	0	59.0	49 - 120	3.24	9.46	20	
Naphthalene	3.017	0.10	5	0	60.3	45 - 120	2.922	3.19	20	
Nitrobenzene	2.921	0.20	5	0	58.4	44 - 120	2.874	1.62	20	
N-Nitrosodiphenylamine	3.303	0.20	5	0	66.1	40 - 125	3.63	9.41	20	
Pentachlorophenol	2.969	0.20	5	0	59.4	19 - 121	3.463	15.4	20	
Phenanthrene	3.292	0.10	5	0	65.8	45 - 121	3.492	5.91	20	
Phenol	2.812	0.20	5	0	56.2	20 - 124	2.755	2.06	20	
Pyrene	3.51	0.10	5	0	70.2	40 - 130	3.62	3.07	20	
Surr: 2,4,6-Tribromophenol	3.267	0.20	5	0	65.3	34 - 129	3.91	17.9	20	
Surr: 2-Fluorobiphenyl	2.918	0.20	5	0	58.4	40 - 125	3.186	8.78	20	
Surr: 2-Fluorophenol	2.579	0.20	5	0	51.6	20 - 120	3.276	23.8	20	R
Surr: 4-Terphenyl-d14	3.715	0.20	5	0	74.3	40 - 135	4.085	9.48	20	
Surr: Nitrobenzene-d5	3.043	0.20	5	0	60.9	41 - 120	3.082	1.25	20	
Surr: Phenol-d6	2.962	0.20	5	0	59.2	20 - 120	3.253	9.35	20	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> 137036	<b>Instrument:</b> SV-6	<b>Method:</b> SW8270
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The following samples were analyzed in this batch:

HS19011117-01	HS19011117-02	HS19011117-03	HS19011117-04
HS19011117-05	HS19011117-06	HS19011117-07	HS19011117-08
HS19011117-09	HS19011117-11	HS19011117-12	HS19011117-13
HS19011117-14	HS19011117-15	HS19011117-16	HS19011117-17
HS19011117-18	HS19011117-19		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID: R331844</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190128</b>	Units: <b>ug/L</b>			Analysis Date: <b>28-Jan-2019 23:41</b>				
Client ID:	Run ID: <b>VOA2_331844</b>	SeqNo: <b>4927949</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.5</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.46</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.9</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>51.78</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.5</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190128</b>	Units: <b>ug/L</b>			Analysis Date: <b>28-Jan-2019 22:53</b>				
Client ID:	Run ID: <b>VOA2_331844</b>	SeqNo: <b>4927948</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	16.74	1.0	20	0	83.7	70 - 124			
Benzene	20.94	1.0	20	0	105	74 - 120			
Chlorobenzene	20.19	1.0	20	0	101	76 - 113			
Ethylbenzene	20.29	1.0	20	0	101	77 - 117			
Methylene chloride	20.8	2.0	20	0	104	70 - 127			
Toluene	20.05	1.0	20	0	100	77 - 118			
Vinyl chloride	20.82	1.0	20	0	104	70 - 130			
Xylenes, Total	62.37	1.0	60	0	104	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.17</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.3</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.88</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

**Batch ID:** R331844      **Instrument:** VOA2      **Method:** SW8260

MS		Sample ID: HS19011117-11MS			Units: ug/L		Analysis Date: 29-Jan-2019 00:29			
Client ID: WG-1620-MW82B-20190122		Run ID: VOA2_331844			SeqNo: 4927951		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.32	1.0	20	0	76.6	70 - 127				
Benzene	19.32	1.0	20	0	96.6	70 - 127				
Chlorobenzene	18.51	1.0	20	0	92.5	70 - 114				
Ethylbenzene	19.18	1.0	20	0	95.9	70 - 124				
Methylene chloride	17.35	2.0	20	0	86.8	70 - 128				
Toluene	18.67	1.0	20	0	93.4	70 - 123				
Vinyl chloride	20.97	1.0	20	0	105	70 - 130				
Xylenes, Total	57.78	1.0	60	0	96.3	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.6</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.2</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.83</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.92</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.01</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19011117-11MSD			Units: ug/L		Analysis Date: 29-Jan-2019 00:53			
Client ID: WG-1620-MW82B-20190122		Run ID: VOA2_331844			SeqNo: 4927952		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.68	1.0	20	0	78.4	70 - 127	15.32	2.36	20	
Benzene	19.19	1.0	20	0	95.9	70 - 127	19.32	0.679	20	
Chlorobenzene	18.72	1.0	20	0	93.6	70 - 114	18.51	1.15	20	
Ethylbenzene	19.22	1.0	20	0	96.1	70 - 124	19.18	0.194	20	
Methylene chloride	17.99	2.0	20	0	90.0	70 - 128	17.35	3.61	20	
Toluene	18.9	1.0	20	0	94.5	70 - 123	18.67	1.18	20	
Vinyl chloride	20.3	1.0	20	0	101	70 - 130	20.97	3.26	20	
Xylenes, Total	58.55	1.0	60	0	97.6	70 - 130	57.78	1.32	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.3</i>	<i>70 - 126</i>	<i>48.6</i>	<i>0.984</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.27</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.5</i>	<i>81 - 113</i>	<i>49.83</i>	<i>1.12</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>51.62</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>77 - 123</i>	<i>51.92</i>	<i>0.588</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>50.01</i>	<i>0.667</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19011117-01    HS19011117-02    HS19011117-03    HS19011117-04  
 HS19011117-05    HS19011117-06    HS19011117-11



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> R331938	<b>Instrument:</b> VOA2	<b>Method:</b> SW8260
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<b>MBLK</b>		Sample ID: <b>VBLKW-190129</b>			Units: <b>ug/L</b>		Analysis Date: <b>29-Jan-2019 12:55</b>			
Client ID:		Run ID: <b>VOA2_331938</b>			SeqNo: <b>4929928</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>43.61</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>87.2</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.13</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.3</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100.0</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>52.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190129</b>			Units: <b>ug/L</b>		Analysis Date: <b>29-Jan-2019 12:07</b>			
Client ID:		Run ID: <b>VOA2_331938</b>			SeqNo: <b>4929927</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.13	1.0	20	0	80.7	70 - 124				
Benzene	20.8	1.0	20	0	104	74 - 120				
Chlorobenzene	20.16	1.0	20	0	101	76 - 113				
Ethylbenzene	20.49	1.0	20	0	102	77 - 117				
Methylene chloride	17.64	2.0	20	0	88.2	70 - 127				
Toluene	19.97	1.0	20	0	99.9	77 - 118				
Xylenes, Total	63.15	1.0	60	0	105	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.96</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.9</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.5</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.01</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.0</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

Batch ID: R331938		Instrument: VOA2		Method: SW8260						
<b>MS</b>	Sample ID: <b>HS19011125-01MS</b>	Units: <b>ug/L</b>			Analysis Date: <b>29-Jan-2019 15:19</b>					
Client ID:	Run ID: <b>VOA2_331938</b>	SeqNo: <b>4929934</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	13.85	1.0	20	0	69.3	70 - 127				S
Benzene	18.31	1.0	20	0	91.6	70 - 127				
Chlorobenzene	18.44	1.0	20	0	92.2	70 - 114				
Ethylbenzene	19.18	1.0	20	0	95.9	70 - 124				
Methylene chloride	16.63	2.0	20	0	83.2	70 - 128				
Toluene	18.75	1.0	20	0	93.7	70 - 123				
Xylenes, Total	57.09	1.0	60	0	95.2	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.46</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>88.9</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.2</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.4</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.45</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.88</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>82 - 127</i>				

<b>MSD</b>	Sample ID: <b>HS19011125-01MSD</b>	Units: <b>ug/L</b>			Analysis Date: <b>29-Jan-2019 15:43</b>					
Client ID:	Run ID: <b>VOA2_331938</b>	SeqNo: <b>4929935</b>		PrepDate:			DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	13.94	1.0	20	0	69.7	70 - 127	13.85	0.617	20	S
Benzene	18.01	1.0	20	0	90.1	70 - 127	18.31	1.65	20	
Chlorobenzene	17.68	1.0	20	0	88.4	70 - 114	18.44	4.22	20	
Ethylbenzene	18.42	1.0	20	0	92.1	70 - 124	19.18	4.06	20	
Methylene chloride	15.81	2.0	20	0	79.0	70 - 128	16.63	5.07	20	
Toluene	18.15	1.0	20	0	90.8	70 - 123	18.75	3.22	20	
Xylenes, Total	55.26	1.0	60	0	92.1	70 - 130	57.09	3.26	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.7</i>	<i>70 - 126</i>	<i>44.46</i>	<i>4.16</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.52</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.0</i>	<i>81 - 113</i>	<i>49.2</i>	<i>1.4</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>77 - 123</i>	<i>49.45</i>	<i>0.0607</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>82 - 127</i>	<i>50.88</i>	<i>1.55</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19011117-07

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID: R331946</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190129</b>	Units: <b>ug/L</b>			Analysis Date: <b>30-Jan-2019 00:32</b>				
Client ID:	Run ID: <b>VOA2_331946</b>	SeqNo: <b>4930130</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>43.24</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>86.5</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.0</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>48.96</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.9</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190129</b>	Units: <b>ug/L</b>			Analysis Date: <b>29-Jan-2019 23:44</b>				
Client ID:	Run ID: <b>VOA2_331946</b>	SeqNo: <b>4930129</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	16.14	1.0	20	0	80.7	70 - 124			
Benzene	20.59	1.0	20	0	103	74 - 120			
Chlorobenzene	20.38	1.0	20	0	102	76 - 113			
Ethylbenzene	19.84	1.0	20	0	99.2	77 - 117			
Methylene chloride	19.54	2.0	20	0	97.7	70 - 127			
Toluene	19.73	1.0	20	0	98.6	77 - 118			
Vinyl chloride	20.42	1.0	20	0	102	70 - 130			
Xylenes, Total	61.49	1.0	60	0	102	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.12</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.2</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.26</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.5</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>49.49</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.07</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

**Batch ID:** R331946      **Instrument:** VOA2      **Method:** SW8260

MS		Sample ID: HS19011117-18MS			Units: ug/L		Analysis Date: 30-Jan-2019 02:56			
Client ID: WG-1620-MW61A-20190123		Run ID: VOA2_331946			SeqNo: 4930196		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.23	1.0	20	0	76.2	70 - 127				
Benzene	19.02	1.0	20	0	95.1	70 - 127				
Chlorobenzene	18.75	1.0	20	0	93.7	70 - 114				
Ethylbenzene	19.01	1.0	20	0	95.1	70 - 124				
Methylene chloride	17.15	2.0	20	0	85.7	70 - 128				
Toluene	18.86	1.0	20	0	94.3	70 - 123				
Vinyl chloride	20.64	1.0	20	0	103	70 - 130				
Xylenes, Total	58.14	1.0	60	0	96.9	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.65</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.3</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.49</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.45</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.61</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19011117-18MSD			Units: ug/L		Analysis Date: 30-Jan-2019 03:20			
Client ID: WG-1620-MW61A-20190123		Run ID: VOA2_331946			SeqNo: 4930197		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.84	1.0	20	0	74.2	70 - 127	15.23	2.59	20	
Benzene	18.86	1.0	20	0	94.3	70 - 127	19.02	0.849	20	
Chlorobenzene	18.88	1.0	20	0	94.4	70 - 114	18.75	0.725	20	
Ethylbenzene	19.23	1.0	20	0	96.2	70 - 124	19.01	1.15	20	
Methylene chloride	17.02	2.0	20	0	85.1	70 - 128	17.15	0.774	20	
Toluene	18.81	1.0	20	0	94.1	70 - 123	18.86	0.271	20	
Vinyl chloride	19.99	1.0	20	0	99.9	70 - 130	20.64	3.21	20	
Xylenes, Total	58.26	1.0	60	0	97.1	70 - 130	58.14	0.214	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.63</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.3</i>	<i>70 - 126</i>	<i>45.65</i>	<i>2.13</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.51</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>81 - 113</i>	<i>50.49</i>	<i>1.96</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>77 - 123</i>	<i>49.45</i>	<i>0.2</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>	<i>50.61</i>	<i>0.526</i>	<i>20</i>	

The following samples were analyzed in this batch:

HS19011117-09	HS19011117-10	HS19011117-12	HS19011117-13
HS19011117-14	HS19011117-15	HS19011117-16	HS19011117-17
HS19011117-18	HS19011117-19		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

<b>Batch ID:</b> R332011	<b>Instrument:</b> VOA2	<b>Method:</b> SW8260
--------------------------	-------------------------	-----------------------

<b>MBLK</b>		Sample ID: <b>VBLKW-190130</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-Jan-2019 14:44</b>			
Client ID:		Run ID: <b>VOA2_332011</b>			SeqNo: <b>4931480</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>42.74</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>85.5</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.59</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.2</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.02</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>51.36</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190130</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-Jan-2019 13:55</b>			
Client ID:		Run ID: <b>VOA2_332011</b>			SeqNo: <b>4931479</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16	1.0	20	0	80.0	70 - 124				
Benzene	19.83	1.0	20	0	99.2	74 - 120				
Chlorobenzene	19.8	1.0	20	0	99.0	76 - 113				
Ethylbenzene	19.48	1.0	20	0	97.4	77 - 117				
Methylene chloride	18.46	2.0	20	0	92.3	70 - 127				
Toluene	19.45	1.0	20	0	97.2	77 - 118				
Xylenes, Total	60.61	1.0	60	0	101	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.7</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.33</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.41</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.9</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QC BATCH REPORT**

**Batch ID:** R332011      **Instrument:** VOA2      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19011301-02MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-Jan-2019 16:44</b>			
Client ID:		Run ID: <b>VOA2_332011</b>			SeqNo: <b>4931485</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.82	1.0	20	0	74.1	70 - 127				
Benzene	18.03	1.0	20	0	90.1	70 - 127				
Chlorobenzene	17.82	1.0	20	0	89.1	70 - 114				
Ethylbenzene	18.33	1.0	20	0	91.7	70 - 124				
Methylene chloride	17.28	2.0	20	0	86.4	70 - 128				
Toluene	17.82	1.0	20	0	89.1	70 - 123				
Xylenes, Total	54.85	1.0	60	0	91.4	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.31</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.6</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.72</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.4</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.87</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.09</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19011301-02MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-Jan-2019 17:08</b>			
Client ID:		Run ID: <b>VOA2_332011</b>			SeqNo: <b>4931486</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.25	1.0	20	0	71.3	70 - 127	14.82	3.93	20	
Benzene	17.96	1.0	20	0	89.8	70 - 127	18.03	0.401	20	
Chlorobenzene	17.94	1.0	20	0	89.7	70 - 114	17.82	0.708	20	
Ethylbenzene	18.28	1.0	20	0	91.4	70 - 124	18.33	0.305	20	
Methylene chloride	16.93	2.0	20	0	84.6	70 - 128	17.28	2.06	20	
Toluene	17.86	1.0	20	0	89.3	70 - 123	17.82	0.251	20	
Xylenes, Total	55.2	1.0	60	0	92.0	70 - 130	54.85	0.634	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.39</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>90.8</i>	<i>70 - 126</i>	<i>46.31</i>	<i>2</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.79</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.6</i>	<i>81 - 113</i>	<i>49.72</i>	<i>0.139</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.56</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.1</i>	<i>77 - 123</i>	<i>49.87</i>	<i>0.634</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>49.98</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100.0</i>	<i>82 - 127</i>	<i>50.09</i>	<i>0.217</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19011117-08

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011117

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

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**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019



Sample Receipt Checklist

Client Name: PBW
Work Order: HS19011117

Date/Time Received: 23-Jan-2019 17:40
Received by: PMG

Checklist completed by: Pablo Martinez
eSignature
Date: 23-Jan-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 28-Jan-2019

Matrices: WATER

Carrier name: Client

- Shipping container/cooler in good condition?
Custody seals intact on shipping container/cooler?
Custody seals intact on sample bottles?
VOA/TX1005/TX1006 Solids in hermetically sealed vials?
Chain of custody present?
Chain of custody signed when relinquished and received?
Samplers name present on COC?
Chain of custody agrees with sample labels?
Samples in proper container/bottle?
Sample containers intact?
Sufficient sample volume for indicated test?
All samples received within holding time?
Container/Temp Blank temperature in compliance?
Temperature(s)/Thermometer(s):

- Yes No Not Present
Yes No Not Present
Yes No Not Present
Yes No Not Present
Yes No
Yes No
Yes No
Yes No
Yes No
Yes No
Yes No
Yes No
Yes No

2 Page(s)
COC IDs:194327, 194323

0.6C/0.9C, 1.2C/1.5C, 0.4C/0.7C, 0.9C/1.2C, 1.1C/1.4C UC/C IR # 25
24950, 43905, 43899, 43681, 44426
1/23/19 19:00

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

Water - VOA vials have zero headspace?

Yes No No VOA vials submitted

Water - pH acceptable upon receipt?

Yes No N/A

pH adjusted?

Yes No N/A

pH adjusted by:

[Empty text box]

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

[Empty text box]

Corrective Action:

[Empty text box]



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# Chain of Custody Form

Page 1 of 2

COC ID: 194327

## HS19011117

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E	
	Suite 4004		Stop 0750	F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwilc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TD0-201901			Water	1	2											
2	WG-1620-MW44A-20190122	1-22-19	0725	W	●	6		X	X	X							
3	WG-1620-MW87C-20190122		0815	W		6	X		X	X							
4	WG-1620-MW33BR-20190122		0905	W		6		X	X	X							
5	WG-1620-MW33A-20190122		1000	W		6	X		X	X							
6	WG-1620-FD04-20190122		1000	W		6	X		X	X							
7	WG-1620-MW38B-20190122		1100	W		6	X		X	X							
8	WG-1620-MW22AR-20190122		1150	W		6	X		X	X							
9	WG-1620-MW22BR-20190122		1235	W		6	X		X	X							
10	WG-1620-MW38A-20190122		1340	W		6	X		X	X							

Sampler(s) Please Print & Sign: **JOHN BRAYTON** *John Brayton*

Shipment Method: **HAND DELIVERED**

Required Turnaround Time: (Check Box)  STD 10 Wk Days  5 Wk Days  2 Wk Days  24 Hour

Results Due Date: \_\_\_\_\_

Relinquished by: *John Brayton* Date: **1/23/19** Time: **17:40**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received by (Laboratory): \_\_\_\_\_ Date: **1/23/19** Time: **17:40**

Checked by (Laboratory): \_\_\_\_\_

Logged by (Laboratory): \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Notes: UPRR Houston MWPW

Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)	
24950	0.6	<input type="checkbox"/> Level II Std OC	<input checked="" type="checkbox"/> TRRF Checklist
43905	1.2	<input type="checkbox"/> Level III Std OC/Raw Data	<input type="checkbox"/> TRRF Level IV
43394	0.4	<input type="checkbox"/> Level IV SW846/CLP	
43031	0.1	<input type="checkbox"/> Other	

Preservative Key: 1-HCl 2-HNO<sub>3</sub> 3-H<sub>2</sub>SO<sub>4</sub> 4-NaOH 5-Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 6-NaHSO<sub>4</sub> 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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*CVF0-3*



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# Chain of Custody Form

Page 2 of 2

COC ID: 194323

HS19011117

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E	ms/msd
	Suite 4004		Stop 0750	F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwilc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TBDS-20190123			Water	1	2											
2	WG-1620-MWB2B-20190122	1-22-19	1455	W		6	X		X	X	X						
3	WG-1620-MW90B-20190122		1600	W		6	X		X	X							
4	WG-1620-MW89B-20190122		1650	W		6	X		X	X							
5	WG-1620-MW27C-20190122		1745	W		6	X		X	X							
6	WG-1620-FB06-20190122		1800	W		6	X		X	X							
7	WG-1620-MW62B-20190123	1-23-19	0715	W		6	X		X	X							
8	WG-1620-MW64A-20190123		0810	W		6	X		X	X							
9	WG-1620-MW61A-20190123		0920	W		6		X	X	X	X						
10	WG-1620-MW47C-20190123		1015	W		6	X		X	X							

Sampler(s) Please Print & Sign <i>DAVID BRAYTON</i>		Shipment Method	Required Turnaround Time: (Check Box)		Results Due Date:
Relinquished by: <i>[Signature]</i>			<input checked="" type="checkbox"/> STD 10 Wk Days	<input type="checkbox"/> 5 Wk Days	<input type="checkbox"/> 2 Wk Days
Date: 1-23-19	Time: 17:40	Received by:	Notes: UPRR Houston MWPW		
Relinquished by:		Received by (Laboratory):	Cooler ID: 24950	Cooler Temp: 0.6	QC Package: (Check One Box Below)
Logged by (Laboratory):		Checked by (Laboratory):	43905	1-2	<input type="checkbox"/> Level II Std QC
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035			43869	0.4	<input checked="" type="checkbox"/> TRRP Checklist
			43681	0.1	<input type="checkbox"/> TRRP Level IV
			44426	1.1	<input type="checkbox"/> Level IV SW846/CLP
					<input type="checkbox"/> Other

Notes: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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February 15, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19011199**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 20 sample(s) on Jan 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER  
Dane J. Wacasey

---

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

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**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey

**Laboratory Review Checklist: Reportable Data**

Laboratory Name: ALS Laboratory Group			LRC Date: 02/15/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19011199				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137100, 137198, 137313, R332110, R332113, R332226				
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?		X			1
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			2
		Were MS/MSD RPDs within laboratory QC limits?	X				
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				3
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 02/15/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19011199			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 137100, 137198, 137313, R332110, R332113, R332226			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section</b>					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods (NELAC Chap 5 or ISO/IEC 17025 Section 5)</b>					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).



**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group	LRC Date: 02/15/2019
Project Name: Houston TX-Wood Preserving Works	Laboratory Job Number: HS19011199
Reviewer Name: Dane Wacasey	Prep Batch Number(s): 137100, 137198, 137313, R332110, R332113, R332226

ER# <sup>5</sup>	Description
1	Semivolatile Organics Method SW8270, samples WG-1620-MW74B-20190123, WG-1620-MW79A-20190123, WG-1620-MW72B-20190124, the surrogate recoveries could not be determined due to dilution below the calibration range.
2	Batch 137100, Semivolatile Organics Method SW8270, sample WG-1620-MW67B-20190124, MS and or MSD recovered outside the control limits for some compounds due to suspect matrix effect.
3	Batch 137100, Semivolatile Organics Method SW8260, samples WG-1620-MW74B-20190123, WG-1620-MW79A-20190123, WG-1620-MW72B-20190124, the GCMS semi-volatile extract of the samples were run at a dilution due to a high level of matrix interference.  Batch R332113, Volatile Organics Method SW8260, samples WG-1620-MW74B-20190123, WG-1620-MW79A-20190123 and WG-1620-MW72B-20190124; lowest practical dilution due to high concentration of non-target analyte(s).

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19011199

**SAMPLE SUMMARY**

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19011199-01	WQ-1620-FB08-20190124	Water		24-Jan-2019 16:15	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-02	WG-1620-MW58A-20190123	Groundwater		23-Jan-2019 11:20	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-03	WG-1620-MW32AR-20190123	Groundwater		23-Jan-2019 12:15	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-04	WG-1620-MW76C-20190123	Groundwater		23-Jan-2019 13:20	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-05	WG-1620-MW74B-20190123	Groundwater		23-Jan-2019 14:15	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-06	WG-1620-MW79A-20190123	Groundwater		23-Jan-2019 15:05	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-07	WG-1620-MW49A-20190123	Groundwater		23-Jan-2019 15:50	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-08	WG-1620-MW59A-20190123	Groundwater		23-Jan-2019 16:40	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-09	WG-1620-MW59B-20190123	Groundwater		23-Jan-2019 17:30	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-10	WQ-1620-FB07-20190123	Water		23-Jan-2019 17:00	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-11	WQ-1620-TB06-20190124	Water	ALS-121118-56	24-Jan-2019 00:00	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-12	WG-1620-MW59D-20190124	Groundwater		24-Jan-2019 07:20	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-13	WG-1620-FD05-20190124	Groundwater		24-Jan-2019 07:20	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-14	WG-1620-MW36D-20190124	Groundwater		24-Jan-2019 08:25	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-15	WG-1620-MW65D-20190124	Groundwater		24-Jan-2019 09:25	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-16	WG-1620-MW66D-20190124	Groundwater		24-Jan-2019 10:30	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-17	WG-1620-MW84B-20190124	Groundwater		24-Jan-2019 11:40	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-18	WG-1620-MW67B-20190124	Groundwater		24-Jan-2019 12:50	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-19	WG-1620-MW19C-20190124	Groundwater		24-Jan-2019 13:50	25-Jan-2019 09:07	<input type="checkbox"/>
HS19011199-20	WG-1620-MW72B-20190124	Groundwater		24-Jan-2019 14:55	25-Jan-2019 09:07	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB08-20190124  
 Collection Date: 24-Jan-2019 16:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:00
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:00
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:00
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:00
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 03:00
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:00
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:00
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.5</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:00</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>93.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:00</i>
<i>Surr: Dibromofluoromethane</i>	<i>98.7</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:00</i>
<i>Surr: Toluene-d8</i>	<i>104</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:00</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB08-20190124  
 Collection Date: 24-Jan-2019 16:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 13:36
<b>2,4-Dimethylphenol</b>	<b>0.00057</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:36
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 13:36
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 13:36
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 13:36
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 13:36
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 13:36
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 13:36
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 13:36
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 13:36
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 13:36
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 13:36
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 13:36
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 13:36
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 13:36
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 13:36
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 13:36
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 13:36
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 13:36
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 13:36
<b>Naphthalene</b>	<b>0.00075</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:36
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 13:36
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 13:36
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 13:36
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 13:36
<b>Phenol</b>	<b>0.00041</b>		<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:36
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 13:36
<i>Surr: 2,4,6-Tribromophenol</i>	<i>77.8</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>64.9</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<i>Surr: 2-Fluorophenol</i>	<i>59.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>73.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<i>Surr: Nitrobenzene-d5</i>	<i>64.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<i>Surr: Phenol-d6</i>	<i>64.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 13:36</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	06-Feb-2019 20:16
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 20:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW58A-20190123  
 Collection Date: 23-Jan-2019 11:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane		U	0.00020	0.0010	mg/L	1	01-Feb-2019 05:00
<b>Benzene</b>	<b>0.0011</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:00
<b>Chlorobenzene</b>	<b>0.00046</b>	J	<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:00
<b>Ethylbenzene</b>	<b>0.0032</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:00
Methylene chloride		U	0.0010	0.0020	mg/L	1	01-Feb-2019 05:00
<b>Toluene</b>	<b>0.0014</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:00
Vinyl chloride		U	0.00020	0.0010	mg/L	1	01-Feb-2019 05:00
<b>Xylenes, Total</b>	<b>0.0050</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:00
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>86.5</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:00</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:00</i>
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:00</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:00</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW58A-20190123  
 Collection Date: 23-Jan-2019 11:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 13:56
<b>2,4-Dimethylphenol</b>	<b>0.00010</b>	J	<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 13:56
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 13:56
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 13:56
<b>2-Methylnaphthalene</b>	<b>0.000072</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 13:56
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 13:56
<b>Acenaphthene</b>	<b>0.023</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	14-Feb-2019 13:48
<b>Acenaphthylene</b>	<b>0.00038</b>		<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Anthracene</b>	<b>0.0020</b>		<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 13:56
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 13:56
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 13:56
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000070</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Chrysene</b>	<b>0.000030</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Dibenzofuran</b>	<b>0.013</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	14-Feb-2019 13:48
<b>Di-n-butyl phthalate</b>	<b>0.000032</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Fluoranthene</b>	<b>0.0020</b>		<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Fluorene</b>	<b>0.015</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	14-Feb-2019 13:48
<b>Naphthalene</b>	<b>0.00042</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 13:56
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 13:56
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 13:56
<b>Phenanthrene</b>	<b>0.0038</b>		<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Phenol</b>	<b>0.000074</b>	J	<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
<b>Pyrene</b>	<b>0.00088</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 13:56
Surr: 2,4,6-Tribromophenol	48.0			34-129	%REC	10	14-Feb-2019 13:48
Surr: 2,4,6-Tribromophenol	83.8			34-129	%REC	1	13-Feb-2019 13:56
Surr: 2-Fluorobiphenyl	54.8			40-125	%REC	1	13-Feb-2019 13:56
Surr: 2-Fluorobiphenyl	44.6			40-125	%REC	10	14-Feb-2019 13:48
Surr: 2-Fluorophenol	30.5	J		20-120	%REC	10	14-Feb-2019 13:48
Surr: 2-Fluorophenol	50.7			20-120	%REC	1	13-Feb-2019 13:56
Surr: 4-Terphenyl-d14	73.2			40-135	%REC	1	13-Feb-2019 13:56
Surr: 4-Terphenyl-d14	43.7			40-135	%REC	10	14-Feb-2019 13:48
Surr: Nitrobenzene-d5	43.2			41-120	%REC	10	14-Feb-2019 13:48
Surr: Nitrobenzene-d5	52.7			41-120	%REC	1	13-Feb-2019 13:56
Surr: Phenol-d6	58.2			20-120	%REC	1	13-Feb-2019 13:56
Surr: Phenol-d6	33.0	J		20-120	%REC	10	14-Feb-2019 13:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW58A-20190123  
 Collection Date: 23-Jan-2019 11:20

**ANALYTICAL REPORT**

WorkOrder:HS19011199  
 Lab ID:HS19011199-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	0.00232		0.000400	0.00200	mg/L	1	06-Feb-2019 20:19
Lead		U	0.000600	0.00200	mg/L	1	06-Feb-2019 20:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW32AR-20190123  
 Collection Date: 23-Jan-2019 12:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:24
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:24
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:24
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:24
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 05:24
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:24
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:24
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>85.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:24</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.6</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:24</i>
<i>Surr: Dibromofluoromethane</i>	<i>100</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:24</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:24</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW32AR-20190123  
 Collection Date: 23-Jan-2019 12:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 14:15
<b>2,4-Dimethylphenol</b>	<b>0.00013</b>	J	<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 14:15
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 14:15
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 14:15
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 14:15
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 14:15
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 14:15
<b>Acenaphthene</b>	<b>0.00010</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 14:15
<b>Anthracene</b>	<b>0.000020</b>	J	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 14:15
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 14:15
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 14:15
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000044</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 14:15
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 14:15
<b>Di-n-butyl phthalate</b>	<b>0.000020</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
<b>Fluoranthene</b>	<b>0.000051</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 14:15
<b>Naphthalene</b>	<b>0.000067</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 14:15
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 14:15
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 14:15
<b>Phenanthrene</b>	<b>0.000034</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 14:15
<b>Pyrene</b>	<b>0.000036</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:15
<i>Surr: 2,4,6-Tribromophenol</i>	77.3			34-129	%REC	1	13-Feb-2019 14:15
<i>Surr: 2-Fluorobiphenyl</i>	50.5			40-125	%REC	1	13-Feb-2019 14:15
<i>Surr: 2-Fluorophenol</i>	41.2			20-120	%REC	1	13-Feb-2019 14:15
<i>Surr: 4-Terphenyl-d14</i>	72.6			40-135	%REC	1	13-Feb-2019 14:15
<i>Surr: Nitrobenzene-d5</i>	41.6			41-120	%REC	1	13-Feb-2019 14:15
<i>Surr: Phenol-d6</i>	48.8			20-120	%REC	1	13-Feb-2019 14:15
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.0316</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:32
<b>Lead</b>	<b>0.000644</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW76C-20190123  
 Collection Date: 23-Jan-2019 13:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:48
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:48
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:48
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:48
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 05:48
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:48
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:48
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.3</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:48</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:48</i>
<i>Surr: Dibromofluoromethane</i>	<i>100</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:48</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:48</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW76C-20190123  
 Collection Date: 23-Jan-2019 13:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-04  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 14:35
<b>2,4-Dimethylphenol</b>	<b>0.0041</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 14:35
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 14:35
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 14:35
<b>2-Methylnaphthalene</b>	<b>0.00031</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 14:35
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 14:35
<b>Acenaphthene</b>	<b>0.00011</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 14:35
<b>Anthracene</b>	<b>0.000041</b>	J	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 14:35
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 14:35
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 14:35
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000091</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 14:35
<b>Dibenzofuran</b>	<b>0.00011</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
<b>Di-n-butyl phthalate</b>	<b>0.000027</b>	J	<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 14:35
<b>Fluorene</b>	<b>0.000076</b>	J	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
<b>Naphthalene</b>	<b>0.0070</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 14:35
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 14:35
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 14:35
<b>Phenanthrene</b>	<b>0.000086</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
<b>Phenol</b>	<b>0.0012</b>		<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 14:35
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 14:35
<i>Surr: 2,4,6-Tribromophenol</i>	87.6			34-129	%REC	1	13-Feb-2019 14:35
<i>Surr: 2-Fluorobiphenyl</i>	63.1			40-125	%REC	1	13-Feb-2019 14:35
<i>Surr: 2-Fluorophenol</i>	57.3			20-120	%REC	1	13-Feb-2019 14:35
<i>Surr: 4-Terphenyl-d14</i>	76.5			40-135	%REC	1	13-Feb-2019 14:35
<i>Surr: Nitrobenzene-d5</i>	59.6			41-120	%REC	1	13-Feb-2019 14:35
<i>Surr: Phenol-d6</i>	66.6			20-120	%REC	1	13-Feb-2019 14:35
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000579</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:34
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 20:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW74B-20190123  
 Collection Date: 23-Jan-2019 14:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.0020	0.010	mg/L	10	01-Feb-2019 06:14
<b>Benzene</b>	<b>0.83</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:14
Chlorobenzene	U		0.0030	0.010	mg/L	10	01-Feb-2019 06:14
<b>Ethylbenzene</b>	<b>0.22</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:14
Methylene chloride	U		0.010	0.020	mg/L	10	01-Feb-2019 06:14
<b>Toluene</b>	<b>0.69</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:14
<b>Xylenes, Total</b>	<b>0.63</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:14
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.1</i>			<i>70-126</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:14</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:14</i>
<i>Surr: Dibromofluoromethane</i>	<i>102</i>			<i>77-123</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:14</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>82-127</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:14</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW74B-20190123  
 Collection Date: 23-Jan-2019 14:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	13-Feb-2019 14:54
<b>2,4-Dimethylphenol</b>	<b>9.0</b>		<b>0.040</b>	<b>0.20</b>	<b>mg/L</b>	1000	14-Feb-2019 15:45
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	13-Feb-2019 14:54
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	13-Feb-2019 14:54
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	13-Feb-2019 14:54
<b>2-Methylnaphthalene</b>	<b>0.22</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	14-Feb-2019 13:28
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	13-Feb-2019 14:54
4-Nitrophenol	U		0.00047	0.010	mg/L	10	13-Feb-2019 14:54
<b>Acenaphthene</b>	<b>0.098</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
<b>Acenaphthylene</b>	<b>0.0032</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
<b>Anthracene</b>	<b>0.0074</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	13-Feb-2019 14:54
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	13-Feb-2019 14:54
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	13-Feb-2019 14:54
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	13-Feb-2019 14:54
Chrysene	U		0.00021	0.0010	mg/L	10	13-Feb-2019 14:54
<b>Dibenzofuran</b>	<b>0.079</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	13-Feb-2019 14:54
<b>Fluoranthene</b>	<b>0.0038</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
<b>Fluorene</b>	<b>0.056</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
<b>Naphthalene</b>	<b>4.0</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	14-Feb-2019 15:45
Nitrobenzene	U		0.0024	0.020	mg/L	100	14-Feb-2019 13:28
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	13-Feb-2019 14:54
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	13-Feb-2019 14:54
<b>Phenanthrene</b>	<b>0.046</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
<b>Phenol</b>	<b>5.0</b>		<b>0.035</b>	<b>0.20</b>	<b>mg/L</b>	1000	14-Feb-2019 15:45
<b>Pyrene</b>	<b>0.0020</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 14:54
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	100	14-Feb-2019 13:28
Surr: 2,4,6-Tribromophenol	0	JS		34-129	%REC	1000	14-Feb-2019 15:45
Surr: 2,4,6-Tribromophenol	80.0			34-129	%REC	10	13-Feb-2019 14:54
Surr: 2-Fluorobiphenyl	63.9			40-125	%REC	10	13-Feb-2019 14:54
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	1000	14-Feb-2019 15:45
Surr: 2-Fluorobiphenyl	0	JS		40-125	%REC	100	14-Feb-2019 13:28
Surr: 2-Fluorophenol	0	JS		20-120	%REC	100	14-Feb-2019 13:28
Surr: 2-Fluorophenol	0	JS		20-120	%REC	1000	14-Feb-2019 15:45
Surr: 2-Fluorophenol	59.7			20-120	%REC	10	13-Feb-2019 14:54
Surr: 4-Terphenyl-d14	70.9			40-135	%REC	10	13-Feb-2019 14:54
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	1000	14-Feb-2019 15:45
Surr: 4-Terphenyl-d14	0	JS		40-135	%REC	100	14-Feb-2019 13:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW74B-20190123  
 Collection Date: 23-Jan-2019 14:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-05  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	14-Feb-2019 13:28
Surr: Nitrobenzene-d5	96.7			41-120	%REC	10	13-Feb-2019 14:54
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	14-Feb-2019 15:45
Surr: Phenol-d6	0	JS		20-120	%REC	1000	14-Feb-2019 15:45
Surr: Phenol-d6	76.7			20-120	%REC	10	13-Feb-2019 14:54
Surr: Phenol-d6	0	JS		20-120	%REC	100	14-Feb-2019 13:28
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	0.00140	J	0.000400	0.00200	mg/L	1	07-Feb-2019 13:22
Lead		U	0.000600	0.00200	mg/L	1	07-Feb-2019 13:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW79A-20190123  
 Collection Date: 23-Jan-2019 15:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.0020	0.010	mg/L	10	01-Feb-2019 06:41
<b>Benzene</b>	<b>0.45</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:41
Chlorobenzene	U		0.0030	0.010	mg/L	10	01-Feb-2019 06:41
<b>Ethylbenzene</b>	<b>0.19</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:41
Methylene chloride	U		0.010	0.020	mg/L	10	01-Feb-2019 06:41
<b>Toluene</b>	<b>0.55</b>		<b>0.0020</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:41
<b>Xylenes, Total</b>	<b>0.54</b>		<b>0.0030</b>	<b>0.010</b>	<b>mg/L</b>	10	01-Feb-2019 06:41
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>87.3</i>			<i>70-126</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:41</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:41</i>
<i>Surr: Dibromofluoromethane</i>	<i>98.6</i>			<i>77-123</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:41</i>
<i>Surr: Toluene-d8</i>	<i>99.8</i>			<i>82-127</i>	<i>%REC</i>	<i>10</i>	<i>01-Feb-2019 06:41</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW79A-20190123  
 Collection Date: 23-Jan-2019 15:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	13-Feb-2019 15:14
<b>2,4-Dimethylphenol</b>	<b>2.5</b>		<b>0.040</b>	<b>0.20</b>	<b>mg/L</b>	1000	14-Feb-2019 17:43
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	13-Feb-2019 15:14
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	13-Feb-2019 15:14
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	13-Feb-2019 15:14
<b>2-Methylnaphthalene</b>	<b>0.10</b>		<b>0.0019</b>	<b>0.010</b>	<b>mg/L</b>	100	14-Feb-2019 16:05
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	13-Feb-2019 15:14
4-Nitrophenol	U		0.00047	0.010	mg/L	10	13-Feb-2019 15:14
<b>Acenaphthene</b>	<b>0.039</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<b>Acenaphthylene</b>	<b>0.0015</b>		<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<b>Anthracene</b>	<b>0.0021</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	13-Feb-2019 15:14
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	13-Feb-2019 15:14
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	13-Feb-2019 15:14
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	13-Feb-2019 15:14
Chrysene	U		0.00021	0.0010	mg/L	10	13-Feb-2019 15:14
<b>Dibenzofuran</b>	<b>0.037</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	13-Feb-2019 15:14
<b>Fluoranthene</b>	<b>0.0010</b>		<b>0.00010</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<b>Fluorene</b>	<b>0.022</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<b>Naphthalene</b>	<b>1.9</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	14-Feb-2019 17:43
Nitrobenzene	U		0.00024	0.0020	mg/L	10	13-Feb-2019 15:14
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	13-Feb-2019 15:14
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	13-Feb-2019 15:14
<b>Phenanthrene</b>	<b>0.012</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<b>Phenol</b>	<b>0.51</b>		<b>0.0035</b>	<b>0.020</b>	<b>mg/L</b>	100	14-Feb-2019 16:05
<b>Pyrene</b>	<b>0.00063</b>	J	<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 15:14
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	100	14-Feb-2019 16:05
<i>Surr: 2,4,6-Tribromophenol</i>	0	JS		34-129	%REC	1000	14-Feb-2019 17:43
<i>Surr: 2,4,6-Tribromophenol</i>	62.8			34-129	%REC	10	13-Feb-2019 15:14
<i>Surr: 2-Fluorobiphenyl</i>	52.2			40-125	%REC	10	13-Feb-2019 15:14
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	1000	14-Feb-2019 17:43
<i>Surr: 2-Fluorobiphenyl</i>	0	JS		40-125	%REC	100	14-Feb-2019 16:05
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	100	14-Feb-2019 16:05
<i>Surr: 2-Fluorophenol</i>	0	JS		20-120	%REC	1000	14-Feb-2019 17:43
<i>Surr: 2-Fluorophenol</i>	56.4			20-120	%REC	10	13-Feb-2019 15:14
<i>Surr: 4-Terphenyl-d14</i>	54.4			40-135	%REC	10	13-Feb-2019 15:14
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	1000	14-Feb-2019 17:43
<i>Surr: 4-Terphenyl-d14</i>	0	JS		40-135	%REC	100	14-Feb-2019 16:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW79A-20190123  
 Collection Date: 23-Jan-2019 15:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-06  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>				Prep:SW3510 / 28-Jan-2019	Analyst: GEY
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	14-Feb-2019 16:05
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	14-Feb-2019 17:43
Surr: Nitrobenzene-d5	51.7			41-120	%REC	10	13-Feb-2019 15:14
Surr: Phenol-d6	53.9			20-120	%REC	10	13-Feb-2019 15:14
Surr: Phenol-d6	0	JS		20-120	%REC	100	14-Feb-2019 16:05
Surr: Phenol-d6	0	JS		20-120	%REC	1000	14-Feb-2019 17:43
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>				Prep:SW3010A / 01-Feb-2019	Analyst: JHD
Arsenic	0.0133		0.000400	0.00200	mg/L	1	07-Feb-2019 13:24
Lead	U		0.000600	0.00200	mg/L	1	07-Feb-2019 13:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW49A-20190123  
 Collection Date: 23-Jan-2019 15:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:14
<b>Benzene</b>	<b>0.0040</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:14
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:14
<b>Ethylbenzene</b>	<b>0.0031</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:14
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 05:14
<b>Toluene</b>	<b>0.0023</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:14
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:14
<b>Xylenes, Total</b>	<b>0.0087</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 05:14
<i>Surr: 1,2-Dichloroethane-d4</i>	99.6			70-126	%REC	1	01-Feb-2019 05:14
<i>Surr: 4-Bromofluorobenzene</i>	98.5			81-113	%REC	1	01-Feb-2019 05:14
<i>Surr: Dibromofluoromethane</i>	98.6			77-123	%REC	1	01-Feb-2019 05:14
<i>Surr: Toluene-d8</i>	101			82-127	%REC	1	01-Feb-2019 05:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW49A-20190123  
 Collection Date: 23-Jan-2019 15:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-07  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 15:33
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 15:33
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 15:33
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 15:33
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 15:33
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 15:33
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 15:33
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 15:33
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 15:33
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 15:33
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 15:33
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 15:33
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 15:33
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 15:33
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000055</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 15:33
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 15:33
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 15:33
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 15:33
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 15:33
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 15:33
<b>Naphthalene</b>	<b>0.000089</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 15:33
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 15:33
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 15:33
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 15:33
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 15:33
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 15:33
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 15:33
<i>Surr: 2,4,6-Tribromophenol</i>	<i>57.5</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>52.0</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<i>Surr: 2-Fluorophenol</i>	<i>40.9</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>75.1</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<i>Surr: Nitrobenzene-d5</i>	<i>48.0</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<i>Surr: Phenol-d6</i>	<i>48.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 15:33</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00120</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:41
<b>Lead</b>	<b>0.00778</b>		<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59A-20190123  
 Collection Date: 23-Jan-2019 16:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	SQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:38
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:38
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:38
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:38
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 05:38
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:38
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 05:38
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 05:38
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>97.7</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:38</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>96.3</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:38</i>
<i>Surr: Dibromofluoromethane</i>		<i>94.7</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:38</i>
<i>Surr: Toluene-d8</i>		<i>100</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 05:38</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59A-20190123  
 Collection Date: 23-Jan-2019 16:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-08  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 15:53
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 15:53
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 15:53
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 15:53
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 15:53
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 15:53
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 15:53
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 15:53
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 15:53
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 15:53
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 15:53
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 15:53
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 15:53
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 15:53
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 15:53
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 15:53
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 15:53
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 15:53
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 15:53
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 15:53
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 15:53
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 15:53
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 15:53
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 15:53
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 15:53
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 15:53
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 15:53
<i>Surr: 2,4,6-Tribromophenol</i>		34.2		34-129	%REC	1	13-Feb-2019 15:53
<i>Surr: 2-Fluorobiphenyl</i>		44.8		40-125	%REC	1	13-Feb-2019 15:53
<i>Surr: 2-Fluorophenol</i>		29.6		20-120	%REC	1	13-Feb-2019 15:53
<i>Surr: 4-Terphenyl-d14</i>		62.2		40-135	%REC	1	13-Feb-2019 15:53
<i>Surr: Nitrobenzene-d5</i>		41.1		41-120	%REC	1	13-Feb-2019 15:53
<i>Surr: Phenol-d6</i>		37.0		20-120	%REC	1	13-Feb-2019 15:53
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>		<b>0.00243</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:43
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 20:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59B-20190123  
 Collection Date: 23-Jan-2019 17:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:03
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:03
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:03
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:03
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 06:03
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:03
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:03
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:03
<i>Surr: 1,2-Dichloroethane-d4</i>		99.3		70-126	%REC	1	01-Feb-2019 06:03
<i>Surr: 4-Bromofluorobenzene</i>		101		81-113	%REC	1	01-Feb-2019 06:03
<i>Surr: Dibromofluoromethane</i>		97.3		77-123	%REC	1	01-Feb-2019 06:03
<i>Surr: Toluene-d8</i>		102		82-127	%REC	1	01-Feb-2019 06:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59B-20190123  
 Collection Date: 23-Jan-2019 17:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-09  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:12
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 16:12
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 16:12
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 16:12
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:12
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 16:12
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:12
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 16:12
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 16:12
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 16:12
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 16:12
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 16:12
<b>Benzo(a)pyrene</b>	<b>0.000033</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 16:12
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000056</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
<b>Chrysene</b>	<b>0.000036</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:12
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:12
<b>Fluoranthene</b>	<b>0.000051</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 16:12
<b>Naphthalene</b>	<b>0.000072</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 16:12
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 16:12
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 16:12
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 16:12
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 16:12
<b>Pyrene</b>	<b>0.000053</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 16:12
<i>Surr: 2,4,6-Tribromophenol</i>	<i>54.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.4</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>65.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<i>Surr: Nitrobenzene-d5</i>	<i>42.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<i>Surr: Phenol-d6</i>	<i>41.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:12</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000983</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:46
<b>Lead</b>	<b>0.00108</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 20:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB07-20190123  
 Collection Date: 23-Jan-2019 17:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-10  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:27
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:27
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:27
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:27
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 06:27
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:27
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:27
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:27
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>97.6</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 06:27</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.9</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 06:27</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.8</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 06:27</i>
<i>Surr: Toluene-d8</i>	<i>99.1</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 06:27</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-FB07-20190123  
 Collection Date: 23-Jan-2019 17:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-10  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:32
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 16:32
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 16:32
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 16:32
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:32
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 16:32
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:32
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 16:32
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 16:32
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 16:32
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 16:32
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 16:32
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:32
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 16:32
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000053</b>	<b>J</b>	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>13-Feb-2019 16:32</b>
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 16:32
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:32
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:32
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 16:32
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 16:32
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:32
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 16:32
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 16:32
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 16:32
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 16:32
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 16:32
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 16:32
<i>Surr: 2,4,6-Tribromophenol</i>	<i>73.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>62.1</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<i>Surr: 2-Fluorophenol</i>	<i>53.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.2</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<i>Surr: Nitrobenzene-d5</i>	<i>57.3</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<i>Surr: Phenol-d6</i>	<i>59.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:32</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	06-Feb-2019 20:48
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 20:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB06-20190124  
 Collection Date: 24-Jan-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-11  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:36
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:36
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:36
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:36
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 03:36
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:36
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:36
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:36
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>101</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:36</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>97.6</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:36</i>
<i>Surr: Dibromofluoromethane</i>		<i>97.2</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:36</i>
<i>Surr: Toluene-d8</i>		<i>100</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 03:36</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59D-20190124  
 Collection Date: 24-Jan-2019 07:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:52
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:52
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:52
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:52
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 06:52
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 06:52
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 06:52
<i>Surr: 1,2-Dichloroethane-d4</i>		98.4		70-126	%REC	1	01-Feb-2019 06:52
<i>Surr: 4-Bromofluorobenzene</i>		97.0		81-113	%REC	1	01-Feb-2019 06:52
<i>Surr: Dibromofluoromethane</i>		95.5		77-123	%REC	1	01-Feb-2019 06:52
<i>Surr: Toluene-d8</i>		98.7		82-127	%REC	1	01-Feb-2019 06:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW59D-20190124  
 Collection Date: 24-Jan-2019 07:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-12  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:52
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 16:52
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 16:52
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 16:52
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 16:52
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 16:52
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:52
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 16:52
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 16:52
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 16:52
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 16:52
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 16:52
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:52
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 16:52
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 16:52
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 16:52
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:52
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 16:52
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 16:52
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 16:52
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 16:52
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 16:52
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 16:52
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 16:52
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 16:52
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 16:52
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 16:52
<i>Surr: 2,4,6-Tribromophenol</i>	<i>60.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>41.1</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<i>Surr: 2-Fluorophenol</i>	<i>36.8</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<i>Surr: Nitrobenzene-d5</i>	<i>43.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<i>Surr: Phenol-d6</i>	<i>41.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 16:52</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000765</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>06-Feb-2019 20:57</b>
<b>Lead</b>	<b>0.000917</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>06-Feb-2019 20:57</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD05-20190124  
 Collection Date: 24-Jan-2019 07:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:16
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:16
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:16
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:16
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 07:16
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:16
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:16
<i>Surr: 1,2-Dichloroethane-d4</i>		99.4		70-126	%REC	1	01-Feb-2019 07:16
<i>Surr: 4-Bromofluorobenzene</i>		99.1		81-113	%REC	1	01-Feb-2019 07:16
<i>Surr: Dibromofluoromethane</i>		96.7		77-123	%REC	1	01-Feb-2019 07:16
<i>Surr: Toluene-d8</i>		98.6		82-127	%REC	1	01-Feb-2019 07:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD05-20190124  
 Collection Date: 24-Jan-2019 07:20

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-13  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:11
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 17:11
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 17:11
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 17:11
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:11
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 17:11
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:11
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 17:11
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 17:11
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 17:11
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 17:11
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 17:11
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:11
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 17:11
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 17:11
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 17:11
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:11
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:11
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 17:11
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 17:11
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:11
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 17:11
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 17:11
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 17:11
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 17:11
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 17:11
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 17:11
<i>Surr: 2,4,6-Tribromophenol</i>	<i>64.0</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>48.3</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<i>Surr: 2-Fluorophenol</i>	<i>43.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.6</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<i>Surr: Nitrobenzene-d5</i>	<i>44.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<i>Surr: Phenol-d6</i>	<i>49.4</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:11</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000637</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>06-Feb-2019 20:59</b>
<b>Lead</b>	<b>0.000727</b>	<b>J</b>	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>06-Feb-2019 20:59</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36D-20190124  
 Collection Date: 24-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:41
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:41
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:41
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:41
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 07:41
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 07:41
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 07:41
<i>Surr: 1,2-Dichloroethane-d4</i>		96.4		70-126	%REC	1	01-Feb-2019 07:41
<i>Surr: 4-Bromofluorobenzene</i>		97.8		81-113	%REC	1	01-Feb-2019 07:41
<i>Surr: Dibromofluoromethane</i>		96.8		77-123	%REC	1	01-Feb-2019 07:41
<i>Surr: Toluene-d8</i>		101		82-127	%REC	1	01-Feb-2019 07:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW36D-20190124  
 Collection Date: 24-Jan-2019 08:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-14  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:31
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 17:31
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 17:31
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 17:31
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:31
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 17:31
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:31
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 17:31
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 17:31
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 17:31
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 17:31
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 17:31
<b>Benzo(a)pyrene</b>	<b>0.000027</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 17:31
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 17:31
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000055</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 17:31
<b>Chrysene</b>	<b>0.000031</b>	J	<b>0.000021</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 17:31
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:31
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:31
<b>Fluoranthene</b>	<b>0.000048</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 17:31
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 17:31
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:31
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 17:31
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 17:31
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 17:31
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 17:31
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 17:31
<b>Pyrene</b>	<b>0.000042</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 17:31
<i>Surr: 2,4,6-Tribromophenol</i>	64.6			34-129	%REC	1	13-Feb-2019 17:31
<i>Surr: 2-Fluorobiphenyl</i>	52.8			40-125	%REC	1	13-Feb-2019 17:31
<i>Surr: 2-Fluorophenol</i>	45.1			20-120	%REC	1	13-Feb-2019 17:31
<i>Surr: 4-Terphenyl-d14</i>	65.9			40-135	%REC	1	13-Feb-2019 17:31
<i>Surr: Nitrobenzene-d5</i>	47.1			41-120	%REC	1	13-Feb-2019 17:31
<i>Surr: Phenol-d6</i>	50.4			20-120	%REC	1	13-Feb-2019 17:31
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.000417</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 21:01
<b>Lead</b>	<b>0.000910</b>	J	<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 21:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW65D-20190124  
 Collection Date: 24-Jan-2019 09:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:48
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:48
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:48
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:48
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 03:48
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 03:48
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 03:48
<i>Surr: 1,2-Dichloroethane-d4</i>		86.5		70-126	%REC	1	01-Feb-2019 03:48
<i>Surr: 4-Bromofluorobenzene</i>		95.1		81-113	%REC	1	01-Feb-2019 03:48
<i>Surr: Dibromofluoromethane</i>		99.2		77-123	%REC	1	01-Feb-2019 03:48
<i>Surr: Toluene-d8</i>		103		82-127	%REC	1	01-Feb-2019 03:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW65D-20190124  
 Collection Date: 24-Jan-2019 09:25

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-15  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine		U	0.000021	0.00020	mg/L	1	12-Feb-2019 20:50
<b>2,4-Dimethylphenol</b>	<b>0.000090</b>	J	<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
2,4-Dinitrotoluene		U	0.000058	0.00020	mg/L	1	12-Feb-2019 20:50
2,6-Dinitrotoluene		U	0.000042	0.00020	mg/L	1	12-Feb-2019 20:50
2-Chloronaphthalene		U	0.000021	0.00020	mg/L	1	12-Feb-2019 20:50
<b>2-Methylnaphthalene</b>	<b>0.00016</b>		<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
4,6-Dinitro-2-methylphenol		U	0.000020	0.00020	mg/L	1	12-Feb-2019 20:50
4-Nitrophenol		U	0.000047	0.0010	mg/L	1	12-Feb-2019 20:50
Acenaphthene		U	0.000027	0.00010	mg/L	1	12-Feb-2019 20:50
Acenaphthylene		U	0.000015	0.00010	mg/L	1	12-Feb-2019 20:50
Anthracene		U	0.000014	0.00010	mg/L	1	12-Feb-2019 20:50
Benz(a)anthracene		U	0.000050	0.00010	mg/L	1	12-Feb-2019 20:50
Benzo(a)pyrene		U	0.000020	0.00010	mg/L	1	12-Feb-2019 20:50
Bis(2-chloroethoxy)methane		U	0.000030	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000060</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Chrysene		U	0.000021	0.00010	mg/L	1	12-Feb-2019 20:50
<b>Dibenzofuran</b>	<b>0.000039</b>	J	<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Di-n-butyl phthalate		U	0.000020	0.00020	mg/L	1	12-Feb-2019 20:50
<b>Fluoranthene</b>	<b>0.000027</b>	J	<b>0.000010</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Fluorene		U	0.000030	0.00010	mg/L	1	12-Feb-2019 20:50
<b>Naphthalene</b>	<b>0.0026</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Nitrobenzene		U	0.000024	0.00020	mg/L	1	12-Feb-2019 20:50
N-Nitrosodiphenylamine		U	0.000025	0.00020	mg/L	1	12-Feb-2019 20:50
Pentachlorophenol		U	0.000079	0.00020	mg/L	1	12-Feb-2019 20:50
Phenanthrene		U	0.000021	0.00010	mg/L	1	12-Feb-2019 20:50
<b>Phenol</b>	<b>0.00019</b>	J	<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	12-Feb-2019 20:50
Pyrene		U	0.000019	0.00010	mg/L	1	12-Feb-2019 20:50
<i>Surr: 2,4,6-Tribromophenol</i>	<i>80.4</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>62.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>53.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>74.5</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: Nitrobenzene-d5</i>	<i>57.6</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<i>Surr: Phenol-d6</i>	<i>59.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 20:50</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 30-Jan-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00202</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	31-Jan-2019 18:59
Lead		U	0.000600	0.00200	mg/L	1	31-Jan-2019 18:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW66D-20190124  
 Collection Date: 24-Jan-2019 10:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:05
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:05
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 08:05
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 08:05
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 08:05
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:05
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 08:05
<i>Surr: 1,2-Dichloroethane-d4</i>		96.7		70-126	%REC	1	01-Feb-2019 08:05
<i>Surr: 4-Bromofluorobenzene</i>		98.1		81-113	%REC	1	01-Feb-2019 08:05
<i>Surr: Dibromofluoromethane</i>		96.0		77-123	%REC	1	01-Feb-2019 08:05
<i>Surr: Toluene-d8</i>		100.0		82-127	%REC	1	01-Feb-2019 08:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW66D-20190124  
 Collection Date: 24-Jan-2019 10:30

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-16  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:50
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	13-Feb-2019 17:50
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 17:50
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 17:50
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 17:50
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 17:50
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:50
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 17:50
Acenaphthene	U		0.000027	0.00010	mg/L	1	13-Feb-2019 17:50
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 17:50
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 17:50
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 17:50
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:50
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 17:50
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00017</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 17:50
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 17:50
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:50
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 17:50
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 17:50
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 17:50
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 17:50
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 17:50
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 17:50
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 17:50
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 17:50
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 17:50
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 17:50
<i>Surr: 2,4,6-Tribromophenol</i>	<i>77.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>56.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<i>Surr: 2-Fluorophenol</i>	<i>50.2</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<i>Surr: Nitrobenzene-d5</i>	<i>56.1</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<i>Surr: Phenol-d6</i>	<i>58.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 17:50</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00204</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 21:04
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 21:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW84B-20190124  
 Collection Date: 24-Jan-2019 11:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:29
<b>Benzene</b>	<b>0.0024</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:29
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 08:29
<b>Ethylbenzene</b>	<b>0.0051</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:29
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 08:29
<b>Toluene</b>	<b>0.00056</b>	J	<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:29
<b>Xylenes, Total</b>	<b>0.0033</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:29
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>99.1</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:29</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:29</i>
<i>Surr: Dibromofluoromethane</i>	<i>97.6</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:29</i>
<i>Surr: Toluene-d8</i>	<i>99.6</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:29</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW84B-20190124  
 Collection Date: 24-Jan-2019 11:40

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-17  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 18:10
<b>2,4-Dimethylphenol</b>	<b>0.00016</b>	J	<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:10
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 18:10
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 18:10
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 18:10
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:10
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 18:10
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 18:10
<b>Acenaphthene</b>	<b>0.000032</b>	J	<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:10
<b>Acenaphthylene</b>	<b>0.000043</b>	J	<b>0.000015</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:10
Anthracene	U		0.000014	0.00010	mg/L	1	13-Feb-2019 18:10
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 18:10
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:10
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 18:10
Bis(2-ethylhexyl)phthalate	U		0.000037	0.00020	mg/L	1	13-Feb-2019 18:10
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:10
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:10
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 18:10
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 18:10
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 18:10
Naphthalene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:10
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 18:10
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 18:10
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 18:10
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:10
Phenol	U		0.000035	0.00020	mg/L	1	13-Feb-2019 18:10
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:10
<i>Surr: 2,4,6-Tribromophenol</i>	<i>70.5</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>47.5</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<i>Surr: 2-Fluorophenol</i>	<i>42.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>65.9</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<i>Surr: Nitrobenzene-d5</i>	<i>43.5</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<i>Surr: Phenol-d6</i>	<i>46.7</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:10</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00219</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 21:06
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 21:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW67B-20190124  
 Collection Date: 24-Jan-2019 12:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 04:00
Benzene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 04:00
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 04:00
Ethylbenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 04:00
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 04:00
Toluene	U		0.00020	0.0010	mg/L	1	01-Feb-2019 04:00
Xylenes, Total	U		0.00030	0.0010	mg/L	1	01-Feb-2019 04:00
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>98.9</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 04:00</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 04:00</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.4</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 04:00</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 04:00</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW67B-20190124  
 Collection Date: 24-Jan-2019 12:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-18  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	12-Feb-2019 21:49
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	12-Feb-2019 21:49
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	12-Feb-2019 21:49
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	12-Feb-2019 21:49
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	12-Feb-2019 21:49
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	12-Feb-2019 21:49
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	12-Feb-2019 21:49
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	12-Feb-2019 21:49
Acenaphthene	U		0.000027	0.00010	mg/L	1	12-Feb-2019 21:49
Acenaphthylene	U		0.000015	0.00010	mg/L	1	12-Feb-2019 21:49
Anthracene	U		0.000014	0.00010	mg/L	1	12-Feb-2019 21:49
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	12-Feb-2019 21:49
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	12-Feb-2019 21:49
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	12-Feb-2019 21:49
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000051</b>	<b>J</b>	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	<b>1</b>	<b>12-Feb-2019 21:49</b>
Chrysene	U		0.000021	0.00010	mg/L	1	12-Feb-2019 21:49
Dibenzofuran	U		0.000020	0.00010	mg/L	1	12-Feb-2019 21:49
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	12-Feb-2019 21:49
Fluoranthene	U		0.000010	0.00010	mg/L	1	12-Feb-2019 21:49
Fluorene	U		0.000030	0.00010	mg/L	1	12-Feb-2019 21:49
Naphthalene	U		0.000020	0.00010	mg/L	1	12-Feb-2019 21:49
Nitrobenzene	U		0.000024	0.00020	mg/L	1	12-Feb-2019 21:49
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	12-Feb-2019 21:49
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	12-Feb-2019 21:49
Phenanthrene	U		0.000021	0.00010	mg/L	1	12-Feb-2019 21:49
Phenol	U		0.000035	0.00020	mg/L	1	12-Feb-2019 21:49
Pyrene	U		0.000019	0.00010	mg/L	1	12-Feb-2019 21:49
<i>Surr: 2,4,6-Tribromophenol</i>	<i>62.6</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>48.7</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<i>Surr: 2-Fluorophenol</i>	<i>43.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>64.2</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<i>Surr: Nitrobenzene-d5</i>	<i>47.2</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<i>Surr: Phenol-d6</i>	<i>50.1</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>12-Feb-2019 21:49</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	U		0.000400	0.00200	mg/L	1	06-Feb-2019 20:05
<b>Lead</b>	<b>0.00331</b>		<b>0.000600</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>06-Feb-2019 20:05</b>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW19C-20190124  
 Collection Date: 24-Jan-2019 13:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MLL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:54
<b>Benzene</b>	<b>0.0044</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:54
Chlorobenzene	U		0.00030	0.0010	mg/L	1	01-Feb-2019 08:54
<b>Ethylbenzene</b>	<b>0.0040</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:54
Methylene chloride	U		0.0010	0.0020	mg/L	1	01-Feb-2019 08:54
<b>Toluene</b>	<b>0.0057</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:54
Vinyl chloride	U		0.00020	0.0010	mg/L	1	01-Feb-2019 08:54
<b>Xylenes, Total</b>	<b>0.0037</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	1	01-Feb-2019 08:54
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>98.0</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:54</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.0</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:54</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.8</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:54</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>01-Feb-2019 08:54</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW19C-20190124  
 Collection Date: 24-Jan-2019 13:50

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-19  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	13-Feb-2019 18:29
<b>2,4-Dimethylphenol</b>	<b>0.00032</b>		<b>0.000040</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	13-Feb-2019 18:29
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	13-Feb-2019 18:29
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	13-Feb-2019 18:29
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:29
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	13-Feb-2019 18:29
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	13-Feb-2019 18:29
<b>Acenaphthene</b>	<b>0.00078</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
Acenaphthylene	U		0.000015	0.00010	mg/L	1	13-Feb-2019 18:29
<b>Anthracene</b>	<b>0.000057</b>	J	<b>0.000014</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	13-Feb-2019 18:29
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:29
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	13-Feb-2019 18:29
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000096</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
Chrysene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:29
Dibenzofuran	U		0.000020	0.00010	mg/L	1	13-Feb-2019 18:29
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	13-Feb-2019 18:29
Fluoranthene	U		0.000010	0.00010	mg/L	1	13-Feb-2019 18:29
Fluorene	U		0.000030	0.00010	mg/L	1	13-Feb-2019 18:29
<b>Naphthalene</b>	<b>0.00036</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
Nitrobenzene	U		0.000024	0.00020	mg/L	1	13-Feb-2019 18:29
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	13-Feb-2019 18:29
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	13-Feb-2019 18:29
Phenanthrene	U		0.000021	0.00010	mg/L	1	13-Feb-2019 18:29
<b>Phenol</b>	<b>0.00013</b>	J	<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	13-Feb-2019 18:29
Pyrene	U		0.000019	0.00010	mg/L	1	13-Feb-2019 18:29
<i>Surr: 2,4,6-Tribromophenol</i>	<i>105</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>79.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<i>Surr: 2-Fluorophenol</i>	<i>73.3</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>100</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<i>Surr: Nitrobenzene-d5</i>	<i>76.7</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<i>Surr: Phenol-d6</i>	<i>80.0</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>13-Feb-2019 18:29</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00149</b>	J	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	06-Feb-2019 21:08
Lead	U		0.000600	0.00200	mg/L	1	06-Feb-2019 21:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW72B-20190124  
 Collection Date: 24-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	0.011		0.0020	0.010	mg/L	10	01-Feb-2019 19:59
Benzene	0.63		0.0020	0.010	mg/L	10	01-Feb-2019 19:59
Chlorobenzene	U		0.0030	0.010	mg/L	10	01-Feb-2019 19:59
Ethylbenzene	0.20		0.0030	0.010	mg/L	10	01-Feb-2019 19:59
Methylene chloride	U		0.010	0.020	mg/L	10	01-Feb-2019 19:59
Toluene	0.58		0.0020	0.010	mg/L	10	01-Feb-2019 19:59
Xylenes, Total	0.63		0.0030	0.010	mg/L	10	01-Feb-2019 19:59
Surr: 1,2-Dichloroethane-d4	100			70-126	%REC	10	01-Feb-2019 19:59
Surr: 4-Bromofluorobenzene	102			81-113	%REC	10	01-Feb-2019 19:59
Surr: Dibromofluoromethane	97.4			77-123	%REC	10	01-Feb-2019 19:59
Surr: Toluene-d8	98.1			82-127	%REC	10	01-Feb-2019 19:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW72B-20190124  
 Collection Date: 24-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.00021	0.0020	mg/L	10	13-Feb-2019 18:49
<b>2,4-Dimethylphenol</b>	<b>2.0</b>		<b>0.040</b>	<b>0.20</b>	<b>mg/L</b>	1000	14-Feb-2019 18:23
2,4-Dinitrotoluene	U		0.00058	0.0020	mg/L	10	13-Feb-2019 18:49
2,6-Dinitrotoluene	U		0.00042	0.0020	mg/L	10	13-Feb-2019 18:49
2-Chloronaphthalene	U		0.00021	0.0020	mg/L	10	13-Feb-2019 18:49
<b>2-Methylnaphthalene</b>	<b>0.071</b>		<b>0.00019</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
4,6-Dinitro-2-methylphenol	U		0.00020	0.0020	mg/L	10	13-Feb-2019 18:49
<b>4-Nitrophenol</b>	<b>0.0073</b>	J	<b>0.00047</b>	<b>0.010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
<b>Acenaphthene</b>	<b>0.019</b>		<b>0.00027</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
<b>Acenaphthylene</b>	<b>0.00069</b>	J	<b>0.00015</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
<b>Anthracene</b>	<b>0.0015</b>		<b>0.00014</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
Benz(a)anthracene	U		0.00050	0.0010	mg/L	10	13-Feb-2019 18:49
Benzo(a)pyrene	U		0.00020	0.0010	mg/L	10	13-Feb-2019 18:49
Bis(2-chloroethoxy)methane	U		0.00030	0.0020	mg/L	10	13-Feb-2019 18:49
Bis(2-ethylhexyl)phthalate	U		0.00037	0.0020	mg/L	10	13-Feb-2019 18:49
Chrysene	U		0.00021	0.0010	mg/L	10	13-Feb-2019 18:49
<b>Dibenzofuran</b>	<b>0.017</b>		<b>0.00020</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
Di-n-butyl phthalate	U		0.00020	0.0020	mg/L	10	13-Feb-2019 18:49
Fluoranthene	U		0.00010	0.0010	mg/L	10	13-Feb-2019 18:49
<b>Fluorene</b>	<b>0.0091</b>		<b>0.00030</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
<b>Naphthalene</b>	<b>1.2</b>		<b>0.020</b>	<b>0.10</b>	<b>mg/L</b>	1000	14-Feb-2019 18:23
Nitrobenzene	U		0.00024	0.0020	mg/L	10	13-Feb-2019 18:49
N-Nitrosodiphenylamine	U		0.00025	0.0020	mg/L	10	13-Feb-2019 18:49
Pentachlorophenol	U		0.00079	0.0020	mg/L	10	13-Feb-2019 18:49
<b>Phenanthrene</b>	<b>0.0042</b>		<b>0.00021</b>	<b>0.0010</b>	<b>mg/L</b>	10	13-Feb-2019 18:49
<b>Phenol</b>	<b>0.58</b>		<b>0.0035</b>	<b>0.020</b>	<b>mg/L</b>	100	14-Feb-2019 18:03
Pyrene	U		0.00019	0.0010	mg/L	10	13-Feb-2019 18:49
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>100</i>	<i>14-Feb-2019 18:03</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>0</i>	<i>JS</i>		<i>34-129</i>	<i>%REC</i>	<i>1000</i>	<i>14-Feb-2019 18:23</i>
<i>Surr: 2,4,6-Tribromophenol</i>	<i>75.5</i>			<i>34-129</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:49</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>54.0</i>			<i>40-125</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:49</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>100</i>	<i>14-Feb-2019 18:03</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	<i>JS</i>		<i>40-125</i>	<i>%REC</i>	<i>1000</i>	<i>14-Feb-2019 18:23</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>100</i>	<i>14-Feb-2019 18:03</i>
<i>Surr: 2-Fluorophenol</i>	<i>0</i>	<i>JS</i>		<i>20-120</i>	<i>%REC</i>	<i>1000</i>	<i>14-Feb-2019 18:23</i>
<i>Surr: 2-Fluorophenol</i>	<i>57.9</i>			<i>20-120</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:49</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>67.5</i>			<i>40-135</i>	<i>%REC</i>	<i>10</i>	<i>13-Feb-2019 18:49</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	<i>JS</i>		<i>40-135</i>	<i>%REC</i>	<i>100</i>	<i>14-Feb-2019 18:03</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	<i>JS</i>		<i>40-135</i>	<i>%REC</i>	<i>1000</i>	<i>14-Feb-2019 18:23</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW72B-20190124  
 Collection Date: 24-Jan-2019 14:55

**ANALYTICAL REPORT**  
 WorkOrder:HS19011199  
 Lab ID:HS19011199-20  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 28-Jan-2019		Analyst: GEY	
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	100	14-Feb-2019 18:03
Surr: Nitrobenzene-d5	0	JS		41-120	%REC	1000	14-Feb-2019 18:23
Surr: Nitrobenzene-d5	46.1			41-120	%REC	10	13-Feb-2019 18:49
Surr: Phenol-d6	56.1			20-120	%REC	10	13-Feb-2019 18:49
Surr: Phenol-d6	0	JS		20-120	%REC	100	14-Feb-2019 18:03
Surr: Phenol-d6	0	JS		20-120	%REC	1000	14-Feb-2019 18:23
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 01-Feb-2019		Analyst: JHD	
Arsenic	0.00106	J	0.000400	0.00200	mg/L	1	07-Feb-2019 13:26
Lead		U	0.000600	0.00200	mg/L	1	07-Feb-2019 13:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

## WEIGHT LOG

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**Batch ID:** 137100      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011199-01	1	1000	1 (mL)	0.001
HS19011199-02	1	1000	1 (mL)	0.001
HS19011199-03	1	1000	1 (mL)	0.001
HS19011199-04	1	1000	1 (mL)	0.001
HS19011199-05	1	1000	1 (mL)	0.001
HS19011199-06	1	1000	1 (mL)	0.001
HS19011199-07	1	1000	1 (mL)	0.001
HS19011199-08	1	1000	1 (mL)	0.001
HS19011199-09	1	1000	1 (mL)	0.001
HS19011199-10	1	1000	1 (mL)	0.001
HS19011199-12	1	1000	1 (mL)	0.001
HS19011199-13	1	1000	1 (mL)	0.001
HS19011199-14	1	1000	1 (mL)	0.001
HS19011199-15	1	1000	1 (mL)	0.001
HS19011199-16	1	1000	1 (mL)	0.001
HS19011199-17	1	1000	1 (mL)	0.001
HS19011199-18	1	1000	1 (mL)	0.001
HS19011199-19	1	1000	1 (mL)	0.001
HS19011199-20	1	1000	1 (mL)	0.001

**Batch ID:** 137198      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011199-15	1	10	10 (mL)	1

**Batch ID:** 137313      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19011199-01	1	10	10 (mL)	1
HS19011199-02	1	10	10 (mL)	1
HS19011199-03	1	10	10 (mL)	1
HS19011199-04	1	10	10 (mL)	1
HS19011199-05	1	10	10 (mL)	1
HS19011199-06	1	10	10 (mL)	1
HS19011199-07	1	10	10 (mL)	1
HS19011199-08	1	10	10 (mL)	1
HS19011199-09	1	10	10 (mL)	1
HS19011199-10	1	10	10 (mL)	1
HS19011199-12	1	10	10 (mL)	1
HS19011199-13	1	10	10 (mL)	1
HS19011199-14	1	10	10 (mL)	1
HS19011199-16	1	10	10 (mL)	1
HS19011199-17	1	10	10 (mL)	1
HS19011199-18	1	10	10 (mL)	1
HS19011199-19	1	10	10 (mL)	1
HS19011199-20	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 137100	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D			<b>Matrix:</b> Groundwater		
HS19011199-02	WG-1620-MW58A-20190123	23 Jan 2019 11:20		28 Jan 2019 13:30	14 Feb 2019 13:48	10
HS19011199-02	WG-1620-MW58A-20190123	23 Jan 2019 11:20		28 Jan 2019 13:30	13 Feb 2019 13:56	1
HS19011199-03	WG-1620-MW32AR-20190123	23 Jan 2019 12:15		28 Jan 2019 13:30	13 Feb 2019 14:15	1
HS19011199-04	WG-1620-MW76C-20190123	23 Jan 2019 13:20		28 Jan 2019 13:30	13 Feb 2019 14:35	1
HS19011199-05	WG-1620-MW74B-20190123	23 Jan 2019 14:15		28 Jan 2019 13:30	14 Feb 2019 15:45	1000
HS19011199-05	WG-1620-MW74B-20190123	23 Jan 2019 14:15		28 Jan 2019 13:30	14 Feb 2019 13:28	100
HS19011199-05	WG-1620-MW74B-20190123	23 Jan 2019 14:15		28 Jan 2019 13:30	13 Feb 2019 14:54	10
HS19011199-06	WG-1620-MW79A-20190123	23 Jan 2019 15:05		28 Jan 2019 13:30	14 Feb 2019 17:43	1000
HS19011199-06	WG-1620-MW79A-20190123	23 Jan 2019 15:05		28 Jan 2019 13:30	14 Feb 2019 16:05	100
HS19011199-06	WG-1620-MW79A-20190123	23 Jan 2019 15:05		28 Jan 2019 13:30	13 Feb 2019 15:14	10
HS19011199-07	WG-1620-MW49A-20190123	23 Jan 2019 15:50		28 Jan 2019 13:30	13 Feb 2019 15:33	1
HS19011199-08	WG-1620-MW59A-20190123	23 Jan 2019 16:40		28 Jan 2019 13:30	13 Feb 2019 15:53	1
HS19011199-09	WG-1620-MW59B-20190123	23 Jan 2019 17:30		28 Jan 2019 13:30	13 Feb 2019 16:12	1
HS19011199-12	WG-1620-MW59D-20190124	24 Jan 2019 07:20		28 Jan 2019 13:30	13 Feb 2019 16:52	1
HS19011199-13	WG-1620-FD05-20190124	24 Jan 2019 07:20		28 Jan 2019 13:30	13 Feb 2019 17:11	1
HS19011199-14	WG-1620-MW36D-20190124	24 Jan 2019 08:25		28 Jan 2019 13:30	13 Feb 2019 17:31	1
HS19011199-15	WG-1620-MW65D-20190124	24 Jan 2019 09:25		28 Jan 2019 13:30	12 Feb 2019 20:50	1
HS19011199-16	WG-1620-MW66D-20190124	24 Jan 2019 10:30		28 Jan 2019 13:30	13 Feb 2019 17:50	1
HS19011199-17	WG-1620-MW84B-20190124	24 Jan 2019 11:40		28 Jan 2019 13:30	13 Feb 2019 18:10	1
HS19011199-18	WG-1620-MW67B-20190124	24 Jan 2019 12:50		28 Jan 2019 13:30	12 Feb 2019 21:49	1
HS19011199-19	WG-1620-MW19C-20190124	24 Jan 2019 13:50		28 Jan 2019 13:30	13 Feb 2019 18:29	1
HS19011199-20	WG-1620-MW72B-20190124	24 Jan 2019 14:55		28 Jan 2019 13:30	14 Feb 2019 18:23	1000
HS19011199-20	WG-1620-MW72B-20190124	24 Jan 2019 14:55		28 Jan 2019 13:30	14 Feb 2019 18:03	100
HS19011199-20	WG-1620-MW72B-20190124	24 Jan 2019 14:55		28 Jan 2019 13:30	13 Feb 2019 18:49	10
<b>Batch ID</b> 137100	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D			<b>Matrix:</b> Water		
HS19011199-01	WQ-1620-FB08-20190124	24 Jan 2019 16:15		28 Jan 2019 13:30	13 Feb 2019 13:36	1
HS19011199-10	WQ-1620-FB07-20190123	23 Jan 2019 17:00		28 Jan 2019 13:30	13 Feb 2019 16:32	1
<b>Batch ID</b> 137198	<b>Test Name :</b> ICP-MS METALS BY SW6020A			<b>Matrix:</b> Groundwater		
HS19011199-15	WG-1620-MW65D-20190124	24 Jan 2019 09:25		30 Jan 2019 11:00	31 Jan 2019 18:59	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 137313	<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Groundwater			
HS19011199-02	WG-1620-MW58A-20190123	23 Jan 2019 11:20		01 Feb 2019 11:00	06 Feb 2019 20:19	1
HS19011199-03	WG-1620-MW32AR-20190123	23 Jan 2019 12:15		01 Feb 2019 11:00	06 Feb 2019 20:32	1
HS19011199-04	WG-1620-MW76C-20190123	23 Jan 2019 13:20		01 Feb 2019 11:00	06 Feb 2019 20:34	1
HS19011199-05	WG-1620-MW74B-20190123	23 Jan 2019 14:15		01 Feb 2019 11:00	07 Feb 2019 13:22	1
HS19011199-06	WG-1620-MW79A-20190123	23 Jan 2019 15:05		01 Feb 2019 11:00	07 Feb 2019 13:24	1
HS19011199-07	WG-1620-MW49A-20190123	23 Jan 2019 15:50		01 Feb 2019 11:00	06 Feb 2019 20:41	1
HS19011199-08	WG-1620-MW59A-20190123	23 Jan 2019 16:40		01 Feb 2019 11:00	06 Feb 2019 20:43	1
HS19011199-09	WG-1620-MW59B-20190123	23 Jan 2019 17:30		01 Feb 2019 11:00	06 Feb 2019 20:46	1
HS19011199-12	WG-1620-MW59D-20190124	24 Jan 2019 07:20		01 Feb 2019 11:00	06 Feb 2019 20:57	1
HS19011199-13	WG-1620-FD05-20190124	24 Jan 2019 07:20		01 Feb 2019 11:00	06 Feb 2019 20:59	1
HS19011199-14	WG-1620-MW36D-20190124	24 Jan 2019 08:25		01 Feb 2019 11:00	06 Feb 2019 21:01	1
HS19011199-16	WG-1620-MW66D-20190124	24 Jan 2019 10:30		01 Feb 2019 11:00	06 Feb 2019 21:04	1
HS19011199-17	WG-1620-MW84B-20190124	24 Jan 2019 11:40		01 Feb 2019 11:00	06 Feb 2019 21:06	1
HS19011199-18	WG-1620-MW67B-20190124	24 Jan 2019 12:50		01 Feb 2019 11:00	06 Feb 2019 20:05	1
HS19011199-19	WG-1620-MW19C-20190124	24 Jan 2019 13:50		01 Feb 2019 11:00	06 Feb 2019 21:08	1
HS19011199-20	WG-1620-MW72B-20190124	24 Jan 2019 14:55		01 Feb 2019 11:00	07 Feb 2019 13:26	1
<b>Batch ID</b> 137313	<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Water			
HS19011199-01	WQ-1620-FB08-20190124	24 Jan 2019 16:15		01 Feb 2019 11:00	06 Feb 2019 20:16	1
HS19011199-10	WQ-1620-FB07-20190123	23 Jan 2019 17:00		01 Feb 2019 11:00	06 Feb 2019 20:48	1
<b>Batch ID</b> R332110	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C		<b>Matrix:</b> Water			
HS19011199-10	WQ-1620-FB07-20190123	23 Jan 2019 17:00			01 Feb 2019 06:27	1
HS19011199-11	WQ-1620-TB06-20190124	24 Jan 2019 00:00			01 Feb 2019 03:36	1
<b>Batch ID</b> R332110	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C		<b>Matrix:</b> Groundwater			
HS19011199-07	WG-1620-MW49A-20190123	23 Jan 2019 15:50			01 Feb 2019 05:14	1
HS19011199-08	WG-1620-MW59A-20190123	23 Jan 2019 16:40			01 Feb 2019 05:38	1
HS19011199-09	WG-1620-MW59B-20190123	23 Jan 2019 17:30			01 Feb 2019 06:03	1
HS19011199-12	WG-1620-MW59D-20190124	24 Jan 2019 07:20			01 Feb 2019 06:52	1
HS19011199-13	WG-1620-FD05-20190124	24 Jan 2019 07:20			01 Feb 2019 07:16	1
HS19011199-14	WG-1620-MW36D-20190124	24 Jan 2019 08:25			01 Feb 2019 07:41	1
HS19011199-16	WG-1620-MW66D-20190124	24 Jan 2019 10:30			01 Feb 2019 08:05	1
HS19011199-17	WG-1620-MW84B-20190124	24 Jan 2019 11:40			01 Feb 2019 08:29	1
HS19011199-18	WG-1620-MW67B-20190124	24 Jan 2019 12:50			01 Feb 2019 04:00	1
HS19011199-19	WG-1620-MW19C-20190124	24 Jan 2019 13:50			01 Feb 2019 08:54	1



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> R332113		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater	
HS19011199-02	WG-1620-MW58A-20190123	23 Jan 2019 11:20			01 Feb 2019 05:00	1
HS19011199-03	WG-1620-MW32AR-20190123	23 Jan 2019 12:15			01 Feb 2019 05:24	1
HS19011199-04	WG-1620-MW76C-20190123	23 Jan 2019 13:20			01 Feb 2019 05:48	1
HS19011199-05	WG-1620-MW74B-20190123	23 Jan 2019 14:15			01 Feb 2019 06:14	10
HS19011199-06	WG-1620-MW79A-20190123	23 Jan 2019 15:05			01 Feb 2019 06:41	10
HS19011199-15	WG-1620-MW65D-20190124	24 Jan 2019 09:25			01 Feb 2019 03:48	1
<b>Batch ID</b> R332113		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS19011199-01	WQ-1620-FB08-20190124	24 Jan 2019 16:15			01 Feb 2019 03:00	1
<b>Batch ID</b> R332226		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Groundwater	
HS19011199-20	WG-1620-MW72B-20190124	24 Jan 2019 14:55			01 Feb 2019 19:59	10

WorkOrder: HS19011199  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200

WorkOrder: HS19011199  
 InstrumentID: SV-7  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

Matrix: Aqueous

Units: mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000082	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000034	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000039	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000062	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000072	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000041	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000024	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000024	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000036	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000056	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000051	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000067	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000076	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000070	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000063	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000070	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000047	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000070	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000061	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000052	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000045	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000088	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000071	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.000072	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000051	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000075	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000066	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19011199  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00054	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

WorkOrder: HS19011199  
 InstrumentID: VOA4  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00064	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00050	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00054	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00046	0.00030	0.0010
A	Methylene chloride	75-09-2	0.0010	0.0017	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00057	0.00020	0.0010
A	Vinyl chloride	75-01-4	0.00050	0.00049	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00044	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

<b>Batch ID:</b> 137198	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-137198</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-Jan-2019 18:55</b>							
Client ID:	Run ID: <b>ICPMS05_332031</b>	SeqNo: <b>4933298</b>	PrepDate: <b>30-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-137198</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-Jan-2019 18:57</b>							
Client ID:	Run ID: <b>ICPMS05_332031</b>	SeqNo: <b>4933299</b>	PrepDate: <b>30-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.0523	0.00200	0.05	0	105	80 - 120				
Lead	0.05089	0.00200	0.05	0	102	80 - 120				

<b>MS</b>	Sample ID: <b>HS19011199-15MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-Jan-2019 19:04</b>							
Client ID: <b>WG-1620-MW65D-20190124</b>	Run ID: <b>ICPMS05_332031</b>	SeqNo: <b>4933302</b>	PrepDate: <b>30-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.05265	0.00200	0.05	0.002025	101	80 - 120				
Lead	0.0502	0.00200	0.05	0.00059	99.2	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19011199-15MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-Jan-2019 19:06</b>							
Client ID: <b>WG-1620-MW65D-20190124</b>	Run ID: <b>ICPMS05_332031</b>	SeqNo: <b>4933303</b>	PrepDate: <b>30-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.04915	0.00200	0.05	0.002025	94.3	80 - 120	0.05265	6.88	20	
Lead	0.05058	0.00200	0.05	0.00059	100.0	80 - 120	0.0502	0.752	20	

<b>PDS</b>	Sample ID: <b>HS19011199-15PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-Jan-2019 19:08</b>							
Client ID: <b>WG-1620-MW65D-20190124</b>	Run ID: <b>ICPMS05_332031</b>	SeqNo: <b>4933304</b>	PrepDate: <b>30-Jan-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	RPD Qual
Arsenic	0.1061	0.00200	0.1	0.002025	104	75 - 125				
Lead	0.1009	0.00200	0.1	0.00059	100	75 - 125				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

<b>Batch ID:</b> 137198		<b>Instrument:</b> ICPMS05		<b>Method:</b> SW6020					
<b>SD</b>	Sample ID: <b>HS19011199-15SD</b>		Units: <b>mg/L</b>		Analysis Date: <b>31-Jan-2019 19:01</b>				
Client ID: <b>WG-1620-MW65D-20190124</b>	Run ID: <b>ICPMS05_332031</b>		SeqNo: <b>4933301</b>		PrepDate: <b>30-Jan-2019</b>		DF: <b>5</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit Qual

Arsenic	0.002692	0.0100					0.002025	0 10	J
Lead	U	0.0100					0.00059	0 10	

The following samples were analyzed in this batch:

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** 137313      **Instrument:** ICPMS05      **Method:** SW6020

<b>MBLK</b>		Sample ID: <b>MBLK-137313</b>			Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:01</b>			
Client ID:		Run ID: <b>ICPMS05_332384</b>			SeqNo: <b>4941148</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>		Sample ID: <b>LCS-137313</b>			Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:03</b>			
Client ID:		Run ID: <b>ICPMS05_332384</b>			SeqNo: <b>4941149</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05434	0.00200	0.05	0	109	80 - 120				
Lead	0.0523	0.00200	0.05	0	105	80 - 120				

<b>MS</b>		Sample ID: <b>HS19011199-18MS</b>			Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:10</b>			
Client ID: <b>WG-1620-MW67B-20190124</b>		Run ID: <b>ICPMS05_332384</b>			SeqNo: <b>4941152</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05236	0.00200	0.05	0.000218	104	80 - 120				
Lead	0.05204	0.00200	0.05	0.003306	97.5	80 - 120				

<b>MSD</b>		Sample ID: <b>HS19011199-18MSD</b>			Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:12</b>			
Client ID: <b>WG-1620-MW67B-20190124</b>		Run ID: <b>ICPMS05_332384</b>			SeqNo: <b>4941153</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05146	0.00200	0.05	0.000218	102	80 - 120	0.05236	1.73	20	
Lead	0.05215	0.00200	0.05	0.003306	97.7	80 - 120	0.05204	0.2	20	

<b>PDS</b>		Sample ID: <b>HS19011199-18PDS</b>			Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:14</b>			
Client ID: <b>WG-1620-MW67B-20190124</b>		Run ID: <b>ICPMS05_332384</b>			SeqNo: <b>4941154</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1088	0.00200	0.1	0	109	75 - 125				
Lead	0.1061	0.00200	0.1	0.003306	103	75 - 125				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** 137313      **Instrument:** ICPMS05      **Method:** SW6020

<b>SD</b>	Sample ID: <b>HS19011199-18SD</b>		Units: <b>mg/L</b>		Analysis Date: <b>06-Feb-2019 20:08</b>				
Client ID: <b>WG-1620-MW67B-20190124</b>	Run ID: <b>ICPMS05_332384</b>		SeqNo: <b>4941151</b>		PrepDate: <b>01-Feb-2019</b>		DF: <b>5</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit Qual
Arsenic	U	0.0100					0.000218	0	10
Lead	0.003298	0.0100					0.003306	0	10 J

**The following samples were analyzed in this batch:**

HS19011199-01	HS19011199-02	HS19011199-03	HS19011199-04
HS19011199-05	HS19011199-06	HS19011199-07	HS19011199-08
HS19011199-09	HS19011199-10	HS19011199-12	HS19011199-13
HS19011199-14	HS19011199-16	HS19011199-17	HS19011199-18
HS19011199-19	HS19011199-20		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7		Method: SW8270						
MBLK	Sample ID: MBLK-137100	Units: ug/L			Analysis Date: 12-Feb-2019 13:19					
Client ID:	Run ID: SV-7_332710	SeqNo: 4948031	PrepDate: 28-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	3.994	0.20	5	0	79.9	34 - 129				
<i>Surr: 2-Fluorobiphenyl</i>	3.584	0.20	5	0	71.7	40 - 125				
<i>Surr: 2-Fluorophenol</i>	3.517	0.20	5	0	70.3	20 - 120				
<i>Surr: 4-Terphenyl-d14</i>	3.832	0.20	5	0	76.6	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.271	0.20	5	0	65.4	41 - 120				
<i>Surr: Phenol-d6</i>	3.794	0.20	5	0	75.9	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7			Method: SW8270					
LCS	Sample ID: LCS-137100	Units: ug/L			Analysis Date: 12-Feb-2019 13:38					
Client ID:	Run ID: SV-7_332710	SeqNo: 4948032			PrepDate: 28-Jan-2019		DF: 1			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	3.105	0.20	5	0	62.1	39 - 127				
2,4-Dimethylphenol	2.853	0.20	5	0	57.1	35 - 120				
2,4-Dinitrotoluene	3.773	0.20	5	0	75.5	50 - 122				
2,6-Dinitrotoluene	3.432	0.20	5	0	68.6	50 - 120				
2-Chloronaphthalene	3.616	0.20	5	0	72.3	50 - 120				
2-Methylnaphthalene	3.546	0.10	5	0	70.9	50 - 120				
4,6-Dinitro-2-methylphenol	4.243	0.20	5	0	84.9	25 - 121				
4-Nitrophenol	3.608	1.0	5	0	72.2	30 - 130				
Acenaphthene	3.084	0.10	5	0	61.7	45 - 120				
Acenaphthylene	3.382	0.10	5	0	67.6	47 - 120				
Anthracene	3.719	0.10	5	0	74.4	45 - 120				
Benz(a)anthracene	3.996	0.10	5	0	79.9	40 - 120				
Benzo(a)pyrene	3.976	0.10	5	0	79.5	45 - 120				
Bis(2-chloroethoxy)methane	3.059	0.20	5	0	61.2	45 - 120				
Bis(2-ethylhexyl)phthalate	3.289	0.20	5	0	65.8	40 - 139				
Chrysene	3.975	0.10	5	0	79.5	43 - 120				
Dibenzofuran	3.54	0.10	5	0	70.8	50 - 120				
Di-n-butyl phthalate	3.552	0.20	5	0	71.0	45 - 123				
Fluoranthene	4.151	0.10	5	0	83.0	45 - 125				
Fluorene	3.691	0.10	5	0	73.8	49 - 120				
Naphthalene	3.314	0.10	5	0	66.3	45 - 120				
Nitrobenzene	3.196	0.20	5	0	63.9	44 - 120				
N-Nitrosodiphenylamine	3.633	0.20	5	0	72.7	40 - 125				
Pentachlorophenol	4.089	0.20	5	0	81.8	19 - 121				
Phenanthrene	3.833	0.10	5	0	76.7	45 - 121				
Phenol	3.127	0.20	5	0	62.5	20 - 124				
Pyrene	3.72	0.10	5	0	74.4	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>5.001</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>100</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.542</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>70.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>3.125</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.5</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>4.074</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>81.5</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>3.216</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.3</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.531</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>70.6</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7		Method: SW8270						
MS		Sample ID: HS19011199-18MS			Units: ug/L		Analysis Date: 12-Feb-2019 22:08			
Client ID: WG-1620-MW67B-20190124		Run ID: SV-7_332710			SeqNo: 4948037		PrepDate: 28-Jan-2019		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	1.699	0.20	5	0	34.0	39 - 127				S
2,4-Dimethylphenol	1.764	0.20	5	0	35.3	35 - 120				
2,4-Dinitrotoluene	1.953	0.20	5	0	39.1	50 - 122				S
2,6-Dinitrotoluene	1.975	0.20	5	0	39.5	50 - 120				S
2-Chloronaphthalene	2.171	0.20	5	0	43.4	50 - 120				S
2-Methylnaphthalene	2.221	0.10	5	0	44.4	50 - 120				S
4,6-Dinitro-2-methylphenol	2.571	0.20	5	0	51.4	25 - 121				
4-Nitrophenol	2.514	1.0	5	0	50.3	30 - 130				
Acenaphthene	1.705	0.10	5	0	34.1	45 - 120				S
Acenaphthylene	1.869	0.10	5	0	37.4	47 - 120				S
Anthracene	2.253	0.10	5	0	45.1	45 - 120				
Benz(a)anthracene	3.528	0.10	5	0	70.6	40 - 120				
Benzo(a)pyrene	3.288	0.10	5	0	65.8	45 - 120				
Bis(2-chloroethoxy)methane	1.817	0.20	5	0	36.3	45 - 120				S
Bis(2-ethylhexyl)phthalate	2.857	0.20	5	0.05071	56.1	40 - 139				
Chrysene	3.537	0.10	5	0	70.7	43 - 120				
Dibenzofuran	1.939	0.10	5	0	38.8	50 - 120				S
Di-n-butyl phthalate	2.686	0.20	5	0	53.7	45 - 123				
Fluoranthene	3.252	0.10	5	0	65.0	45 - 125				
Fluorene	1.858	0.10	5	0	37.2	49 - 120				S
Naphthalene	2.148	0.10	5	0	43.0	45 - 120				S
Nitrobenzene	2.1	0.20	5	0	42.0	44 - 120				S
N-Nitrosodiphenylamine	2.082	0.20	5	0	41.6	40 - 125				
Pentachlorophenol	3.096	0.20	5	0	61.9	19 - 121				
Phenanthrene	2.443	0.10	5	0	48.9	45 - 121				
Phenol	2.003	0.20	5	0	40.1	20 - 124				
Pyrene	3.084	0.10	5	0	61.7	40 - 130				
Surr: 2,4,6-Tribromophenol	2.667	0.20	5	0	53.3	34 - 129				
Surr: 2-Fluorobiphenyl	2.046	0.20	5	0	40.9	40 - 125				
Surr: 2-Fluorophenol	1.891	0.20	5	0	37.8	20 - 120				
Surr: 4-Terphenyl-d14	3.311	0.20	5	0	66.2	40 - 135				
Surr: Nitrobenzene-d5	2.183	0.20	5	0	43.7	41 - 120				
Surr: Phenol-d6	2.164	0.20	5	0	43.3	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7		Method: SW8270						
MS		Sample ID: HS19011199-15MS		Units: ug/L		Analysis Date: 12-Feb-2019 21:10				
Client ID: WG-1620-MW65D-20190124		Run ID: SV-7_332710		SeqNo: 4948034		PrepDate: 28-Jan-2019		DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,2-Diphenylhydrazine	2.488	0.20	5	0	49.8	39 - 127				
2,4-Dimethylphenol	2.329	0.20	5	0.09028	44.8	35 - 120				
2,4-Dinitrotoluene	3.009	0.20	5	0	60.2	50 - 122				
2,6-Dinitrotoluene	2.807	0.20	5	0	56.1	50 - 120				
2-Chloronaphthalene	2.958	0.20	5	0	59.2	50 - 120				
2-Methylnaphthalene	3.255	0.10	5	0.1627	61.8	50 - 120				
4,6-Dinitro-2-methylphenol	3.674	0.20	5	0	73.5	25 - 121				
4-Nitrophenol	3.52	1.0	5	0	70.4	30 - 130				
Acenaphthene	2.583	0.10	5	0	51.7	45 - 120				
Acenaphthylene	2.76	0.10	5	0	55.2	47 - 120				
Anthracene	3.118	0.10	5	0	62.4	45 - 120				
Benz(a)anthracene	3.534	0.10	5	0	70.7	40 - 120				
Benzo(a)pyrene	3.292	0.10	5	0	65.8	45 - 120				
Bis(2-chloroethoxy)methane	2.604	0.20	5	0	52.1	45 - 120				
Bis(2-ethylhexyl)phthalate	2.992	0.20	5	0.05994	58.6	40 - 139				
Chrysene	3.63	0.10	5	0	72.6	43 - 120				
Dibenzofuran	2.964	0.10	5	0.03937	58.5	50 - 120				
Di-n-butyl phthalate	3.153	0.20	5	0	63.1	45 - 123				
Fluoranthene	3.663	0.10	5	0.0266	72.7	45 - 125				
Fluorene	3.004	0.10	5	0	60.1	49 - 120				
Naphthalene	5.042	0.10	5	2.596	48.9	45 - 120				
Nitrobenzene	2.776	0.20	5	0	55.5	44 - 120				
N-Nitrosodiphenylamine	2.868	0.20	5	0	57.4	40 - 125				
Pentachlorophenol	3.82	0.20	5	0	76.4	19 - 121				
Phenanthrene	3.371	0.10	5	0	67.4	45 - 121				
Phenol	2.796	0.20	5	0.1887	52.2	20 - 124				
Pyrene	3.277	0.10	5	0.01826	65.2	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>4.459</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>89.2</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.073</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.5</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.705</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>54.1</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.826</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>76.5</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.864</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.3</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.076</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.5</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7		Method: SW8270							
MSD		Sample ID: HS19011199-18MSD		Units: ug/L		Analysis Date: 12-Feb-2019 22:28					
Client ID: WG-1620-MW67B-20190124		Run ID: SV-7_332710		SeqNo: 4948038		PrepDate: 28-Jan-2019		DF: 1			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
1,2-Diphenylhydrazine	1.659	0.20	5	0	33.2	39 - 127	1.699	2.39	20	S	
2,4-Dimethylphenol	1.605	0.20	5	0	32.1	35 - 120	1.764	9.4	20	S	
2,4-Dinitrotoluene	1.964	0.20	5	0	39.3	50 - 122	1.953	0.551	20	S	
2,6-Dinitrotoluene	2.014	0.20	5	0	40.3	50 - 120	1.975	1.96	20	S	
2-Chloronaphthalene	2.115	0.20	5	0	42.3	50 - 120	2.171	2.6	20	S	
2-Methylnaphthalene	2.219	0.10	5	0	44.4	50 - 120	2.221	0.089	20	S	
4,6-Dinitro-2-methylphenol	2.609	0.20	5	0	52.2	25 - 121	2.571	1.48	30		
4-Nitrophenol	2.853	1.0	5	0	57.1	30 - 130	2.514	12.6	20		
Acenaphthene	1.706	0.10	5	0	34.1	45 - 120	1.705	0.0831	20	S	
Acenaphthylene	1.868	0.10	5	0	37.4	47 - 120	1.869	0.0763	20	S	
Anthracene	2.144	0.10	5	0	42.9	45 - 120	2.253	4.96	20	S	
Benz(a)anthracene	3.485	0.10	5	0	69.7	40 - 120	3.528	1.22	20		
Benzo(a)pyrene	3.374	0.10	5	0	67.5	45 - 120	3.288	2.58	20		
Bis(2-chloroethoxy)methane	1.834	0.20	5	0	36.7	45 - 120	1.817	0.922	20	S	
Bis(2-ethylhexyl)phthalate	2.905	0.20	5	0.05071	57.1	40 - 139	2.857	1.67	20		
Chrysene	3.488	0.10	5	0	69.8	43 - 120	3.537	1.41	20		
Dibenzofuran	1.952	0.10	5	0	39.0	50 - 120	1.939	0.66	20	S	
Di-n-butyl phthalate	2.844	0.20	5	0	56.9	45 - 123	2.686	5.69	20		
Fluoranthene	3.271	0.10	5	0	65.4	45 - 125	3.252	0.585	20		
Fluorene	1.889	0.10	5	0	37.8	49 - 120	1.858	1.66	20	S	
Naphthalene	2.178	0.10	5	0	43.6	45 - 120	2.148	1.39	20	S	
Nitrobenzene	2.044	0.20	5	0	40.9	44 - 120	2.1	2.72	20	S	
N-Nitrosodiphenylamine	2.04	0.20	5	0	40.8	40 - 125	2.082	2.02	20		
Pentachlorophenol	3.153	0.20	5	0	63.1	19 - 121	3.096	1.8	20		
Phenanthrene	2.35	0.10	5	0	47.0	45 - 121	2.443	3.89	20		
Phenol	2	0.20	5	0	40.0	20 - 124	2.003	0.125	20		
Pyrene	3.045	0.10	5	0	60.9	40 - 130	3.084	1.26	20		
Surr: 2,4,6-Tribromophenol	2.76	0.20	5	0	55.2	34 - 129	2.667	3.45	20		
Surr: 2-Fluorobiphenyl	2.122	0.20	5	0	42.4	40 - 125	2.046	3.65	20		
Surr: 2-Fluorophenol	2.043	0.20	5	0	40.9	20 - 120	1.891	7.76	20		
Surr: 4-Terphenyl-d14	3.607	0.20	5	0	72.1	40 - 135	3.311	8.56	20		
Surr: Nitrobenzene-d5	2.092	0.20	5	0	41.8	41 - 120	2.183	4.24	20		
Surr: Phenol-d6	2.345	0.20	5	0	46.9	20 - 120	2.164	8.02	20		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

Batch ID: 137100		Instrument: SV-7		Method: SW8270						
MSD	Sample ID: HS19011199-15MSD	Units: ug/L			Analysis Date: 12-Feb-2019 21:29					
Client ID: WG-1620-MW65D-20190124	Run ID: SV-7_332710	SeqNo: 4948035	PrepDate: 28-Jan-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	2.64	0.20	5	0	52.8	39 - 127	2.488	5.93	20	
2,4-Dimethylphenol	2.262	0.20	5	0.09028	43.4	35 - 120	2.329	2.92	20	
2,4-Dinitrotoluene	3.071	0.20	5	0	61.4	50 - 122	3.009	2.02	20	
2,6-Dinitrotoluene	2.985	0.20	5	0	59.7	50 - 120	2.807	6.14	20	
2-Chloronaphthalene	3.308	0.20	5	0	66.2	50 - 120	2.958	11.2	20	
2-Methylnaphthalene	3.503	0.10	5	0.1627	66.8	50 - 120	3.255	7.32	20	
4,6-Dinitro-2-methylphenol	3.437	0.20	5	0	68.7	25 - 121	3.674	6.65	30	
4-Nitrophenol	3.088	1.0	5	0	61.8	30 - 130	3.52	13.1	20	
Acenaphthene	2.872	0.10	5	0	57.4	45 - 120	2.583	10.6	20	
Acenaphthylene	2.988	0.10	5	0	59.8	47 - 120	2.76	7.93	20	
Anthracene	3.134	0.10	5	0	62.7	45 - 120	3.118	0.496	20	
Benz(a)anthracene	3.334	0.10	5	0	66.7	40 - 120	3.534	5.82	20	
Benzo(a)pyrene	3.359	0.10	5	0	67.2	45 - 120	3.292	2.01	20	
Bis(2-chloroethoxy)methane	2.923	0.20	5	0	58.5	45 - 120	2.604	11.6	20	
Bis(2-ethylhexyl)phthalate	2.849	0.20	5	0.05994	55.8	40 - 139	2.992	4.87	20	
Chrysene	3.397	0.10	5	0	67.9	43 - 120	3.63	6.64	20	
Dibenzofuran	3.202	0.10	5	0.03937	63.3	50 - 120	2.964	7.72	20	
Di-n-butyl phthalate	3.011	0.20	5	0	60.2	45 - 123	3.153	4.6	20	
Fluoranthene	3.407	0.10	5	0.0266	67.6	45 - 125	3.663	7.23	20	
Fluorene	3.198	0.10	5	0	64.0	49 - 120	3.004	6.25	20	
Naphthalene	5.52	0.10	5	2.596	58.5	45 - 120	5.042	9.04	20	
Nitrobenzene	3.031	0.20	5	0	60.6	44 - 120	2.776	8.78	20	
N-Nitrosodiphenylamine	3.06	0.20	5	0	61.2	40 - 125	2.868	6.48	20	
Pentachlorophenol	3.674	0.20	5	0	73.5	19 - 121	3.82	3.91	20	
Phenanthrene	3.325	0.10	5	0	66.5	45 - 121	3.371	1.37	20	
Phenol	3.072	0.20	5	0.1887	57.7	20 - 124	2.796	9.4	20	
Pyrene	3.224	0.10	5	0.01826	64.1	40 - 130	3.277	1.64	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>4.333</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>86.7</i>	<i>34 - 129</i>	<i>4.459</i>	<i>2.86</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.404</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>68.1</i>	<i>40 - 125</i>	<i>3.073</i>	<i>10.2</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>2.92</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>58.4</i>	<i>20 - 120</i>	<i>2.705</i>	<i>7.65</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.451</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.0</i>	<i>40 - 135</i>	<i>3.826</i>	<i>10.3</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>3.051</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.0</i>	<i>41 - 120</i>	<i>2.864</i>	<i>6.33</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.329</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>66.6</i>	<i>20 - 120</i>	<i>3.076</i>	<i>7.92</i>	<i>20</i>	

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** 137100      **Instrument:** SV-7      **Method:** SW8270

The following samples were analyzed in this batch:	HS19011199-01	HS19011199-02	HS19011199-03	HS19011199-04
	HS19011199-05	HS19011199-06	HS19011199-07	HS19011199-08
	HS19011199-09	HS19011199-10	HS19011199-12	HS19011199-13
	HS19011199-14	HS19011199-15	HS19011199-16	HS19011199-17
	HS19011199-18	HS19011199-19	HS19011199-20	



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

<b>Batch ID: R332110</b>		<b>Instrument: VOA4</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190131</b>	Units: <b>ug/L</b>			Analysis Date: <b>01-Feb-2019 03:11</b>				
Client ID:	Run ID: <b>VOA4_332110</b>	SeqNo: <b>4933749</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.75</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>49.77</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>49.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.3</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190131</b>	Units: <b>ug/L</b>			Analysis Date: <b>01-Feb-2019 02:22</b>				
Client ID:	Run ID: <b>VOA4_332110</b>	SeqNo: <b>4933748</b>		PrepDate:			DF: <b>1</b>		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	20.9	1.0	20	0	104	70 - 124			
Benzene	18.93	1.0	20	0	94.6	74 - 120			
Chlorobenzene	18.75	1.0	20	0	93.8	76 - 113			
Ethylbenzene	19.22	1.0	20	0	96.1	77 - 117			
Methylene chloride	19.97	2.0	20	0	99.9	70 - 127			
Toluene	18.66	1.0	20	0	93.3	77 - 118			
Vinyl chloride	19.46	1.0	20	0	97.3	70 - 130			
Xylenes, Total	58.87	1.0	60	0	98.1	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.9</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.63</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.3</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.85</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.12</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** R332110      **Instrument:** VOA4      **Method:** SW8260

MS		Sample ID: HS19011199-18MS			Units: ug/L		Analysis Date: 01-Feb-2019 04:25			
Client ID: WG-1620-MW67B-20190124		Run ID: VOA4_332110			SeqNo: 4933752		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	18.24	1.0	20	0	91.2	70 - 127				
Benzene	17.42	1.0	20	0	87.1	70 - 127				
Chlorobenzene	17.15	1.0	20	0	85.8	70 - 114				
Ethylbenzene	19.25	1.0	20	0	96.2	70 - 124				
Methylene chloride	17.37	2.0	20	0	86.9	70 - 128				
Toluene	17.34	1.0	20	0	86.7	70 - 123				
Vinyl chloride	16.95	1.0	20	0	84.7	70 - 130				
Xylenes, Total	55.55	1.0	60	0	92.6	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.54</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>50.19</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.29</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19011199-18MSD			Units: ug/L		Analysis Date: 01-Feb-2019 04:49			
Client ID: WG-1620-MW67B-20190124		Run ID: VOA4_332110			SeqNo: 4933753		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	18.02	1.0	20	0	90.1	70 - 127	18.24	1.24	20	
Benzene	17.17	1.0	20	0	85.9	70 - 127	17.42	1.45	20	
Chlorobenzene	16.66	1.0	20	0	83.3	70 - 114	17.15	2.95	20	
Ethylbenzene	17.54	1.0	20	0	87.7	70 - 124	19.25	9.28	20	
Methylene chloride	17.92	2.0	20	0	89.6	70 - 128	17.37	3.08	20	
Toluene	17.01	1.0	20	0	85.0	70 - 123	17.34	1.95	20	
Vinyl chloride	16.31	1.0	20	0	81.6	70 - 130	16.95	3.83	20	
Xylenes, Total	54.77	1.0	60	0	91.3	70 - 130	55.55	1.42	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.35</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>70 - 126</i>	<i>49.42</i>	<i>0.141</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 113</i>	<i>50.54</i>	<i>0.655</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.88</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>77 - 123</i>	<i>50.19</i>	<i>0.608</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.99</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>82 - 127</i>	<i>50.29</i>	<i>1.39</i>	<i>20</i>	

The following samples were analyzed in this batch:

HS19011199-07	HS19011199-08	HS19011199-09	HS19011199-10
HS19011199-11	HS19011199-12	HS19011199-13	HS19011199-14
HS19011199-16	HS19011199-17	HS19011199-18	HS19011199-19

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

<b>Batch ID: R332113</b>		<b>Instrument: VOA2</b>		<b>Method: SW8260</b>					
<b>MBLK</b>	Sample ID: <b>VBLKW-190131</b>	Units: <b>ug/L</b>			Analysis Date: <b>01-Feb-2019 02:11</b>				
Client ID:	Run ID: <b>VOA2_332113</b>	SeqNo: <b>4933801</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Vinyl chloride	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>88.8</i>	<i>70 - 123</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.2</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.1</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>51.94</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>81 - 120</i>			

<b>LCS</b>	Sample ID: <b>VLCSW-190131</b>	Units: <b>ug/L</b>			Analysis Date: <b>01-Feb-2019 01:23</b>				
Client ID:	Run ID: <b>VOA2_332113</b>	SeqNo: <b>4933800</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	16.41	1.0	20	0	82.0	70 - 124			
Benzene	19.95	1.0	20	0	99.7	74 - 120			
Chlorobenzene	19.65	1.0	20	0	98.2	76 - 113			
Ethylbenzene	19.88	1.0	20	0	99.4	77 - 117			
Methylene chloride	18.88	2.0	20	0	94.4	70 - 127			
Toluene	19.7	1.0	20	0	98.5	77 - 118			
Vinyl chloride	18.72	1.0	20	0	93.6	70 - 130			
Xylenes, Total	60.87	1.0	60	0	101	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>46.16</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>92.3</i>	<i>70 - 130</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.67</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.3</i>	<i>82 - 115</i>			
<i>Surr: Dibromofluoromethane</i>	<i>49.89</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>73 - 126</i>			
<i>Surr: Toluene-d8</i>	<i>50.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** R332113      **Instrument:** VOA2      **Method:** SW8260

MS		Sample ID: HS19011199-15MS			Units: ug/L		Analysis Date: 01-Feb-2019 04:12			
Client ID: WG-1620-MW65D-20190124		Run ID: VOA2_332113			SeqNo: 4933806		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	14.81	1.0	20	0	74.0	70 - 127				
Benzene	18.79	1.0	20	0	93.9	70 - 127				
Chlorobenzene	18.92	1.0	20	0	94.6	70 - 114				
Ethylbenzene	19.44	1.0	20	0	97.2	70 - 124				
Methylene chloride	18.1	2.0	20	0	90.5	70 - 128				
Toluene	19.19	1.0	20	0	95.9	70 - 123				
Vinyl chloride	20.51	1.0	20	0	103	70 - 130				
Xylenes, Total	57.72	1.0	60	0	96.2	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>44.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>88.8</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.18</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.64</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.3</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>50.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 127</i>				

MSD		Sample ID: HS19011199-15MSD			Units: ug/L		Analysis Date: 01-Feb-2019 04:36			
Client ID: WG-1620-MW65D-20190124		Run ID: VOA2_332113			SeqNo: 4933807		PrepDate:		DF: 1	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	15.59	1.0	20	0	77.9	70 - 127	14.81	5.13	20	
Benzene	18.81	1.0	20	0	94.0	70 - 127	18.79	0.115	20	
Chlorobenzene	18.69	1.0	20	0	93.4	70 - 114	18.92	1.23	20	
Ethylbenzene	19.21	1.0	20	0	96.0	70 - 124	19.44	1.18	20	
Methylene chloride	17.79	2.0	20	0	89.0	70 - 128	18.1	1.7	20	
Toluene	18.64	1.0	20	0	93.2	70 - 123	19.19	2.9	20	
Vinyl chloride	19.91	1.0	20	0	99.6	70 - 130	20.51	2.95	20	
Xylenes, Total	57.81	1.0	60	0	96.3	70 - 130	57.72	0.149	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>47.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>94.4</i>	<i>70 - 126</i>	<i>44.42</i>	<i>6.09</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.79</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>81 - 113</i>	<i>50.18</i>	<i>2.81</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>77 - 123</i>	<i>49.64</i>	<i>0.528</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>50.07</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>82 - 127</i>	<i>50.38</i>	<i>0.615</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19011199-01 HS19011199-02 HS19011199-03 HS19011199-04  
 HS19011199-05 HS19011199-06 HS19011199-15

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

<b>Batch ID:</b> R332226	<b>Instrument:</b> VOA4	<b>Method:</b> SW8260
--------------------------	-------------------------	-----------------------

<b>MBLK</b>		Sample ID: <b>VBLKW-190201</b>			Units: <b>ug/L</b>		Analysis Date: <b>01-Feb-2019 15:25</b>			
Client ID:		Run ID: <b>VOA4_332226</b>			SeqNo: <b>4936393</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.66</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.3</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.38</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.8</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>46.91</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>93.8</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.23</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190201</b>			Units: <b>ug/L</b>		Analysis Date: <b>01-Feb-2019 14:36</b>			
Client ID:		Run ID: <b>VOA4_332226</b>			SeqNo: <b>4936392</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	20.77	1.0	20	0	104	70 - 124				
Benzene	18.48	1.0	20	0	92.4	74 - 120				
Chlorobenzene	18.92	1.0	20	0	94.6	76 - 113				
Ethylbenzene	19.02	1.0	20	0	95.1	77 - 117				
Methylene chloride	18.44	2.0	20	0	92.2	70 - 127				
Toluene	18.4	1.0	20	0	92.0	77 - 118				
Xylenes, Total	59.46	1.0	60	0	99.1	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.34</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.7</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.73</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.87</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QC BATCH REPORT**

**Batch ID:** R332226      **Instrument:** VOA4      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19011333-01MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>01-Feb-2019 17:30</b>			
Client ID:		Run ID: <b>VOA4_332226</b>			SeqNo: <b>4936396</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	19.96	1.0	20	0	99.8	70 - 127				
Benzene	18.43	1.0	20	0	92.1	70 - 127				
Chlorobenzene	17.94	1.0	20	0	89.7	70 - 114				
Ethylbenzene	19.12	1.0	20	0	95.6	70 - 124				
Methylene chloride	17.05	2.0	20	0	85.2	70 - 128				
Toluene	17.69	1.0	20	0	88.4	70 - 123				
Xylenes, Total	61.45	1.0	60	0	102	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.61</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.62</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.2</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.22</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.4</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.87</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.7</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19011333-01MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>01-Feb-2019 17:54</b>			
Client ID:		Run ID: <b>VOA4_332226</b>			SeqNo: <b>4936397</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	20.03	1.0	20	0	100	70 - 127	19.96	0.336	20	
Benzene	17.45	1.0	20	0	87.3	70 - 127	18.43	5.44	20	
Chlorobenzene	17.75	1.0	20	0	88.7	70 - 114	17.94	1.11	20	
Ethylbenzene	18.24	1.0	20	0	91.2	70 - 124	19.12	4.71	20	
Methylene chloride	16.29	2.0	20	0	81.4	70 - 128	17.05	4.57	20	
Toluene	17.47	1.0	20	0	87.4	70 - 123	17.69	1.21	20	
Xylenes, Total	59.67	1.0	60	0	99.4	70 - 130	61.45	2.95	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>49.48</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.0</i>	<i>70 - 126</i>	<i>49.61</i>	<i>0.261</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.86</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.7</i>	<i>81 - 113</i>	<i>49.62</i>	<i>0.484</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>48.45</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.9</i>	<i>77 - 123</i>	<i>48.22</i>	<i>0.491</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>49.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.4</i>	<i>82 - 127</i>	<i>48.87</i>	<i>0.691</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19011199-20

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19011199

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019



Sample Receipt Checklist

Client Name: PBW
Work Order: HS19011199

Date/Time Received: 25-Jan-2019 09:07
Received by: PMG

Checklist completed by: Pablo Martinez 25-Jan-2019
Reviewed by:
eSignature Date eSignature Date

Matrices: WATER Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [ ] Not Present [ ]
Custody seals intact on shipping container/cooler? Yes [ ] No [ ] Not Present [checked]
Custody seals intact on sample bottles? Yes [ ] No [ ] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [ ] No [ ] Not Present [checked]
Chain of custody present? Yes [checked] No [ ]
Chain of custody signed when relinquished and received? Yes [checked] No [ ]
Samplers name present on COC? Yes [ ] No [checked]
Chain of custody agrees with sample labels? Yes [checked] No [ ]
Samples in proper container/bottle? Yes [checked] No [ ]
Sample containers intact? Yes [checked] No [ ]
Sufficient sample volume for indicated test? Yes [checked] No [ ]
All samples received within holding time? Yes [checked] No [ ]
Container/Temp Blank temperature in compliance? Yes [checked] No [ ]

2 Page(s)
COC IDs:194326, 194312

Temperature(s)/Thermometer(s): 0.2C/0.5C, 0.1C/0.4C, 0.8C/1.1C, 0.6C/0.9C, 0.1C/0.4C UC/C IR # 25

Cooler(s)/Kit(s): 43020, 43161, 44439, 25768, 42702

Date/Time sample(s) sent to storage: 1/25/19 12:30

- Water - VOA vials have zero headspace? Yes [checked] No [ ] No VOA vials submitted [ ]
Water - pH acceptable upon receipt? Yes [checked] No [ ] N/A [ ]
pH adjusted? Yes [ ] No [checked] N/A [ ]

pH adjusted by:

Login Notes: All Sample Labels missing Collection Date/Time, logged per CoC

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



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# Chain of Custody Form

## HS19011199

wv

Page 2 of 2

COC ID: 194326

Golder Associates Inc.

Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:											
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)										
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)										
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)										
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)										
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E											
	Suite 4004		Stop 0750	F											
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G											
Phone	(512) 671-3434	Phone		H											
Fax	(512) 671-3446	Fax		I											
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J											

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold	
1	WG-1620-FB08-20190124 <del>WG-1620-TD0-201901</del>	1-24-19	1615	W	*	6												
2	WG-1620-MWS8A-20190123	1-25-19	1120	W		6		X	X	X								
3	WG-1620-MWS2AR-20190123	↓	1215	W		6	X		X	X								
4	WG-1620-MW76C-20190123		1320	W		6	X		X	X								
5	WG-1620-MW74B-20190123		1415	W		6	X		X	X								
6	WG-1620-MW79A-20190123		1505	W		6	X		X	X								
7	WG-1620-MW49A-20190123		1550	W		6		X	X	X								
8	WG-1620-MWS9A-20190123		1640	W		6		X	X	X								
9	WG-1620-MWS9B-20190123		1730	W		6		X	X	X								
10	WG-1620-FB07-20190123		1700	W		6		X	X	X								

Sampler(s) Please Print & Sign <b>JOHN BEAYTON</b>		Shipment Method <b>HAND DELIVERED</b>	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour				Results Due Date:	
Refrigerated by: <b>John B</b>	Date: 1-25-19	Time: 09:51	Received by:	Notes: UPRR Houston MWPW		QC Package: (Check One Box Below)		
Refrigerated by:	Date:	Time:	Received by (Laboratory):	Cooler ID	Cooler Temp.	<input type="checkbox"/> Level II Std QC	<input checked="" type="checkbox"/> TRRF Checklist	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	43020	0.2C	<input type="checkbox"/> Level III Std QC/RA Date	<input type="checkbox"/> TRRF Level IV	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035				43161	0.1C	<input type="checkbox"/> Level IV SW/AG/CLP		
				44439	0.8C	<input type="checkbox"/> Other		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

25766 0.6C  
42702 0.1C 1R7C 1FL17

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# Chain of Custody Form

Page 2 of 2

COC ID: 194312

HS19011199

wv

Golder Associates Inc.  
Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information		
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A 8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B 8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C 8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive	Address	1400 Douglas Street	E MS/MSD
	Suite 4004		Stop 0750	F
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G
Phone	(512) 671-3434	Phone		H
Fax	(512) 671-3448	Fax		I
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-TB306-20190124	1-24-19		Water	f	2											
2	WG-1620-MW59D-20190124	1-24-19	0720	W		6											
3	WG-1620-FD05-20190124		0720	W		6											
4	WG-1620-MW36D-20190124		0825	W		6											
5	WG-1620-MW65D-20190124		0925	W		6					X						
6	WG-1620-MW66D-20190124		1030	W		6											
7	WG-1620-MW84B-20190124		1140	W		6											
8	WG-1620-MW67B-20190124		1250	W		6						X					
9	WG-1620-MW19C-20190124		1350	W		6											
10	WG-1620-MW72B-20190124		1455	W		6											

Sampler(s) Please Print & Sign <b>JOHN BEAULOU John B</b>		Shipment Method <b>HAND DELIVERED</b>	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour		Other: _____	Results Due Date: _____
Relinquished by: <b>John B</b>	Date: <b>1-25-19</b>	Time: <b>09:07</b>	Received by:	Notes: <b>UPRR Houston MWPW</b>		
Relinquished by:	Date:	Time:	Received by (Laboratory): <b>1123119 09:07</b>	Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):			<input type="checkbox"/> Low III Std GC <input type="checkbox"/> Level III Std GC/Raw Date <input type="checkbox"/> Level IV SW946/CLP <input checked="" type="checkbox"/> TRRP Checklist <input type="checkbox"/> TRRP Level IV
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035						

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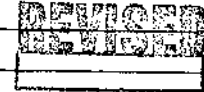
# Chain of Custody Form

Page 2 of 2

COC ID: 194326

## HS19011199

Golder Associates Inc.  
Houston TX-Wood Preserving Works



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5626002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	
				F	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681750750	G	
Phone	(512) 671-3434	Phone		H	
Fax	(512) 671-3446	Fax		I	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-FB07-20190123	1-24-19	1615	W	*	6	X		X	X							
2	WG-1620-MWS8A-20190123	1-25-19	1120	W		6		X	X	X							
3	WG-1620-MW32AR-20190123		1215	W		6	X		X	X							
4	WG-1620-MW76C-20190123		1320	W		6	X		X	X							
5	WG-1620-MW74B-20190123		1415	W		6	X		X	X							
6	WG-1620-MW79A-20190123		1505	W		6	X		X	X							
7	WG-1620-MW49A-20190123		1550	W		6		X	X	X							
8	WG-1620-MWS9A-20190123		1640	W		6		X	X	X							
9	WG-1620-MWS9B-20190123		1730	W		6		X	X	X							
10	WG-1620-FB07-20190123		1700	W		6		X	X	X							

Sampler(s) Please Print & Sign <b>JOHN BRAYTON</b>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Chgs <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour			Results Due Date:	
Refrigerated by: <b>John</b>	Date: 1-25-19	Time: 09:01	Received by:	Notes: UPRR Houston MWPW		QC Package: (Check One Box Below)		
Refrigerated by:	Date:	Time:	Received by (Laboratory): <b>1/25/19 09:01</b>	Cooler ID: 43020	Cooler Temp.: 0.2C	Level II Std GC <input type="checkbox"/>		
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	43161	0.1C	Level III Std GC/RS w/ Date <input type="checkbox"/>		
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035				44439	0.8C	Level IV SW240/CLP <input type="checkbox"/>		
				25766	0.6C	Other <input type="checkbox"/>		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

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### Chain of Custody Form

Page 2 of 2

COC ID: 194312

HS19011199

Golder Associates Inc.  
Houston TX-Wood Preserving Works



ALS Project Manager:

Customer Information		Project Information		
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A 8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92686	B 8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C 8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E MS/MSD
				F
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	G <b>REVISED</b>
Phone	(512) 671-3434	Phone		H
Fax	(512) 671-3446	Fax		I
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		J

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WG-1620-11306-20190124 <del>WG-4520-TBC-201801</del>	1-24-19		Water	1	2	X										
2	WG-1620-MW59D-20190124	1-24-19	0720	W		6	X		X	X							
3	WG-1620-FDOS-20190124		0720	W		6	X		X	X							
4	WG-1620-MW36D-20190124		0825	W		6	X		X	X							
5	WG-1620-MW65D-20190124		0925	W		6	X		X	X	X						
6	WG-1620-MW66D-20190124		1030	W		6	X		X	X							
7	WG-1620-MW84B-20190124		1140	W		6	X		X	X							
8	WG-1620-MW67B-20190124		1250	W		6	X		X	X	X						
9	WG-1620-MW19C-20190124		1350	W		6		X	X	X							
10	WG-1620-MW72B-20190124		1455	W		6	X		X	X							

Sampler(s) Please Print & Sign <b>JOHN BEATSON</b>		Shipment Method <b>HAND DELIVERED</b>		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour			Results Due Date:	
Relinquished by:	Date: 1-25-19	Time: 09:01	Received by:	Notes: UPRR Houston MWPW				
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID:	Cooler Temp.:	OC Package: (Check One Box Below)		
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):			<input type="checkbox"/> Level II SLO OC	<input checked="" type="checkbox"/> TRRP Checker	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035						<input type="checkbox"/> Level III SLO OC	<input type="checkbox"/> TRRP Level IV	
						<input type="checkbox"/> Level IV SWS/CLP		

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
3. The Chain of Custody is a legal document. All information must be completed accurately.

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February 15, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19020155**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 3 sample(s) on Feb 02, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL

Dane J. Wacasey

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

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**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

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**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey



Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 02/15/2019			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19020155			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 137448,137737,R332708			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?		X			1
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?		X			2
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

<b>Laboratory Review Checklist: Supporting Data</b>							
Laboratory Name: ALS Laboratory Group			LRC Date: 02/15/2019				
Project Name: Houston TX-Wood Preserving Works			Laboratory Job Number: HS19020155				
Reviewer Name: Dane Wacasey			Prep Batch Number(s): 137448,137737,R332708				
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data</b> (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods</b> (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Laboratory Review Checklist: Exception Reports**

Laboratory Name: ALS Laboratory Group		LRC Date: 02/15/2019
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19020155
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 137448,137737,R332708
ER# <sup>5</sup>	Description	
1	Batch 137448, Semivolatile Organics Method SW8270, LCS/LCSD RPD was above the RPD limit for select compounds. The individual recoveries were in control.	
2	Batch 137448, Semivolatile Organics Method SW8270, LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch	
<p>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);          NA = Not Applicable;          NR = Not Reviewed;          R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>		

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19020155

**SAMPLE SUMMARY**

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Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19020155-01	WG-1620-MW77A-201290201	Water		01-Feb-2019 13:05	02-Feb-2019 09:22	<input type="checkbox"/>
HS19020155-02	WG-1620-MW85C-201290201	Water		01-Feb-2019 14:00	02-Feb-2019 09:22	<input type="checkbox"/>
HS19020155-03	WG-1620-TB07-20190201	Water	ALS- 121118-65	01-Feb-2019 00:00	02-Feb-2019 09:22	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW77A-201290201  
 Collection Date: 01-Feb-2019 13:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19020155  
 Lab ID:HS19020155-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:11
Benzene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:11
Chlorobenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:11
Ethylbenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:11
Methylene chloride	U		0.0010	0.0020	mg/L	1	11-Feb-2019 17:11
Toluene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:11
Xylenes, Total	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:11
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.2</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:11</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.3</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:11</i>
<i>Surr: Dibromofluoromethane</i>	<i>107</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:11</i>
<i>Surr: Toluene-d8</i>	<i>99.1</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:11</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW77A-201290201  
 Collection Date: 01-Feb-2019 13:05

**ANALYTICAL REPORT**  
 WorkOrder:HS19020155  
 Lab ID:HS19020155-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 06-Feb-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000022	0.00021	mg/L	1	14-Feb-2019 01:48
2,4-Dimethylphenol	U		0.000042	0.00021	mg/L	1	14-Feb-2019 01:48
2,4-Dinitrotoluene	U		0.000060	0.00021	mg/L	1	14-Feb-2019 01:48
2,6-Dinitrotoluene	U		0.000044	0.00021	mg/L	1	14-Feb-2019 01:48
2-Chloronaphthalene	U		0.000022	0.00021	mg/L	1	14-Feb-2019 01:48
2-Methylnaphthalene	U		0.000020	0.00010	mg/L	1	14-Feb-2019 01:48
4,6-Dinitro-2-methylphenol	U		0.000021	0.00021	mg/L	1	14-Feb-2019 01:48
4-Nitrophenol	U		0.000049	0.0010	mg/L	1	14-Feb-2019 01:48
Acenaphthene	U		0.000028	0.00010	mg/L	1	14-Feb-2019 01:48
Acenaphthylene	U		0.000016	0.00010	mg/L	1	14-Feb-2019 01:48
Anthracene	U		0.000015	0.00010	mg/L	1	14-Feb-2019 01:48
Benz(a)anthracene	U		0.000052	0.00010	mg/L	1	14-Feb-2019 01:48
Benzo(a)pyrene	U		0.000021	0.00010	mg/L	1	14-Feb-2019 01:48
Bis(2-chloroethoxy)methane	U		0.000031	0.00021	mg/L	1	14-Feb-2019 01:48
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00010</b>	J	<b>0.000039</b>	<b>0.00021</b>	<b>mg/L</b>	1	14-Feb-2019 01:48
Chrysene	U		0.000022	0.00010	mg/L	1	14-Feb-2019 01:48
Dibenzofuran	U		0.000021	0.00010	mg/L	1	14-Feb-2019 01:48
<b>Di-n-butyl phthalate</b>	<b>0.000081</b>	J	<b>0.000021</b>	<b>0.00021</b>	<b>mg/L</b>	1	14-Feb-2019 01:48
Fluoranthene	U		0.000010	0.00010	mg/L	1	14-Feb-2019 01:48
Fluorene	U		0.000031	0.00010	mg/L	1	14-Feb-2019 01:48
Naphthalene	U		0.000021	0.00010	mg/L	1	14-Feb-2019 01:48
Nitrobenzene	U		0.000025	0.00021	mg/L	1	14-Feb-2019 01:48
N-Nitrosodiphenylamine	U		0.000026	0.00021	mg/L	1	14-Feb-2019 01:48
Pentachlorophenol	U		0.000082	0.00021	mg/L	1	14-Feb-2019 01:48
Phenanthrene	U		0.000022	0.00010	mg/L	1	14-Feb-2019 01:48
Phenol	U		0.000036	0.00021	mg/L	1	14-Feb-2019 01:48
Pyrene	U		0.000020	0.00010	mg/L	1	14-Feb-2019 01:48
<i>Surr: 2,4,6-Tribromophenol</i>	40.2			34-129	%REC	1	14-Feb-2019 01:48
<i>Surr: 2-Fluorobiphenyl</i>	40.9			40-125	%REC	1	14-Feb-2019 01:48
<i>Surr: 2-Fluorophenol</i>	26.6			20-120	%REC	1	14-Feb-2019 01:48
<i>Surr: 4-Terphenyl-d14</i>	55.7			40-135	%REC	1	14-Feb-2019 01:48
<i>Surr: Nitrobenzene-d5</i>	43.6			41-120	%REC	1	14-Feb-2019 01:48
<i>Surr: Phenol-d6</i>	36.6			20-120	%REC	1	14-Feb-2019 01:48
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 14-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00207</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	14-Feb-2019 18:33
Lead	U		0.000600	0.00200	mg/L	1	14-Feb-2019 18:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW85C-201290201  
 Collection Date: 01-Feb-2019 14:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19020155  
 Lab ID:HS19020155-02  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:35
Benzene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:35
Chlorobenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:35
Ethylbenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:35
Methylene chloride	U		0.0010	0.0020	mg/L	1	11-Feb-2019 17:35
Toluene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 17:35
Xylenes, Total	U		0.00030	0.0010	mg/L	1	11-Feb-2019 17:35
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.4</i>			<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:35</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>94.4</i>			<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:35</i>
<i>Surr: Dibromofluoromethane</i>	<i>106</i>			<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:35</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>11-Feb-2019 17:35</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW85C-201290201  
 Collection Date: 01-Feb-2019 14:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19020155  
 Lab ID:HS19020155-02  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 06-Feb-2019		Analyst: ACN	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	14-Feb-2019 02:08
2,4-Dimethylphenol	U		0.000041	0.00020	mg/L	1	14-Feb-2019 02:08
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	14-Feb-2019 02:08
2,6-Dinitrotoluene	U		0.000043	0.00020	mg/L	1	14-Feb-2019 02:08
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	14-Feb-2019 02:08
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	14-Feb-2019 02:08
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	14-Feb-2019 02:08
4-Nitrophenol	U		0.000048	0.0010	mg/L	1	14-Feb-2019 02:08
Acenaphthene	U		0.000028	0.00010	mg/L	1	14-Feb-2019 02:08
Acenaphthylene	U		0.000015	0.00010	mg/L	1	14-Feb-2019 02:08
Anthracene	U		0.000014	0.00010	mg/L	1	14-Feb-2019 02:08
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	14-Feb-2019 02:08
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	14-Feb-2019 02:08
Bis(2-chloroethoxy)methane	U		0.000031	0.00020	mg/L	1	14-Feb-2019 02:08
Bis(2-ethylhexyl)phthalate	U		0.000038	0.00020	mg/L	1	14-Feb-2019 02:08
Chrysene	U		0.000021	0.00010	mg/L	1	14-Feb-2019 02:08
Dibenzofuran	U		0.000020	0.00010	mg/L	1	14-Feb-2019 02:08
Di-n-butyl phthalate	U		0.000020	0.00020	mg/L	1	14-Feb-2019 02:08
Fluoranthene	U		0.000010	0.00010	mg/L	1	14-Feb-2019 02:08
Fluorene	U		0.000031	0.00010	mg/L	1	14-Feb-2019 02:08
Naphthalene	U		0.000020	0.00010	mg/L	1	14-Feb-2019 02:08
Nitrobenzene	U		0.000024	0.00020	mg/L	1	14-Feb-2019 02:08
N-Nitrosodiphenylamine	U		0.000026	0.00020	mg/L	1	14-Feb-2019 02:08
Pentachlorophenol	U		0.000081	0.00020	mg/L	1	14-Feb-2019 02:08
Phenanthrene	U		0.000021	0.00010	mg/L	1	14-Feb-2019 02:08
Phenol	U		0.000036	0.00020	mg/L	1	14-Feb-2019 02:08
Pyrene	U		0.000019	0.00010	mg/L	1	14-Feb-2019 02:08
<i>Surr: 2,4,6-Tribromophenol</i>	<i>34.1</i>			<i>34-129</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<i>Surr: 2-Fluorobiphenyl</i>	<i>40.6</i>			<i>40-125</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<i>Surr: 2-Fluorophenol</i>	<i>24.6</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>58.0</i>			<i>40-135</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<i>Surr: Nitrobenzene-d5</i>	<i>43.4</i>			<i>41-120</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<i>Surr: Phenol-d6</i>	<i>31.5</i>			<i>20-120</i>	<i>%REC</i>	<i>1</i>	<i>14-Feb-2019 02:08</i>
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 14-Feb-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00136</b>	<b>J</b>	<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	<b>1</b>	<b>14-Feb-2019 18:35</b>
Lead	U		0.000600	0.00200	mg/L	1	14-Feb-2019 18:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-TB07-20190201  
 Collection Date: 01-Feb-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19020155  
 Lab ID:HS19020155-03  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	11-Feb-2019 16:23
Benzene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 16:23
Chlorobenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 16:23
Ethylbenzene	U		0.00030	0.0010	mg/L	1	11-Feb-2019 16:23
Methylene chloride	U		0.0010	0.0020	mg/L	1	11-Feb-2019 16:23
Toluene	U		0.00020	0.0010	mg/L	1	11-Feb-2019 16:23
Xylenes, Total	U		0.00030	0.0010	mg/L	1	11-Feb-2019 16:23
<i>Surr: 1,2-Dichloroethane-d4</i>		94.3		70-126	%REC	1	11-Feb-2019 16:23
<i>Surr: 4-Bromofluorobenzene</i>		93.1		81-113	%REC	1	11-Feb-2019 16:23
<i>Surr: Dibromofluoromethane</i>		107		77-123	%REC	1	11-Feb-2019 16:23
<i>Surr: Toluene-d8</i>		100		82-127	%REC	1	11-Feb-2019 16:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**WEIGHT LOG**

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**Batch ID:** 137448      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020155-01	1	960	1 (mL)	0.001042
HS19020155-02	1	980	1 (mL)	0.00102

**Batch ID:** 137737      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19020155-01	1	10	10 (mL)	1
HS19020155-02	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 137448		<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Water		
HS19020155-01	WG-1620-MW77A-201290201	01 Feb 2019 13:05		06 Feb 2019 09:27	14 Feb 2019 01:48	1
HS19020155-02	WG-1620-MW85C-201290201	01 Feb 2019 14:00		06 Feb 2019 09:27	14 Feb 2019 02:08	1
<b>Batch ID</b> 137737		<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Water		
HS19020155-01	WG-1620-MW77A-201290201	01 Feb 2019 13:05		14 Feb 2019 10:00	14 Feb 2019 18:33	1
HS19020155-02	WG-1620-MW85C-201290201	01 Feb 2019 14:00		14 Feb 2019 10:00	14 Feb 2019 18:35	1
<b>Batch ID</b> R332708		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C		<b>Matrix:</b> Water		
HS19020155-01	WG-1620-MW77A-201290201	01 Feb 2019 13:05			11 Feb 2019 17:11	1
HS19020155-02	WG-1620-MW85C-201290201	01 Feb 2019 14:00			11 Feb 2019 17:35	1
HS19020155-03	WG-1620-TB07-20190201	01 Feb 2019 00:00			11 Feb 2019 16:23	1

WorkOrder: HS19020155  
 InstrumentID: ICPMS05  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000460	0.000400	0.00200
A	Lead	7439-92-1	0.00100	0.00100	0.000600	0.00200

WorkOrder: HS19020155  
 InstrumentID: SV-6  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000070	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000041	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000052	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000052	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000061	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000056	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000022	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00020	0.00019	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000066	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000072	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000074	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000074	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000066	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000069	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000083	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000082	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000060	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000080	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000074	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000073	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000065	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.000083	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000068	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00010	0.00016	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000077	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000066	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000074	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19020155  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00066	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00060	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00063	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00063	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00051	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00065	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00056	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

<b>Batch ID:</b> 137737	<b>Instrument:</b> ICPMS05	<b>Method:</b> SW6020
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<b>MBLK</b>	Sample ID: <b>MBLK-137737</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Feb-2019 18:06</b>							
Client ID:	Run ID: <b>ICPMS05_332852</b>	SeqNo: <b>4950662</b>	PrepDate: <b>14-Feb-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Lead	U	0.00200								

<b>LCS</b>	Sample ID: <b>LCS-137737</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Feb-2019 18:08</b>							
Client ID:	Run ID: <b>ICPMS05_332852</b>	SeqNo: <b>4950663</b>	PrepDate: <b>14-Feb-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.0547	0.00200	0.05	0	109	80 - 120				
Lead	0.05513	0.00200	0.05	0	110	80 - 120				

<b>MS</b>	Sample ID: <b>HS19020360-06MS</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Feb-2019 18:15</b>							
Client ID:	Run ID: <b>ICPMS05_332852</b>	SeqNo: <b>4950666</b>	PrepDate: <b>14-Feb-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.05653	0.00200	0.05	0.001329	110	80 - 120				
Lead	0.05239	0.00200	0.05	0	105	80 - 120				

<b>MSD</b>	Sample ID: <b>HS19020360-06MSD</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Feb-2019 18:17</b>							
Client ID:	Run ID: <b>ICPMS05_332852</b>	SeqNo: <b>4950667</b>	PrepDate: <b>14-Feb-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.05641	0.00200	0.05	0.001329	110	80 - 120	0.05653	0.212	20	
Lead	0.05378	0.00200	0.05	0	108	80 - 120	0.05239	2.63	20	

<b>PDS</b>	Sample ID: <b>HS19020360-06PDS</b>	Units: <b>mg/L</b>	Analysis Date: <b>14-Feb-2019 18:19</b>							
Client ID:	Run ID: <b>ICPMS05_332852</b>	SeqNo: <b>4950668</b>	PrepDate: <b>14-Feb-2019</b> DF: <b>1</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Arsenic	0.1054	0.00200	0.1	0.001329	104	75 - 125				
Lead	0.1015	0.00200	0.1	0.000121	101	75 - 125				

Client: Golder Associates Inc.  
Project: Houston TX-Wood Preserving Works  
WorkOrder: HS19020155

QC BATCH REPORT

Batch ID: 137737 Instrument: ICPMS05 Method: SW6020

SD Sample ID: HS19020360-06SD Units: mg/L Analysis Date: 14-Feb-2019 18:12  
Client ID: Run ID: ICPMS05\_332852 SeqNo: 4950665 PrepDate: 14-Feb-2019 DF: 5  
Analyte Result MQL SPK Val SPK Ref Control RPD Ref %D %D  
Value %REC Limit Value %D Limit Qual

Arsenic	U	0.0100					0.001329	0	10
Lead	U	0.0100					0.000121	0	10

The following samples were analyzed in this batch: HS19020155-01 HS19020155-02



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

Batch ID: 137448		Instrument: SV-6		Method: SW8270						
MBLK	Sample ID: MBLK-137448	Units: ug/L			Analysis Date: 08-Feb-2019 11:26					
Client ID:	Run ID: SV-6_332610	SeqNo: 4944276	PrepDate: 06-Feb-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	<i>2.907</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>58.1</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.789</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>55.8</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.854</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>57.1</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.062</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.2</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.578</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>51.6</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.103</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>62.1</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

Batch ID: 137448		Instrument: SV-6		Method: SW8270						
LCS	Sample ID: LCS-137448	Units: ug/L			Analysis Date: 08-Feb-2019 18:13					
Client ID:	Run ID: SV-6_332612	SeqNo: 4944310		PrepDate: 06-Feb-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	2.611	0.20	5	0	52.2	39 - 127				
2,4-Dimethylphenol	2.518	0.20	5	0	50.4	35 - 120				
2,4-Dinitrotoluene	2.659	0.20	5	0	53.2	50 - 122				
2,6-Dinitrotoluene	2.949	0.20	5	0	59.0	50 - 120				
2-Chloronaphthalene	2.976	0.20	5	0	59.5	50 - 120				
2-Methylnaphthalene	2.817	0.10	5	0	56.3	50 - 120				
4,6-Dinitro-2-methylphenol	2.638	0.20	5	0	52.8	25 - 121				
4-Nitrophenol	1.883	1.0	5	0	37.7	30 - 130				
Acenaphthene	2.641	0.10	5	0	52.8	45 - 120				
Acenaphthylene	2.731	0.10	5	0	54.6	47 - 120				
Anthracene	2.843	0.10	5	0	56.9	45 - 120				
Benz(a)anthracene	2.826	0.10	5	0	56.5	40 - 120				
Benzo(a)pyrene	3.019	0.10	5	0	60.4	45 - 120				
Bis(2-chloroethoxy)methane	2.696	0.20	5	0	53.9	45 - 120				
Bis(2-ethylhexyl)phthalate	2.851	0.20	5	0	57.0	40 - 139				
Chrysene	2.815	0.10	5	0	56.3	43 - 120				
Dibenzofuran	2.757	0.10	5	0	55.1	50 - 120				
Di-n-butyl phthalate	2.838	0.20	5	0	56.8	45 - 123				
Fluoranthene	2.883	0.10	5	0	57.7	45 - 125				
Fluorene	2.833	0.10	5	0	56.7	49 - 120				
Naphthalene	2.664	0.10	5	0	53.3	45 - 120				
Nitrobenzene	2.517	0.20	5	0	50.3	44 - 120				
N-Nitrosodiphenylamine	3.039	0.20	5	0	60.8	40 - 125				
Pentachlorophenol	2.403	0.20	5	0	48.1	19 - 121				
Phenanthrene	2.782	0.10	5	0	55.6	45 - 121				
Phenol	3.217	0.20	5	0	64.3	20 - 124				
Pyrene	2.85	0.10	5	0	57.0	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.392</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>67.8</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>2.97</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>59.4</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>2.727</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>54.5</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>3.222</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.4</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>2.623</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>52.5</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>3.09</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>61.8</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

Batch ID: 137448		Instrument: SV-6		Method: SW8270						
LCSD		Sample ID: LCSD-137448		Units: ug/L		Analysis Date: 08-Feb-2019 10:47				
Client ID:		Run ID: SV-6_332610		SeqNo: 4944275		PrepDate: 06-Feb-2019		DF: 1		
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	2.89	0.20	5	0	57.8	39 - 127	2.611	10.2	20	
2,4-Dimethylphenol	3.153	0.20	5	0	63.1	35 - 120	2.518	22.4	20	R
2,4-Dinitrotoluene	3.088	0.20	5	0	61.8	50 - 122	2.659	14.9	20	
2,6-Dinitrotoluene	3.151	0.20	5	0	63.0	50 - 120	2.949	6.61	20	
2-Chloronaphthalene	3.338	0.20	5	0	66.8	50 - 120	2.976	11.5	20	
2-Methylnaphthalene	3.264	0.10	5	0	65.3	50 - 120	2.817	14.7	20	
4,6-Dinitro-2-methylphenol	4.105	0.20	5	0	82.1	25 - 121	2.638	43.5	30	R
4-Nitrophenol	3.228	1.0	5	0	64.6	30 - 130	1.883	52.6	20	R
Acenaphthene	2.907	0.10	5	0	58.1	45 - 120	2.641	9.56	20	
Acenaphthylene	3.114	0.10	5	0	62.3	47 - 120	2.731	13.1	20	
Anthracene	3.188	0.10	5	0	63.8	45 - 120	2.843	11.4	20	
Benz(a)anthracene	3.115	0.10	5	0	62.3	40 - 120	2.826	9.71	20	
Benzo(a)pyrene	3.388	0.10	5	0	67.8	45 - 120	3.019	11.5	20	
Bis(2-chloroethoxy)methane	3.015	0.20	5	0	60.3	45 - 120	2.696	11.2	20	
Bis(2-ethylhexyl)phthalate	3.041	0.20	5	0	60.8	40 - 139	2.851	6.45	20	
Chrysene	3.358	0.10	5	0	67.2	43 - 120	2.815	17.6	20	
Dibenzofuran	3.08	0.10	5	0	61.6	50 - 120	2.757	11.1	20	
Di-n-butyl phthalate	3.255	0.20	5	0	65.1	45 - 123	2.838	13.7	20	
Fluoranthene	3.271	0.10	5	0	65.4	45 - 125	2.883	12.6	20	
Fluorene	3.155	0.10	5	0	63.1	49 - 120	2.833	10.8	20	
Naphthalene	3.073	0.10	5	0	61.5	45 - 120	2.664	14.3	20	
Nitrobenzene	2.676	0.20	5	0	53.5	44 - 120	2.517	6.12	20	
N-Nitrosodiphenylamine	3.3	0.20	5	0	66.0	40 - 125	3.039	8.23	20	
Pentachlorophenol	3.405	0.20	5	0	68.1	19 - 121	2.403	34.5	20	R
Phenanthrene	3.143	0.10	5	0	62.9	45 - 121	2.782	12.2	20	
Phenol	3.33	0.20	5	0	66.6	20 - 124	3.217	3.43	20	
Pyrene	3.275	0.10	5	0	65.5	40 - 130	2.85	13.9	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>3.758</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>75.2</i>	<i>34 - 129</i>	<i>3.392</i>	<i>10.2</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>3.216</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.3</i>	<i>40 - 125</i>	<i>2.97</i>	<i>7.93</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>3.227</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>64.5</i>	<i>20 - 120</i>	<i>2.727</i>	<i>16.8</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>3.491</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.8</i>	<i>40 - 135</i>	<i>3.222</i>	<i>8.03</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>2.813</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>56.3</i>	<i>41 - 120</i>	<i>2.623</i>	<i>7.01</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>3.491</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>69.8</i>	<i>20 - 120</i>	<i>3.09</i>	<i>12.2</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19020155-01 HS19020155-02

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

**Batch ID:** R332708      **Instrument:** VOA2      **Method:** SW8260

<b>MBLK</b>		Sample ID: <b>VBLKW-190211</b>			Units: <b>ug/L</b>		Analysis Date: <b>11-Feb-2019 11:56</b>			
Client ID:		Run ID: <b>VOA2_332708</b>			SeqNo: <b>4946341</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>45.67</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.3</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>45.83</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>91.7</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>52.39</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				

<b>LCS</b>		Sample ID: <b>VLCSW-190211</b>			Units: <b>ug/L</b>		Analysis Date: <b>11-Feb-2019 10:44</b>			
Client ID:		Run ID: <b>VOA2_332708</b>			SeqNo: <b>4946340</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	17.52	1.0	20	0	87.6	70 - 124				
Benzene	18.99	1.0	20	0	94.9	74 - 120				
Chlorobenzene	20.07	1.0	20	0	100	76 - 113				
Ethylbenzene	20.86	1.0	20	0	104	77 - 117				
Methylene chloride	19.08	2.0	20	0	95.4	70 - 127				
Toluene	19.54	1.0	20	0	97.7	77 - 118				
Xylenes, Total	59.46	1.0	60	0	99.1	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.08</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.2</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>47.66</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>95.3</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.95</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.9</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>49.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.1</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QC BATCH REPORT**

**Batch ID:** R332708      **Instrument:** VOA2      **Method:** SW8260

<b>MS</b>		Sample ID: <b>HS19020162-01MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>11-Feb-2019 15:11</b>			
Client ID:		Run ID: <b>VOA2_332708</b>			SeqNo: <b>4946349</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	16.91	1.0	20	0	84.6	70 - 127				
Benzene	18.5	1.0	20	0	92.5	70 - 127				
Chlorobenzene	18.97	1.0	20	0	94.9	70 - 114				
Ethylbenzene	20.21	1.0	20	0	101	70 - 124				
Methylene chloride	18.41	2.0	20	0	92.1	70 - 128				
Toluene	18.96	1.0	20	0	94.8	70 - 123				
Xylenes, Total	56.98	1.0	60	0	95.0	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.8</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.6</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.4</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>48.74</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.5</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>48.91</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.8</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19020162-01MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>11-Feb-2019 15:35</b>			
Client ID:		Run ID: <b>VOA2_332708</b>			SeqNo: <b>4946350</b>		PrepDate:		DF: <b>1</b>	
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	17.19	1.0	20	0	85.9	70 - 127	16.91	1.61	20	
Benzene	18.89	1.0	20	0	94.4	70 - 127	18.5	2.07	20	
Chlorobenzene	19.19	1.0	20	0	95.9	70 - 114	18.97	1.12	20	
Ethylbenzene	20.55	1.0	20	0	103	70 - 124	20.21	1.67	20	
Methylene chloride	19	2.0	20	0	95.0	70 - 128	18.41	3.14	20	
Toluene	19.05	1.0	20	0	95.3	70 - 123	18.96	0.466	20	
Xylenes, Total	57.51	1.0	60	0	95.8	70 - 130	56.98	0.927	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>48.56</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.1</i>	<i>70 - 126</i>	<i>48.8</i>	<i>0.487</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>48.03</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>96.1</i>	<i>81 - 113</i>	<i>48.71</i>	<i>1.4</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>48.7</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.4</i>	<i>77 - 123</i>	<i>48.74</i>	<i>0.0752</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>48.71</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>97.4</i>	<i>82 - 127</i>	<i>48.91</i>	<i>0.415</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19020155-01      HS19020155-02      HS19020155-03

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19020155

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Arkansas	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019

Sample Receipt Checklist

Client Name: PBW
Work Order: HS19020155

Date/Time Received: 02-Feb-2019 09:22
Received by: PMG

Checklist completed by: Nilesh D. Ranchod
eSignature
Date: 5-Feb-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 13-Feb-2019

Matrices: Water

Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [ ] Not Present [ ]
Custody seals intact on shipping container/cooler? Yes [ ] No [ ] Not Present [checked]
Custody seals intact on sample bottles? Yes [ ] No [ ] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [ ] No [ ] Not Present [checked]
Chain of custody present? Yes [checked] No [ ]
Chain of custody signed when relinquished and received? Yes [checked] No [ ]
Samplers name present on COC? Yes [ ] No [checked]
Chain of custody agrees with sample labels? Yes [checked] No [ ]
Samples in proper container/bottle? Yes [checked] No [ ]
Sample containers intact? Yes [checked] No [ ]
Sufficient sample volume for indicated test? Yes [checked] No [ ]
All samples received within holding time? Yes [checked] No [ ]
Container/Temp Blank temperature in compliance? Yes [checked] No [ ]

1 Page(s)
COC IDs:194314

Temperature(s)/Thermometer(s): 0.9C / 1.2C UC/C IR # 25
Cooler(s)/Kit(s): 44538
Date/Time sample(s) sent to storage: 02/02/2019 13:00
Water - VOA vials have zero headspace? Yes [checked] No [ ] No VOA vials submitted [ ]
Water - pH acceptable upon receipt? Yes [checked] No [ ] N/A [ ]
pH adjusted? Yes [ ] No [ ] N/A [checked]
pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:





Cincinnati, OH  
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# Chain of Custody Form

Page 1 of 1

COC ID: 194314

HS19020155

Golder Associates Inc.  
Houston TX-Wood Preserving Works

m, WV  
8

0



Customer Information		Project Information		ALS Project Manager:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 Volatile Organics Site Specific)
Work Order		Project Number	1620-06-Rev0 SR 92688	B	8260_LL_W (5632528 VOC Site Specific + V.C.)
Company Name	Golder Associates	Bill To Company	Union Pacific Railroad- A/P	C	8270_LOW_W (5632532 SemiVolatiles Site specific)
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	ICP_TW (5636002 5652646 Metals - As, Pb)
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E	
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	F	
Phone	(512) 671-3434	Phone		G	
Fax	(512) 671-3446	Fax		H	
e-Mail Address	eric.matzner@pbwllc.com	e-Mail Address		I	
				J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WQ-1620-TB0_-201801			Water		2											
2	WG-1620-MW77A-20190201	2-1-19	1305	W		6	X		X	X							
3	WG-1620-MW85C-20190201	2-1-19	1400	W		6	X		X	X							
4	WG-1620-TB07-20190201	2-1-19	-	W		2	X										
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>John Beaton</i>		Shipment Method HAND DELIVERED		Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour			Results Due Date:	
Relinquished by:	Date: 2-2-19	Time: 09:22	Received by:	Notes: UPRR Houston MWPW		QC Package: (Check One Box Below)		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID: 44538	Cooler Temp: 09	<input type="checkbox"/> Level II Std QC	<input checked="" type="checkbox"/> TRRP Checklist	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	3718	RETURN	<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035				Other: #25		<input type="checkbox"/> Level IV SWB4/CLP	<input type="checkbox"/> Other	

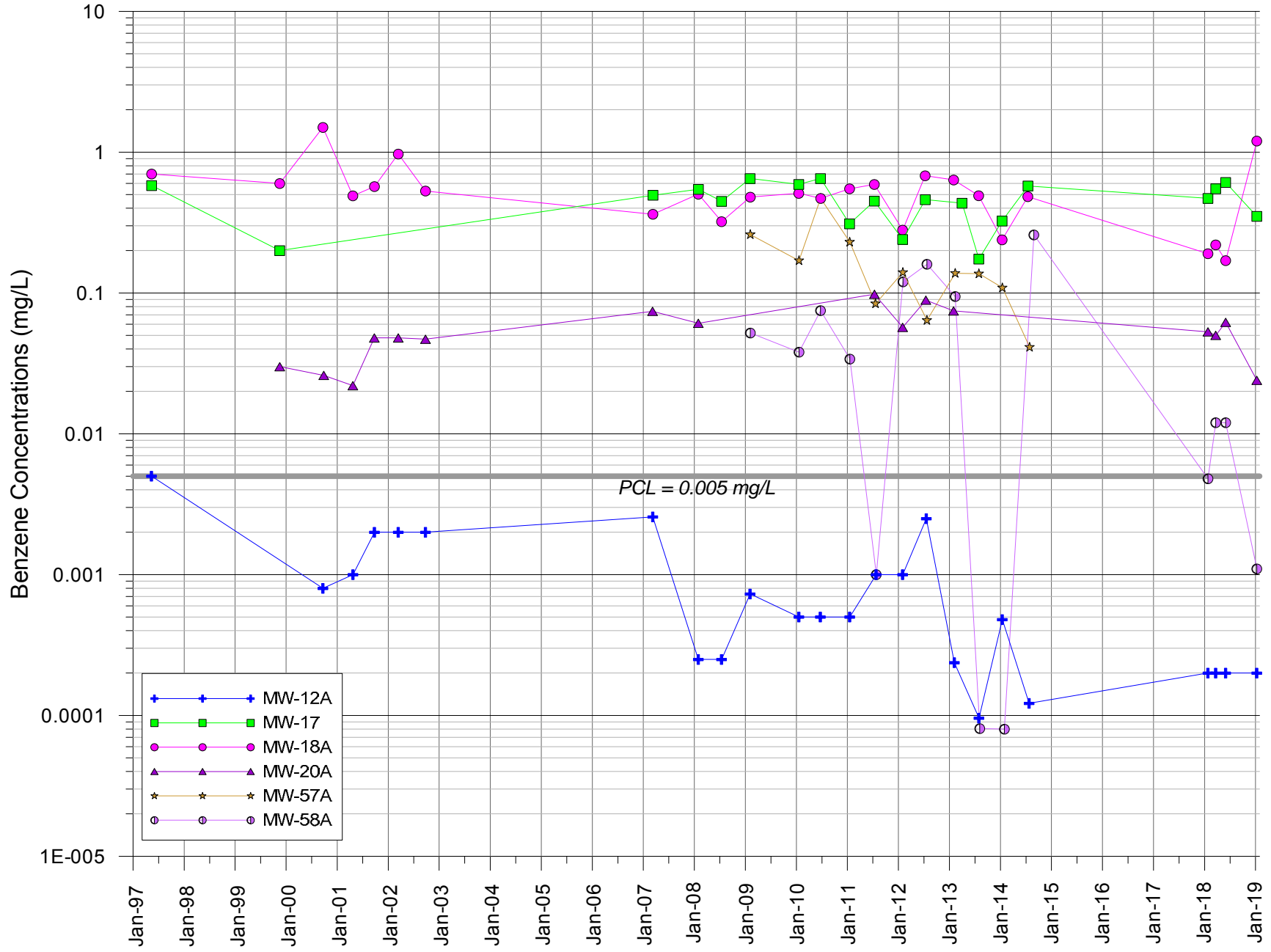
Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
3. The Chain of Custody is a legal document. All information must be completed accurately.

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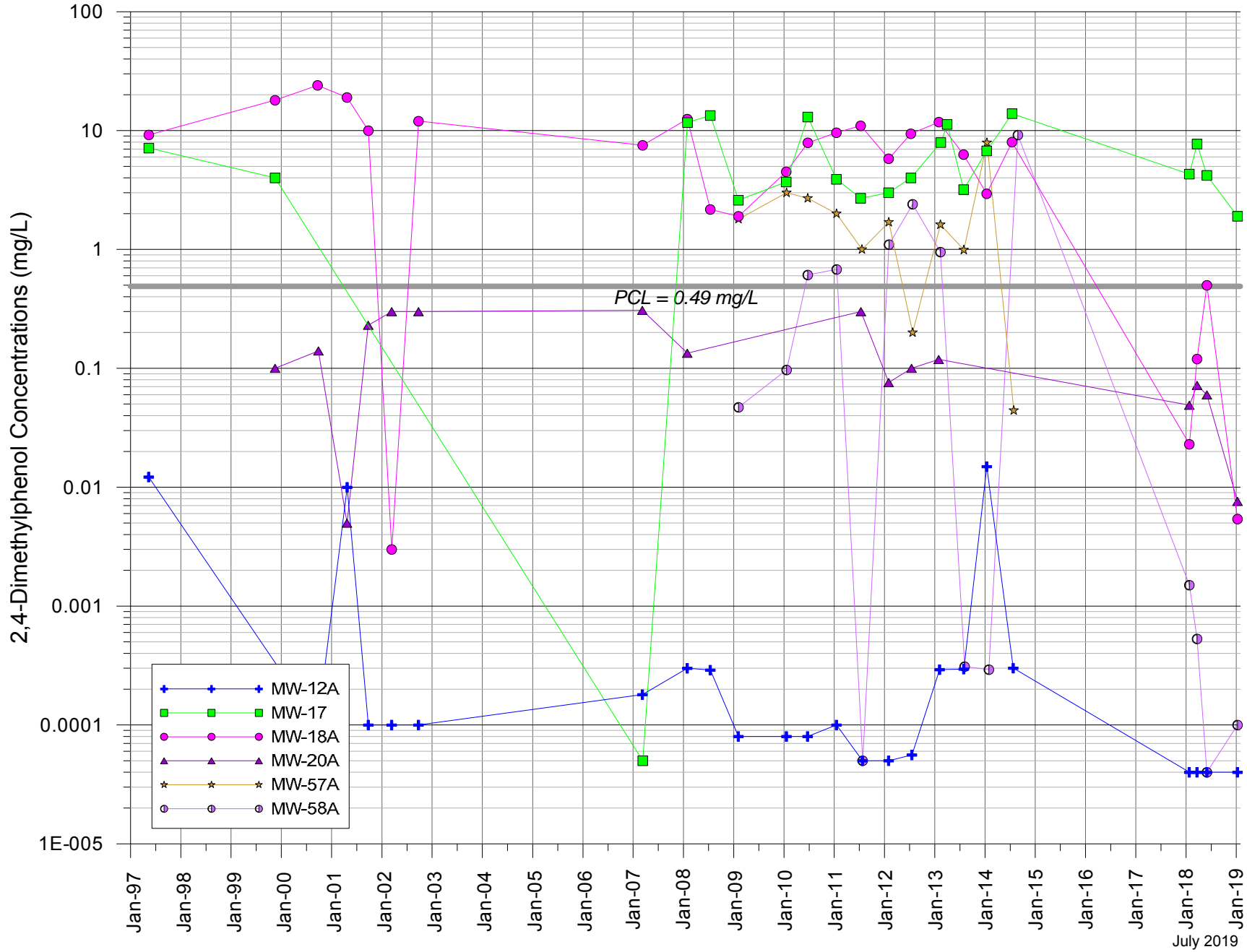
**ATTACHMENT B**

## **COC Concentration Graphs**

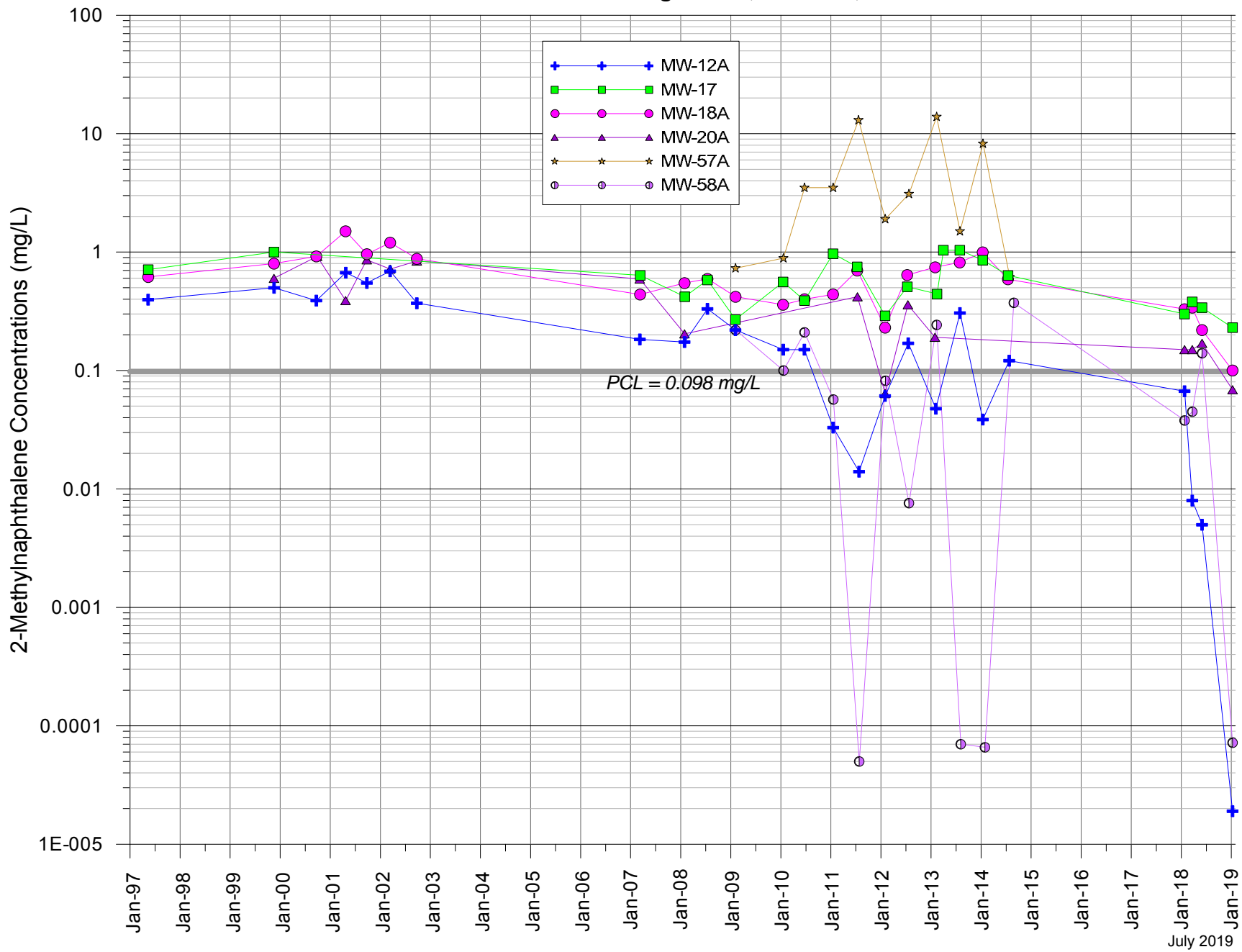
**ATTACHMENT 1B-1**  
**Benzene Concentrations at Source Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



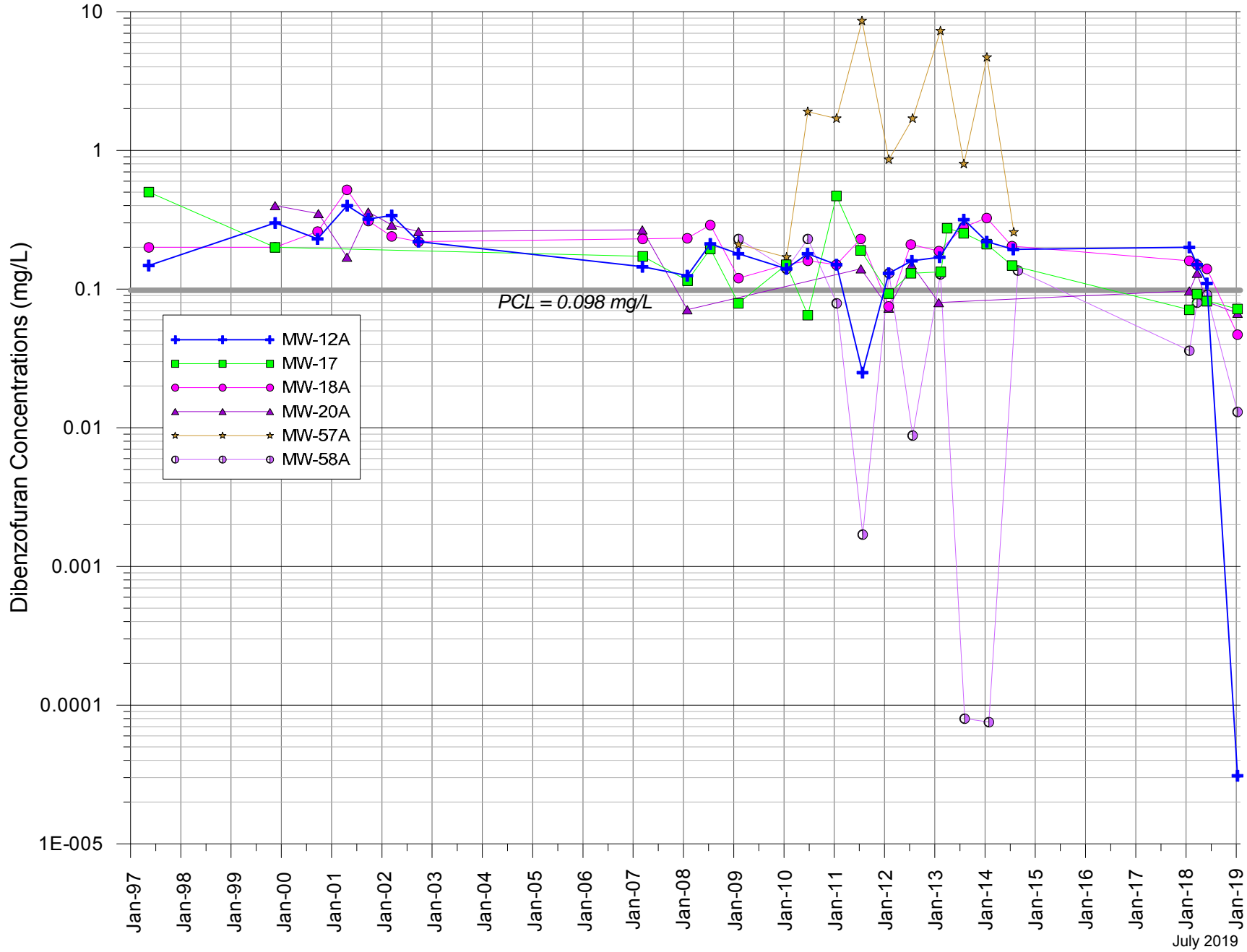
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**2,4-Dimethylphenol Concentrations at Source Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



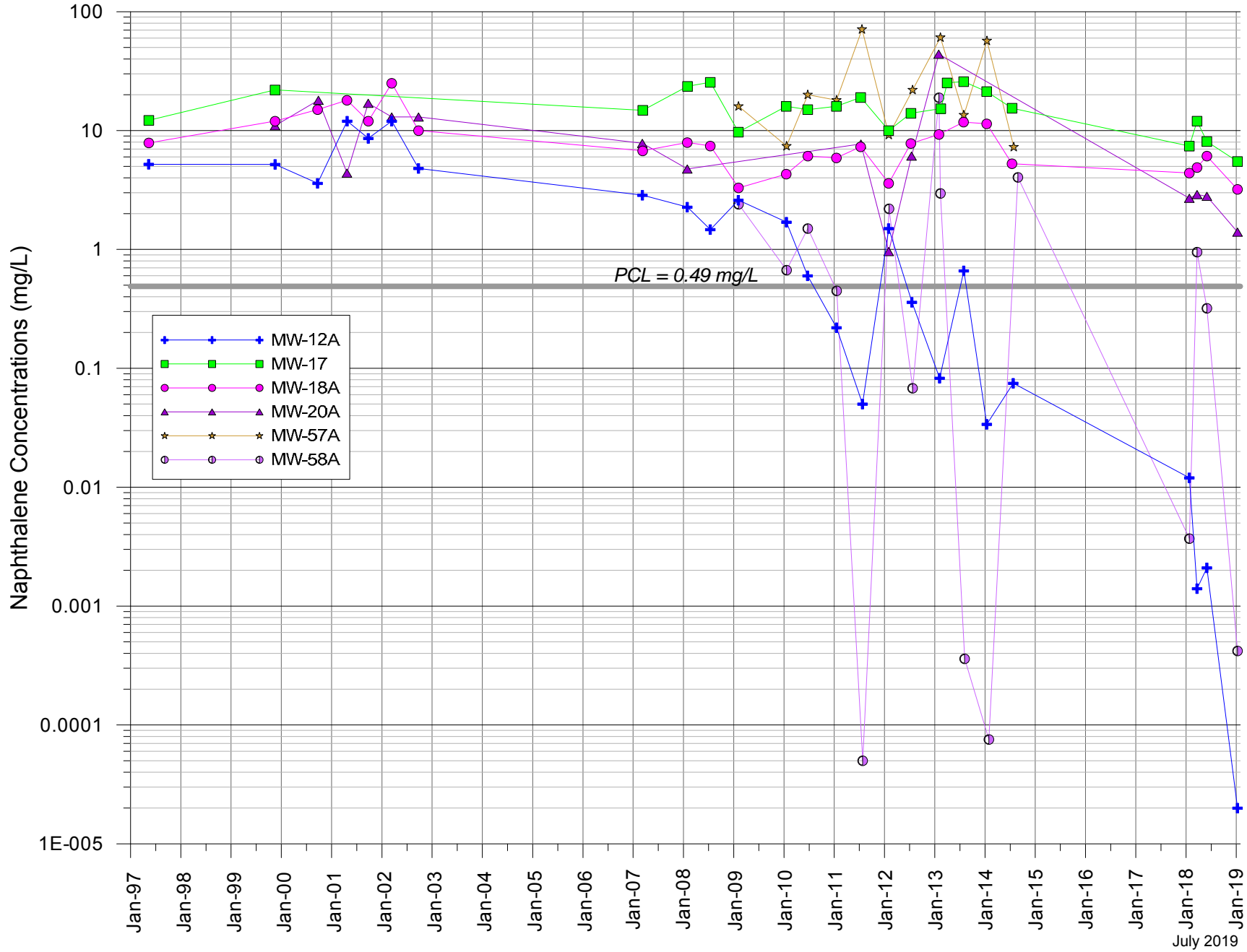
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**2-Methylnaphthalene Concentrations at Source Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



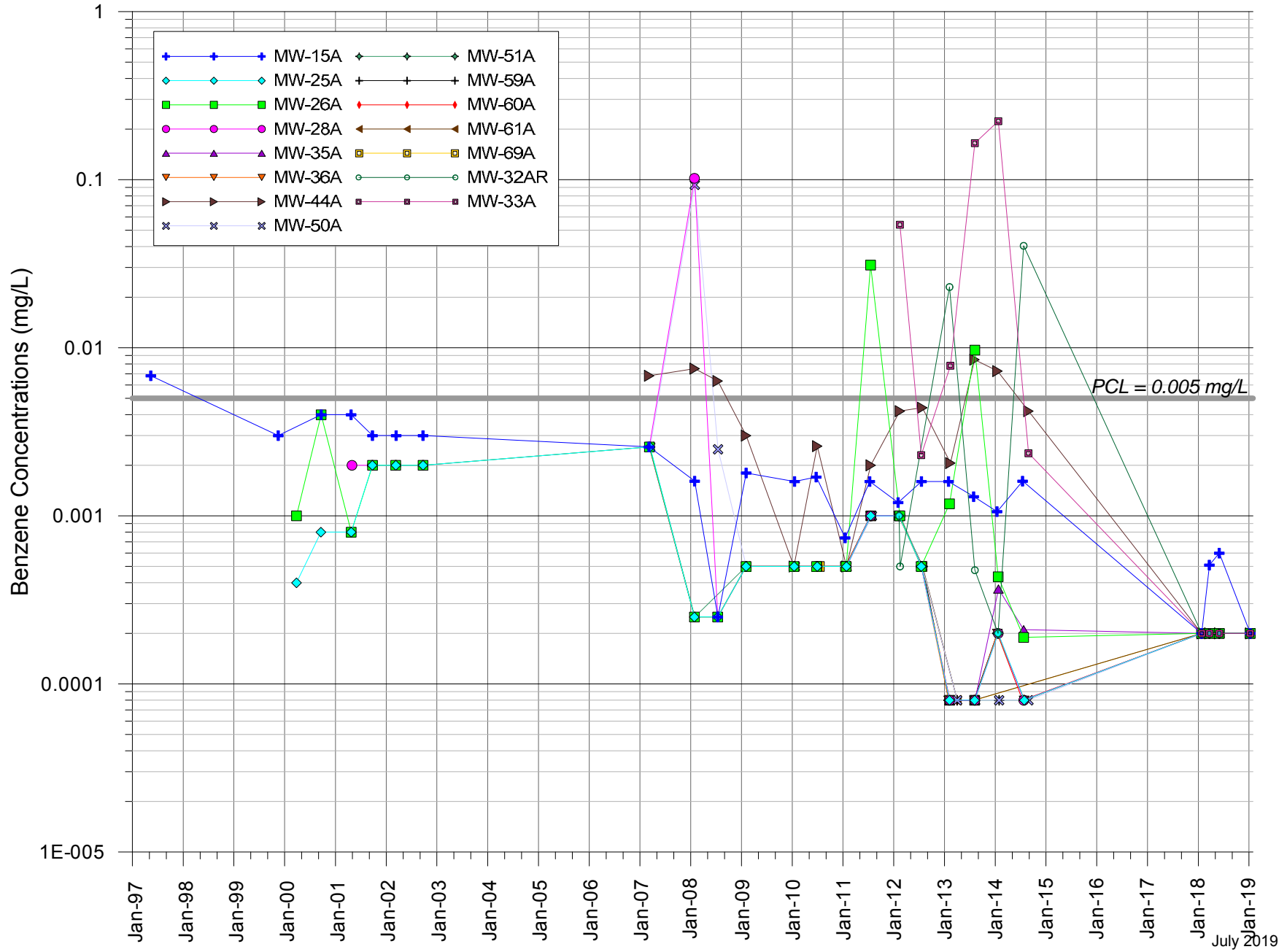
**ATTACHMENT 1B-4**  
**Dibenzofuran Concentrations at Source Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



**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**

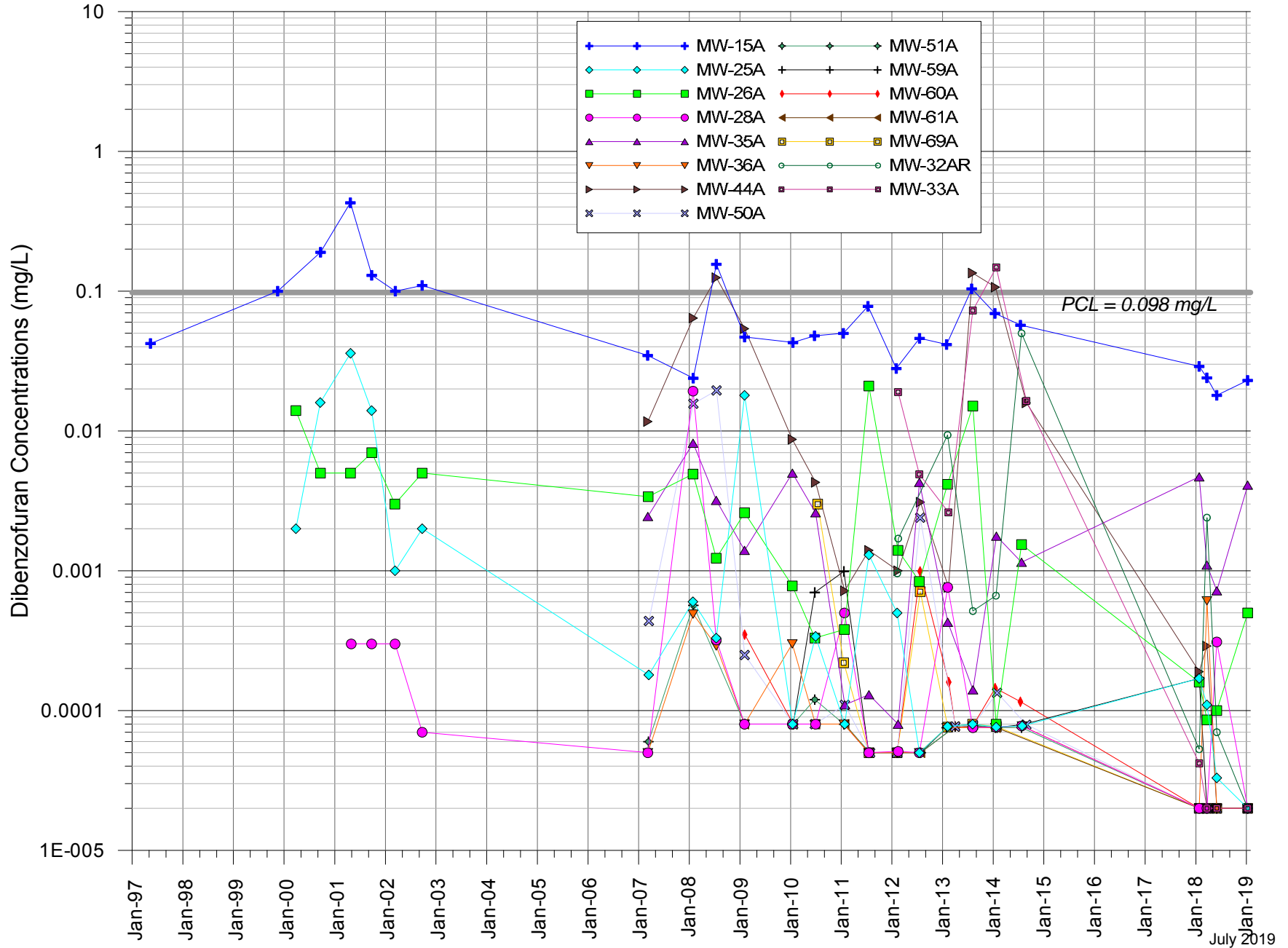




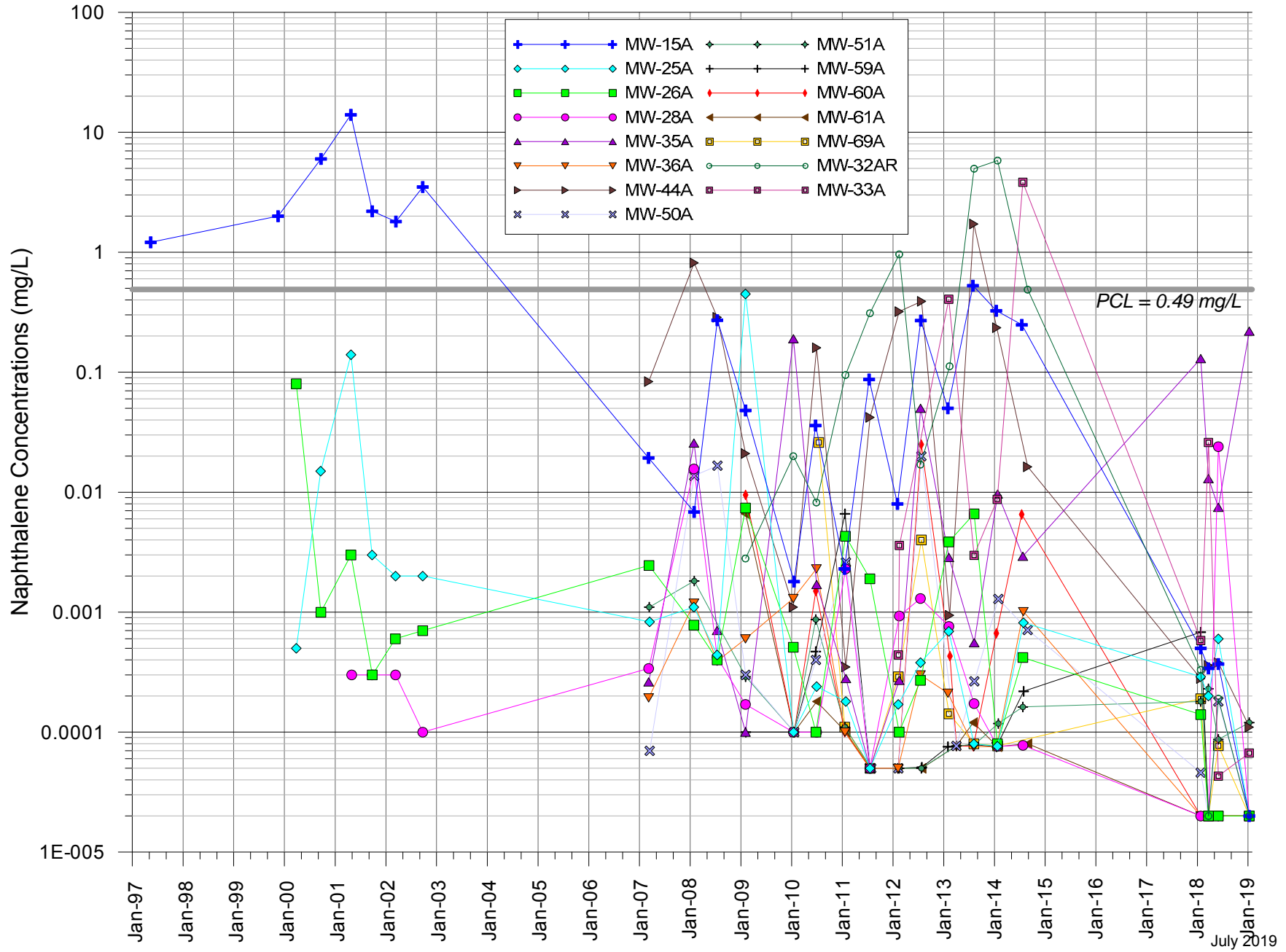




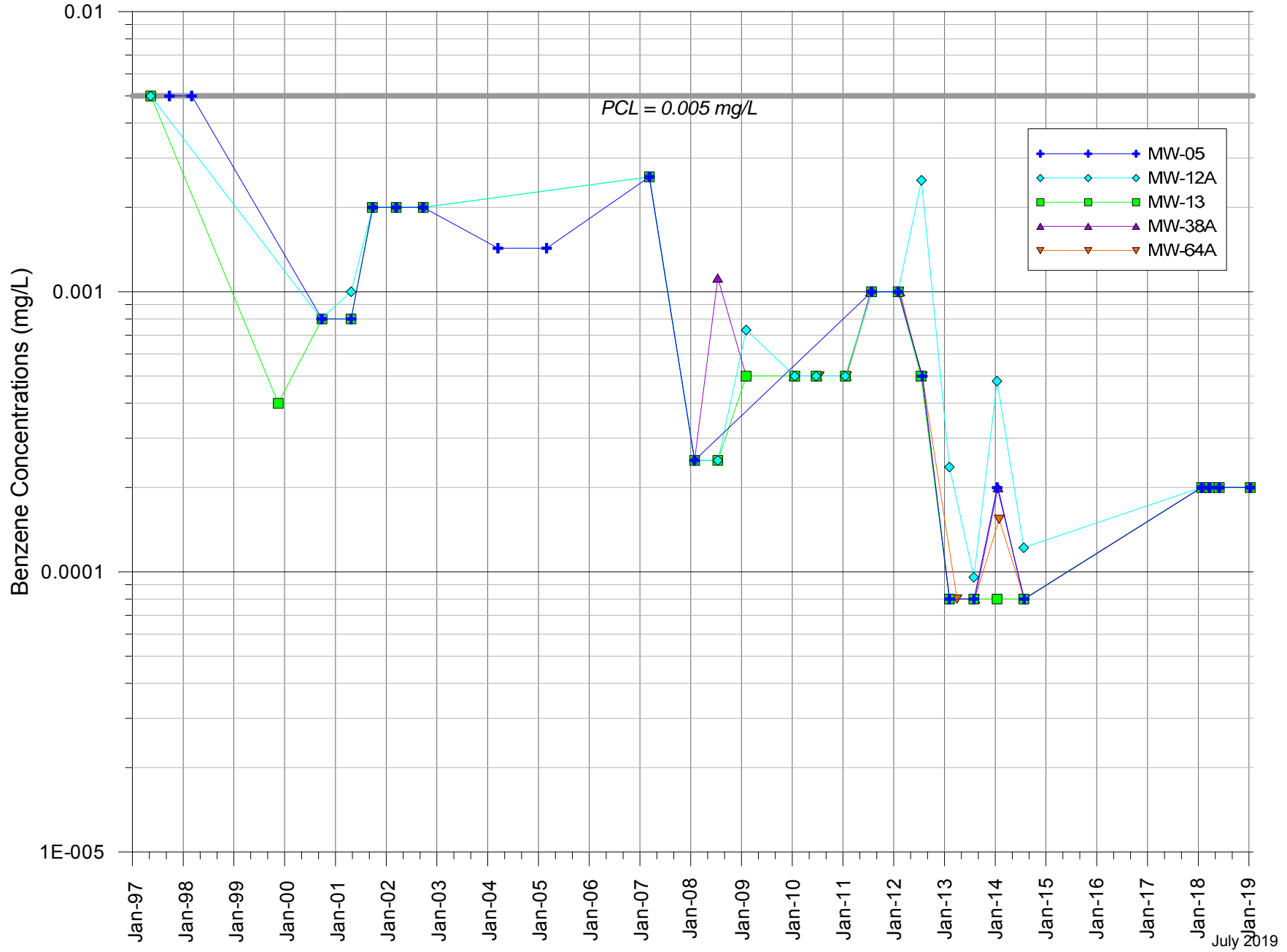
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**Dibenzofuran Concentrations at Perimeter Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



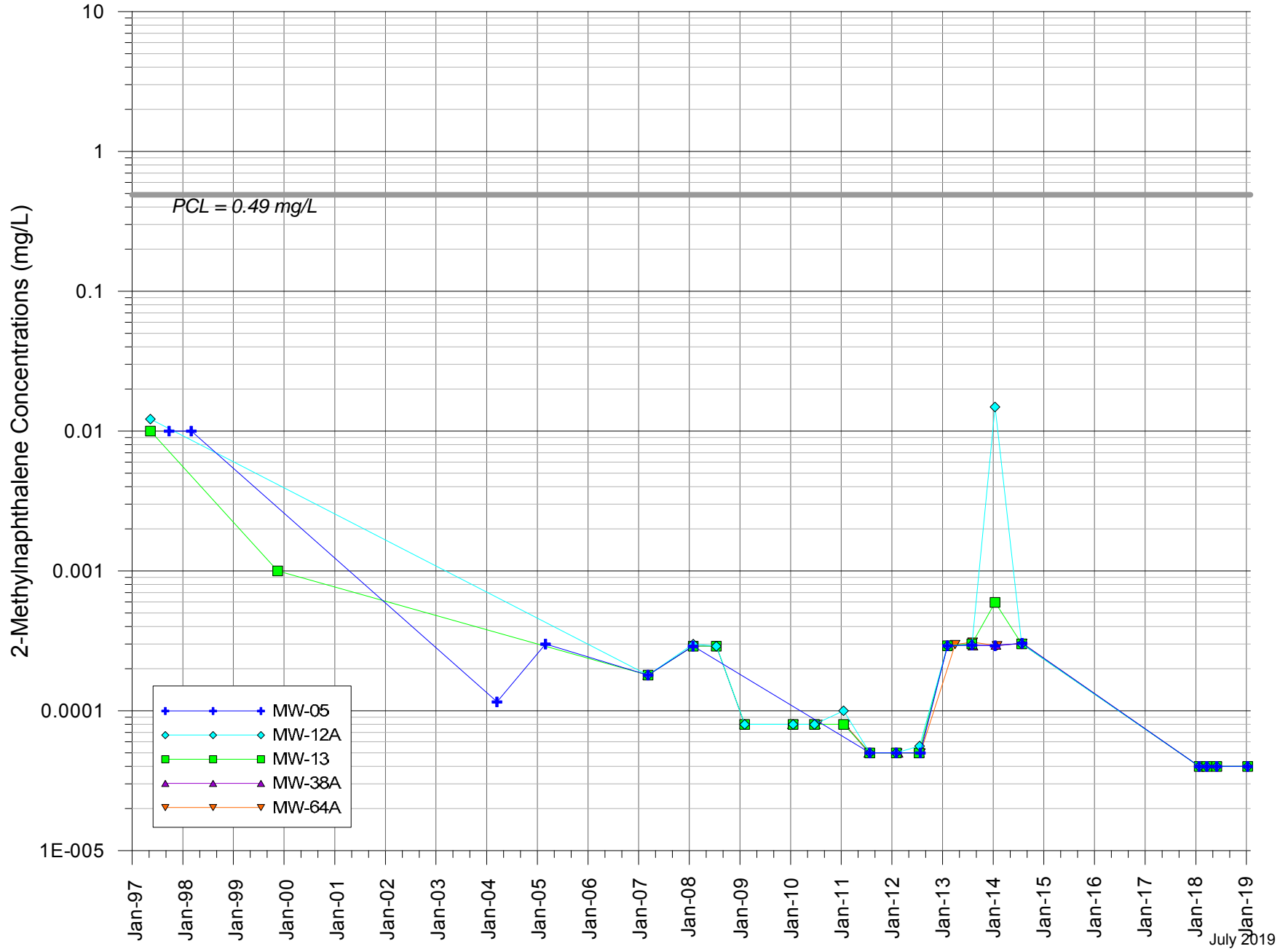
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**Naphthalene Concentrations at Perimeter Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



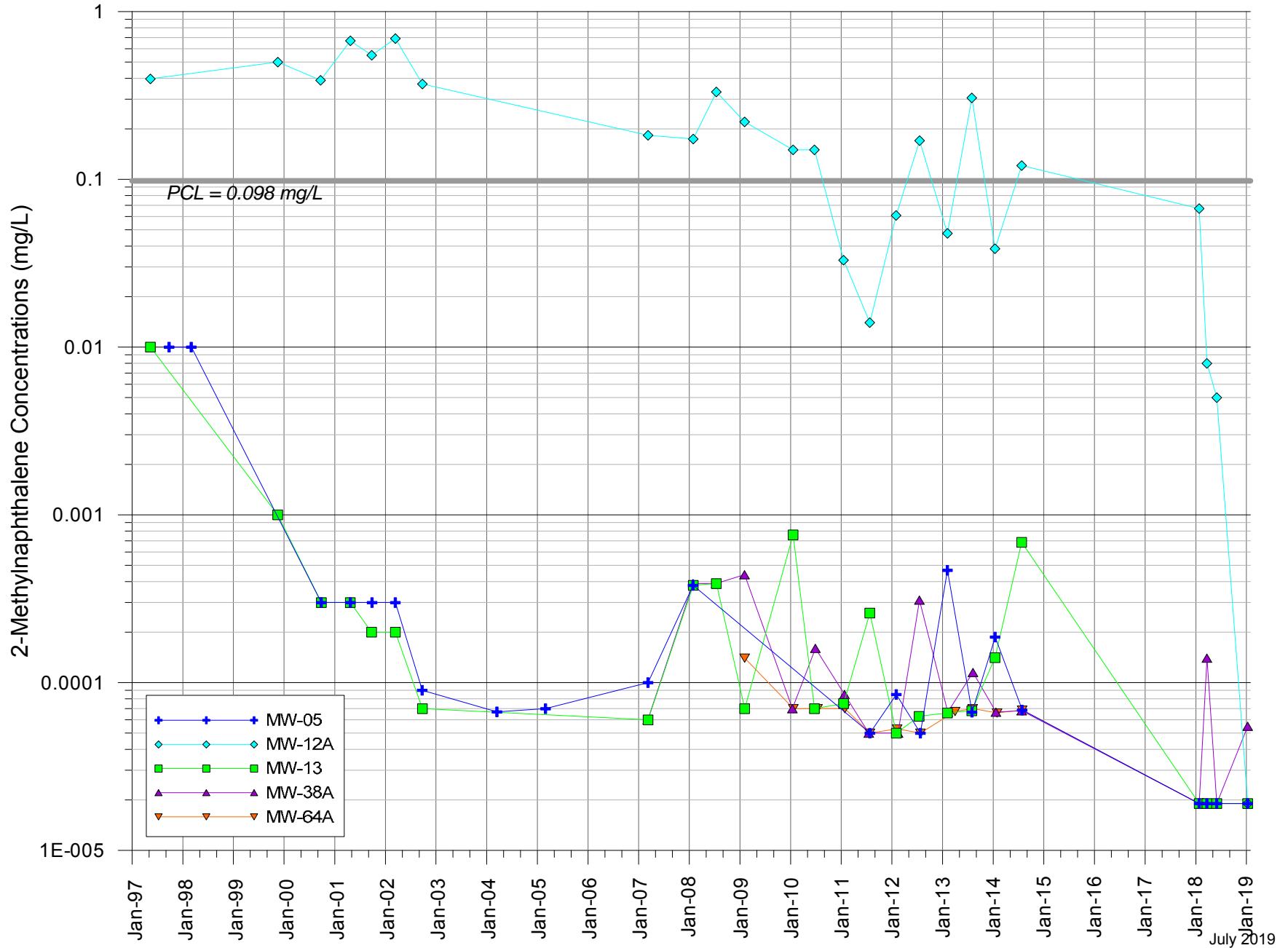
**ATTACHMENT 1B-11**  
**Benzene Concentrations at West End Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



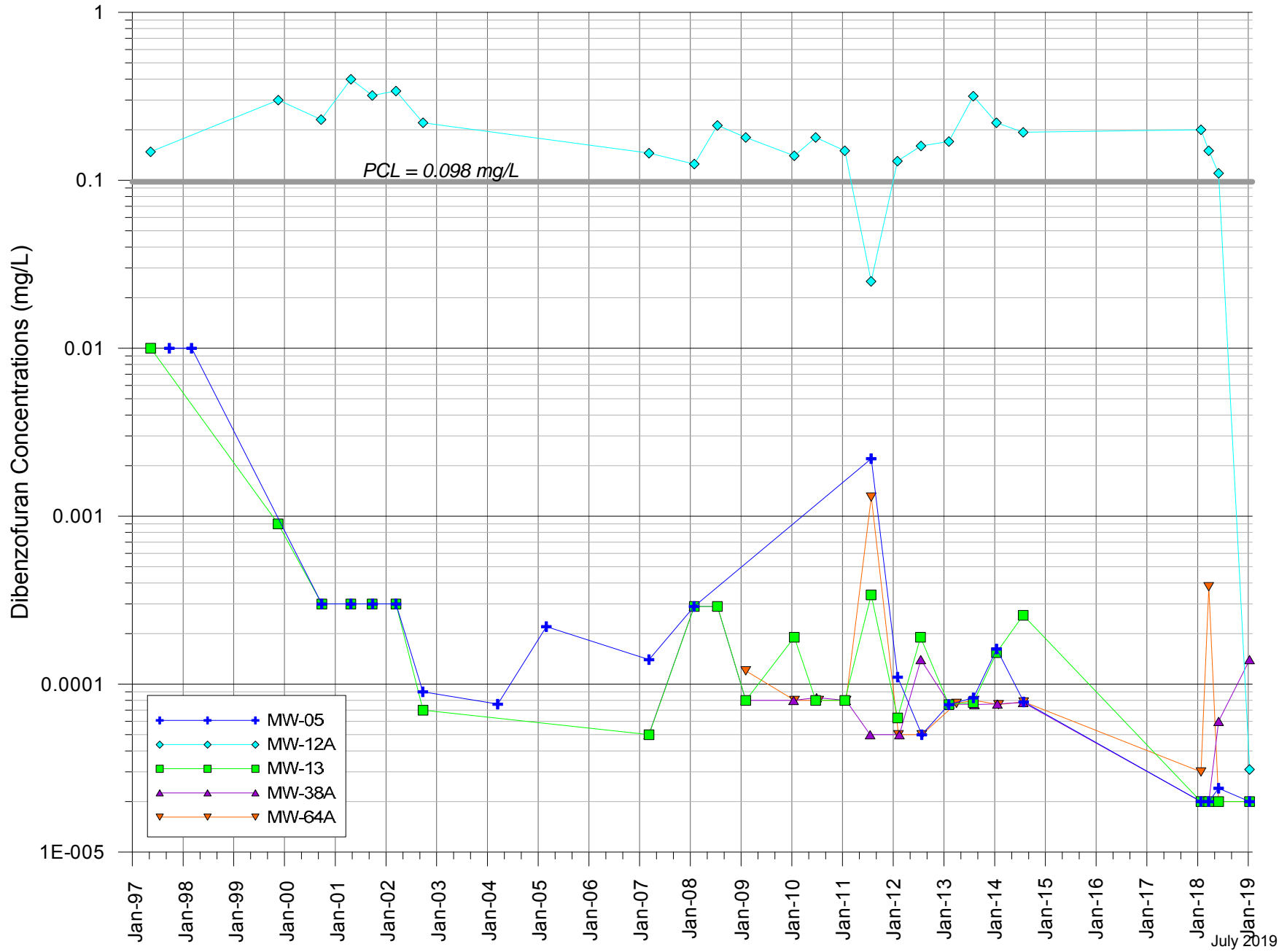
**ATTACHMENT 1B-12**  
**2,4-Dimethylphenol Concentrations at West End Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



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

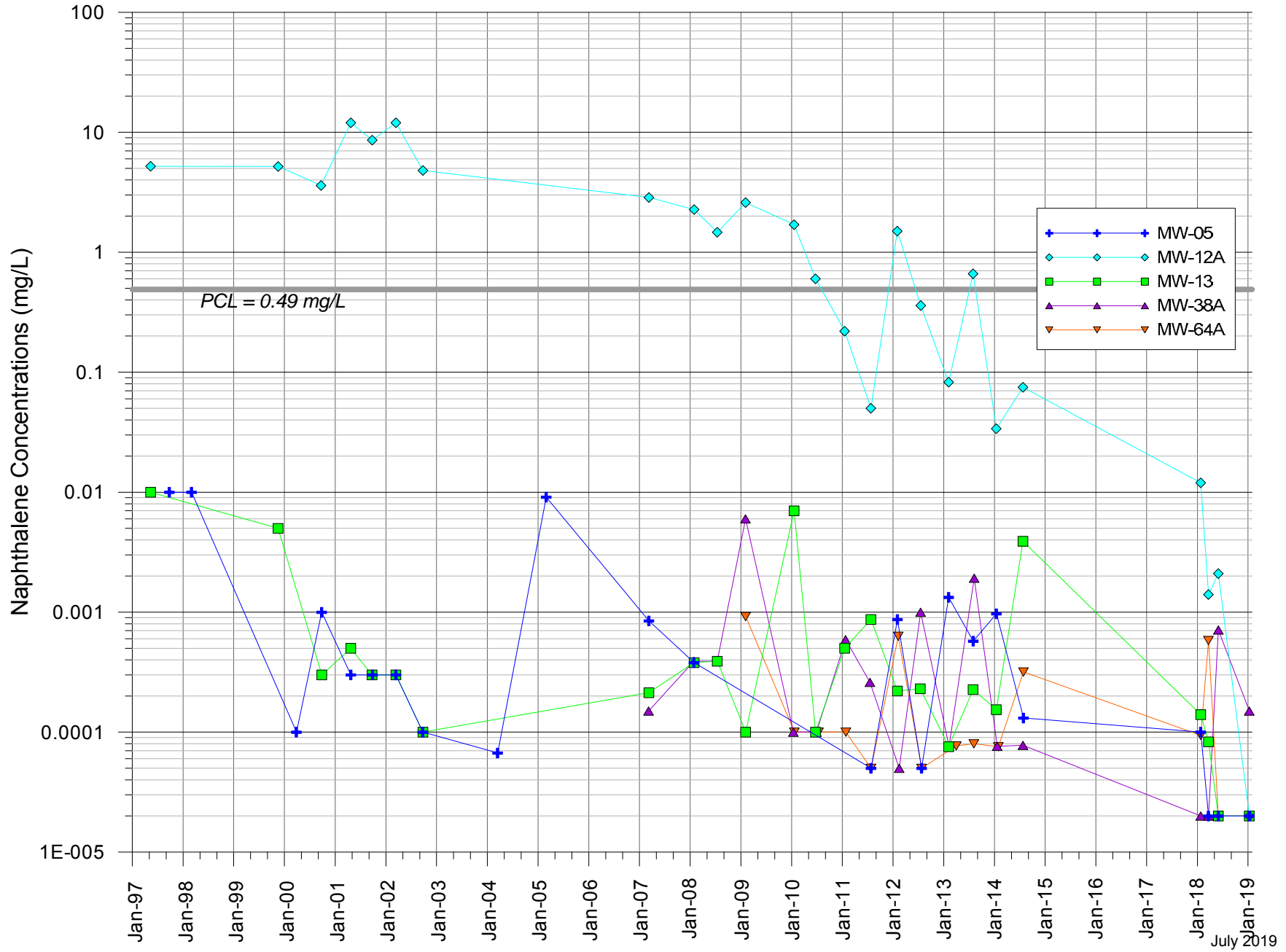


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**UPRR Houston Wood Preserving Works, Houston, Texas**

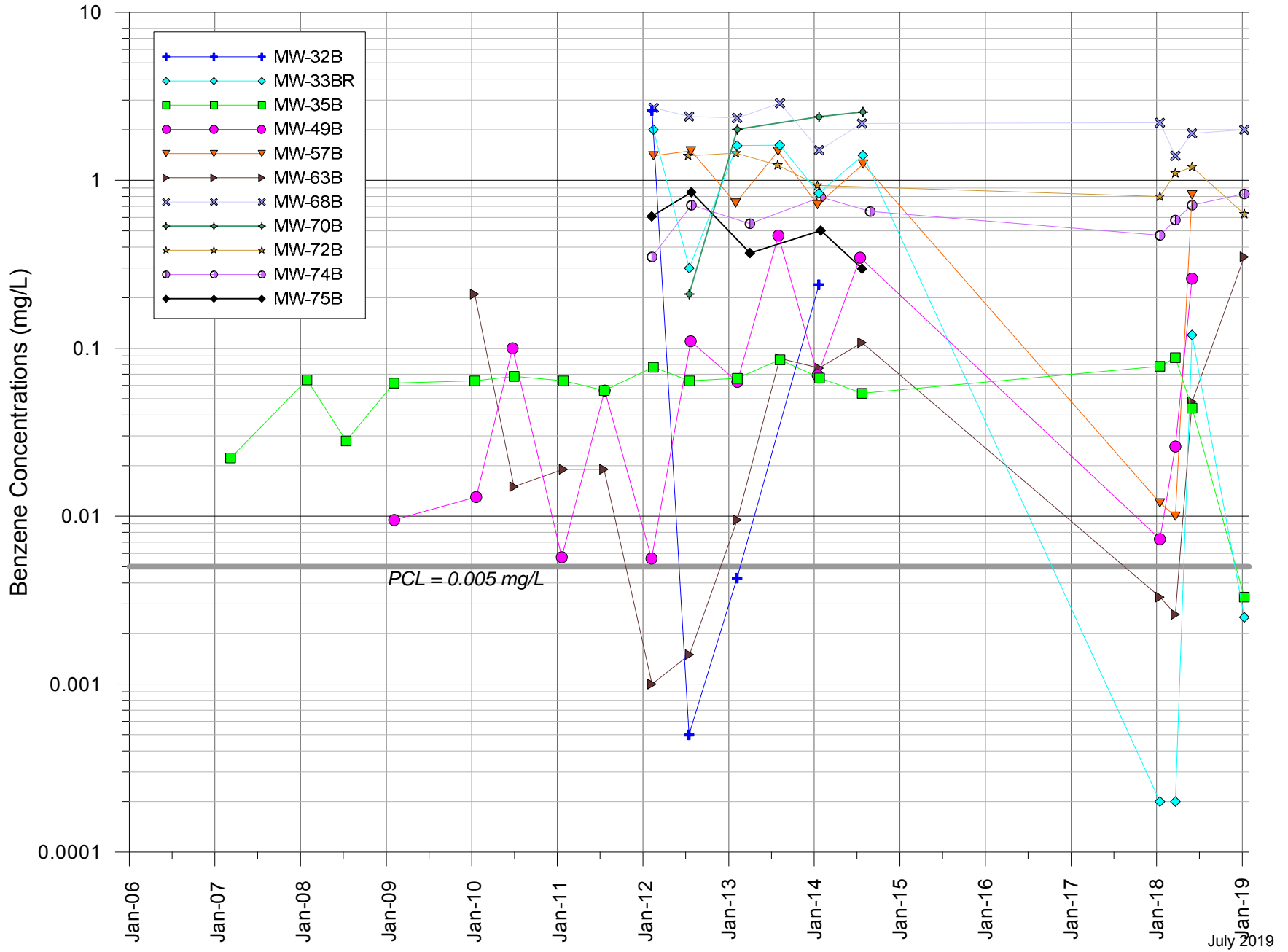




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**Naphthalene Concentrations at West End Area Wells - A-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**

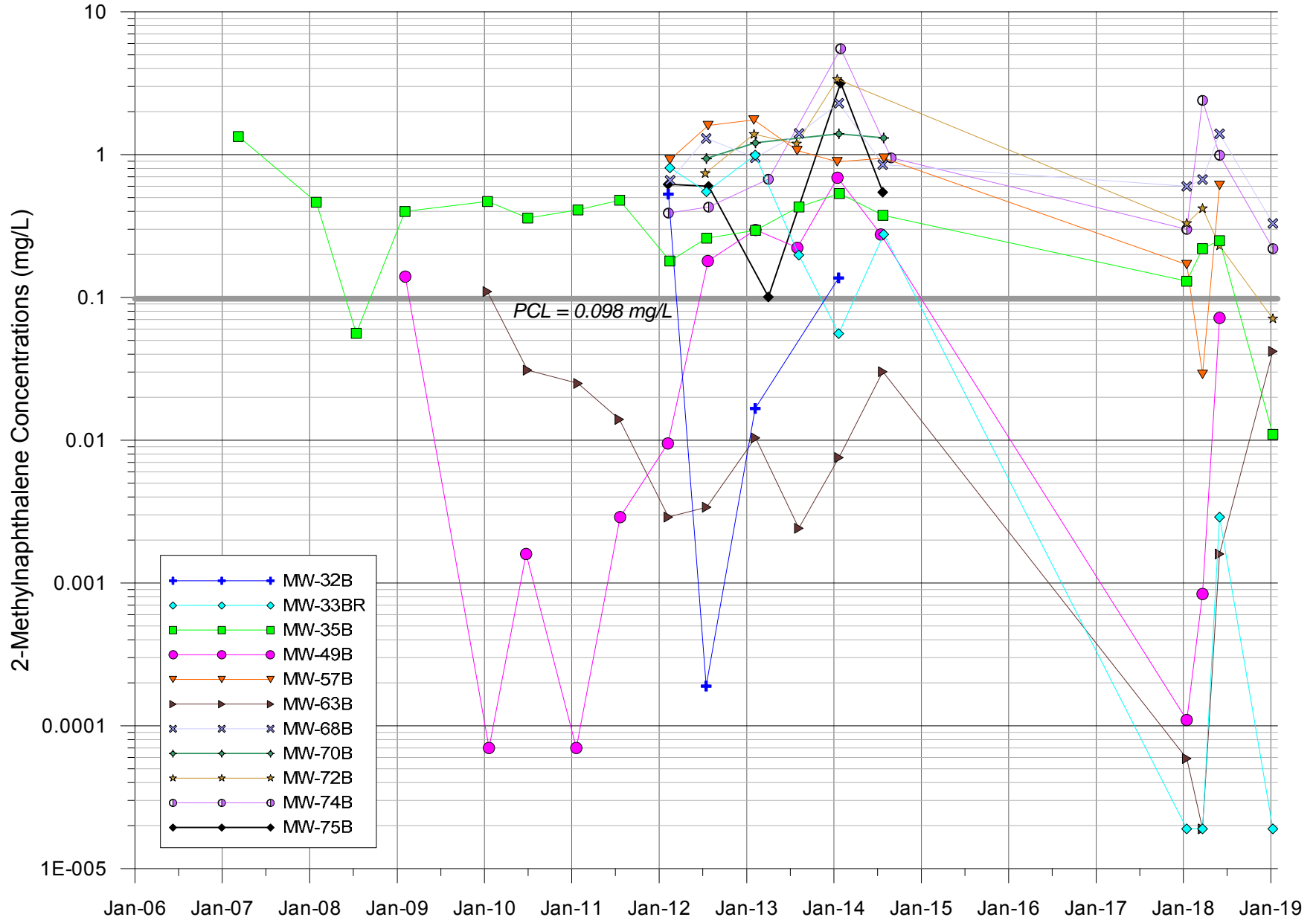


**ATTACHMENT 1B-16**  
**Benzene Concentrations at Source Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**

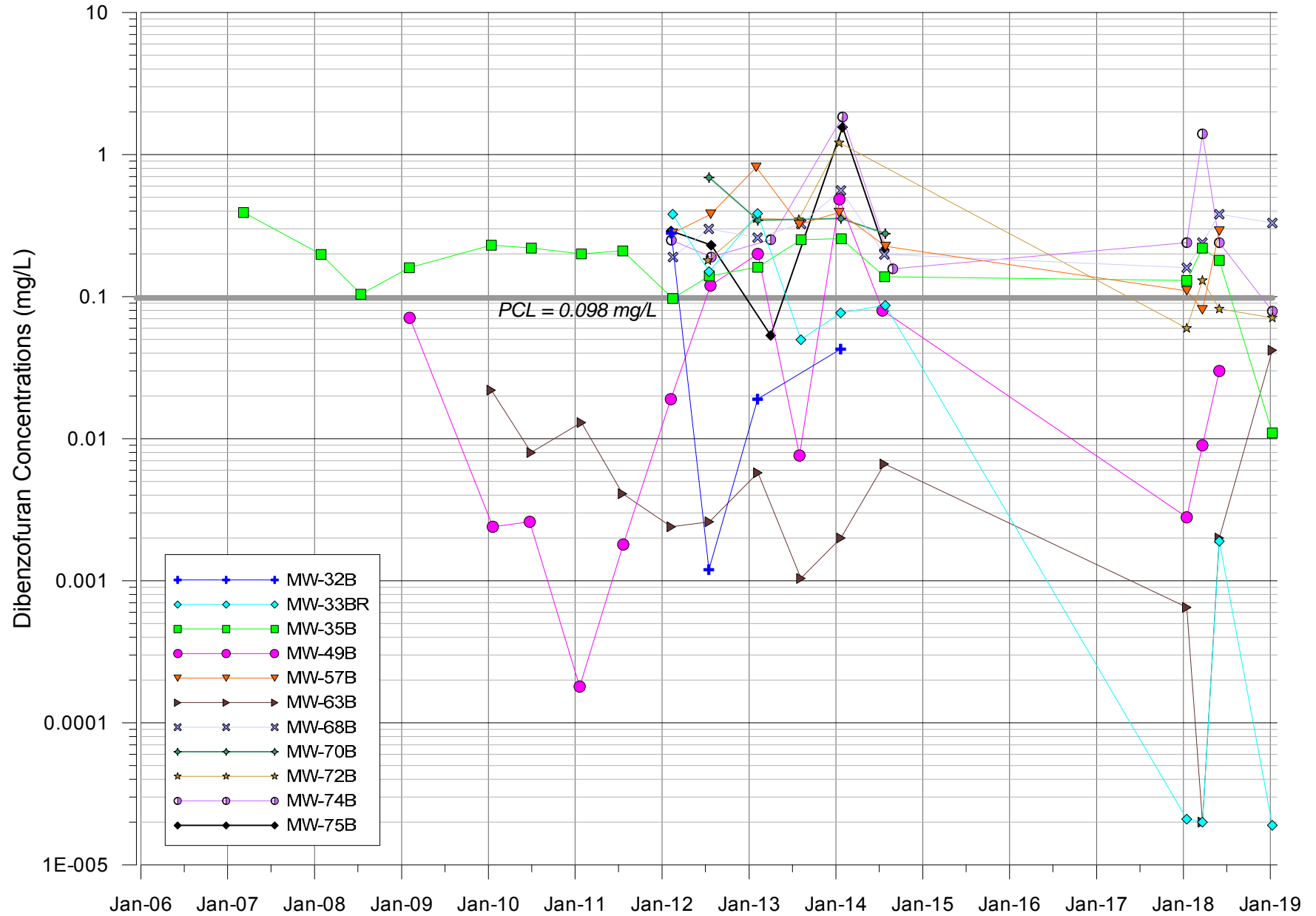




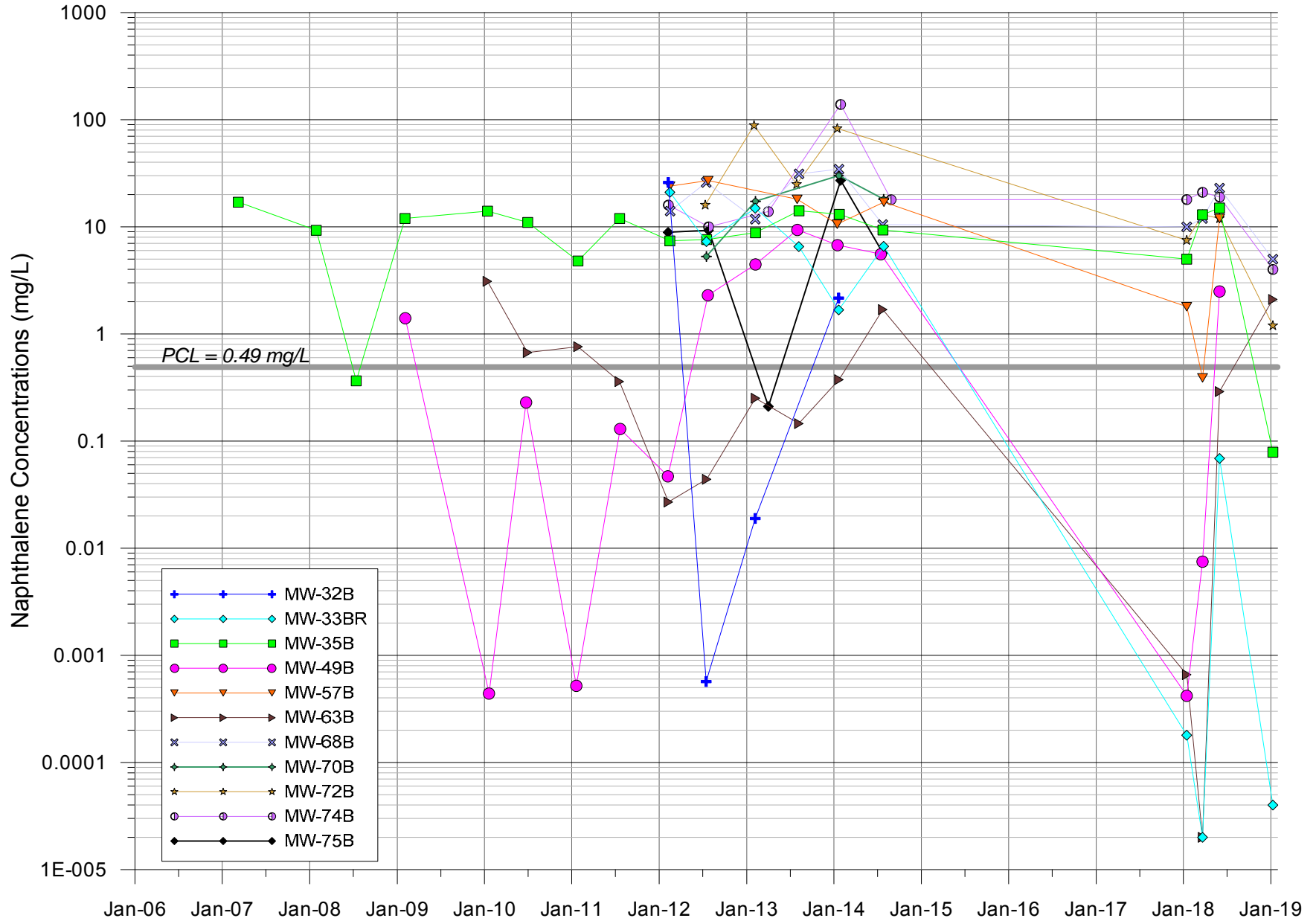
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**2-Methylnaphthalene Concentrations at Source Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



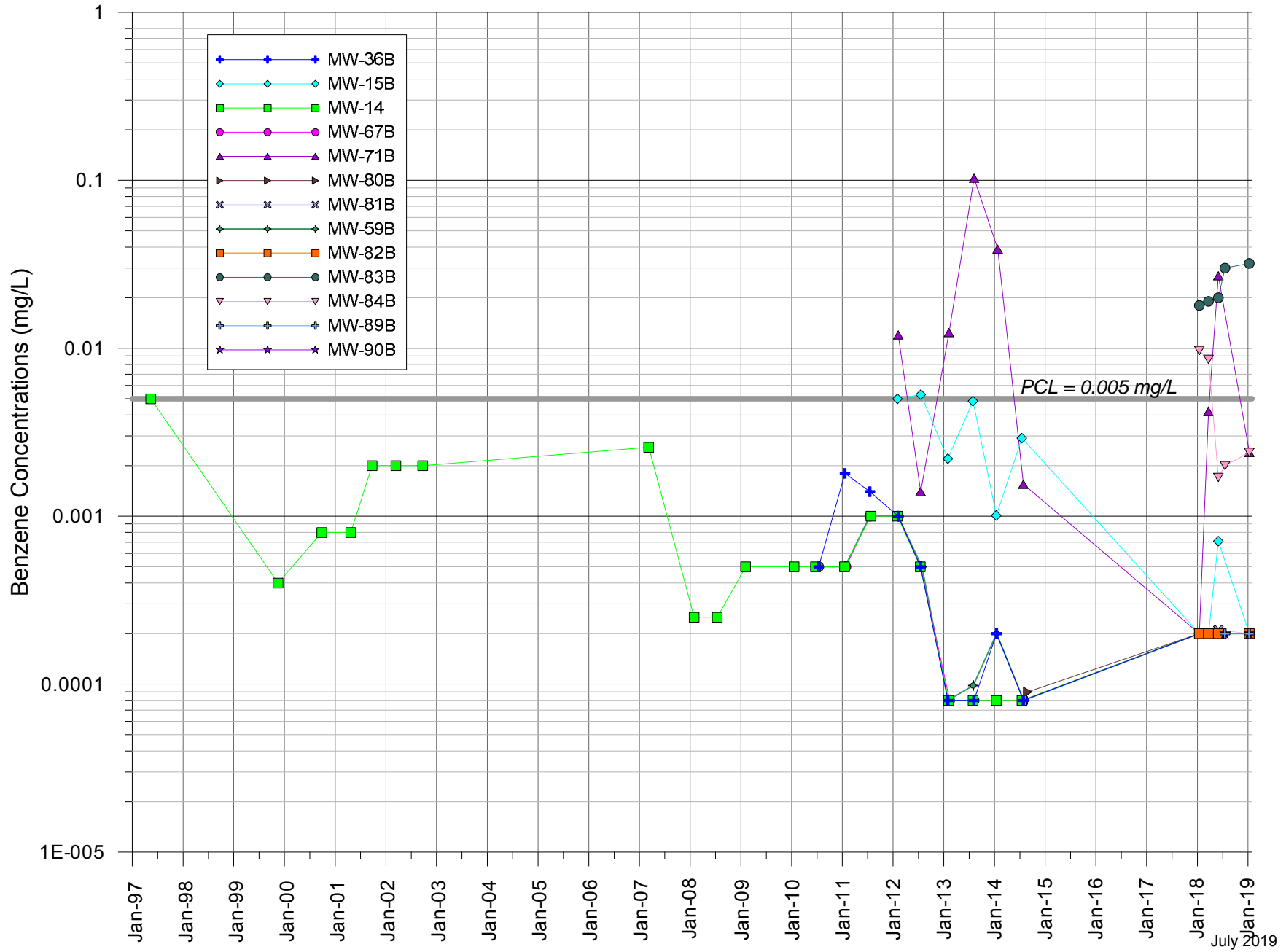
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**Dibenzofuran Concentrations at Source Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



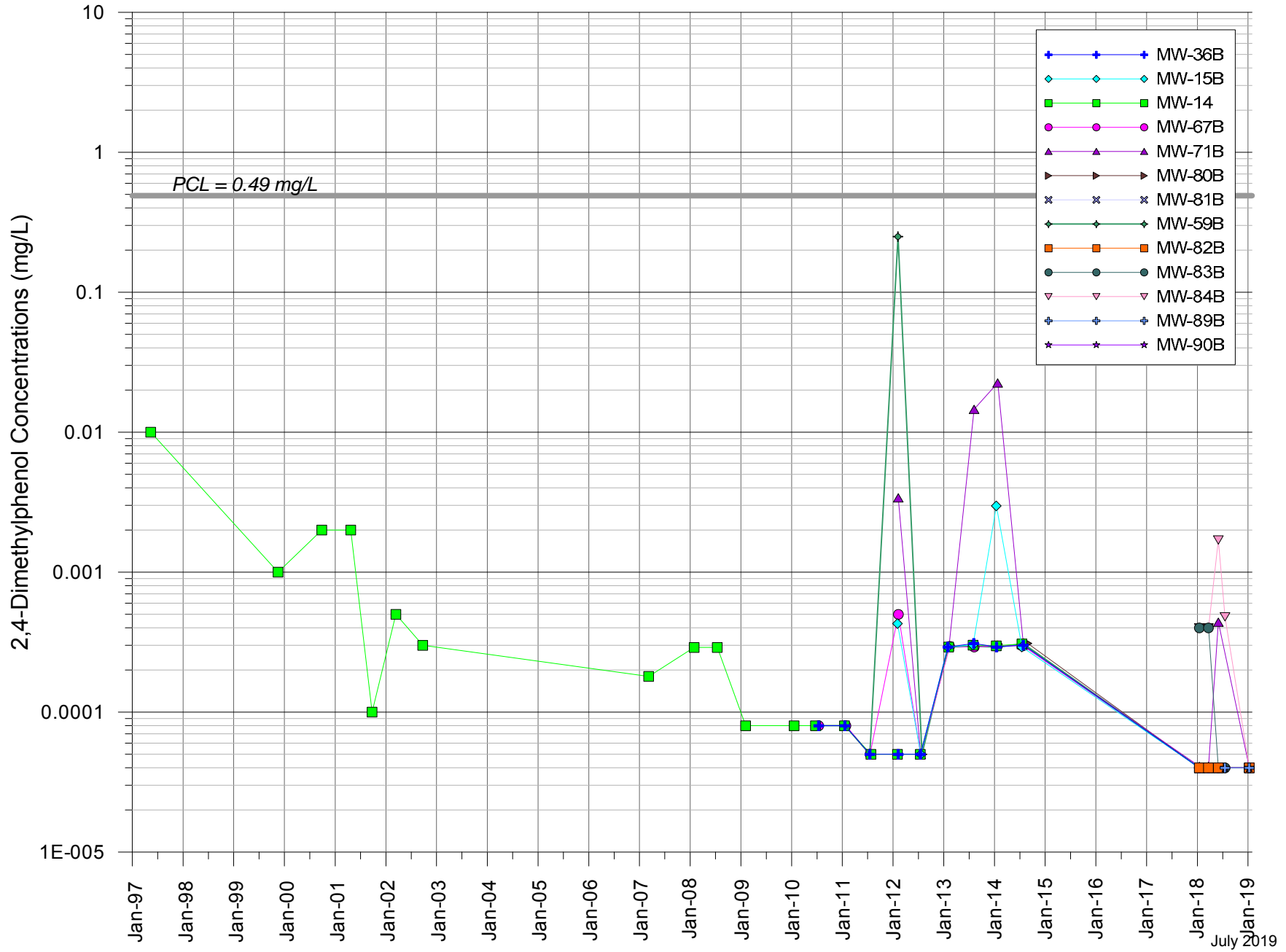
**ATTACHMENT 1B-20**  
**Naphthalene Concentrations at Source Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



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

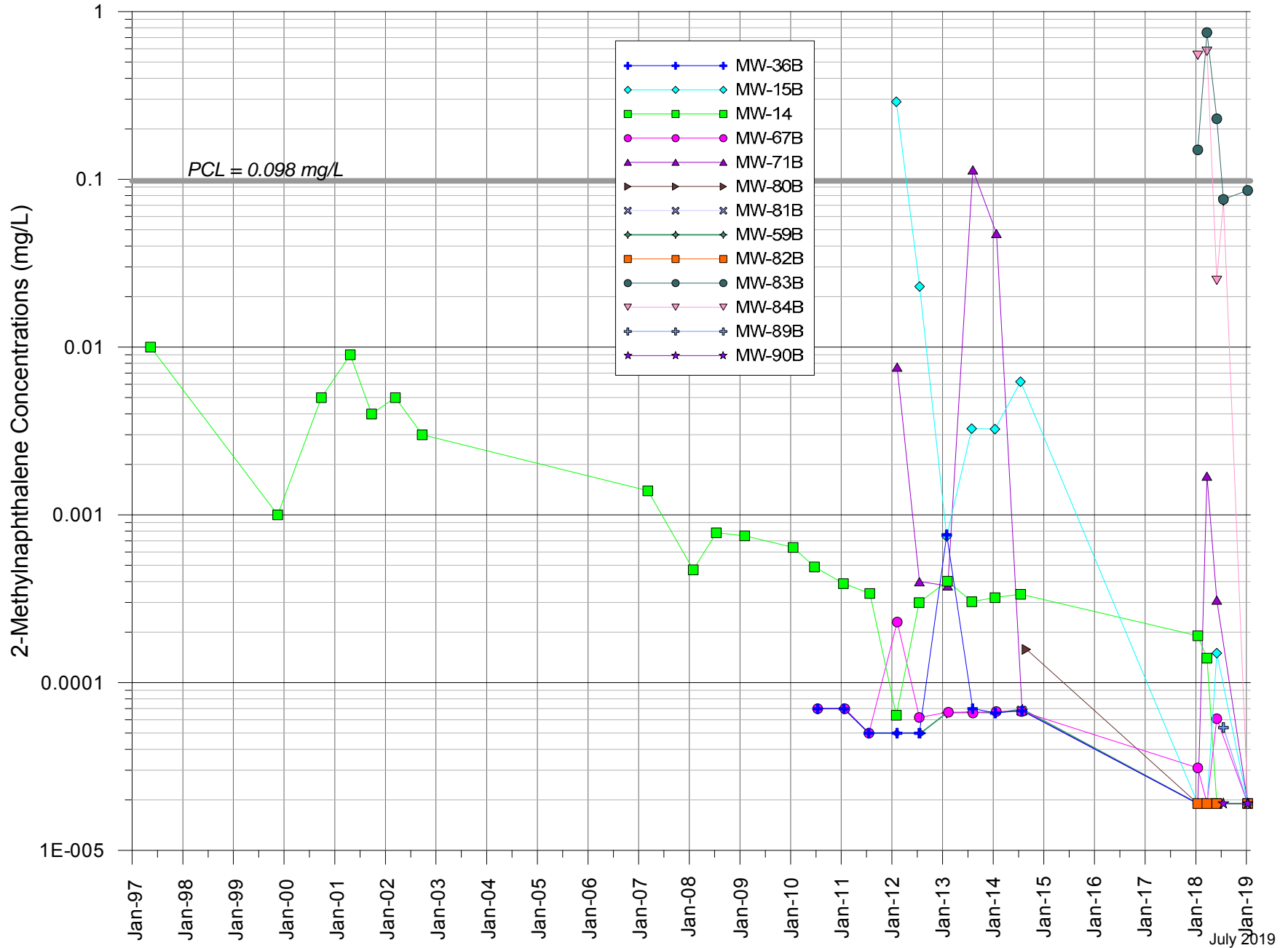


**ATTACHMENT 1B-22**  
**2,4-Dimethylphenol Concentrations at Perimeter Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



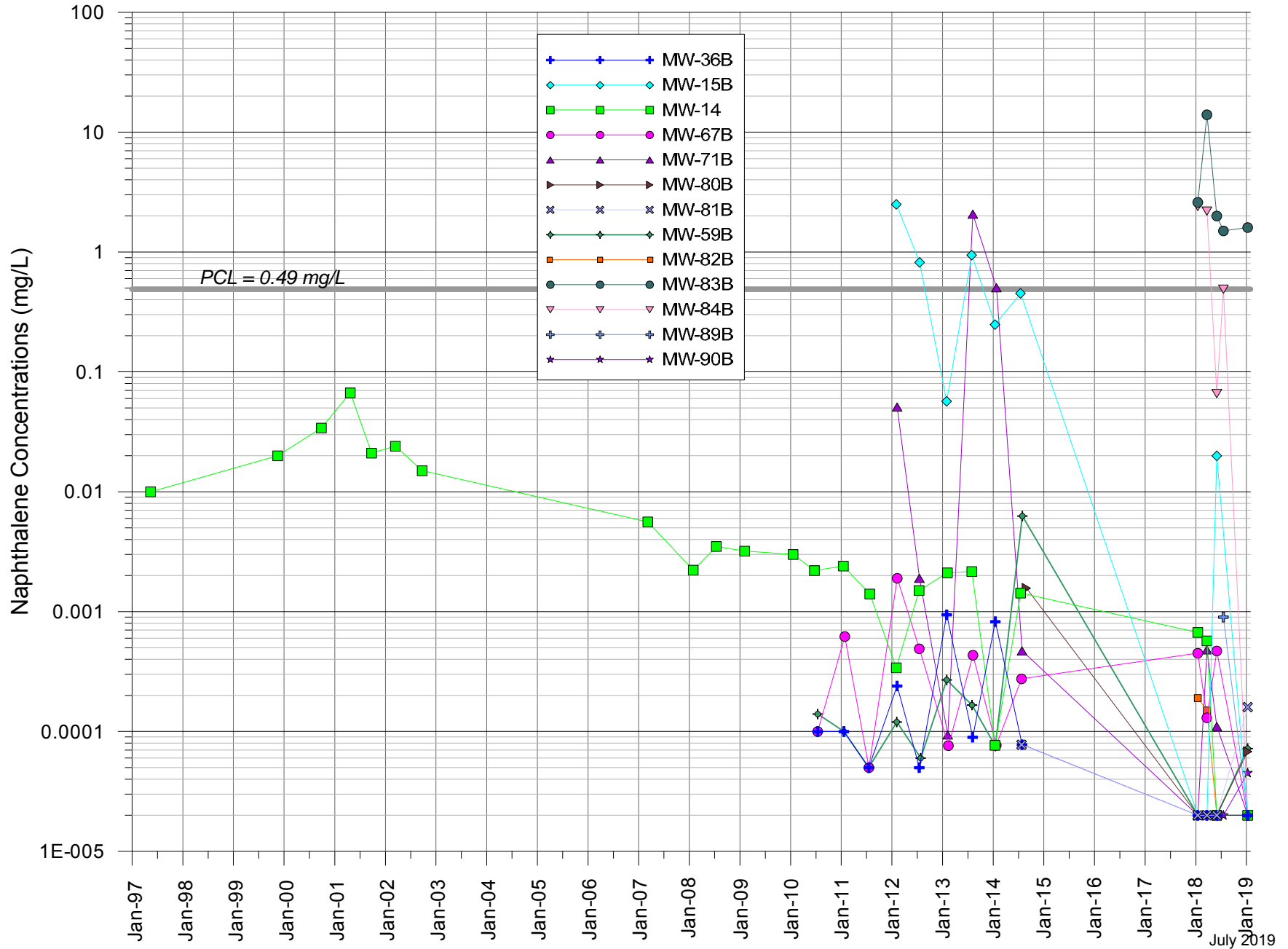


**ATTACHMENT 1B-23**  
**2-Methylnaphthalene Concentrations at Perimeter Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



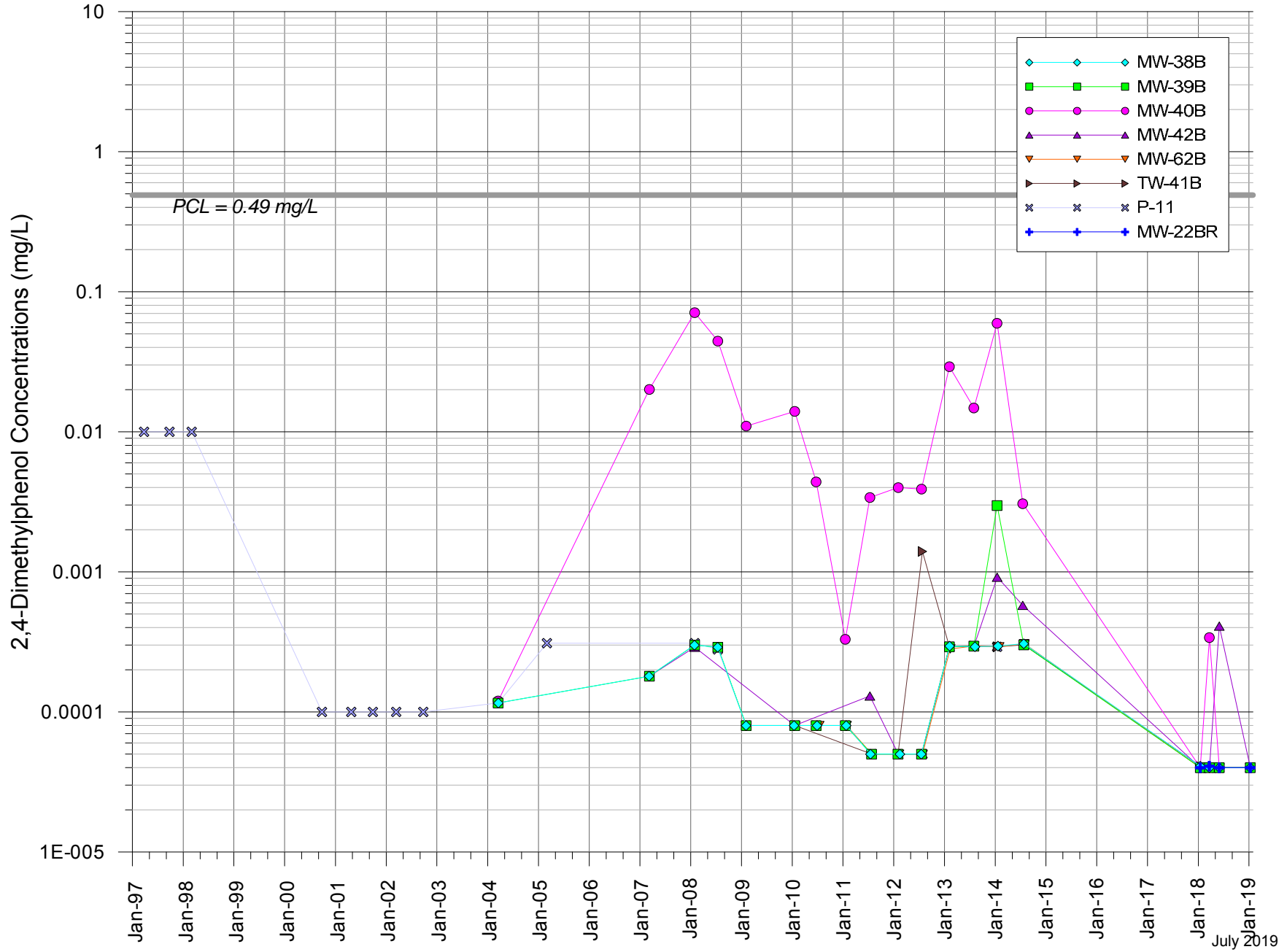


**ATTACHMENT 1B-25**  
**Naphthalene Concentrations at Perimeter Wells - B-CZ/B-TZ**  
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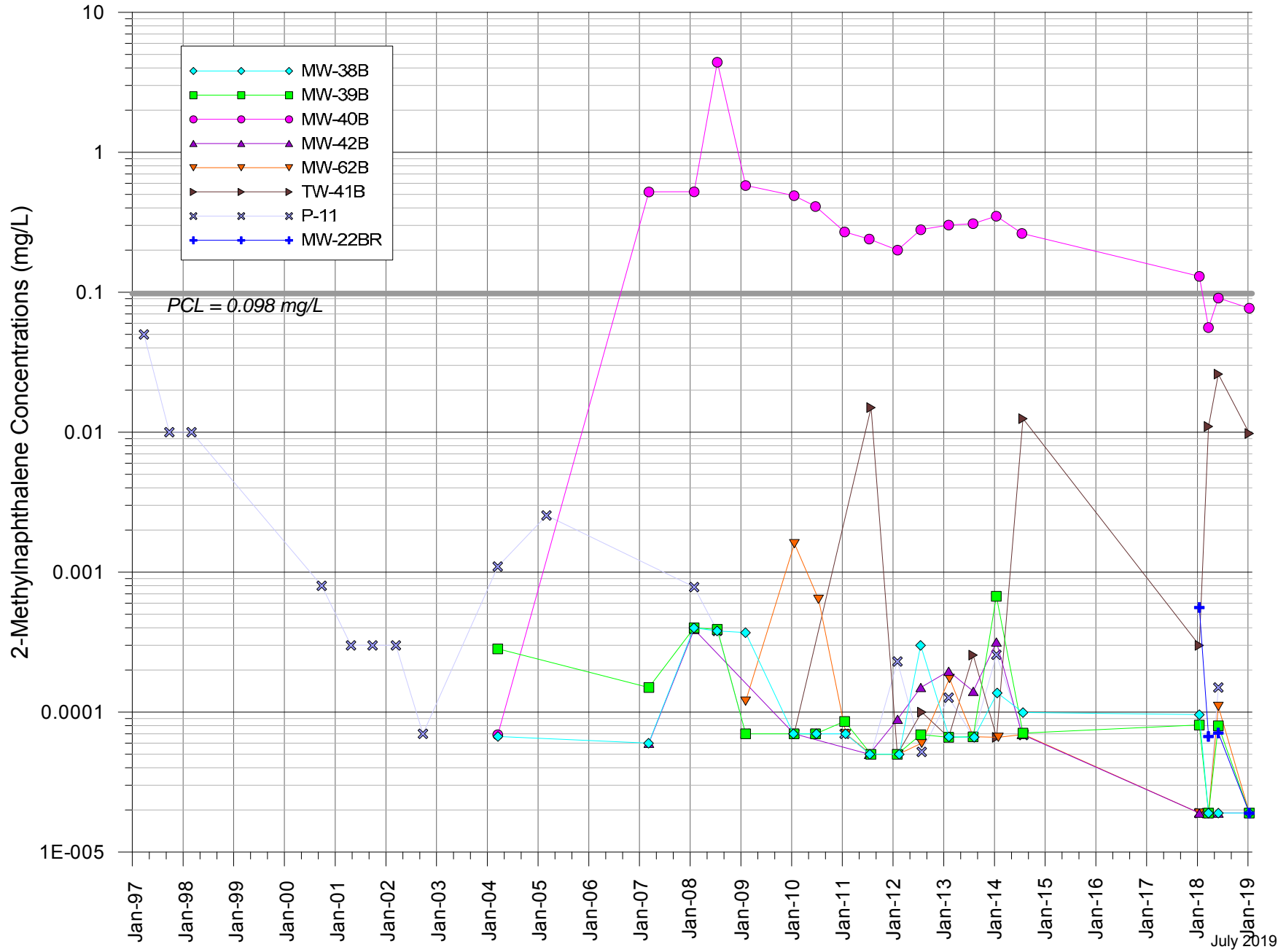




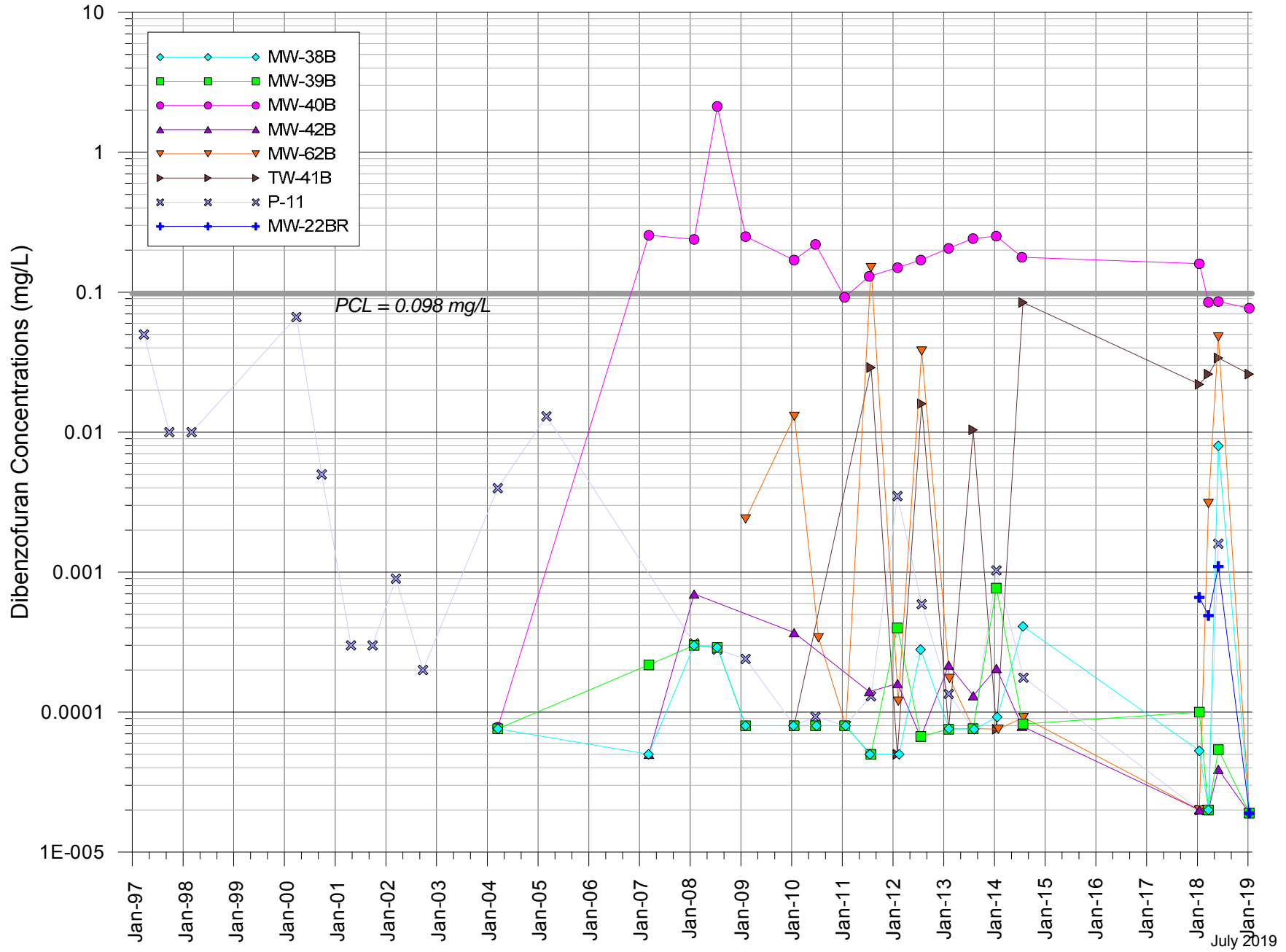
**ATTACHMENT 1B-27**  
**2,4-Dimethylphenol Concentrations at West End Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



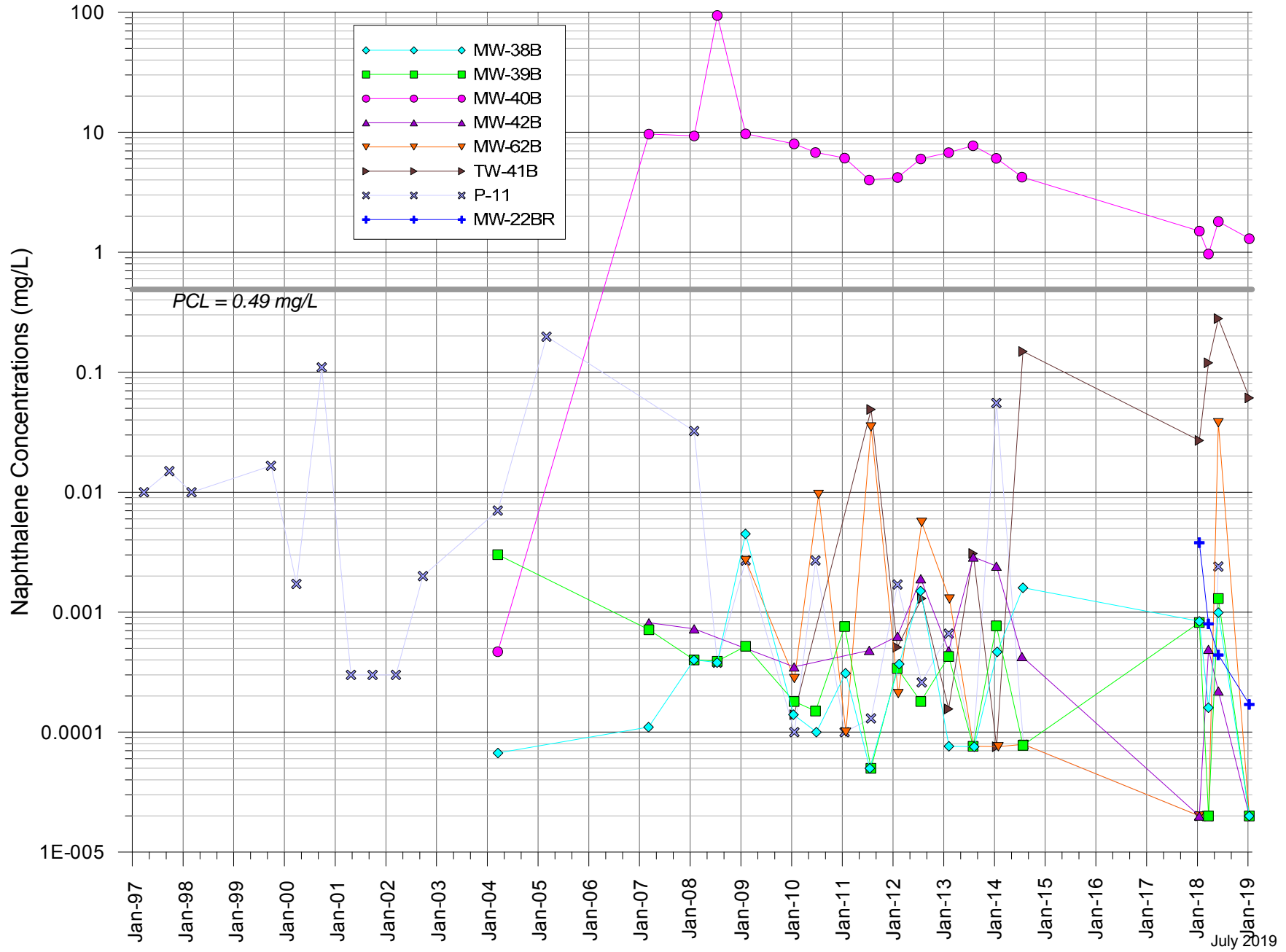
**ATTACHMENT 1B-28**  
**2-Methylnaphthalene Concentrations at West End Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



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

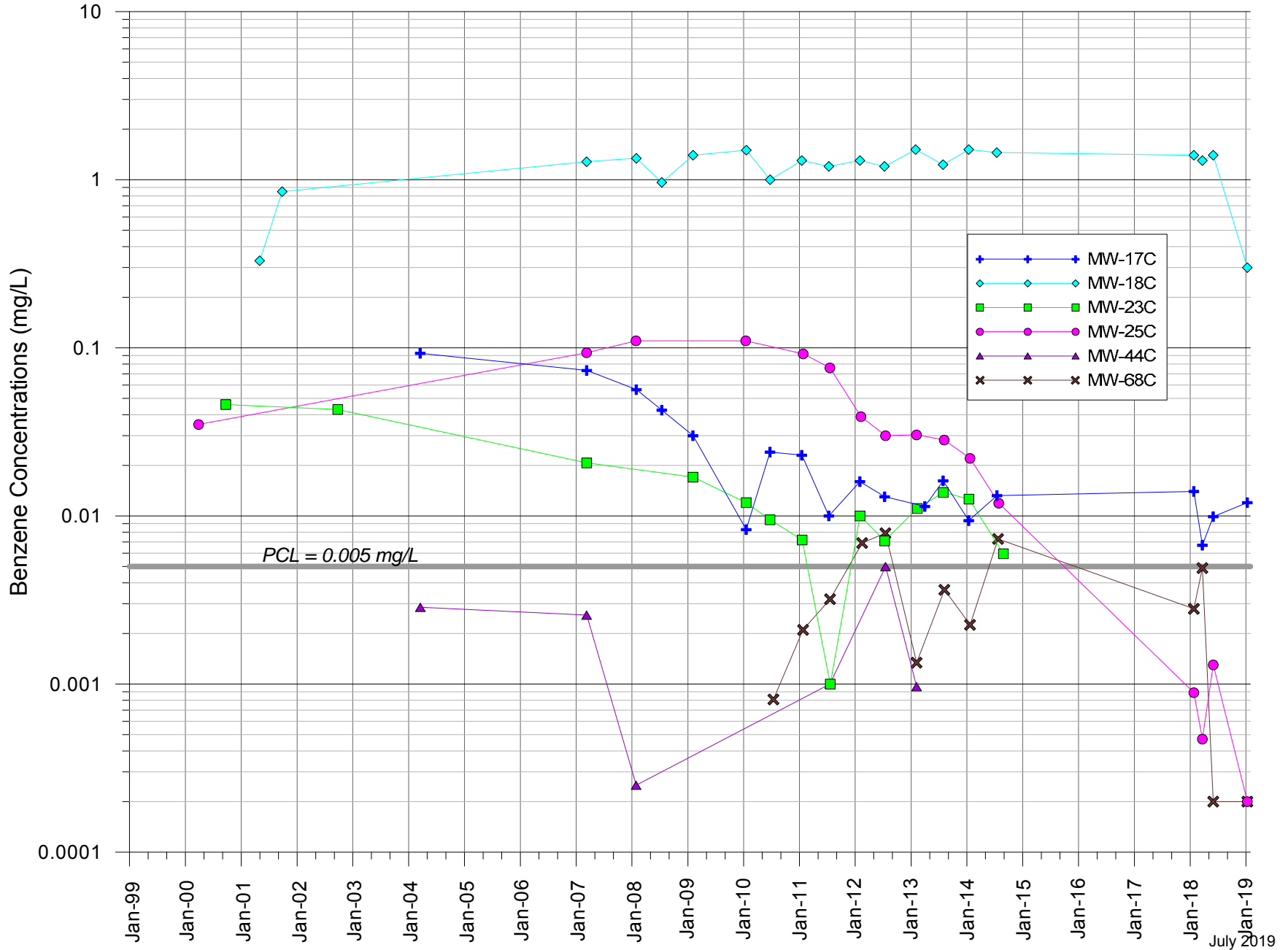


**ATTACHMENT 1B-30**  
**Naphthalene Concentrations at West End Area Wells - B-CZ/B-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**

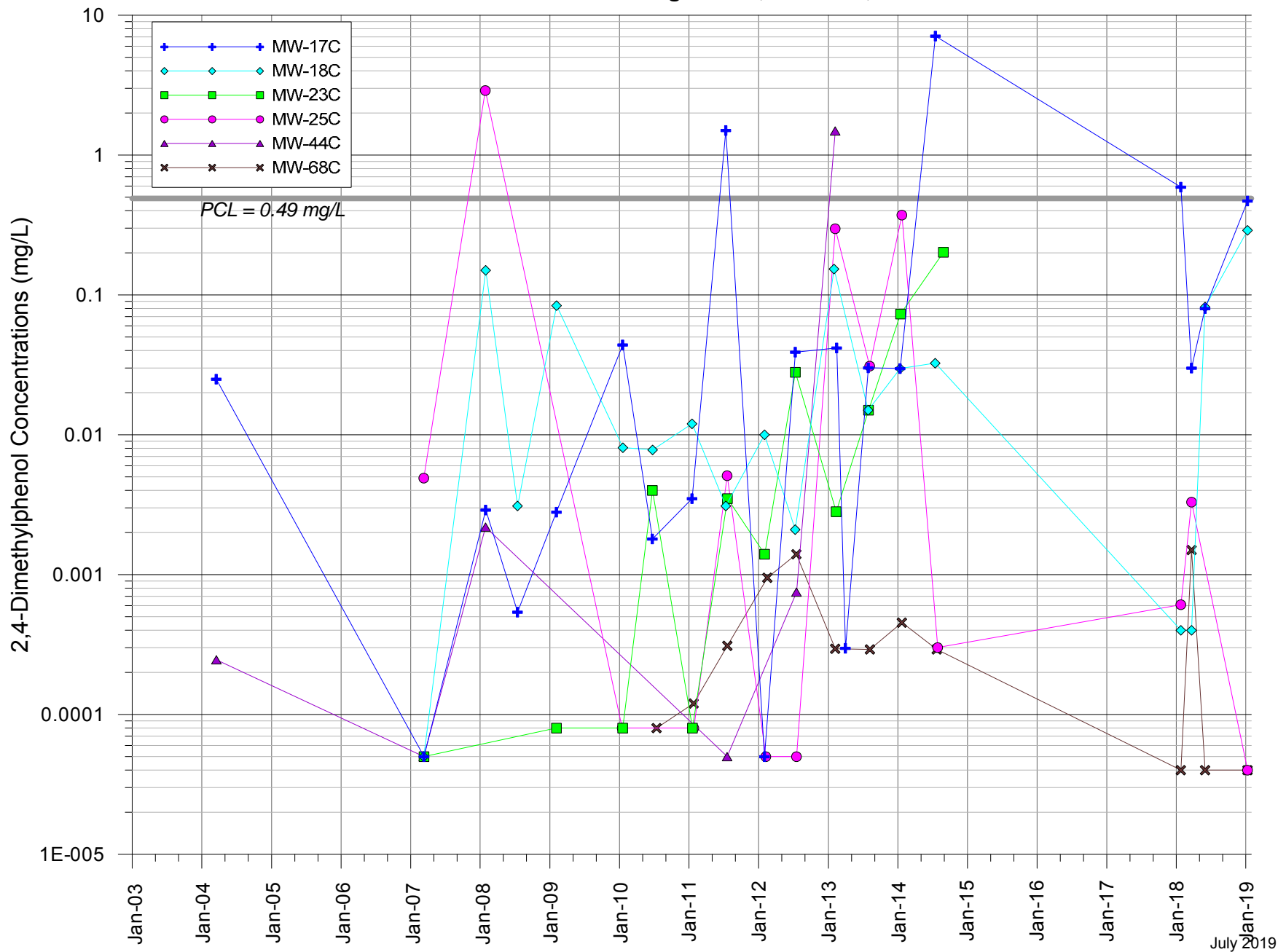




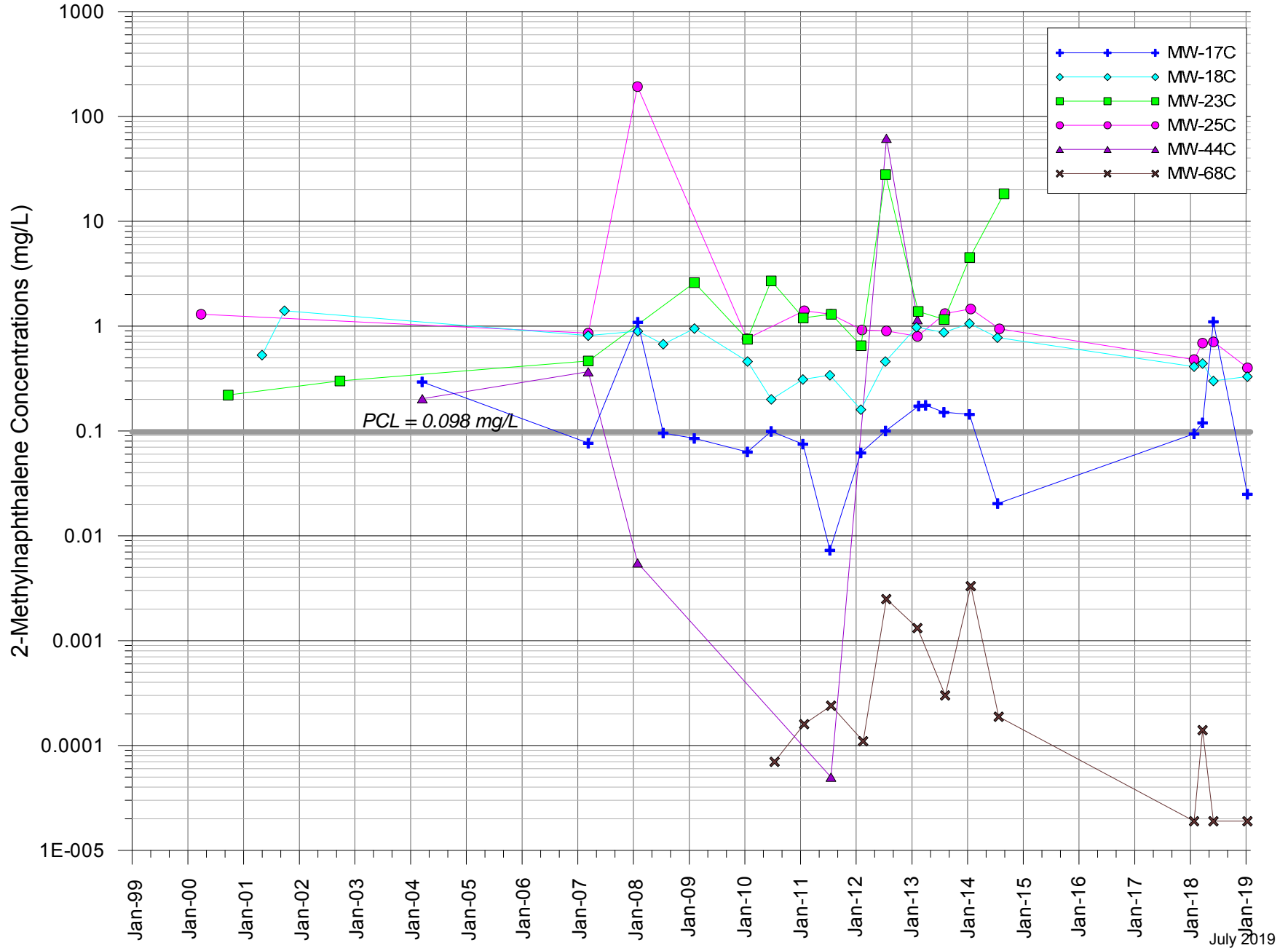
**ATTACHMENT 1B-31**  
**Benzene Concentrations at Source Area Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



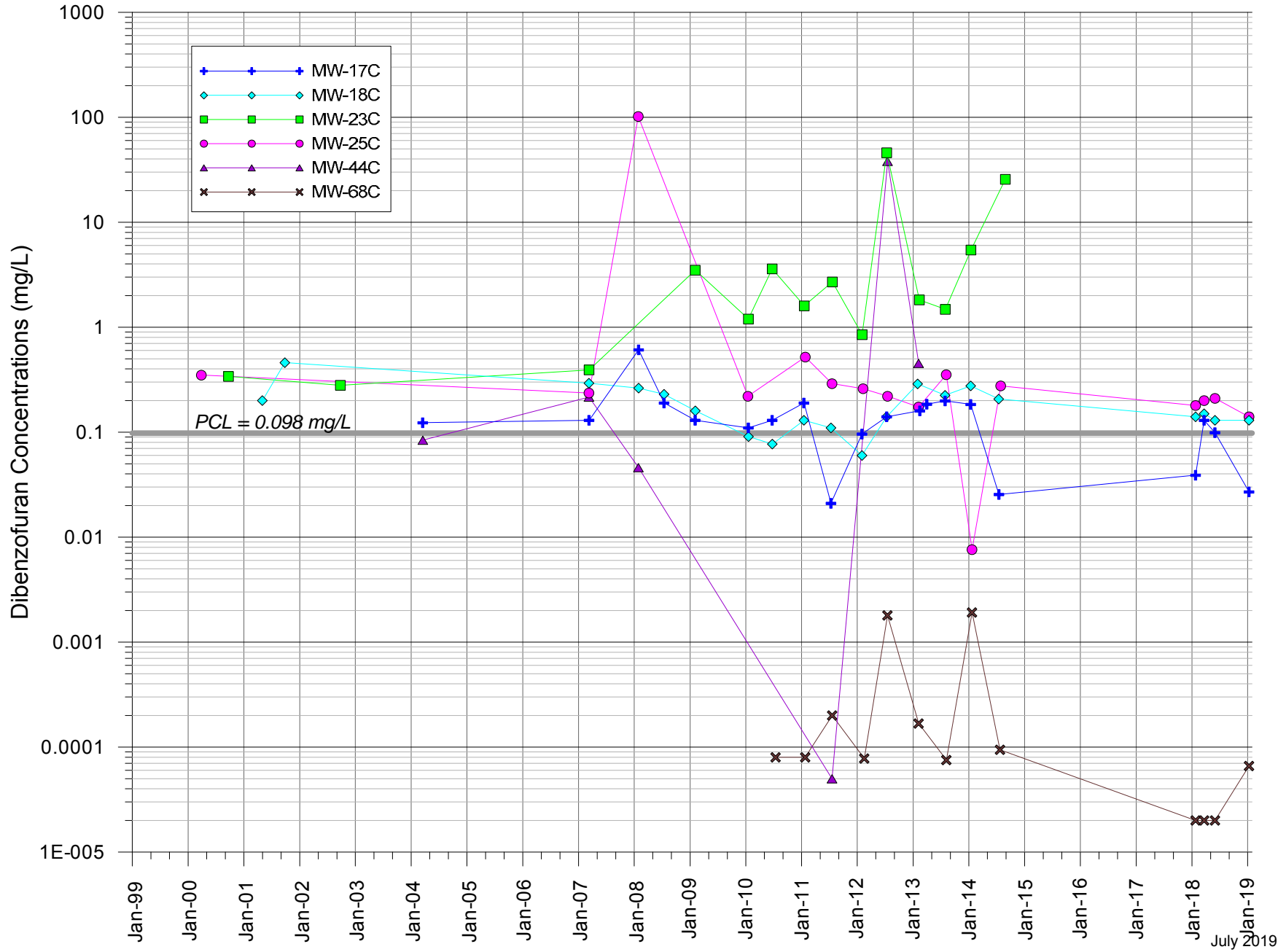
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**2,4-Dimethylphenol Concentrations at Source Area Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



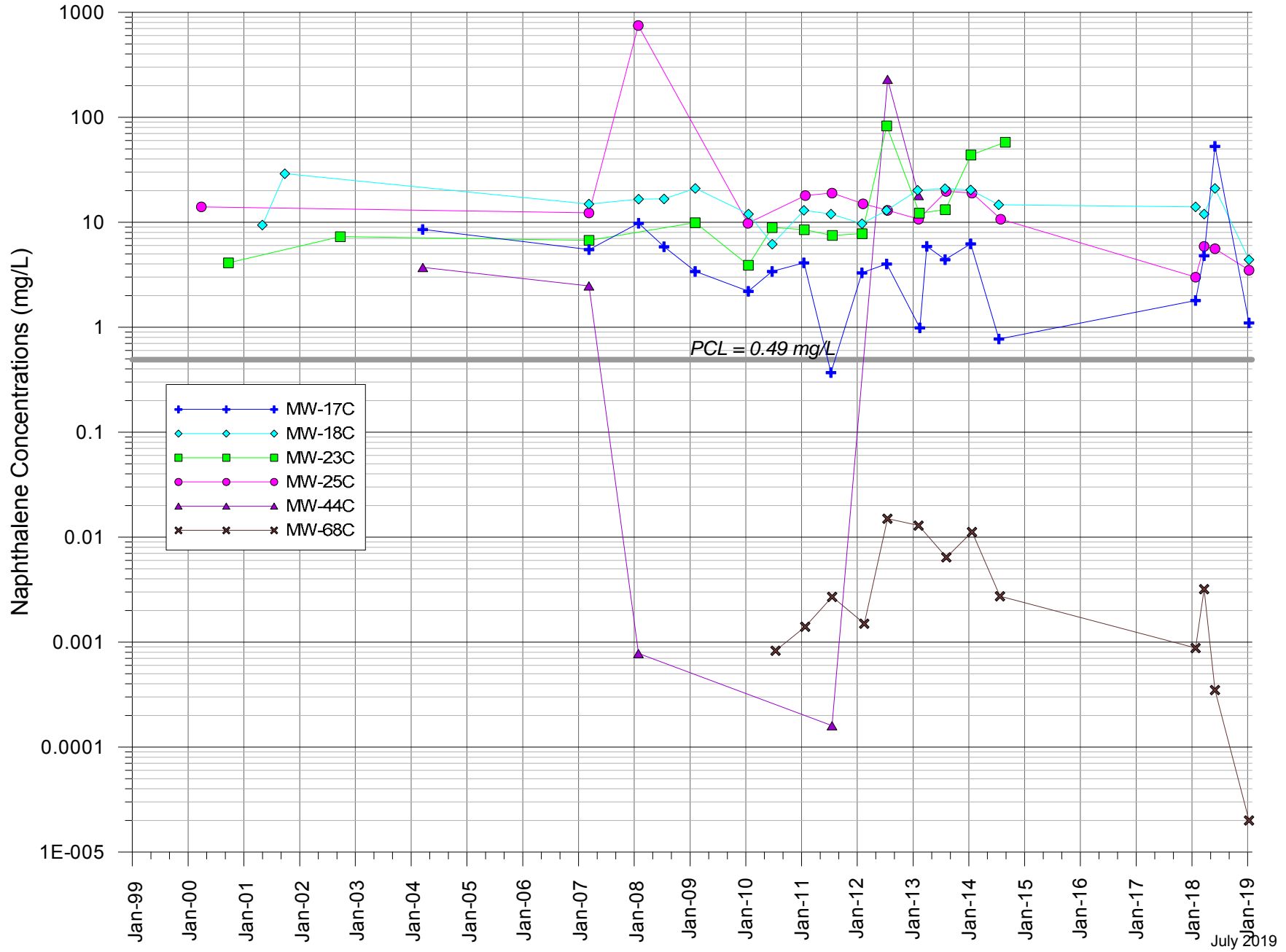
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**UPRR Houston Wood Preserving Works, Houston, Texas**



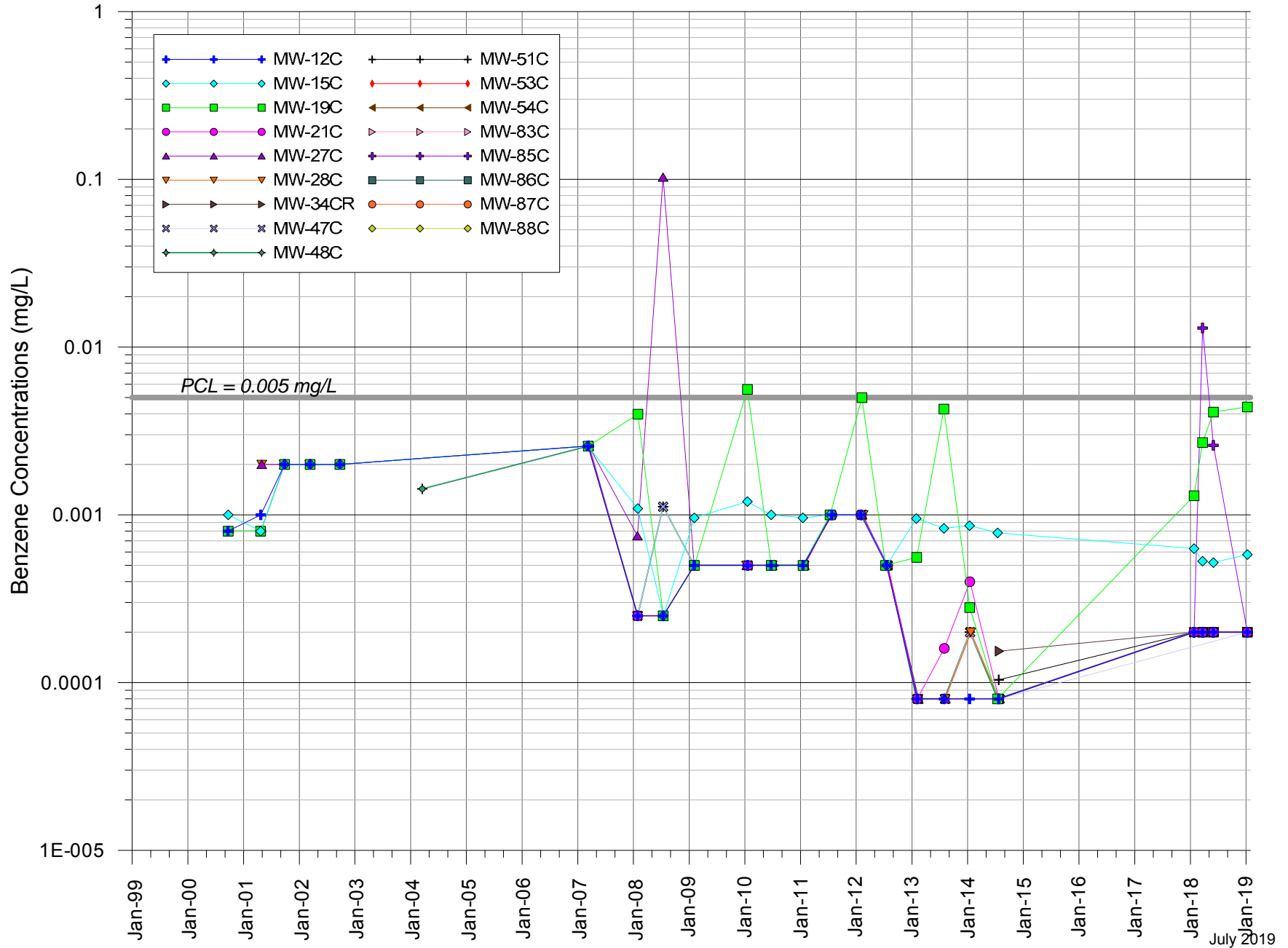
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**Dibenzofuran Concentrations at Source Area Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



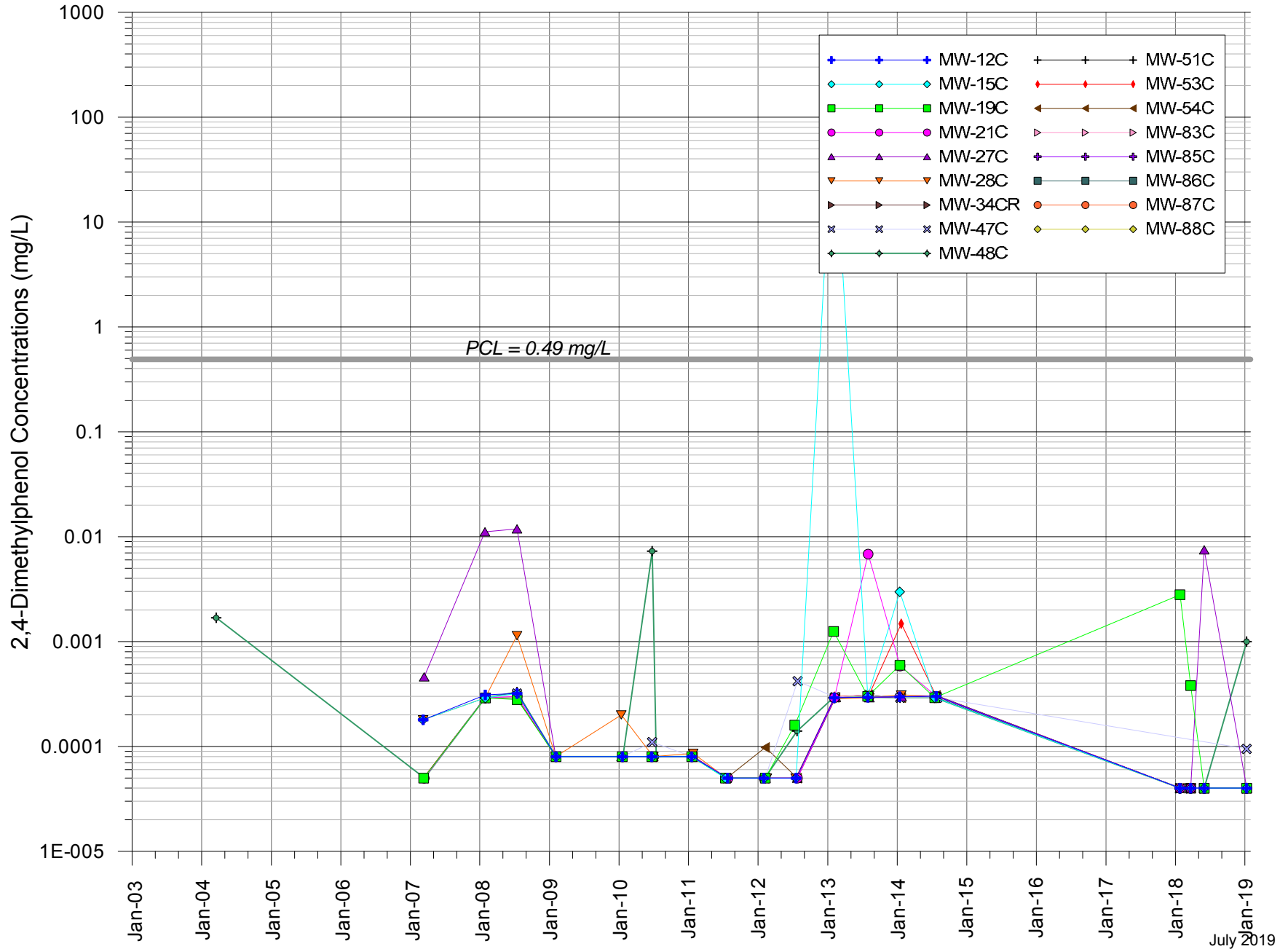
**ATTACHMENT 1B-35**  
**Naphthalene Concentrations at Source Area Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



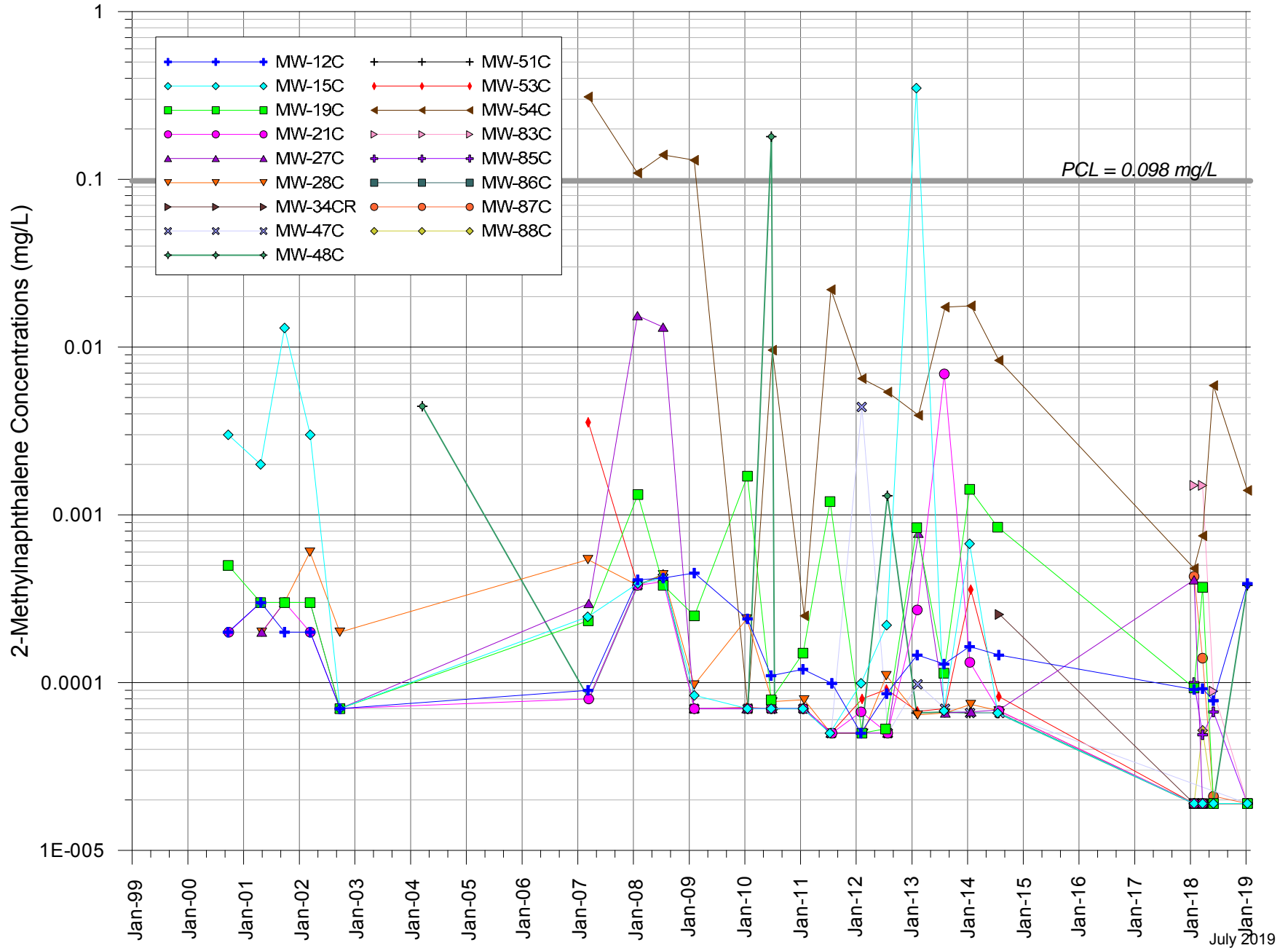
**ATTACHMENT 1B-36**  
**Benzene Concentrations at Perimeter Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



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



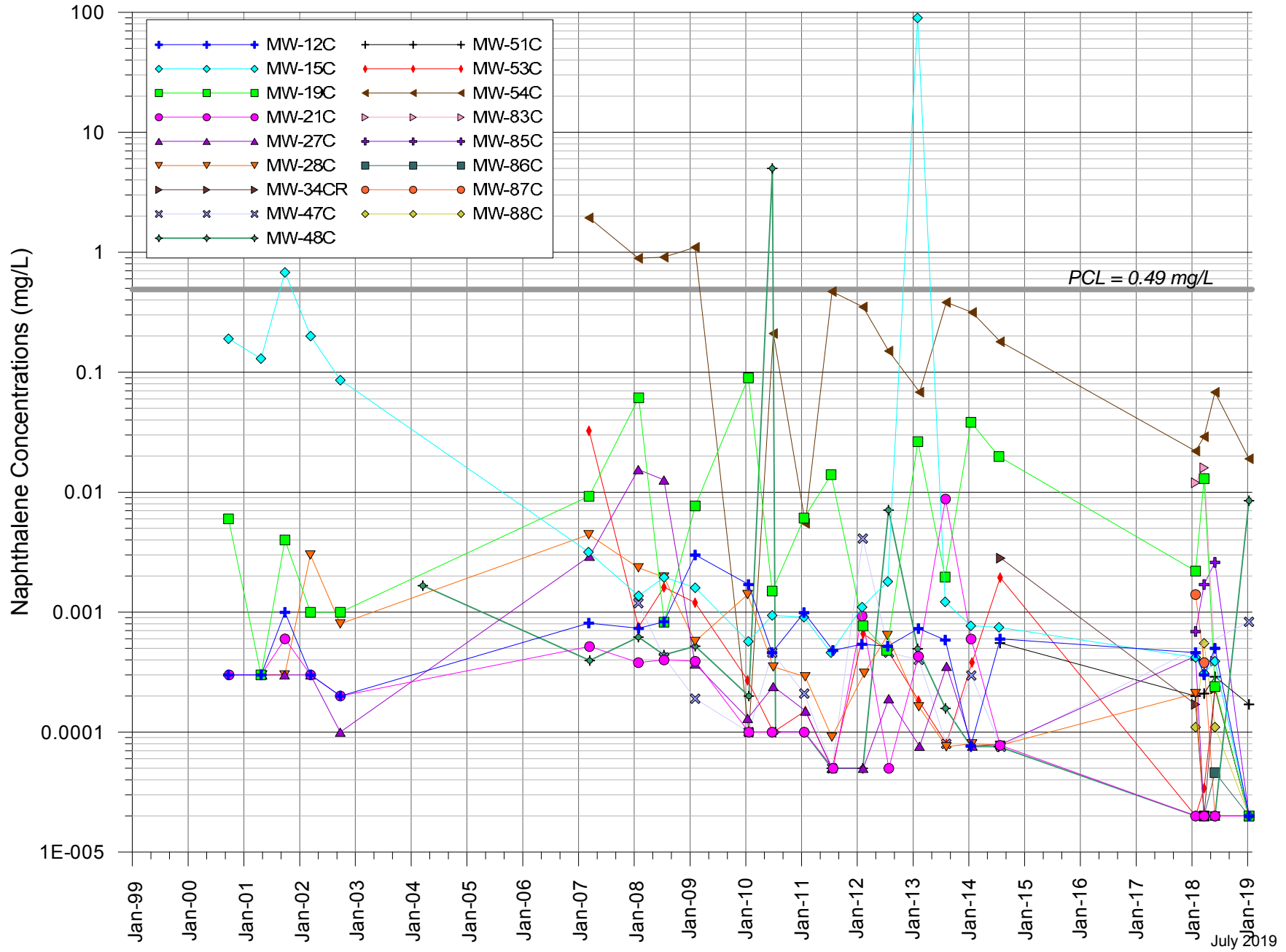
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**2-Methylnaphthalene Concentrations at Perimeter Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



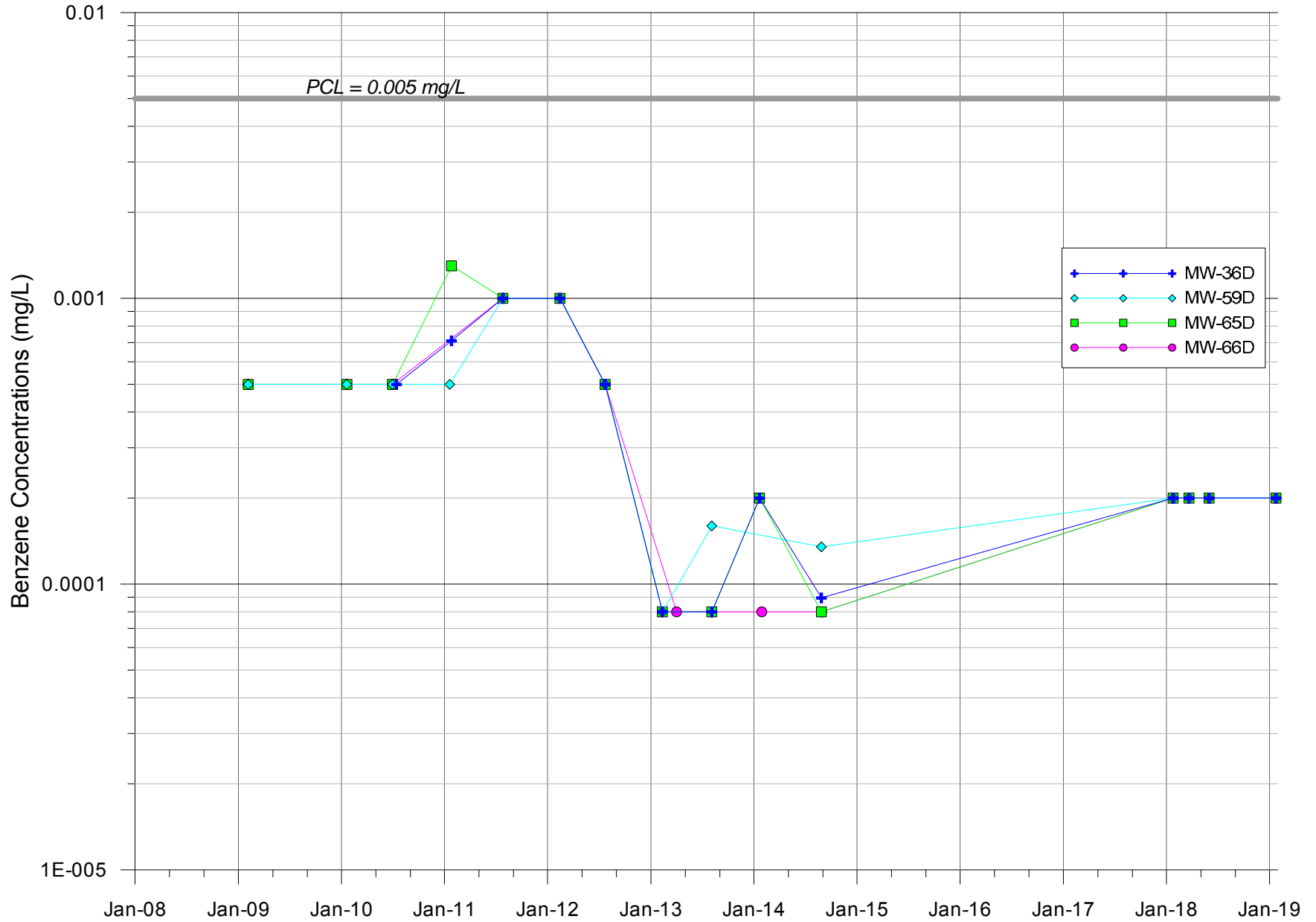




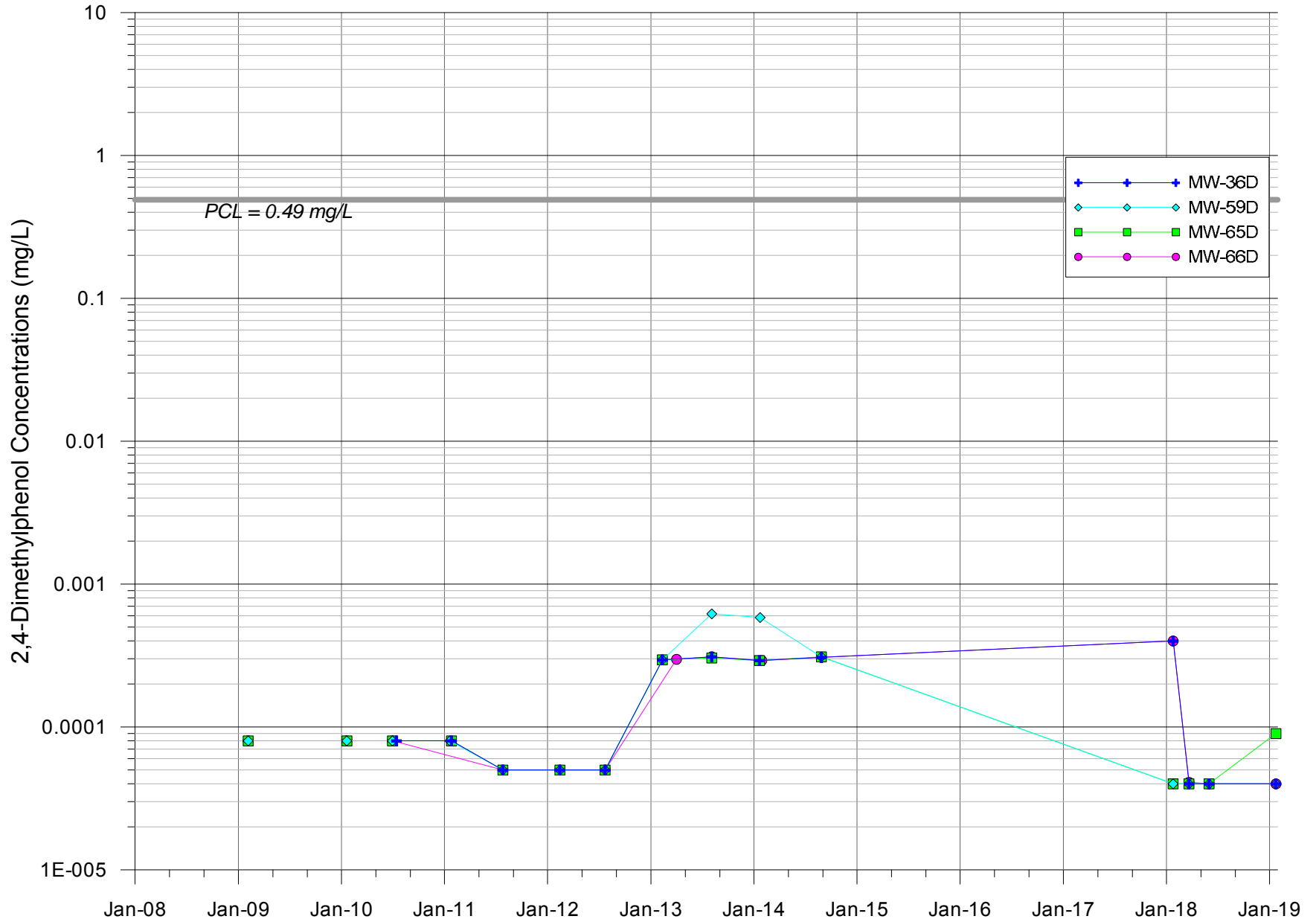
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**Naphthalene Concentrations at Perimeter Wells - C-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



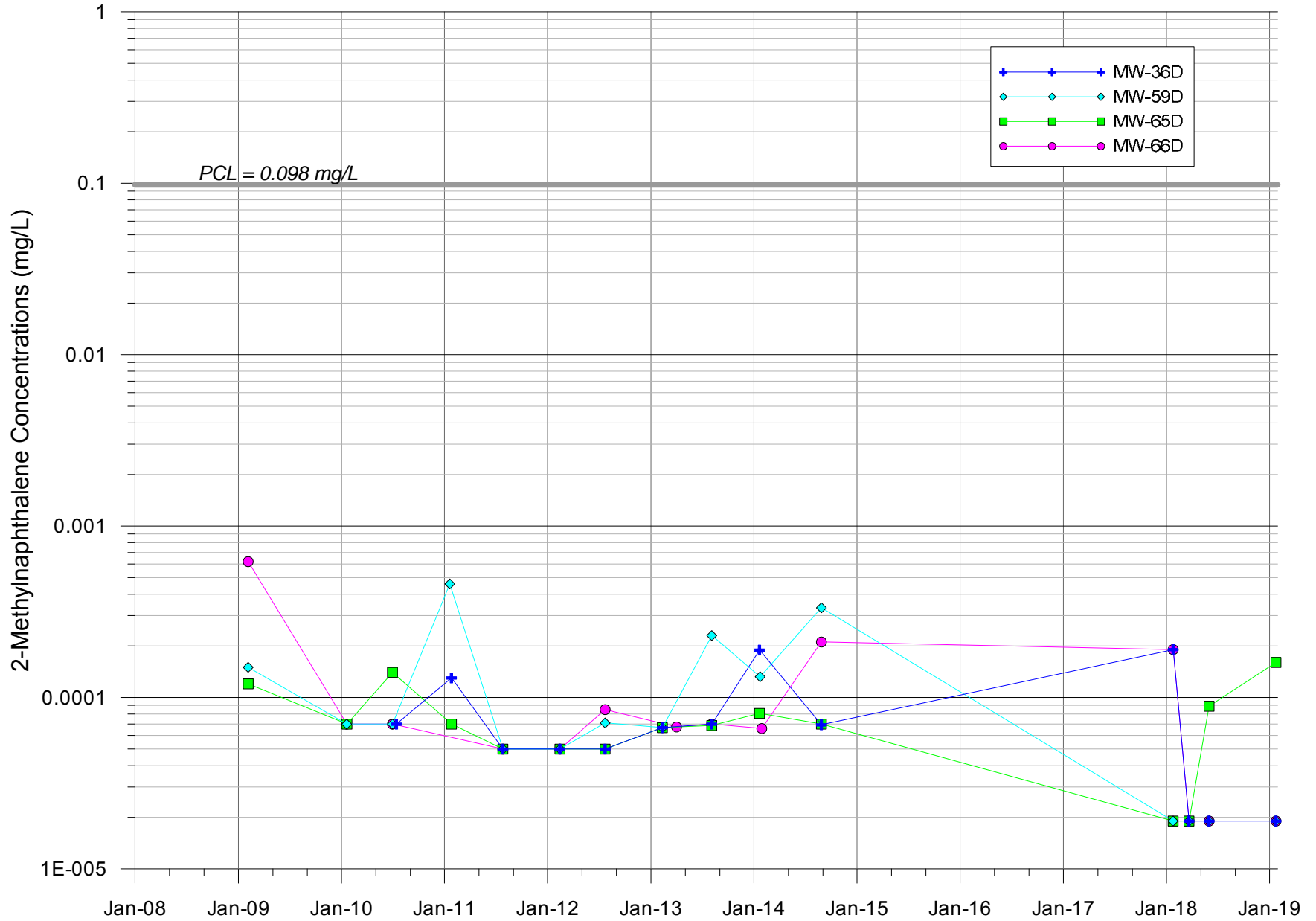
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**Benzene Concentrations at Source Area Wells - D-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



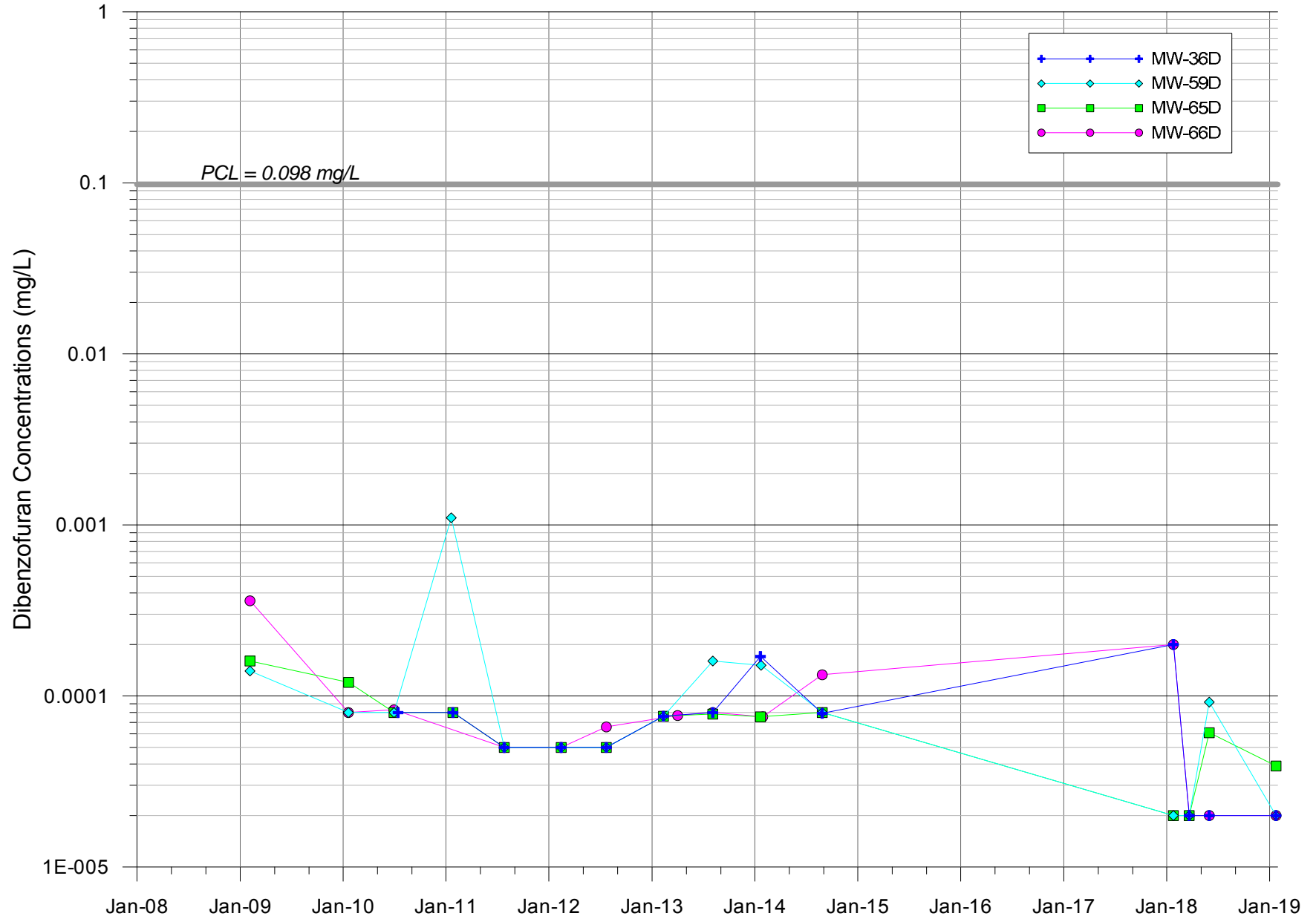
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**UPRR Houston Wood Preserving Works, Houston, Texas**



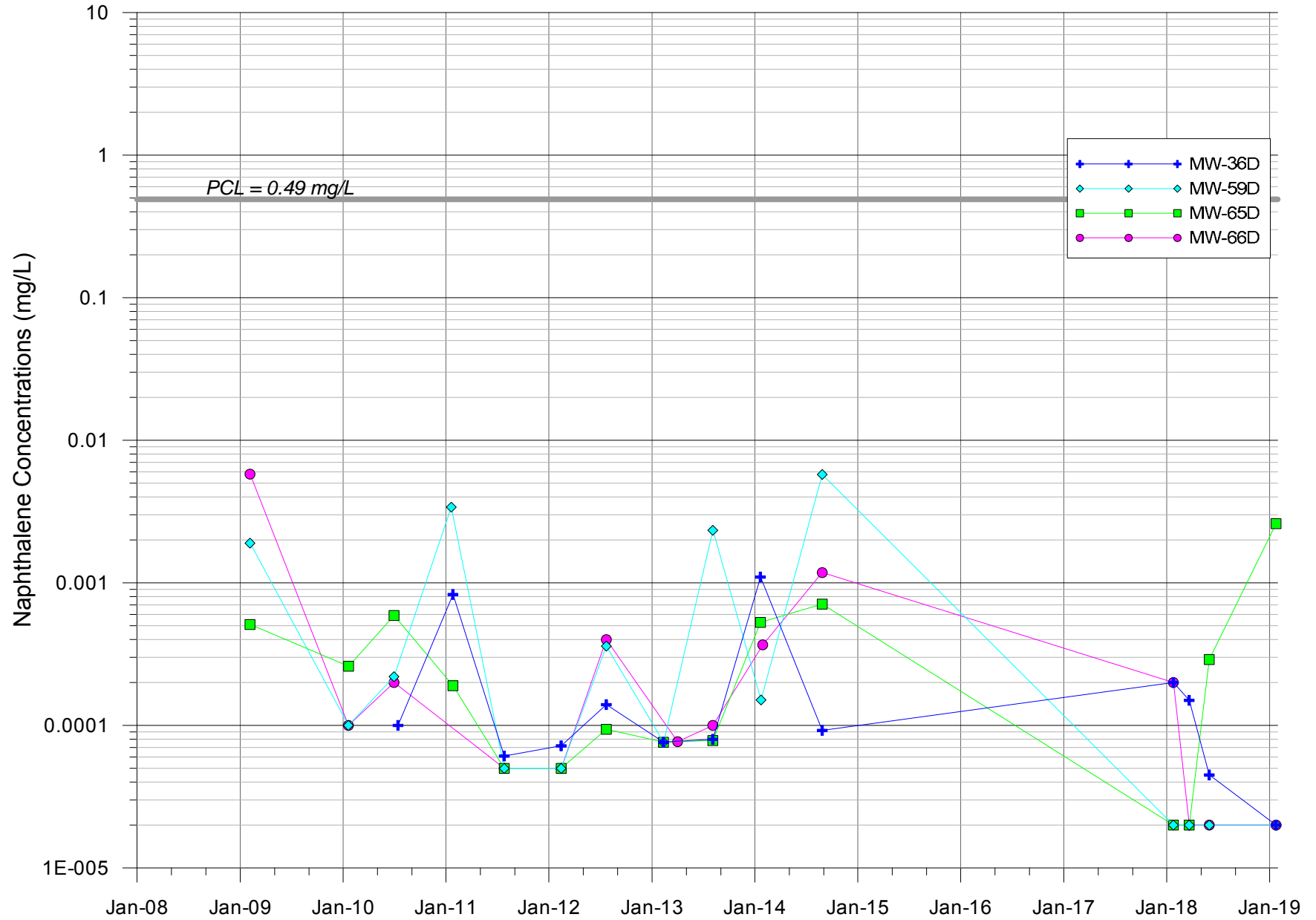
**ATTACHMENT 1B-43**  
**2-Methylnaphthalene Concentrations at Source Area Wells - D-TZ**  
**UPRR Houston Wood Preserving Works, Houston, Texas**



**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**



**APPENDIX 3**

**STUDIES AND TESTS DOCUMENTATION**

***RESPONSE TO 4<sup>TH</sup> TECHNICAL NOTICE OF DEFICIENCY – DEFICIENCY NO. SPECIFIC T59  
– LETTER DATED JULY 3, 2019***





July 3, 2019

Project No. 19119232

**Ms. Maureen Hatfield**

Texas Commission on Environmental Quality  
VCP-CA Section, Team 1, Remediation Division, MC-127  
P.O. Box 13087  
Austin, Texas 78711-3087

**RE: RESPONSE TO 4<sup>TH</sup> TECHNICAL NOTICE OF DEFICIENCY – DEFICIENCY NO. SPECIFIC T59  
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 Ms. Hatfield

Golder Associates Inc. (Golder), on behalf of Union Pacific Railroad Company (UPRR), is providing this letter detailing the response to Deficiency No. Specific T59 provided in the Texas Commission on Environmental Quality (TCEQ) 4<sup>th</sup> Technical Notice of Deficiency (TNOD) for Permit Renewal dated April 11, 2019 for the UPRR Houston Wood Preserving Works Facility (the Site). A supplemental groundwater evaluation of the potential for vapor intrusion (VI) was conducted in the residential area north of the Site in response to the TCEQ Deficiency ID T59. Details of the assessment and response to the TCEQ deficiency is attached with this letter.

If you have any questions or need additional information, please feel free to call me at (512) 671-3434 or Mr. Kevin Peterburs of UPRR at (414) 267-4164.

Sincerely,

**Golder Associates Inc.**

Tim Nickels  
*Senior Consultant*

Eric C. Matzner, P.G.  
*Associate / Practice Leader*



CC: Waste Program Manager, TCEQ Region 12, Houston

**Response to Deficiency No. Specific T59 in the Texas Commission on Environmental Quality (TCEQ) 4<sup>th</sup> Technical Notice of Deficiency (TNOD) for Permit Renewal dated April 11, 2019**

TCEQ Deficiency No. Specific T59

*Based on review of the August 13, 2018 Monitoring Report, UPRR needs to conduct further assessment to evaluate the potential in-door air VI pathways into structures located north of the HWPW Facility near the intersection of Clementine and Wylie Street. The highest concentration of naphthalene in off-site wells screened in the second transmissive unit, B- CZ/B-TZ, was reported in monitoring well MW-68B (23 mg/l). Concentrations of COCs in off- site monitoring wells screened in the uppermost transmissive unit, A-TZ, were either non- detect or less than the residential Tier 1 PCLs for Class 1 groundwater. However, there are no wells near MW-68B that are screened in the ATZ to determine if the ATZ has been affected in this area.*

*Considering that naphthalene is a petroleum hydrocarbon and the vertical separation distance between the ground surface and observed water table at well location MW-68B, if the uppermost transmissive zone (A-TZ) at MW-68B is not impacted, the VI pathway would be incomplete for the off-site affected properties. However, there are no wells near MW-68B that are screened in the A-TZ to determine if the groundwater in Zone A-TZ has been affected in this area. Therefore, UPRR should install additional monitoring wells screened in the ATZ at well location MW-68B. Please submit an interim assessment work plan and schedule that describes a proposed assessment strategy for the VI pathway.*

**UPRR Response:**

Per the meeting with the TCEQ on April 24, 2019 and as provided in the letter from UPRR to the TCEQ dated May 8, 2019, UPRR proposed to expedite the potential petroleum vapor intrusion (PVI) assessment to address the TCEQ's noted deficiency. Details of the assessment are provided below.

***Supplemental Groundwater Evaluation – MW-68A***

Monitoring well MW-68A was installed in the uppermost water-bearing zone A-TZ near monitoring well MW-68B, as shown on Figure 1, on May 21, 2019 to evaluate potential PVI impacts from the A-TZ. The monitoring well was completed to the base of the A-TZ and constructed with a 10-foot screened interval. The boring log and monitoring well completion information is provided in Attachment A. Following the well installation and development activities, a groundwater sample and field duplicate groundwater sample were collected at MW-68A on May 29, 2019 and analyzed for site-specific chemicals of concern (COCs). Groundwater sampling field records and the laboratory analytical report with data usability summary are provided in Attachments B and C, respectively. Details of the preliminary VI assessment are provided below.

EPA VISL Calculator

As part of the preliminary assessment, the U.S. Environmental Protection Agency's (EPA's) vapor intrusion screening level (VISL) calculator (EPA, 2015, EPA, 2019) was used to calculate conservative, non-site specific, risk-based potential VI screening values for the identified COCs. The EPA tool calculates the COC concentration in groundwater, based on certain default conditions, at which the COC is not expected to pose an unacceptable VI risk and, as such, can be eliminated from further consideration.

The VISL calculator (EPA, 2019) provides a screening level based on several basic inputs, including a residential or commercial exposure scenario, target hazard quotient, target carcinogenic risk, and groundwater temperature. For this evaluation, the selected inputs were – residential scenario, hazard quotient of 0.1, carcinogenic risk of  $10^{-5}$  (consistent with the Texas Risk Reduction Program, or TRRP, criteria), and groundwater temperature of 25°C. Based on these inputs, the calculated groundwater screening concentrations were estimated. These values were compared with the MW-68A groundwater sample COC concentrations from the May 21, 2019 sampling event for the Site-specific COCs below:

**Table 1 – EPA VISL Screening Tool**

COC	VISL Screening Level for Elimination from Further Consideration (mg/L)	Measured COC Concentration in MW-68A and Field Duplicate May 2019 Samples (mg/L)
Benzene	0.014	<0.0002 / <0.0002
Chlorobenzene	0.041	<0.0003 / <0.0003
Ethylbenzene	0.035	<0.0003 / <0.0003
Methylene Chloride	0.471	<0.001 / <0.001
Toluene	1.92	<0.0002 / <0.0002
Xylenes	0.0385	<0.0003 / <0.0003
Benzo(a)anthracene	0.344	<0.00005 / <0.000051
Naphthalene	0.0174	0.00019 / 0.00025
Nitrobenzene	0.715	<0.000024 / <0.000024

EPA’s VISL calculator uses a conservative default attenuation factor of 0.001 for the attenuation of vapors between the groundwater source and the overlying receptor. This attenuation factor is not adjusted for the more rapid attenuation observed in petroleum hydrocarbon vapors and is therefore likely overly conservative for these compounds. Nevertheless, as indicated above, the MW-68A COC concentrations were well below the conservative EPA VISL-calculated screening levels.

## **Summary**

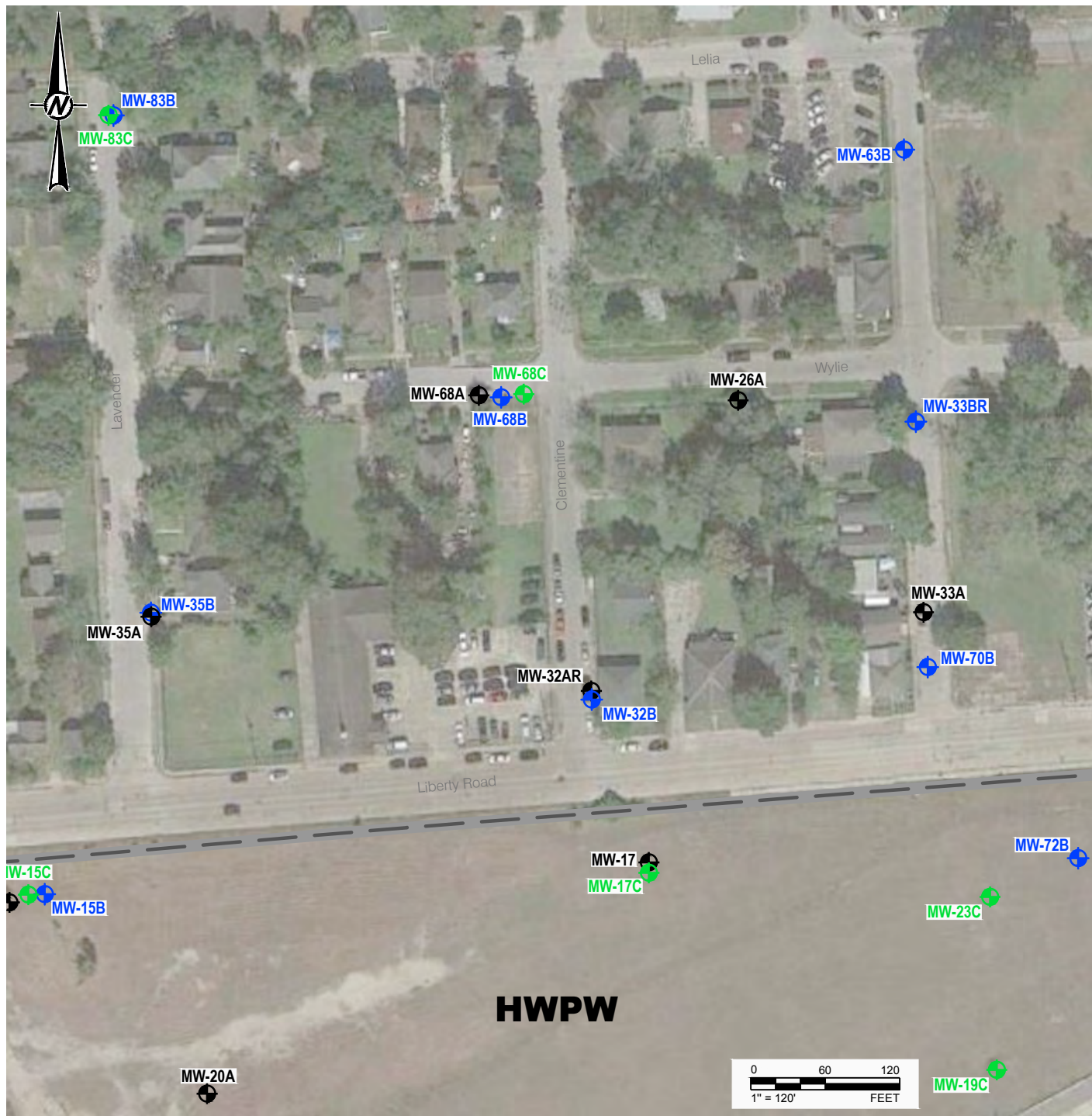
Based on the results summarized in Table 1, groundwater COC concentrations at monitoring well MW-68A from the May 2019 sampling event are below the screening values estimated by EPA's VISL calculator (EPA, 2019) and indicate the VI pathway is incomplete.

## **References:**

- United States Environmental Protection Agency (EPA). 2019. Vapor Intrusion Screening Level (VISL) calculator, <https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator>. Accessed April 2019.
- United States Environmental Protection Agency (EPA). 2015. *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*. OSWER 9200.2-154. Office of Solid Waste and Emergency Response, Environmental Protection Agency, Washington, D.C. June.

Figure 1





**LEGEND**

- 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

**NOTE(S)**

1. LOCATION OF MW-68A IS APPROXIMATE, PENDING AS-BUILT SURVEY.

**REFERENCE(S)**

BASE MAP FROM GOOGLE EARTH, IMAGERY DATED 10/28/17.

**CLIENT**

UNION PACIFIC RAILROAD CO.

**PROJECT**

HOUSTON WOOD PRESERVING WORKS

**TITLE**

MONITORING WELL LOCATION MAP

**CONSULTANT**



YYYY-MM-DD	2019-06-06
DESIGNED	AJD
PREPARED	AJD
REVIEWED	MH
APPROVED	ECM

PROJECT NO.  
19119232

REV.  
0

FIGURE  
1

**ATTACHMENT A**

## Monitoring Well MW-68A Boring Log

**LOG OF BORING:  
MW-68A**



**Union Pacific Railroad**



SITE INFORMATION		PROJECT AND DRILLING INFORMATION	
Houston Wood Preserving Works Houston, TX		Drilling Company: Cascade Drilling Completion Date: 5/21/2019 Driller: Davis Ocana/ TJ Haley Driller's License: 59380M Logged By: M. Hermiston	Borehole Diameter (in.): 8.25' Total Depth (ft): 25 Water Level (ft bgl): 5.33 Northing: Easting: TOC Elev. (ft AMSL): Ground Elev. (ft AMSL):
Project No. 19119232		Drilling Method: HSA Sampling Method: 2.25" x 5'	

Depth (ft)	Well Materials	Recovery (ft/ft)	PID (ppm)	USCS	LITHOLOGIC DESCRIPTION
0					(0 - 10) No Recovery - Hydrovac to 10.0'
5		NR	NA	NR	
10		2.5/5.0	1.5	SM	(10 - 18.3) Silty SAND, SM, light gray and bluish-gray, wet, fine-grained sand, no odor.
15		5.0/5.0	0.3	CL	(18.3 - 19.3) CLAY, CL, light gray and reddish brown mottling, low to moderate plasticity, firm, no odor.
20		2.5/2.5	0.1	SP	(19.3 - 23) SAND, SP, light brown with some light gray, moist to wet, fine-grained (slightly larger grain-size than sand above), no odor.
25		2.5/2.5	0.2	CL	(23 - 25) CLAY, CL, light gray and reddish brown mottling with olive brown, calcareous nodules observed at approximately 24 feet, firm, no odor.



**GOLDER**

2201 Double Creek Dr., Suite 4004  
Round Rock, Texas 78664  
O-512.671.3434 F-512.671.3446

**Notes:** 1.) Top 10.0' drilled out with a hydrovac to clear for utilities

**Casing Materials**

(0.0 - 13.0) 2" SCH-40 PVC Casing  
(13.0 - 23.0) 2" SCH-40 PVC 0.010" Slotted Screen  
(23.0 - 23.4) End Cap

**Annular Materials**

(0.0 - 1.0) Concrete  
(1.0 - 11.0) 3/8" Bentonite Chips  
(11.0 - 23.0) 16/30 Silica Sand



**ATTACHMENT B**

# Groundwater Sampling Field Records

# WELL DEVELOPMENT RECORD

PAGE 1 of 1

Project Number: 19119232 Project Name: UPRR - HWPW Date: 5-28-19

Well Location (well ID, etc.): <u>MW-68A</u>	Starting Water Level (ft. BMP): <u>5.51</u>
Developed by: <u>JTB</u>	Casing Stickup (ft.): <u>AT GRADE</u>
Measuring Point (MP) of Well: <u>TDC/PVC</u>	Starting Water Level (ft. BGL): <u>5.51</u>
Screened Interval (ft. BGL): <u>=</u>	Total Depth (ft. BGL): <u>22.95</u>
Filter Pack Interval (ft. BGL):	Casing Diameter (In ID): <u>2.0</u>
	Casing Volume (gal.): <u>2.8</u>

## QUALITY ASSURANCE

METHODS (describe):

Cleaning Equipment: new equipment

Purging: Wattens Surge Equipment: Wattens

Disposal of Discharged Water: 55-gallon drum

## INSTRUMENTS (Indicate make, model, I.d.)

Water Level: SOUNST Thermometer: HORIBA

pH Meter: HORIBA Field Calibration: 7-4

Conductivity Meter: HORIBA Field Calibration: 1413

Other: -

## DEVELOPMENT MEASUREMENTS

Time	Flow		Water Quality			Appearance		Remarks
	Cum. Vol. (gal./L)	Purge Rate (gal./L pm)	Temp. (°C)	pH	Spec. Cond. (µmhos/cm)	Color	Turbidity & Sediment	
0733	5	hand pump	22.9	6.77	1870	tan	silty	
0749	10		23.1	6.79	1890	"	"	
0802	15		23.4	6.81	1890	lt tan	cloudy	
0813	20		23.1	6.80	1910	"	"	
0829	25		23.2	6.81	1910	"	slt. cloudy	
0841	30	↙	23.2	6.82	1900	neutral	slt. cloudy	

Total Discharge (gallons): 30

Observations/Comments:


**Pastor, Behling & Wheeler, LLC**  
 2201 Double Creek Dr., Suite 4004  
 Round Rock, Texas 78684  
 Phone: (512) 671-3434 Fax: (512) 671-3446





**ATTACHMENT C**

# Laboratory Report and Data Usability Summary (DUS)



# Memorandum

June 5, 2019

To: Eric Matzner Ref. No.: 11183954-1620

From: *CK* Chris G. Knight/cs/272-NF Tel: 512-506-8803

cc: Jesse Orth, Jon Lang; Julie Lidstone

**Subject: Data Usability Summary  
Monitoring Well Installation and Sampling Event  
Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works  
Houston, Texas  
May 2019**

## 1. Scope of Data Usability Study

This document details a Data Usability Summary (DUS) of analytical results for groundwater samples collected in support of the Monitoring Well Installation and Sampling Event at the Union Pacific Railroad (UPRR)/Houston TX-Wood Preserving Works site during May 2019. Samples were submitted to ALS Environmental (ALS), located in Houston, Texas and are reported in data package HS19051771. The intended use of the data is to support the Monitoring Well Installation and Sampling Event at the site by providing current concentration of chemicals of concern.

Data were reviewed and validated by Chris G. Knight of GHD, in accordance with Title 30 of the Texas Administrative Code Section 350.54 (30 TAC 350.54) as described in the Texas Commission on Environmental Quality (TCEQ) Regulatory Guidance document entitled "Review and Reporting of COC Concentration Data under TRRP", (RG-366/TRRP-13), revised May 2010, herein referred to as "TRRP-13 Guidance". Evaluation of the data was based on information obtained from the chain of custody forms, the finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spikes (MS), duplicate analyses, field quality assurance/quality control (QA/QC) samples, the laboratory review checklists (LRC), and the laboratory exception report (ER).

A sample collection and analysis summary is presented in Table 1. This summary provides a cross-reference of field sample identification numbers and location identification. Each sample is assigned a unique field identification number.

The validated sample results are presented in Table 2. A summary of the analytical methodology is presented in Table 3.



## **2. Laboratory Qualifications**

The Laboratory's quality assurance program is consistent with the quality standards outlined in the National Environmental Laboratory Accreditation Program (NELAP). This laboratory was accredited under Texas Certification number # TX104704231 at the time the analysis was performed and the certificate is included in Attachment A.

## **3. Project Objectives**

### **3.1 Sampling/Analytical QA/QC Objectives**

The QA/QC program was designed to identify contamination resulting from the sampling, sample transport and analytical process through the analysis of a trip blank sample, a field duplicate sample set, and method blanks. The QA/QC program was designed to evaluate the quality of the resulting data with respect to bias and precision through analysis of LCS analyses, matrix spike/matrix spike duplicate (MS/MSD) analyses, and duplicate sample analysis.

## **4. Data Review/Validation Results**

### **4.1 Sample Holding Time and Preservation**

Samples were shipped with a chain of custody and the paper work was filled out properly. All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

The sample chain of custody documents and the analytical report were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

### **4.2 Sample Containers**

Sample containers used were certified pre-cleaned glass and plastic containers provided by the laboratory. These containers meet or exceed analyte specifications established in the United States Environmental Protection Agency (USEPA) *Specifications and Guidance for Contaminant-free Sample Containers*.

### **4.3 Calibrations**

According to the LRC, initial calibration and continuing calibration data met the criteria for the selected method.

### **4.4 Laboratory Method Blank Analyses**

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. As these were not discrete samples handled in the field, these blanks are not listed on the sample identification cross-reference list found in the data package.





For this study, laboratory method blanks were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch and results are reported in the laboratory data package.

The method blank result was non-detect or below the method quantitation limit (MQL), indicating that laboratory contamination was not a factor for this investigation.

#### **4.5 Internal Standard and Surrogate Spike Recoveries**

Recoveries of internal standards are addressed in the LRC of the data package. All internal standard recoveries associated with the compounds of interest were acceptable per the LRC.

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project. Each individual surrogate compound is expected to meet the laboratory control limits. According to the TRRP-13 Guidelines, one outlying surrogate is acceptable for methods with multiple surrogate spike compounds as long as the recovery is at least ten percent.

Surrogate recoveries were assessed against laboratory control limits and/or the guidance in TRRP-13. All surrogate recoveries met the above criteria.

#### **4.6 Laboratory Control Sample Analysis**

LCS or LCS/laboratory control sample duplicate (LCSD) are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. The relative percent difference (RPD) of the LCS/LCSD recoveries is used to evaluate analytical precision. The recovery ranges established by the laboratory are adopted as the acceptance criteria for the project.

For this study, LCS or LCS/LCSD were analyzed at a minimum frequency of one per twenty investigative samples and/or one per analytical batch.

The LCS or LCS/LCSD contained all analytes specified in the methods. All LCS recoveries and/or RPDs were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision (where applicable).

#### **4.7 Matrix Spike/Matrix Spike Duplicate Analysis**

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of interest and analyzed as MS/MSD samples. The RPD between the MS and MSD is used to assess analytical precision.

The laboratory performed MS/MSD on non-site samples. These cannot be used to assess accuracy and precision for the site samples.



#### **4.8 Duplicate Sample Analyses**

Analytical precision is evaluated based on the analysis of laboratory duplicate samples.

The laboratory performed a duplicate analysis on a non-site sample. This cannot be used to assess precision for the site samples.

#### **4.9 Field QA/QC Samples**

The field QA/QC consisted of one trip blank sample and one field duplicate sample set.

##### ***Trip Blank Sample Analysis***

To evaluate contamination from sample collection, transportation, storage, and analytical activities, one trip blank sample was submitted to the laboratory for VOCs analysis. All results were non-detect for the compounds of interest.

##### ***Field Duplicate Sample Analysis***

To assess the analytical and sampling protocol precision, one field duplicate sample set was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than thirty percent for water samples. The RPDs are only used when sample concentrations are above the estimated regions of detection.

Field duplicate summary data are presented in Table 2. All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

#### **4.10 Field Procedures**

Golder Associates, Inc. collected groundwater samples in accordance with their Standard Operating Procedures (SOP) for sample collection.

#### **4.11 Analyte Reporting**

The laboratory reported detected results for each analyte down to the sample detection limit (SDL), which is defined as the method detection limit (MDL) with sample-specific adjustments for dilutions, aliquot size, volumes, etc. Positive analyte detections less than the MQL but greater than the SDL were qualified as estimated (J) in Table 2.

All detectability check standard (DCS) results supported the laboratory MDL.

## **5. Conclusion**

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are usable for the purpose of supporting the Monitoring Well Installation and Sampling Event at the site by providing current concentration of chemicals of concern without qualification.



Table 1

**Sample Collection and Analysis Summary  
Monitoring Well Installation and Sampling Event  
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works  
Houston, Texas  
May 2019**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters			Comments
					VOCs	SVOCs	Arsenic	
WG-1620-MW68A-20190529	MW-68A	Water	05/29/2019	11:15	X	X	X	
WG-1620-FD01-20190529	MW-68A	Water	05/29/2019	11:15	X	X	X	Field duplicate of MW-68A
WQ-1620-TB01-20190529	Trip Blank	Water	05/29/2019	-	X	X	X	Trip Blank

## Notes:

VOCs - Volatile Organic Compounds  
SVOCs - Semi-volatile Organic Compounds  
"- " - Not Applicable

**Monitoring Well Installation and Sampling Event  
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works  
Houston, Texas  
May 2019**

	Location ID:	MW-68A	MW-68A
	Sample Name:	WG-1620-MW68A-20190529	WG-1620-FD01-20190529
	Sample Date:	05/29/2019	05/29/2019 Duplicate
Parameters	Unit		
<b>Volatile Organic Compounds</b>			
1,2-Dichloroethane	mg/L	<0.00020	<0.00020
Benzene	mg/L	<0.00020	<0.00020
Chlorobenzene	mg/L	<0.00030	<0.00030
Ethylbenzene	mg/L	<0.00030	<0.00030
Methylene chloride	mg/L	<0.0010	<0.0010
Toluene	mg/L	<0.00020	<0.00020
Xylenes (total)	mg/L	<0.00030	<0.00030
<b>Semivolatile Organic Compounds</b>			
1,2-Diphenylhydrazine	mg/L	<0.000021	<0.000021
2,4-Dimethylphenol	mg/L	<0.000040	<0.000040
2,4-Dinitrotoluene	mg/L	<0.000058	<0.000059
2,6-Dinitrotoluene	mg/L	<0.000042	<0.000042
2-Chloronaphthalene	mg/L	<0.000021	<0.000021
2-Methylnaphthalene	mg/L	<0.000019	0.000026 J
4,6-Dinitro-2-methylphenol	mg/L	<0.000020	<0.000020
4-Nitrophenol	mg/L	<0.000047	<0.000047
Acenaphthene	mg/L	0.0012	0.0011
Acenaphthylene	mg/L	<0.000015	<0.000015
Anthracene	mg/L	<0.000014	<0.000014
Benzo(a)anthracene	mg/L	<0.000050	<0.000051
Benzo(a)pyrene	mg/L	<0.000020	<0.000020
bis(2-Chloroethoxy)methane	mg/L	<0.000030	<0.000030
bis(2-Ethylhexyl)phthalate (DEHP)	mg/L	0.00015 J	0.000074 J
Chrysene	mg/L	<0.000021	<0.000021
Di-n-butylphthalate (DBP)	mg/L	0.00087	0.00064
Dibenzofuran	mg/L	<0.000020	<0.000020
Fluoranthene	mg/L	<0.000010	<0.000010
Fluorene	mg/L	0.000044 J	0.000042 J
N-Nitrosodiphenylamine	mg/L	<0.000025	<0.000025
Naphthalene	mg/L	0.00019	0.00025
Nitrobenzene	mg/L	<0.000024	<0.000024
Pentachlorophenol	mg/L	<0.000079	<0.000080
Phenanthrene	mg/L	<0.000021	<0.000021
Phenol	mg/L	0.000041 J	<0.000035
Pyrene	mg/L	<0.000019	<0.000019
<b>Metals</b>			
Arsenic	mg/L	0.00966	0.00894

## Notes:

- < - Not detected at the associated reporting limit
- J - Estimated concentration

Table 3

**Analytical Methods  
Monitoring Well Installation and Sampling Event  
Union Pacific Railroad (UPRR)/Houston, TX-Wood Preserving Works  
Houston, Texas  
May 2019**

Parameter	Method	Matrix	Holding Time	
			Collection to Extraction (Days)	Extraction to Analysis (Days)
VOCs	SW-846 8260C	Water	-	14
SVOCs	SW-846 8270	Water	7	40
Arsenic	SW-846 6020A	Water	-	180

## Notes:

VOCs - Volatile Organic Compounds  
SVOCs - Semi-volatile Organic Compounds  
"-" - Not Applicable

## Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

**Attachment A**  
**Laboratory NELAP Certificate**



# Texas Commission on Environmental Quality

## NELAP - Recognized Laboratory Fields of Accreditation



ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210  
Houston, TX 77099-4338

Certificate: T104704231-19-23  
Expiration Date: 4/30/2020  
Issue Date: 5/1/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

**Matrix: *Drinking Water***

**Method EPA 1613**

Analyte	AB	Analyte ID	Method ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

**Method EPA 200.8**

Analyte	AB	Analyte ID	Method ID
Copper	TX	1055	10014605
Lead	TX	1075	10014605



---

10450 Stancliff Rd. Suite 210  
Houston, TX 77099  
T: +1 281 530 5656  
F: +1 281 530 5887

June 03, 2019

Eric Matzner  
Golder Associates Inc.  
2201 Double Creek Drive  
Suite 4004  
Round Rock, TX 78664

Work Order: **HS19051771**

Laboratory Results for: **Houston TX-Wood Preserving Works**

Dear Eric,

ALS Environmental received 3 sample(s) on May 29, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DANE.WACASEY

Dane J. Wacasey

---

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

---

**TRRP Laboratory Data  
Package Cover Page**

This data package consists of all or some of the following as applicable:

This signature page, the laboratory review checklist, and the following reportable data:

- R1 Field chain-of-custody documentation;
- R2 Sample identification cross-reference;
- R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC Chapter 5,
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- R5 Test reports/summary forms for blank samples;
- R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits.
- R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) the amount of analyte measured in the duplicate,
  - b) the calculated RPD, and
  - c) the laboratory's QC limits for analytical duplicates.
- R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 Other problems or anomalies.  
The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

---

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

---

**TRRP Laboratory Data  
Package Cover Page**

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory have been identified by the laboratory in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable:  [NA] This laboratory meets an exception under 30 TAC §25.6 and was last inspected by  TCEQ or  \_\_\_\_\_ on (enter date of last inspection). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.



Dane J. Wacasey



Laboratory Review Checklist: Reportable Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 6/3/19			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19051771			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 141401, 141478, R339435, R339533			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>R1</b>	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
<b>R2</b>	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
<b>R3</b>	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW-846 Method 5035?			X		
		If required for the project, TICs reported?			X		
<b>R4</b>	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?	X				
		Were surrogate percent recoveries in all samples within the laboratory QC limits?	X				
<b>R5</b>	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
<b>R6</b>	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
<b>R7</b>	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
		Were MS/MSD RPDs within laboratory QC limits?	X				
<b>R8</b>	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
<b>R9</b>	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
<b>R10</b>	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Were all necessary corrective actions performed for the reported data?	X				
		Was applicable and available technology used to lower the SDL and minimize the matrix interference affects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Program for the analytes, matrices and methods associated with this laboratory data package?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

Laboratory Review Checklist: Supporting Data							
Laboratory Name: ALS Laboratory Group				LRC Date: 6/3/19			
Project Name: Houston TX-Wood Preserving Works				Laboratory Job Number: HS19051771			
Reviewer Name: Dane Wacasey				Prep Batch Number(s): 141401, 141478, R339435, R339533			
# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
<b>S1</b>	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
<b>S2</b>	OI	<b>Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB)</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
<b>S3</b>	O	<b>Mass spectral tuning:</b>					
		Was the appropriate compound for the method used for tuning?	X				
		Were ion abundance data within the method-required QC limits?	X				
<b>S4</b>	O	<b>Internal standards (IS):</b>					
		Were IS area counts and retention times within the method-required QC limits?	X				
<b>S5</b>	OI	<b>Raw data</b> (NELAC section 1 appendix A glossary, and section 5.12 or ISO/IEC 17025 section					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
<b>S6</b>	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
<b>S7</b>	O	<b>Tentatively identified compounds (TICs):</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
<b>S8</b>	I	<b>Interference Check Sample (ICS) results:</b>					
		Were percent recoveries within method QC limits?	X				
<b>S9</b>	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
<b>S10</b>	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSs?	X				
<b>S11</b>	OI	<b>Proficiency test reports:</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
<b>S12</b>	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
<b>S13</b>	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
<b>S14</b>	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5C or ISO/IEC 4?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
<b>S15</b>	OI	<b>Verification/validation documentation for methods</b> (NELAC Chap 5 or ISO/IEC 17025 Section 5)					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
<b>S16</b>	OI	<b>Laboratory standard operating procedures (SOPs):</b>					
		Are laboratory SOPs current and on file for each method performed?	X				

Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.

O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable);

NA = Not Applicable;

NR = Not Reviewed;

R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Laboratory Review Checklist: Exception Data**

Laboratory Name: ALS Laboratory Group		LRC Date: 6/3/19	
Project Name: Houston TX-Wood Preserving Works		Laboratory Job Number: HS19051771	
Reviewer Name: Dane Wacasey		Prep Batch Number(s): 141401, 141478, R339435, R339533	
<b>ER#<sup>s</sup></b>	<b>Description</b>		
	No Exceptions		
<p>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period. O = Organic Analyses; I = Inorganic Analyses (and general chemistry, when applicable); NA = Not Applicable; NR = Not Reviewed; R# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**Work Order:** HS19051771

**SAMPLE SUMMARY**

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Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051771-01	WQ-1620-TB01-20190529	Water	C&G-052219-12	29-May-2019 00:00	29-May-2019 14:55	<input type="checkbox"/>
HS19051771-02	WG-1620-MW68A-20190529	Groundwater		29-May-2019 11:15	29-May-2019 14:55	<input type="checkbox"/>
HS19051771-03	WG-1620-FD01-20190529	Groundwater		29-May-2019 11:15	29-May-2019 14:55	<input type="checkbox"/>

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WQ-1620-TB01-20190529  
 Collection Date: 29-May-2019 00:00

**ANALYTICAL REPORT**  
 WorkOrder:HS19051771  
 Lab ID:HS19051771-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: AKP			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	29-May-2019 23:51
Benzene	U		0.00020	0.0010	mg/L	1	29-May-2019 23:51
Chlorobenzene	U		0.00030	0.0010	mg/L	1	29-May-2019 23:51
Ethylbenzene	U		0.00030	0.0010	mg/L	1	29-May-2019 23:51
Methylene chloride	U		0.0010	0.0020	mg/L	1	29-May-2019 23:51
Toluene	U		0.00020	0.0010	mg/L	1	29-May-2019 23:51
Xylenes, Total	U		0.00030	0.0010	mg/L	1	29-May-2019 23:51
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>102</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>29-May-2019 23:51</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>99.7</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>29-May-2019 23:51</i>
<i>Surr: Dibromofluoromethane</i>		<i>103</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>29-May-2019 23:51</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>29-May-2019 23:51</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68A-20190529  
 Collection Date: 29-May-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19051771  
 Lab ID:HS19051771-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: PC			
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-May-2019 18:17
Benzene	U		0.00020	0.0010	mg/L	1	30-May-2019 18:17
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-May-2019 18:17
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-May-2019 18:17
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-May-2019 18:17
Toluene	U		0.00020	0.0010	mg/L	1	30-May-2019 18:17
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-May-2019 18:17
<i>Surr: 1,2-Dichloroethane-d4</i>		86.5		70-126	%REC	1	30-May-2019 18:17
<i>Surr: 4-Bromofluorobenzene</i>		103		81-113	%REC	1	30-May-2019 18:17
<i>Surr: Dibromofluoromethane</i>		90.7		77-123	%REC	1	30-May-2019 18:17
<i>Surr: Toluene-d8</i>		105		82-127	%REC	1	30-May-2019 18:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-MW68A-20190529  
 Collection Date: 29-May-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19051771  
 Lab ID:HS19051771-02  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 30-May-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	31-May-2019 18:16
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	31-May-2019 18:16
2,4-Dinitrotoluene	U		0.000058	0.00020	mg/L	1	31-May-2019 18:16
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	31-May-2019 18:16
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	31-May-2019 18:16
2-Methylnaphthalene	U		0.000019	0.00010	mg/L	1	31-May-2019 18:16
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	31-May-2019 18:16
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	31-May-2019 18:16
<b>Acenaphthene</b>	<b>0.0012</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	31-May-2019 18:16
Acenaphthylene	U		0.000015	0.00010	mg/L	1	31-May-2019 18:16
Anthracene	U		0.000014	0.00010	mg/L	1	31-May-2019 18:16
Benz(a)anthracene	U		0.000050	0.00010	mg/L	1	31-May-2019 18:16
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	31-May-2019 18:16
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	31-May-2019 18:16
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.00015</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	31-May-2019 18:16
Chrysene	U		0.000021	0.00010	mg/L	1	31-May-2019 18:16
Dibenzofuran	U		0.000020	0.00010	mg/L	1	31-May-2019 18:16
<b>Di-n-butyl phthalate</b>	<b>0.00087</b>		<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	31-May-2019 18:16
Fluoranthene	U		0.000010	0.00010	mg/L	1	31-May-2019 18:16
<b>Fluorene</b>	<b>0.000044</b>	J	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	31-May-2019 18:16
<b>Naphthalene</b>	<b>0.00019</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	31-May-2019 18:16
Nitrobenzene	U		0.000024	0.00020	mg/L	1	31-May-2019 18:16
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	31-May-2019 18:16
Pentachlorophenol	U		0.000079	0.00020	mg/L	1	31-May-2019 18:16
Phenanthrene	U		0.000021	0.00010	mg/L	1	31-May-2019 18:16
<b>Phenol</b>	<b>0.000041</b>	J	<b>0.000035</b>	<b>0.00020</b>	<b>mg/L</b>	1	31-May-2019 18:16
Pyrene	U		0.000019	0.00010	mg/L	1	31-May-2019 18:16
<i>Surr: 2,4,6-Tribromophenol</i>	66.8			34-129	%REC	1	31-May-2019 18:16
<i>Surr: 2-Fluorobiphenyl</i>	60.8			40-125	%REC	1	31-May-2019 18:16
<i>Surr: 2-Fluorophenol</i>	56.8			20-120	%REC	1	31-May-2019 18:16
<i>Surr: 4-Terphenyl-d14</i>	94.2			40-135	%REC	1	31-May-2019 18:16
<i>Surr: Nitrobenzene-d5</i>	59.8			41-120	%REC	1	31-May-2019 18:16
<i>Surr: Phenol-d6</i>	60.6			20-120	%REC	1	31-May-2019 18:16
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 31-May-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00966</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	01-Jun-2019 00:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD01-20190529  
 Collection Date: 29-May-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19051771  
 Lab ID:HS19051771-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>					Analyst: PC
1,2-Dichloroethane	U		0.00020	0.0010	mg/L	1	30-May-2019 18:41
Benzene	U		0.00020	0.0010	mg/L	1	30-May-2019 18:41
Chlorobenzene	U		0.00030	0.0010	mg/L	1	30-May-2019 18:41
Ethylbenzene	U		0.00030	0.0010	mg/L	1	30-May-2019 18:41
Methylene chloride	U		0.0010	0.0020	mg/L	1	30-May-2019 18:41
Toluene	U		0.00020	0.0010	mg/L	1	30-May-2019 18:41
Xylenes, Total	U		0.00030	0.0010	mg/L	1	30-May-2019 18:41
<i>Surr: 1,2-Dichloroethane-d4</i>		<i>86.0</i>		<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>30-May-2019 18:41</i>
<i>Surr: 4-Bromofluorobenzene</i>		<i>102</i>		<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>30-May-2019 18:41</i>
<i>Surr: Dibromofluoromethane</i>		<i>90.0</i>		<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>30-May-2019 18:41</i>
<i>Surr: Toluene-d8</i>		<i>103</i>		<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>30-May-2019 18:41</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.



Client: Golder Associates Inc.  
 Project: Houston TX-Wood Preserving Works  
 Sample ID: WG-1620-FD01-20190529  
 Collection Date: 29-May-2019 11:15

**ANALYTICAL REPORT**  
 WorkOrder:HS19051771  
 Lab ID:HS19051771-03  
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	SDL	MQL	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW-LEVEL SEMIVOLATILES BY 8270D</b>		<b>Method:SW8270</b>		Prep:SW3510 / 30-May-2019		Analyst: GEY	
1,2-Diphenylhydrazine	U		0.000021	0.00020	mg/L	1	01-Jun-2019 15:05
2,4-Dimethylphenol	U		0.000040	0.00020	mg/L	1	01-Jun-2019 15:05
2,4-Dinitrotoluene	U		0.000059	0.00020	mg/L	1	01-Jun-2019 15:05
2,6-Dinitrotoluene	U		0.000042	0.00020	mg/L	1	01-Jun-2019 15:05
2-Chloronaphthalene	U		0.000021	0.00020	mg/L	1	01-Jun-2019 15:05
<b>2-Methylnaphthalene</b>	<b>0.000026</b>	J	<b>0.000019</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
4,6-Dinitro-2-methylphenol	U		0.000020	0.00020	mg/L	1	01-Jun-2019 15:05
4-Nitrophenol	U		0.000047	0.0010	mg/L	1	01-Jun-2019 15:05
<b>Acenaphthene</b>	<b>0.0011</b>		<b>0.000027</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
Acenaphthylene	U		0.000015	0.00010	mg/L	1	01-Jun-2019 15:05
Anthracene	U		0.000014	0.00010	mg/L	1	01-Jun-2019 15:05
Benz(a)anthracene	U		0.000051	0.00010	mg/L	1	01-Jun-2019 15:05
Benzo(a)pyrene	U		0.000020	0.00010	mg/L	1	01-Jun-2019 15:05
Bis(2-chloroethoxy)methane	U		0.000030	0.00020	mg/L	1	01-Jun-2019 15:05
<b>Bis(2-ethylhexyl)phthalate</b>	<b>0.000074</b>	J	<b>0.000037</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
Chrysene	U		0.000021	0.00010	mg/L	1	01-Jun-2019 15:05
Dibenzofuran	U		0.000020	0.00010	mg/L	1	01-Jun-2019 15:05
<b>Di-n-butyl phthalate</b>	<b>0.00064</b>		<b>0.000020</b>	<b>0.00020</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
Fluoranthene	U		0.000010	0.00010	mg/L	1	01-Jun-2019 15:05
<b>Fluorene</b>	<b>0.000042</b>	J	<b>0.000030</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
<b>Naphthalene</b>	<b>0.00025</b>		<b>0.000020</b>	<b>0.00010</b>	<b>mg/L</b>	1	01-Jun-2019 15:05
Nitrobenzene	U		0.000024	0.00020	mg/L	1	01-Jun-2019 15:05
N-Nitrosodiphenylamine	U		0.000025	0.00020	mg/L	1	01-Jun-2019 15:05
Pentachlorophenol	U		0.000080	0.00020	mg/L	1	01-Jun-2019 15:05
Phenanthrene	U		0.000021	0.00010	mg/L	1	01-Jun-2019 15:05
Phenol	U		0.000035	0.00020	mg/L	1	01-Jun-2019 15:05
Pyrene	U		0.000019	0.00010	mg/L	1	01-Jun-2019 15:05
<i>Surr: 2,4,6-Tribromophenol</i>	59.3			34-129	%REC	1	01-Jun-2019 15:05
<i>Surr: 2-Fluorobiphenyl</i>	76.9			40-125	%REC	1	01-Jun-2019 15:05
<i>Surr: 2-Fluorophenol</i>	66.7			20-120	%REC	1	01-Jun-2019 15:05
<i>Surr: 4-Terphenyl-d14</i>	93.9			40-135	%REC	1	01-Jun-2019 15:05
<i>Surr: Nitrobenzene-d5</i>	63.2			41-120	%REC	1	01-Jun-2019 15:05
<i>Surr: Phenol-d6</i>	69.3			20-120	%REC	1	01-Jun-2019 15:05
<b>ICP-MS METALS BY SW6020A</b>		<b>Method:SW6020</b>		Prep:SW3010A / 31-May-2019		Analyst: JHD	
<b>Arsenic</b>	<b>0.00894</b>		<b>0.000400</b>	<b>0.00200</b>	<b>mg/L</b>	1	01-Jun-2019 00:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

**WEIGHT LOG**

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**Batch ID:** 141401      **Method:** LOW-LEVEL SEMIVOLATILES BY 8270D      **Prep:** 3510\_B\_LOW

<b>SampID</b>	<b>Container</b>	<b>Sample Wt/Vol</b>	<b>Final Volume</b>	<b>Prep Factor</b>
HS19051771-02	1	1000	1 (mL)	0.001
HS19051771-03	1	990	1 (mL)	0.00101

**Batch ID:** 141478      **Method:** ICP-MS METALS BY SW6020A      **Prep:** 3010A

<b>SampID</b>	<b>Container</b>	<b>Sample Wt/Vol</b>	<b>Final Volume</b>	<b>Prep Factor</b>
HS19051771-02	1	10	10 (mL)	1
HS19051771-03	1	10	10 (mL)	1

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
<b>Batch ID</b> 141401	<b>Test Name :</b> LOW-LEVEL SEMIVOLATILES BY 8270D		<b>Matrix:</b> Groundwater			
HS19051771-02	WG-1620-MW68A-20190529	29 May 2019 11:15		30 May 2019 10:22	31 May 2019 18:16	1
HS19051771-03	WG-1620-FD01-20190529	29 May 2019 11:15		30 May 2019 10:22	01 Jun 2019 15:05	1
<b>Batch ID</b> 141478	<b>Test Name :</b> ICP-MS METALS BY SW6020A		<b>Matrix:</b> Groundwater			
HS19051771-02	WG-1620-MW68A-20190529	29 May 2019 11:15		31 May 2019 11:00	01 Jun 2019 00:08	1
HS19051771-03	WG-1620-FD01-20190529	29 May 2019 11:15		31 May 2019 11:00	01 Jun 2019 00:09	1
<b>Batch ID</b> R339435	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C		<b>Matrix:</b> Water			
HS19051771-01	WQ-1620-TB01-20190529	29 May 2019 00:00			29 May 2019 23:51	1
<b>Batch ID</b> R339533	<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C		<b>Matrix:</b> Groundwater			
HS19051771-02	WG-1620-MW68A-20190529	29 May 2019 11:15			30 May 2019 18:17	1
HS19051771-03	WG-1620-FD01-20190529	29 May 2019 11:15			30 May 2019 18:41	1

WorkOrder: HS19051771  
 InstrumentID: ICPMS06  
 Test Code: ICP\_TW  
 Test Number: SW6020  
 Test Name: ICP-MS Metals by SW6020A

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous      **Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	Arsenic	7440-38-2	0.000500	0.000438	0.000400	0.00200

WorkOrder: HS19051771  
 InstrumentID: SV-7  
 Test Code: 8270\_LOW\_W  
 Test Number: SW8270  
 Test Name: Low-Level Semivolatiles by 8270D

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Diphenylhydrazine	122-66-7	0.00010	0.000086	0.000021	0.00020
A	2,4-Dimethylphenol	105-67-9	0.00010	0.000058	0.000040	0.00020
A	2,4-Dinitrotoluene	121-14-2	0.00010	0.000066	0.000058	0.00020
A	2,6-Dinitrotoluene	606-20-2	0.00010	0.000083	0.000042	0.00020
A	2-Chloronaphthalene	91-58-7	0.00010	0.000071	0.000021	0.00020
A	2-Methylnaphthalene	91-57-6	0.000050	0.000033	0.000019	0.00010
A	4,6-Dinitro-2-methylphenol	534-52-1	0.00010	0.000015	0.000020	0.00020
A	4-Nitrophenol	100-02-7	0.00010	0.000066	0.000047	0.0010
A	Acenaphthene	83-32-9	0.000050	0.000044	0.000027	0.00010
A	Acenaphthylene	208-96-8	0.000050	0.000042	0.000015	0.00010
A	Anthracene	120-12-7	0.000050	0.000043	0.000014	0.00010
A	Benz(a)anthracene	56-55-3	0.000050	0.000044	0.000050	0.00010
A	Benzo(a)pyrene	50-32-8	0.000050	0.000036	0.000020	0.00010
A	Bis(2-chloroethoxy)methane	111-91-1	0.00010	0.000070	0.000030	0.00020
A	Bis(2-ethylhexyl)phthalate	117-81-7	0.00010	0.000095	0.000037	0.00020
A	Chrysene	218-01-9	0.000050	0.000041	0.000021	0.00010
A	Dibenzofuran	132-64-9	0.000050	0.000035	0.000020	0.00010
A	Di-n-butyl phthalate	84-74-2	0.00010	0.000084	0.000020	0.00020
A	Fluoranthene	206-44-0	0.000050	0.000041	0.000010	0.00010
A	Fluorene	86-73-7	0.000050	0.000042	0.000030	0.00010
A	Naphthalene	91-20-3	0.000050	0.000045	0.000020	0.00010
A	Nitrobenzene	98-95-3	0.00010	0.00010	0.000024	0.00020
A	N-Nitrosodiphenylamine	86-30-6	0.00010	0.000072	0.000025	0.00020
A	Pentachlorophenol	87-86-5	0.00040	0.00024	0.000079	0.00020
A	Phenanthrene	85-01-8	0.000050	0.000045	0.000021	0.00010
A	Phenol	108-95-2	0.00010	0.000085	0.000035	0.00020
A	Pyrene	129-00-0	0.000050	0.000044	0.000019	0.00010
S	2,4,6-Tribromophenol	118-79-6	0	0	0	0.00020
S	2-Fluorobiphenyl	321-60-8	0	0	0	0.00020
S	2-Fluorophenol	367-12-4	0	0	0	0.00020
S	4-Terphenyl-d14	1718-51-0	0	0	0	0.00020
S	Nitrobenzene-d5	4165-60-0	0	0	0	0.00020
S	Phenol-d6	13127-88-3	0	0	0	0.00020

WorkOrder: HS19051771  
 InstrumentID: VOA2  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00065	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00059	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00060	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00062	0.00030	0.0010
A	Methylene chloride	75-09-2	0.00050	0.00067	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00066	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00076	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

WorkOrder: HS19051771  
 InstrumentID: VOA6  
 Test Code: 8260\_LL\_W  
 Test Number: SW8260  
 Test Name: Low Level Volatiles by SW8260C

**METHOD DETECTION /  
 REPORTING LIMITS**

**Matrix:** Aqueous

**Units:** mg/L

Type	Analyte	CAS	DCS Spike	DCS	MDL	PQL
A	1,2-Dichloroethane	107-06-2	0.00050	0.00072	0.00020	0.0010
A	Benzene	71-43-2	0.00050	0.00066	0.00020	0.0010
A	Chlorobenzene	108-90-7	0.00050	0.00072	0.00030	0.0010
A	Ethylbenzene	100-41-4	0.00050	0.00073	0.00030	0.0010
A	Methylene chloride	75-09-2	0.0010	0.00080	0.0010	0.0020
A	Toluene	108-88-3	0.00050	0.00072	0.00020	0.0010
A	Xylenes, Total	1330-20-7	0.00050	0.00072	0.00030	0.0010
S	1,2-Dichloroethane-d4	17060-07-0	0	0	0	0.0010
S	4-Bromofluorobenzene	460-00-4	0	0	0	0.0010
S	Dibromofluoromethane	1868-53-7	0	0	0	0.0010
S	Toluene-d8	2037-26-5	0	0	0	0.0010

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

Batch ID: 141478 ( 0 )		Instrument: ICPMS06		Method: ICP-MS METALS BY SW6020A						
<b>MBLK</b>	Sample ID: <b>MBLKF1-141478</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:28</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102626</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	U	0.00200								
<b>MBLK</b>	Sample ID: <b>MBLK-141478</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:26</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102625</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	U	0.00200								
<b>LCS</b>	Sample ID: <b>LCS-141478</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:30</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102627</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	0.04876	0.00200	0.05	0	97.5	80 - 120				
<b>MS</b>	Sample ID: <b>HS19051850-03MS</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:39</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102632</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	0.05055	0.00200	0.05	0.000794	99.5	80 - 120				
<b>MSD</b>	Sample ID: <b>HS19051850-03MSD</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:41</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102633</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	0.05277	0.00200	0.05	0.000794	104	80 - 120	0.05055	4.3	20	
<b>PDS</b>	Sample ID: <b>HS19051850-03PDS</b>	Units: <b>mg/L</b>		Analysis Date: <b>31-May-2019 23:43</b>						
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102634</b>		PrepDate: <b>31-May-2019</b>		DF: <b>1</b>				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Arsenic	0.1244	0.00200	0.1	0.000794	124	75 - 125				



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

**Batch ID:** 141478 ( 0 )      **Instrument:** ICPMS06      **Method:** ICP-MS METALS BY SW6020A

<b>SD</b>	Sample ID: <b>HS19051850-03SD</b>	Units: <b>mg/L</b>	Analysis Date: <b>31-May-2019 23:38</b>							
Client ID:	Run ID: <b>ICPMS06_339538</b>	SeqNo: <b>5102631</b>	PrepDate: <b>31-May-2019</b> DF: <b>5</b>							
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual

Arsenic	U	0.0100					0.000794	0	10
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The following samples were analyzed in this batch: 

HS19051771-02	HS19051771-03
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**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

Batch ID: 141401 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
MBLK	Sample ID: MBLK-141401	Units: ug/L			Analysis Date: 30-May-2019 15:27					
Client ID:	Run ID: SV-7_339394	SeqNo: 5099150		PrepDate: 30-May-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,2-Diphenylhydrazine	U	0.20								
2,4-Dimethylphenol	U	0.20								
2,4-Dinitrotoluene	U	0.20								
2,6-Dinitrotoluene	U	0.20								
2-Chloronaphthalene	U	0.20								
2-Methylnaphthalene	U	0.10								
4,6-Dinitro-2-methylphenol	U	0.20								
4-Nitrophenol	U	1.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benz(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Bis(2-chloroethoxy)methane	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Dibenzofuran	U	0.10								
Di-n-butyl phthalate	U	0.20								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Naphthalene	U	0.10								
Nitrobenzene	U	0.20								
N-Nitrosodiphenylamine	U	0.20								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Phenol	U	0.20								
Pyrene	U	0.10								
<i>Surr: 2,4,6-Tribromophenol</i>	3.553	0.20	5	0	71.1	34 - 129				
<i>Surr: 2-Fluorobiphenyl</i>	4.08	0.20	5	0	81.6	40 - 125				
<i>Surr: 2-Fluorophenol</i>	3.361	0.20	5	0	67.2	20 - 120				
<i>Surr: 4-Terphenyl-d14</i>	4.517	0.20	5	0	90.3	40 - 135				
<i>Surr: Nitrobenzene-d5</i>	3.733	0.20	5	0	74.7	41 - 120				
<i>Surr: Phenol-d6</i>	3.819	0.20	5	0	76.4	20 - 120				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

Batch ID: 141401 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
LCS	Sample ID: LCS-141401	Units: ug/L			Analysis Date: 30-May-2019 13:30					
Client ID:	Run ID: SV-7_339394	SeqNo: 5098683		PrepDate: 30-May-2019		DF: 1				
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	4.977	0.20	5	0	99.5	39 - 127				
2,4-Dimethylphenol	4.835	0.20	5	0	96.7	35 - 120				
2,4-Dinitrotoluene	5.449	0.20	5	0	109	50 - 122				
2,6-Dinitrotoluene	5.582	0.20	5	0	112	50 - 120				
2-Chloronaphthalene	5.501	0.20	5	0	110	50 - 120				
2-Methylnaphthalene	5.078	0.10	5	0	102	50 - 120				
4,6-Dinitro-2-methylphenol	3.974	0.20	5	0	79.5	25 - 121				
4-Nitrophenol	5.316	1.0	5	0	106	30 - 130				
Acenaphthene	4.926	0.10	5	0	98.5	45 - 120				
Acenaphthylene	5.12	0.10	5	0	102	47 - 120				
Anthracene	5.16	0.10	5	0	103	45 - 120				
Benz(a)anthracene	5.056	0.10	5	0	101	40 - 120				
Benzo(a)pyrene	5.469	0.10	5	0	109	45 - 120				
Bis(2-chloroethoxy)methane	5.07	0.20	5	0	101	45 - 120				
Bis(2-ethylhexyl)phthalate	5.83	0.20	5	0	117	40 - 139				
Chrysene	5.629	0.10	5	0	113	43 - 120				
Dibenzofuran	5.42	0.10	5	0	108	50 - 120				
Di-n-butyl phthalate	5.539	0.20	5	0	111	45 - 123				
Fluoranthene	5.61	0.10	5	0	112	45 - 125				
Fluorene	5.441	0.10	5	0	109	49 - 120				
Naphthalene	4.947	0.10	5	0	98.9	45 - 120				
Nitrobenzene	4.969	0.20	5	0	99.4	44 - 120				
N-Nitrosodiphenylamine	5.296	0.20	5	0	106	40 - 125				
Pentachlorophenol	3.378	0.20	5	0	67.6	19 - 121				
Phenanthrene	5.071	0.10	5	0	101	45 - 121				
Phenol	5.075	0.20	5	0	102	20 - 124				
Pyrene	5.601	0.10	5	0	112	40 - 130				
<i>Surr: 2,4,6-Tribromophenol</i>	<i>5.472</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>109</i>	<i>34 - 129</i>				
<i>Surr: 2-Fluorobiphenyl</i>	<i>5.379</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>108</i>	<i>40 - 125</i>				
<i>Surr: 2-Fluorophenol</i>	<i>4.04</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>80.8</i>	<i>20 - 120</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>5.653</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>113</i>	<i>40 - 135</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>4.905</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>98.1</i>	<i>41 - 120</i>				
<i>Surr: Phenol-d6</i>	<i>4.883</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>97.7</i>	<i>20 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

Batch ID: 141401 ( 0 )		Instrument: SV-7		Method: LOW-LEVEL SEMIVOLATILES BY 8270D						
LCSD	Sample ID: LCSD-141401	Units: ug/L			Analysis Date: 30-May-2019 13:49					
Client ID:	Run ID: SV-7_339394	SeqNo: 5098684	PrepDate: 30-May-2019	DF: 1						
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	5.214	0.20	5	0	104	39 - 127	4.977	4.66	20	
2,4-Dimethylphenol	5.081	0.20	5	0	102	35 - 120	4.835	4.96	20	
2,4-Dinitrotoluene	5.44	0.20	5	0	109	50 - 122	5.449	0.152	20	
2,6-Dinitrotoluene	5.388	0.20	5	0	108	50 - 120	5.582	3.54	20	
2-Chloronaphthalene	5.372	0.20	5	0	107	50 - 120	5.501	2.36	20	
2-Methylnaphthalene	5.501	0.10	5	0	110	50 - 120	5.078	8.01	20	
4,6-Dinitro-2-methylphenol	3.792	0.20	5	0	75.8	25 - 121	3.974	4.68	30	
4-Nitrophenol	5.08	1.0	5	0	102	30 - 130	5.316	4.54	20	
Acenaphthene	4.759	0.10	5	0	95.2	45 - 120	4.926	3.46	20	
Acenaphthylene	5.045	0.10	5	0	101	47 - 120	5.12	1.47	20	
Anthracene	5.429	0.10	5	0	109	45 - 120	5.16	5.08	20	
Benz(a)anthracene	5.174	0.10	5	0	103	40 - 120	5.056	2.3	20	
Benzo(a)pyrene	4.775	0.10	5	0	95.5	45 - 120	5.469	13.5	20	
Bis(2-chloroethoxy)methane	5.443	0.20	5	0	109	45 - 120	5.07	7.09	20	
Bis(2-ethylhexyl)phthalate	5.895	0.20	5	0	118	40 - 139	5.83	1.1	20	
Chrysene	5.776	0.10	5	0	116	43 - 120	5.629	2.59	20	
Dibenzofuran	5.305	0.10	5	0	106	50 - 120	5.42	2.14	20	
Di-n-butyl phthalate	5.783	0.20	5	0	116	45 - 123	5.539	4.31	20	
Fluoranthene	5.515	0.10	5	0	110	45 - 125	5.61	1.71	20	
Fluorene	5.122	0.10	5	0	102	49 - 120	5.441	6.04	20	
Naphthalene	5.255	0.10	5	0	105	45 - 120	4.947	6.03	20	
Nitrobenzene	5.014	0.20	5	0	100	44 - 120	4.969	0.908	20	
N-Nitrosodiphenylamine	5.548	0.20	5	0	111	40 - 125	5.296	4.65	20	
Pentachlorophenol	3.302	0.20	5	0	66.0	19 - 121	3.378	2.29	20	
Phenanthrene	5.171	0.10	5	0	103	45 - 121	5.071	1.95	20	
Phenol	4.753	0.20	5	0	95.1	20 - 124	5.075	6.56	20	
Pyrene	5.823	0.10	5	0	116	40 - 130	5.601	3.88	20	
<i>Surr: 2,4,6-Tribromophenol</i>	<i>5.111</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>102</i>	<i>34 - 129</i>	<i>5.472</i>	<i>6.81</i>	<i>20</i>	
<i>Surr: 2-Fluorobiphenyl</i>	<i>5.229</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>105</i>	<i>40 - 125</i>	<i>5.379</i>	<i>2.82</i>	<i>20</i>	
<i>Surr: 2-Fluorophenol</i>	<i>4.486</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>89.7</i>	<i>20 - 120</i>	<i>4.04</i>	<i>10.5</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>5.825</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>117</i>	<i>40 - 135</i>	<i>5.653</i>	<i>2.99</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>5.076</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>102</i>	<i>41 - 120</i>	<i>4.905</i>	<i>3.42</i>	<i>20</i>	
<i>Surr: Phenol-d6</i>	<i>4.579</i>	<i>0.20</i>	<i>5</i>	<i>0</i>	<i>91.6</i>	<i>20 - 120</i>	<i>4.883</i>	<i>6.44</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19051771-02 HS19051771-03

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

**Batch ID:** R339435 ( 0 )      **Instrument:** VOA2      **Method:** LOW LEVEL VOLATILES BY SW8260C

**MBLK**      Sample ID: **VBLKW-190529**      Units: **ug/L**      Analysis Date: **29-May-2019 23:02**  
 Client ID:      Run ID: **VOA2\_339435**      SeqNo: **5098155**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

1,2-Dichloroethane	U	1.0								
Benzene	U	1.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
Methylene chloride	U	2.0								
Toluene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	1.0								
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>50.91</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>70 - 123</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.42</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>51.09</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>52</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>81 - 120</i>				

**LCS**      Sample ID: **VLCSW-190529**      Units: **ug/L**      Analysis Date: **29-May-2019 22:38**  
 Client ID:      Run ID: **VOA2\_339435**      SeqNo: **5098154**      PrepDate:      DF: **1**  
 Analyte      Result      MQL      SPK Val      SPK Ref Value      %REC      Control Limit      RPD Ref Value      %RPD      RPD Limit Qual

1,2-Dichloroethane	19.01	1.0	20	0	95.0	70 - 124				
Benzene	18.23	1.0	20	0	91.2	74 - 120				
Chlorobenzene	19.17	1.0	20	0	95.9	76 - 113				
Ethylbenzene	19.08	1.0	20	0	95.4	77 - 117				
Methylene chloride	19.16	2.0	20	0	95.8	70 - 127				
Toluene	17.88	1.0	20	0	89.4	77 - 118				
Vinyl chloride	20.11	1.0	20	0	101	70 - 130				
Xylenes, Total	56.28	1.0	60	0	93.8	75 - 122				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>53.47</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>107</i>	<i>70 - 130</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.74</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.5</i>	<i>82 - 115</i>				
<i>Surr: Dibromofluoromethane</i>	<i>49.89</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>73 - 126</i>				
<i>Surr: Toluene-d8</i>	<i>50.69</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>81 - 120</i>				

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

<b>Batch ID:</b> R339435 ( 0 )		<b>Instrument:</b> VOA2		<b>Method:</b> LOW LEVEL VOLATILES BY SW8260C					
<b>MS</b>	Sample ID: <b>HS19051379-03MS</b>	Units: <b>ug/L</b>			Analysis Date: <b>30-May-2019 01:05</b>				
Client ID:	Run ID: <b>VOA2_339435</b>	SeqNo: <b>5098160</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	17.5	1.0	20	0	87.5	70 - 127			
Benzene	18.18	1.0	20	0	90.9	70 - 127			
Chlorobenzene	19.21	1.0	20	0	96.1	70 - 114			
Ethylbenzene	19.46	1.0	20	0	97.3	70 - 124			
Methylene chloride	19.24	2.0	20	0	96.2	70 - 128			
Toluene	18.19	1.0	20	0	91.0	70 - 123			
Vinyl chloride	21.92	1.0	20	0	110	70 - 130			
Xylenes, Total	57.59	1.0	60	0	96.0	70 - 130			
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>53.2</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>106</i>	<i>70 - 126</i>			
<i>Surr: 4-Bromofluorobenzene</i>	<i>49.17</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.3</i>	<i>81 - 113</i>			
<i>Surr: Dibromofluoromethane</i>	<i>50.37</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>101</i>	<i>77 - 123</i>			
<i>Surr: Toluene-d8</i>	<i>51.25</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>103</i>	<i>82 - 127</i>			

<b>MSD</b>	Sample ID: <b>HS19051379-03MSD</b>	Units: <b>ug/L</b>			Analysis Date: <b>30-May-2019 01:29</b>				
Client ID:	Run ID: <b>VOA2_339435</b>	SeqNo: <b>5098161</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	17.79	1.0	20	0	88.9	70 - 127	17.5	1.59	20
Benzene	17.43	1.0	20	0	87.2	70 - 127	18.18	4.23	20
Chlorobenzene	18.66	1.0	20	0	93.3	70 - 114	19.21	2.95	20
Ethylbenzene	18.87	1.0	20	0	94.3	70 - 124	19.46	3.13	20
Methylene chloride	18.1	2.0	20	0	90.5	70 - 128	19.24	6.11	20
Toluene	17.44	1.0	20	0	87.2	70 - 123	18.19	4.23	20
Vinyl chloride	20.42	1.0	20	0	102	70 - 130	21.92	7.05	20
Xylenes, Total	55.16	1.0	60	0	91.9	70 - 130	57.59	4.32	20
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>53.52</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>107</i>	<i>70 - 126</i>	<i>53.2</i>	<i>0.585</i>	<i>20</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>50.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>100</i>	<i>81 - 113</i>	<i>49.17</i>	<i>2.09</i>	<i>20</i>
<i>Surr: Dibromofluoromethane</i>	<i>49.9</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>99.8</i>	<i>77 - 123</i>	<i>50.37</i>	<i>0.939</i>	<i>20</i>
<i>Surr: Toluene-d8</i>	<i>51.76</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>104</i>	<i>82 - 127</i>	<i>51.25</i>	<i>0.978</i>	<i>20</i>

The following samples were analyzed in this batch: HS19051771-01

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

<b>Batch ID:</b> R339533 ( 0 )		<b>Instrument:</b> VOA6		<b>Method:</b> LOW LEVEL VOLATILES BY SW8260C					
<b>MBLK</b>	Sample ID: <b>VBLKW-190530</b>	Units: <b>ug/L</b>			Analysis Date: <b>30-May-2019 13:53</b>				
Client ID:	Run ID: <b>VOA6_339533</b>	SeqNo: <b>5100302</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

1,2-Dichloroethane	U	1.0							
Benzene	U	1.0							
Chlorobenzene	U	1.0							
Ethylbenzene	U	1.0							
Methylene chloride	U	2.0							
Toluene	U	1.0							
Xylenes, Total	U	1.0							
<i>Surr: 1,2-Dichloroethane-d4</i>	43.79	1.0	50	0	87.6	70 - 123			
<i>Surr: 4-Bromofluorobenzene</i>	51.42	1.0	50	0	103	82 - 115			
<i>Surr: Dibromofluoromethane</i>	45.23	1.0	50	0	90.5	73 - 126			
<i>Surr: Toluene-d8</i>	52.3	1.0	50	0	105	81 - 120			

<b>LCS</b>	Sample ID: <b>VLCSW-190530</b>	Units: <b>ug/L</b>			Analysis Date: <b>30-May-2019 13:05</b>				
Client ID:	Run ID: <b>VOA6_339533</b>	SeqNo: <b>5100301</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	MLQ	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,2-Dichloroethane	20.88	1.0	20	0	104	70 - 124			
Benzene	23.17	1.0	20	0	116	74 - 120			
Chlorobenzene	21.12	1.0	20	0	106	76 - 113			
Ethylbenzene	20.62	1.0	20	0	103	77 - 117			
Methylene chloride	24.41	2.0	20	0	122	70 - 127			
Toluene	21.12	1.0	20	0	106	77 - 118			
Xylenes, Total	64.07	1.0	60	0	107	75 - 122			
<i>Surr: 1,2-Dichloroethane-d4</i>	48.32	1.0	50	0	96.6	70 - 130			
<i>Surr: 4-Bromofluorobenzene</i>	57.13	1.0	50	0	114	82 - 115			
<i>Surr: Dibromofluoromethane</i>	54.93	1.0	50	0	110	73 - 126			
<i>Surr: Toluene-d8</i>	43.15	1.0	50	0	86.3	81 - 120			

**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QC BATCH REPORT**

**Batch ID:** R339533 ( 0 )      **Instrument:** VOA6      **Method:** LOW LEVEL VOLATILES BY SW8260C

<b>MS</b>		Sample ID: <b>HS19051504-02MS</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-May-2019 15:53</b>			
Client ID:		Run ID: <b>VOA6_339533</b>			SeqNo: <b>5100305</b>		PrepDate:		DF: <b>50</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	775.3	50	1000	0	77.5	70 - 127				
Benzene	1169	50	1000	284.9	88.4	70 - 127				
Chlorobenzene	890.6	50	1000	0	89.1	70 - 114				
Ethylbenzene	954.4	50	1000	57.57	89.7	70 - 124				
Methylene chloride	879.4	100	1000	0	87.9	70 - 128				
Toluene	979.6	50	1000	105.7	87.4	70 - 123				
Xylenes, Total	2953	50	3000	159.2	93.1	70 - 130				
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>2136</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>85.4</i>	<i>70 - 126</i>				
<i>Surr: 4-Bromofluorobenzene</i>	<i>2586</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>103</i>	<i>81 - 113</i>				
<i>Surr: Dibromofluoromethane</i>	<i>2254</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>90.2</i>	<i>77 - 123</i>				
<i>Surr: Toluene-d8</i>	<i>2559</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>102</i>	<i>82 - 127</i>				

<b>MSD</b>		Sample ID: <b>HS19051504-02MSD</b>			Units: <b>ug/L</b>		Analysis Date: <b>30-May-2019 16:17</b>			
Client ID:		Run ID: <b>VOA6_339533</b>			SeqNo: <b>5100306</b>		PrepDate:		DF: <b>50</b>	
Analyte	Result	MQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Dichloroethane	769.4	50	1000	0	76.9	70 - 127	775.3	0.757	20	
Benzene	1126	50	1000	284.9	84.1	70 - 127	1169	3.8	20	
Chlorobenzene	863.1	50	1000	0	86.3	70 - 114	890.6	3.13	20	
Ethylbenzene	912.8	50	1000	57.57	85.5	70 - 124	954.4	4.46	20	
Methylene chloride	861.5	100	1000	0	86.2	70 - 128	879.4	2.05	20	
Toluene	958.3	50	1000	105.7	85.3	70 - 123	979.6	2.2	20	
Xylenes, Total	2826	50	3000	159.2	88.9	70 - 130	2953	4.4	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>2172</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>86.9</i>	<i>70 - 126</i>	<i>2136</i>	<i>1.68</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>2667</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>107</i>	<i>81 - 113</i>	<i>2586</i>	<i>3.1</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>2285</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>91.4</i>	<i>77 - 123</i>	<i>2254</i>	<i>1.39</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>2590</i>	<i>50</i>	<i>2500</i>	<i>0</i>	<i>104</i>	<i>82 - 127</i>	<i>2559</i>	<i>1.2</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19051771-02      HS19051771-03



**Client:** Golder Associates Inc.  
**Project:** Houston TX-Wood Preserving Works  
**WorkOrder:** HS19051771

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

<b>Acronym</b>	<b>Description</b>
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
mg/L	Milligrams per Liter

**CERTIFICATIONS,ACCREDITATIONS & LICENSES**

<b>Agency</b>	<b>Number</b>	<b>Expire Date</b>
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: PBW
Work Order: HS19051771

Date/Time Received: 29-May-2019 14:55
Received by: JRM

Checklist completed by: Paresh M. Giga
eSignature
Date: 29-May-2019

Reviewed by: Dane J. Wacasey
eSignature
Date: 31-May-2019

Matrices: Groundwater/Water

Carrier name: Client

- Shipping container/cooler in good condition? Yes [checked] No [ ] Not Present [ ]
Custody seals intact on shipping container/cooler? Yes [ ] No [ ] Not Present [checked]
Custody seals intact on sample bottles? Yes [ ] No [ ] Not Present [checked]
VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes [ ] No [ ] Not Present [checked]
Chain of custody present? Yes [checked] No [ ]
Chain of custody signed when relinquished and received? Yes [checked] No [ ]
Samplers name present on COC? Yes [checked] No [ ]
Chain of custody agrees with sample labels? Yes [checked] No [ ]
Samples in proper container/bottle? Yes [checked] No [ ]
Sample containers intact? Yes [checked] No [ ]
Sufficient sample volume for indicated test? Yes [checked] No [ ]
All samples received within holding time? Yes [checked] No [ ]
Container/Temp Blank temperature in compliance? Yes [checked] No [ ]

1 Page(s)
COC IDs:205441

Temperature(s)/Thermometer(s): 1.5c U/C IR25
Cooler(s)/Kit(s): 43942
Date/Time sample(s) sent to storage: 5/29/19 16:20
Water - VOA vials have zero headspace? Yes [checked] No [ ] No VOA vials submitted [ ]
Water - pH acceptable upon receipt? Yes [checked] No [ ] N/A [ ]
pH adjusted? Yes [ ] No [checked] N/A [ ]
pH adjusted by:

Login Notes: 5/31/19: Per email from Ms. Hermiston, Report arsenic only for metals and remove V.C. from VOC list.

Client Contacted: Date Contacted: Person Contacted:
Contacted By: Regarding:
Comments:
Corrective Action:



Cincinnati, OH  
+1 513 733 5336

Everett, WA  
+1 425 356 2600

Fort Collins, CO  
+1 970 490 1511

Holland, MI  
+1 616 399 6070

# Chain of Custody Form

Page 1 of 1

COC ID: 205441

Houston, TX  
+1 281 530 5656


Middletown, PA  
+1 717 944 5541

Spring City, PA  
+1 610 948 4903

Salt Lake City, UT  
+1 801 266 7700

South Charleston, WV  
+1 304 356 3168

York, PA  
+1 717 505 5280

Customer Information		Project Information		ALS Project Manager:		ALS Work Order #:	
Purchase Order	UPRR/Kevin Peterburs	Project Name	Houston TX-Wood Preserving Works	A	8260_LL_W (5632528 VOC Site Specific + V.C.)		
Work Order		Project Number	1620-07-Rey0 SR 92688	B	8270_LOW_S (5632532 SemiVolatiles Site Specific)		
Company Name	Golder Associates Inc.	Bill To Company	Union Pacific Railroad- A/P	C	ICP_TW (5636002 5652646 Metals - As, Pb)		
Send Report To	Eric Matzner	Invoice Attn	Accounts Payable	D	<p style="text-align: center;"><b>HS19051771</b></p> <p style="text-align: center;">Golder Associates Inc. Houston TX-Wood Preserving Works</p> 		
Address	2201 Double Creek Drive Suite 4004	Address	1400 Douglas Street Stop 0750	E			
City/State/Zip	Round Rock, TX 78664	City/State/Zip	Omaha NE 681790750	F			
Phone	(512) 671-3434	Phone		G			
Fax	(512) 671-3446	Fax		H			
e-Mail Address	Eric_Matzner@golder.com	e-Mail Address		I			
				J			

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WQ-1620-TB01-2019_0529	5-29-19	-	Water	1.8	2	X										
2	WG-1620-MW6BA-2019_0529	5-29-19	1115	Water	1.2.8	6	X	X	X								
3	WG-1620-FD01-2019_0529	5-29-19	1115	Groundwa	1.2.8	6	X	X	X								
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign <i>John Brayton</i>		Shipment Method <b>HAND DELIVERED</b>	Required Turnaround Time: (Check Box) <input checked="" type="checkbox"/> 3 <input type="checkbox"/> STD 10 Wk Days <input type="checkbox"/> 5 Wk Days <input type="checkbox"/> 2 Wk Days <input type="checkbox"/> 24 Hour		Results Due Date:
Relinquished by: <i>John Brayton</i>	Date: 5-29-19	Time: 14:55	Received by:	Notes: UPRR Houston HWPW 1620	
Relinquished by:	Date: 5/29/19	Time: 14:55	Received by (Laboratory): <i>J. Juran</i>	Cooler ID: 43942	Cooler Temp: 1.5
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	QC Package: (Check One Box Below)	
Preservative Key: 1-HCl 2-HNO <sub>3</sub> 3-H <sub>2</sub> SO <sub>4</sub> 4-NaOH 5-Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> 6-NaHSO <sub>4</sub> 7-Other 8-4°C 9-5035				<input type="checkbox"/> Level II Std QC	<input checked="" type="checkbox"/> TRRP Checklist
				<input type="checkbox"/> Level III Std Q-Raw Data	<input type="checkbox"/> TRRP Level IV
				<input type="checkbox"/> Level IV SWB40/CLP	<input type="checkbox"/> Other

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.  
 2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.  
 3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.

**APPENDIX 5**

**LANDOWNER CONCURRENCE**

***SIGNED RESTRICTIVE COVENANTS – CITY OF HOUSTON AND OFF-SITE PROPERTIES  
FOR PRELIMINARY PMZ***







## 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 **City of Houston Right-of-Way (ROW) (Property)** presented in Exhibits A-1 and A-2 attached hereto and incorporated herein by reference.

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 and plume management zone, as those terms are defined in the TRRP, is shown on Exhibit B attached hereto and incorporated herein by reference.

This Restrictive Covenant is required for the following reasons:

### Plume Management Zone

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 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). A plume management zone was established so that the COCs 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 plume management zone. Exhibit C describes the maintenance and monitoring required and Table C-2 lists the COCs that exceed the TCEQ's Protective Concentration Levels. This maintenance and monitoring is required until TCEQ approves some modification of those requirements.

As of the date of this Restrictive Covenant, the City of Houston with an address of 901 Bagby Street, Houston, Texas 77002 owns municipal right-of-way easements over the Property. Fee title underlying the easements is owned by the abutting property owners. In consideration of the Response Actions by Union Pacific Railroad (Responder) at the Former Houston Wood Preserving Works Site at 4910 Liberty Road, Houston, Texas, approval of the Response Action Completion Report, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the City of Houston has agreed, to the extent of its ownership interest, 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 C is required to be performed by the Responder. 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

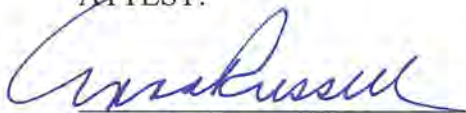
Mail: TCEQ - MC 199  
P O Box 13087  
Austin, Texas 78711-3087

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.

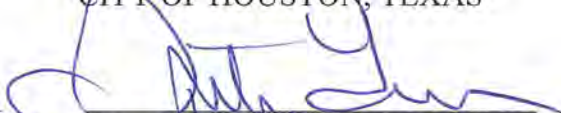
Executed this 9<sup>th</sup> day of June, 2017.

ATTEST:



Anna Russell  
City Secretary

CITY OF HOUSTON, TEXAS



Sylvester Turner  
Mayor of the City of Houston

APPROVED AS TO FORM:

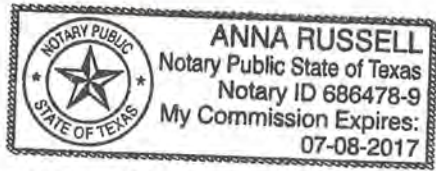


Phillip M. Goodwin, P.G.  
Assistant City Attorney  
LD#067-1600017-001



STATE OF TEXAS       §  
                                      §  
COUNTY OF HARRIS   §

This instrument was acknowledged before me on the 9<sup>th</sup> day of June, 2017, by **Sylvester Turner, Mayor** of the **CITY OF HOUSTON, TEXAS**, a municipal corporation, on behalf of said corporation.



(Notary Seal)

  
\_\_\_\_\_  
Notary Public, State of Texas

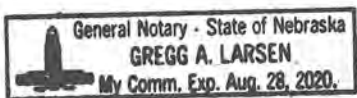
Union Pacific Railroad Company [RESPONDER]

By: Tony Love  
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 25<sup>th</sup> day of May, Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation [responder], 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 25<sup>th</sup> day of May, 20 17.



Greg A. Larsen  
Notary Public in and for the State of Nebraska  
County of Douglas  
My Commission Expires: August 28, 2020

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS                    §  
( \_\_\_\_\_ ) COUNTY            §

BEFORE ME, on this the \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ personally appeared \_\_\_\_\_  
[name], \_\_\_\_\_ [title], of The Texas Commission of 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 \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public in and for the State of Texas,  
County of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

**EXHIBIT A -1**

**SURVEY PLAT AND LEGAL DESCRIPTION OF CITY OF HOUSTON RIGHT-OF-WAY INSTITUTIONAL CONTROL BOUNDARY – EASTERN PROPERTY**







## ***Doyle & Wachtstetter, Inc***

Surveying and Mapping • GPS/GIS

### **UNION PACIFIC RAILROAD COMPANY**

### **10.7152 ACRE PMZ TRACT**

### **HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32**

### **HARRIS COUNTY, TEXAS**

### **PAGE 1 OF 3**

**BEING ALL THAT CERTAIN** 10.7152 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being a portion of Block 2 and Block 3, all of Block 5 and Block 6, a portion of 50 foot wide Grumbach Street, a portion of 50 foot wide Tunis Street (Jones Street), a portion of Erastus Street (Sunset Avenue), a portion of 50 foot wide Harlem Street (Baer Avenue), and a portion of 50 foot wide Lockwood Drive (Cushing Avenue) as shown on the map of Englewood Subdivision, according to the map or plat recorded in Volume 53, Page 346 of the Harris County Deed Records (H.C.D.R.) a portion of Block 22, a portion of 50 foot wide Chew Avenue, and a portion of 50 foot wide Tunis Street (Jones Street), as shown on the map of F. F. Chew Addition, according to the map or plat recorded in Volume 1, Page 8 of the Harris County Map Records (H.C.M.R.), and a portion of Block 11 and Block 18 as shown of the map of the Subdivision of the South Part of the Gagne Homesteads, according to the map or plat thereof recorded in Volume 89, Page 240 of the H.C.D.R., the herein described 10.7152 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**COMMENCING** at 5/8" iron rod found marking the intersection of the southeastern right-of-way boundary line of said 60 foot wide Liberty Road with the northwestern right-of-way boundary line of the 100 foot wide Texas and New Orleans Rail Road Company right-of-way, same being the southeastern boundary line of all that certain called 5.79 acre tract of land conveyed by deed recorded on July 24, 1890 from R. B. Baer to Texas & New Orleans Railroad Company as recorded in Volume 50, Page 535 of the H.C.D.R., said Point of Commencement being located at Texas State Plane coordinate X=3136759.96 and Y=13852340.99;

**THENCE** North 62°10'18" East, coincident with the southeastern right-of-way boundary line of said 60 foot wide Liberty Road, same being the northwestern boundary line of the 100 foot wide Texas and New Orleans Rail Road Company right-of-way, a distance of 653.86 feet to an angle point at the intersection of the southeastern right-of-way boundary line of said 60 foot wide Liberty Road with the northern extension of the western right-of-way boundary line of 50 foot wide Sam Willis Street, at position X=3137338.15 and Y=13852646.20;

**THENCE** South 2°35'12" East, coincident with the northern extension of the western right-of-way boundary line of said 50 foot wide Sam Willis Street, a distance of 364.63 feet to a point located on the eastern boundary line of said Block 22 of the F. F. Chew Addition, for the northeast corner and the **POINT OF BEGINNING** of the herein described 10.7152 acre tract, at position X=3137354.60 and Y=13852281.98;

**THENCE** South 2°35'12" East, coincident with the western right-of-way boundary line of said 50 foot wide Sam Willis Street, same begin the eastern boundary line of said Block 22 of the F. F. Chew Addition, a distance of 85.45 feet to the point of curvature of a non-tangent curve to the left, having a radius of 269.72 feet, at position X=3137358.46 and Y=13852196.62;

**UNION PACIFIC RAILROAD COMPANY  
10.7152 ACRE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 2 OF 3**

**THENCE** in an southwesterly direction, along said curve to left, having a radius of 269.72 feet, an arc length of 246.03 feet, a central angle of  $52^{\circ}15'51''$ , a chord bearing and distance of South  $54^{\circ}47'15''$  West – 237.59 feet to a point for corner, located on the eastern right-of-way boundary line of 60 foot wide Chew Street, same being the western boundary line of said Block 22 of the F. F. Chew Addition, for an angle corner of the herein described 10.7152 acre tract, at position X=3137164.36 and Y=1385259.64;

**THENCE** South  $2^{\circ}36'08''$  East, coincident with the eastern right-of-way boundary line of 60 foot wide Chew Street, same being the western boundary line of said Block 22, Block 25 and Block 26 of the F. F. Chew Addition, a distance of 662.55 feet to a point at the intersection of the eastern right-of-way boundary line of said 60 foot wide Chew Street with easterly extension of the southern boundary line of 55 foot wide Tunis Street (not open), for the southeast corner of the herein described 10.7152 acre tract, at position X=3137194.44 and Y=13851397.84;

**THENCE** South  $87^{\circ}28'24''$  West, coincident with the southern right-of-way boundary line of said 55 foot wide Tunis Street (not open), same being northern boundary line of Block 16 of said F. F. Chew Addition, the northern boundary line of Block 9 and Block 8 of said Englewood Subdivision, a distance of 517.83 feet to a point located on the eastern right-of-way boundary line of said 50 foot wide Harlem Street, for the northwest corner of said Block 8 of said Englewood Addition and an interior corner of the herein described 10.7152 acre tract, at position X=3136677.16 and Y=13851375.01;

**THENCE** South  $2^{\circ}31'36''$  East, coincident with the eastern right-of-way boundary line of said 50 foot wide Harlem Street, same being the western boundary line of said Block 8 of said Englewood Subdivision, a distance of 350.00 feet to the intersection of the eastern boundary line of said 50 foot wide Harlem Street with the southern right-of-way boundary line of 50 foot wide Sudan Street, for the northwest corner of Block 11 of said Englewood Subdivision, for an exterior corner of the herein described 10.7152 acre tract, at position X=3136692.59 and Y=13851025.39;

**THENCE** South  $87^{\circ}28'24''$  West, coincident with the southern right-of-way boundary line of said 50 foot wide Sudan Street, the northern boundary line of Block 10 of said Englewood Subdivision, a distance of 260.00 feet to a point located on the eastern right-of-way boundary line Erastus Street, right-of-way varies, for an interior corner of the herein described 10.7152 acre tract, at position X=3136432.87 and Y=13851013.93;

**THENCE** South  $2^{\circ}31'36''$  East, coincident with the eastern right-of-way boundary line Erastus Street, right-of-way varies, same being the western boundary line of said Block 10 of said Englewood Subdivision, a distance of 237.41 feet to a point at the intersection of the easterly extension of the southern boundary line of Block 18 of said Subdivision of the South Part of the Gagne Homestead, for an exterior corner of the herein described 10.7152 acre tract, at position X=3136443.34 and Y=13850776.78;

**THENCE** South  $87^{\circ}15'46''$  West, a distance of 62.36 feet to a point located on western right-of-way boundary line of said Erastus Street, right-of-way varies and the southern boundary line of said Block 18 of the said Subdivision of the South Part of the Gagne Subdivision, for an the southwest corner of the herein described 10.7152 acre tract, at position X=3136381.05 and Y=13850773.80;

**UNION PACIFIC RAILROAD COMPANY  
10.7152 ACRE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 3 OF 3**

**THENCE** North 2°44'14" West, coincident with the western right-of-way boundary line of said Erastus Street, right-of-way varies, a distance of 287.64 feet to a point located within Block 11 of said Subdivision of the South Part of the Gagne Homestead, at the intersection of the western right-of-way boundary line of said Erastus Street with the northern right-of-way boundary line of said 50 foot wide Sudan Street, for an exterior corner of the herein described 10.7152 acre tract, at position X=3136367.32 and Y=13851061.08;

**THENCE** North 87°28'24" East, coincident with the northern right-of-way boundary line of said 50 foot wide Sudan Street, same being the southern boundary line of said Block 7 of said Englewood Subdivision, a distance of 273.42 feet to a point located on the western right-of-way boundary line of said 50 foot wide Harlem Street, for the southeast corner of said Block 7 and an interior corner of the herein described 10.7152 acre tract, at position X=3136640.44 and Y=13851073.13;

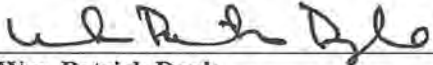
**THENCE** North 2°49'16" West, coincident with the western right-of-way boundary line of said 50 foot wide Harlem Street, same being the eastern boundary line of Block 7, Block 4 and Block 1, of said Englewood Subdivision, a distance of 827.94 feet to the northwest corner of the herein described 10.7152 acre tract, at position X=3136599.69 and Y=13851899.99;

**THENCE** North 53°51'57" East, a distance of 288.79 feet to the a angle corner of the herein described 10.7152 acre tract, at position X=3136832.90 and Y=13852070.26;

**THENCE** North 61°51'16" East, a distance of 190.34 feet to an angle corner of the herein described 10.7152 acre tract, located on curve to the right, having a radius of 1179.16 feet, at position X=3137000.72 and Y=13852160.04;

**THENCE** in an easterly direction, along said curve to the right, having a radius of 1179.16 feet, an arc length of 375.93 feet, a central angle of 18°15'53", and a chord bearing and distance of North 70°59'12" East – 374.34 feet to the **POINT OF BEGINNING**, containing 10.7152 acres of land, more or less.



  
**Wm. Patrick Doyle**  
**Registered Professional Land Surveyor**  
**Texas Registration Number 4467**  
**June 29, 2016**

*This description is based on plat dated June 28, 2016 is on file in the office of Doyle & Wachtstetter, Inc.  
V:\Pat\Pastor Behling & Wheeler\UPPR Englewood Yard Offsite PMZ 10.7152 acre tract.doc*



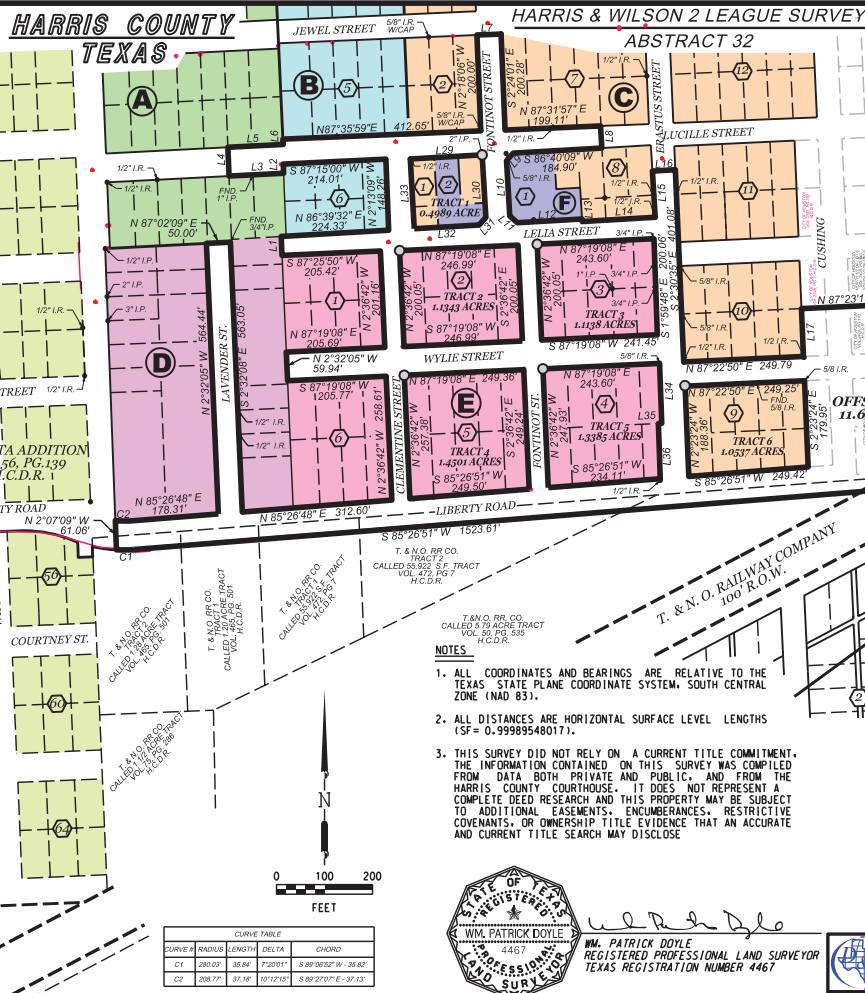
**EXHIBIT A - 2**

**SURVEY PLAT AND LEGAL DESCRIPTION OF CITY OF HOUSTON RIGHT-OF-WAY INSTITUTIONAL CONTROL BOUNDARY – NORTHERN AND WESTERN PROPERTIES**

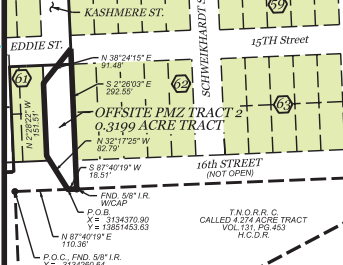
**SUBDIVISION LEGEND**

- (A) BALLARD GARDENS VOL. 1528, PG. 725, H.C.D.R.
- (B) FAIRGROUND PARK ANNEX VOL. 499, PG. 70, H.C.D.R.
- (C) FAIR GROUNDS PARK ADDITION VOL. 81, PG. 460, H.C.D.R.
- (D) LIBERTY ROAD ESTATES UNRECORDED
- (E) GAGNE HOMESTEAD VOL. 1, PG. 5, H.C.M.R.
- (F) GREATER TRUE VINE MISSIONARY BAPTIST CHURCH F.C. 599251, H.C.M.R.
- (G) KASHMERE GARDENS ANNEX VOL. 958, PG. 606, H.C.D.R.

LINE #	DIRECTION	LENGTH	LINE #	DIRECTION	LENGTH
L1	N 2°32'05" W	39.50	L22	S 89°43'40" W	30.63
L2	S 2°13'09" E	19.17	L23	N 2°32'15" W	92.46
L3	S 87°04'51" W	114.00	L24	N 87°23'53" E	131.87
L4	N 2°13'09" W	60.00	L25	S 2°48'39" E	51.59
L5	N 87°04'51" W	115.34	L26	S 19°53'48" E	12.60
L6	N 2°36'44" W	11.18	L27	N 62°25'37" E	145.44
L7	N 87°48'32" E	50.40	L28	S 2°50'20" E	111.49
L8	S 3°23'23" E	45.11	L29	N 86°45'15" E	149.97
L9	S 41°40'02" W	21.21	L30	S 3°20'56" E	130.37
L10	S 3°20'11" E	115.26	L31	S 41°35'58" W	21.21
L11	S 48°20'07" E	21.21	L32	S 86°38'32" W	135.28
L12	N 86°39'53" E	135.00	L33	N 3°13'55" W	145.64
L13	S 3°32'04" E	5.22	L29	N 86°45'10" E	149.97
L14	N 86°39'22" E	152.41	L30	S 3°20'56" E	130.37
L15	N 3°28'13" W	86.31	L31	S 41°35'58" W	21.21
L16	N 86°39'22" E	48.05	L32	S 86°39'32" W	135.28
L17	N 2°23'24" W	100.05	L33	N 3°13'55" W	145.64
L18	S 10°38'10" E	5.08	L34	S 1°59'48" E	125.01
L19	S 2°06'20" E	101.23	L35	S 87°19'08" W	7.04
L20	N 62°01'40" E	145.35	L36	S 1°59'48" E	115.29
L21	N 1°22'20" W	20.77			



LESS & EXCEPT TRACTS	POINT OF BEGINNING X =	Y =
TRACT 1 0.4989 ACRE	3135967.82	13853042.55
TRACT 2 1.1343 ACRES	3135795.90	13852842.99
TRACT 3 1.1138 ACRES	3136082.54	13852856.42
TRACT 4 1.4501 ACRES	3135805.06	13852583.18
TRACT 5 1.3385 ACRES	313604.07	13852596.71
TRACT 6 1.0537 ACRES	3136390.09	13852561.66



- NOTES**
- ALL COORDINATES AND BEARINGS ARE RELATIVE TO THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE (NAD 83).
  - ALL DISTANCES ARE HORIZONTAL SURFACE LEVEL LENGTHS (SF = 0.999895480171).
  - THIS SURVEY DID NOT RELY ON A CURRENT TITLE COMMITMENT. THE INFORMATION CONTAINED ON THIS SURVEY WAS COMPILED FROM DATA BOTH PRIVATE AND PUBLIC, AND FROM THE HARRIS COUNTY COURTHOUSE. IT DOES NOT REPRESENT A COMPLETE DEED RESEARCH AND THIS PROPERTY MAY BE SUBJECT TO ADDITIONAL EASEMENTS, ENCUMBRANCES, RESTRICTIVE COVENANTS, OR OWNERSHIP TITLE EVIDENCE THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.

**EXHIBIT OF**  
**CITY OF HOUSTON**  
**INSTITUTIONAL CONTROL**  
**BOUNDARY**  
 IN THE  
**HARRIS & WILSON 2 LEAGUE SURVEY**  
**ABSTRACT 32**  
**HARRIS COUNTY, TEXAS**  
 106  
**UNION PACIFIC RAILROAD COMPANY**



*Wm. Patrick Doyle*  
**WM. PATRICK DOYLE**  
 REGISTERED PROFESSIONAL LAND SURVEYOR  
 TEXAS REGISTRATION NUMBER 4467

**CURVE TABLE**

CURVE #	RADIUS	LENGTH	DEFLA	CHORD
C1	280.03	35.80	7°20'51"	S. 89°18'52" W - 35.62'
C2	208.77	37.18	10°12'15"	S. 89°27'01" E - 37.13'

**Doyle & Wachtstetter, Inc.**  
 Surveying and Mapping GPS/CIS  
 151 COMMERCIAL STREET, CLUTE, TEXAS 77531  
 OFFICE: 979.265.1627 FAX: 979.265.0600 TDD: 979.265.1627  
 SURVEYED: 1-12-16 BOOK: 1098 IMAGE: 1915-16-03  
 DRAWN BY: JAM/1-14-16 CHECKED: WPD/2-20-16 REVISED: 1915-16-03

DATE PLOTTED: 1/14/16 10:42:27 AM  
 USER: jwach  
 PLOTTER: HP DesignJet 5000



**UNION PACIFIC RAILROAD COMPANY  
11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 1 OF 13**

**BEING ALL THAT CERTAIN** 11.6378 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being a portion of Liberty Road, right-of-way varies, all of 30 foot wide Lelia Street (11<sup>th</sup> Street), all of 60 foot wide Wylie Street (12<sup>th</sup> Street), all of 40 foot wide Clementine Street and all of 40 foot wide Fontinot Street, as shown on the map of the Subdivision of Shares 2 & 3 of the Gagne Homestead, according to the map or plat thereof recorded in Volume 1, Page 55 of the Harris County Map Records (H.C.M.R.), a portion of 60 foot wide Lucille Street, as shown on the map of Ballard Gardens Addition, according to the map or plat thereof recorded in Volume 1528, Page 725 of the Harris County Deed Records (H.C.D.R.), a portion of 50 foot wide Lucille Street and a portion of 50 foot wide Clementine Street (formerly Lots 1 and 10, Block 6) as shown on the map of Fairgrounds Park Annex according to the map or plat thereof recorded in Volume 499, Page 70 of the H.C.D.R., a portion of 50 foot wide Lucille Street, a portion of 50 foot wide Fontinot Street, and a portion of 50 foot wide Erastus Street as shown on the Map of Fair Ground Park Addition, according to the map or plat thereof recorded in Volume 81, Page 460 of the H.C.D.R., a portion of Old Lockwood Drive (right-of-way varies) as shown on the map of Kashmere Gardens Annex, according to the map or plat thereof recorded in Volume 996, Page 606 of the H.C.D.R., a portion of Cushing Street, a portion of Lockwood Drive, all of Lavender Street conveyed by deed recorded on May 24, 1948 from Carl S. Smith, et al to Harris County, as recorded in Volume 1740, Page 359 of the H.C.D.R., a portion of all that certain called 1.28 acre tract and a portion of all that certain called 1.20 acre tract of land conveyed by deed recorded on February 8, 1921 from W. N. Reece to Texas & New Orleans Railroad Company as recorded in Volume 465, Page 501 of the H.C.D.R.; a portion of all that certain called 55,922 square foot tract of land and a portion of all that certain called 55,922 square foot tract of land conveyed by deed recorded on February 7, 1921 from W. N. Reece to Texas & New Orleans Railroad Company as recorded in Volume 472, Page 7 of the H.C.D.R., and a portion of all that certain called 5.79 acre tract of land conveyed by deed recorded on July 24, 1890 from R. B. Baer to Texas & New Orleans Railroad Company as recorded in Volume 50, Page 535 of the H.C.D.R., the herein described 11.6378 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**BEGINNING** at 5/8" iron rod found marking the intersection of the southern right-of-way boundary line of said Liberty Road, right-of-way varies, with the northwestern right-of-way boundary line of the 100 foot wide Texas and New Orleans Rail Road Company right-of-way, same being the southeastern boundary line of said Texas and New Orleans Rail Road Company called 5.79 acre tract, said Point of Beginning being located at Texas State Plane coordinate X=3136759.96 and Y=13852340.99;

**THENCE** South 85°26'51" West, coincident with the southern boundary line of said Liberty Road, right-of-way varies, a distance of 1523.61 feet to a 5/8" iron rod found marking the point of curvature of a curve to the right, having a radius of 280.03 feet;

**THENCE** in a westerly direction, coincident with the southern boundary line of said Liberty Road, right-of-way varies, along said curve to the right, having a radius of 280.03 feet, an arc length of 35.84 feet, a central angle of 7°20'01", a chord bearing and distance of South 89°06'52" West – 35.82 feet to the southwest corner of the herein described 11.6378 acre tract;

**THENCE** North 2°07'09" West, crossing said Liberty Road, right-of-way varies, a distance of 61.06 feet to a point located on the northern right-of-way boundary line of said Liberty Road, right-of-way varies, for the southwest corner of Tract 1, Block 2 of the unrecorded subdivision of Liberty Road Estates, being the same tract conveyed by deed recorded on March 27, 2014 from Harris County, et al to 2013 Cottage, LLC, as recorded in Clerk's File No. 20140123340 of the H.C.O.R., located on a curve to the left, having a radius of 208.77 feet, for an angle corner of the herein described 11.6378 acre tract,

**UNION PACIFIC RAILROAD COMPANY**



**11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
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**THENCE** in an easterly direction, coincident with northern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the southern boundary line of said Tract 1, Block 2 of the unrecorded subdivision of Liberty Road Estates, along said curve to the left, having a radius of 208.77 feet, an arc length of 37.18 feet, a central angle of 10°12'15", a chord bearing and distance of South 89°27'07" East – 37.13 feet to a point for corner;

**THENCE** North 85°26'48" East, coincident with northern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the southern boundary line of said Tract 1, Block of the unrecorded subdivision of Liberty Road Estates, a distance of 178.31 feet to the intersection of the northern right-of-way boundary line of said Liberty Road, right-of-way varies, and the western right-of-way boundary line of said Lavender Street, for the southeast corner of said Lot 1, Block 2 of the unrecorded subdivision of Liberty Road Estates, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°32'05" West, coincident with the western right-of-way boundary line of said Lavender Street, same being the eastern boundary line of Tract 1, the eastern boundary line of Lot 16, being the same tract conveyed by deed recorded on July 2, 1952 from Clark Investment Company to John Ellis, et ux as recorded in Volume 2458, page 665 of the H.C.D.R., the eastern boundary line of Tract 14, being the same tract conveyed by deed recorded on March 27, 2014 from Harris County, et al to 2013 Cottage, LLC, as recorded in Clerk's File No. 20140123340 of the H.C.O.R., the eastern boundary line of Tract 13, being the same tract conveyed by deed recorded on May 11, 2001 from Larry Charles Wyatt to Francis A. Wyatt, as recorded in Clerk's File No. V045715 of the H.C.O.R., and the eastern boundary line of Tract 12, being the same tract conveyed by deed recorded on February 16, 1950 from Clark Investment Company to Arthur Brooks, et ux as recorded in Volume 2035, Page 571 of the H.C.D.R., all being out of Block 2, of the unrecorded subdivision of Liberty Road Estates, a distance of 564.44 feet to a point located on the southern boundary line of Lot 5 of said Ballard Gardens Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°02'09" East, coincident with the southern boundary line of Lot 5 and Lot 6 of said Ballard Gardens Addition, a distance of 50.00 feet to the northwest corner of Tract 11 of the unrecorded subdivision of Liberty Road Estates, being the same tract conveyed by deed recorded on January 28, 2003 from Harris County, et al to Sandra Rena Thompson, as recorded in Clerk's File NO. W386946 of the H.C.O.R., for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°32'08" East, coincident with the eastern right-of-way boundary line of said 50 foot wide Lavender Street, same being the western boundary line of said Tract 11, Tract 6A, being the same tract conveyed by deed recorded on September 24, 1993 from Clark Investment Company, Inc. to Essie Lee Hutchins as recorded in Clerk's File No. P469225 of the H.C.O.R., Tract 6B, in the name of Zearlene Osborne, recordation information not found, Tract 6 and Tract 6C, in the name of Lucille Long, recordation information not found, Tract 5, being the same tract conveyed by deed recorded on March 1, 2011 from Constable Jack F. Abercia, Precinct 1, Harris County, Texas to Greater Mount Nebo Baptist Church as recorded in Clerk's File No. 2011-083443 of the H.C.O.R., Tract 4, being the same tract conveyed by deed recorded on August 14, 2009 from Jack Anthony Coachman to Ray Carrington as recorded in Clerk's File No. 2009-0369151 of the H.C.O.R., Tract 3, being the same tract described in deed recorded on November 22, 1951 from Clark Investment Company to Jessie Beal, et al, as recorded in Volume 2344, Page 164 of the H.C.D.R., and Tract 1, being the same tract conveyed by deed recorded on August 5, 2013 from Constable Alan Rosen Precinct 1, Harris County, Texas to Greater Mount Nebo Missionary Baptist Church, as recorded in Clerk's File No. 2013-0394211 of the H.C.O.R., all being out of Block 2 of the unrecorded subdivision of Liberty Road Estates, a distance of 563.05 feet to the intersection of the eastern right-of-way boundary line of said 50 foot wide Lavender Street with the northern right-of-way boundary line Liberty Road, right-of-way varies, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 85°26'48" East, coincident with the northern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the southern boundary line of said Tract 1 of the unrecorded subdivision of Liberty Road Estates and the southern boundary line of Block 6 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 312.60 feet to the southeast corner of said Block 6, same being the intersection of the northern right-of-way boundary line of said Liberty Road, right-of-way varies, with the western right-of-way boundary line of 40 foot wide Clementine Street, for an angle corner of the herein described 11.6378 acre tract;

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**THENCE** North 2°36'42" West, coincident with the western right-of-way boundary line of said 40 foot wide Clementine Street, same being the eastern boundary line of Block 6 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 258.61 feet to the northeast corner of said Block 6, same being the intersection of said western right-of-way boundary line of 40 foot wide Clementine Street with the southern right-of-way boundary line of 60 foot wide Wylie Street (12<sup>th</sup> Street), for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 87°19'08" West, coincident with the southern right-of-way boundary line of 60 foot wide Wylie Street (12<sup>th</sup> Street), same being the northern boundary line of Block 6 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 205.77 feet to the northwest corner of said Block 6, located on the eastern boundary line of said unrecorded subdivision of Liberty Road Estates, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°32'05" West, coincident with the eastern boundary line of said unrecorded subdivision of Liberty Road Estates, a distance of 59.94 feet to the southwest corner of Block 1, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, located on the northern boundary line of said 60 foot wide Wylie Street (12<sup>th</sup> Street), for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°19'08" East, coincident with the northern boundary line of said 60 foot wide Wylie Street (12<sup>th</sup> Street), same being the southern boundary line of Block 1 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 205.69 feet, to the southeast corner of said Block 1, at the intersection of the northern right-of-way boundary line of said Wylie Street (12<sup>th</sup> Street) with the western right-of-way boundary line of said 40 foot wide Clementine Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°36'42" West, coincident with the western right-of-way boundary line of said 40 foot wide Clementine Street, same being the eastern boundary line of Block 1 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 201.16 feet to the northeast corner of said Block 1, at the intersection of the western boundary line of said 40 foot wide Clementine Street with the southern right-of-way boundary line of called 30 foot wide Lelia Street (11<sup>th</sup> Street), for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 87°25'50" West, coincident with the southern right-of-way boundary line of called 30 foot wide Lelia Street (11<sup>th</sup> Street), same being the northern boundary line of Block 1 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 205.42 feet, to the northwest corner of said Block 1, located on the eastern boundary line of said unrecorded subdivision of Liberty Road Estates, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°32'05" West, coincident with the eastern boundary line of said unrecorded subdivision of Liberty Road Estates, a distance of 39.50 feet, to a point located on the northern right-of-way boundary line of said called 30 foot wide Lelia Street (11<sup>th</sup> Street), same being the southern boundary line of Lot 8 of said Ballard Gardens Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 86°39'32" East, coincident with the northern right-of-way boundary line of said called 30 foot wide Lelia Street (11<sup>th</sup> Street), same being the southern boundary line of said Lot 8 of Ballard Gardens Subdivision and the southern boundary line of Block 6 of said Fairgrounds Park Annex, a distance of 224.33 feet to the intersection of the northern right-of-way boundary line of said called 30 foot wide Lelia Street with the western right-of-way boundary line 50 foot wide Clementine Street, formerly Lots 1 and 10, Block 6, Fairgrounds Park Annex, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°13'09" West, coincident with the western right-of-way boundary line 50 foot wide Clementine Street, a distance of 148.26 feet, to a point located at the intersection of the western right-of-way boundary line of said 50 foot wide Clementine Street with the southern right-of-way boundary line of 50 foot wide Lucille Street, same being the northern boundary line of Block 6 of said Fairground Park Annex, for an angle corner of the herein described 11.6378 acre tract;

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**THENCE** South 87°15'00" West, coincident with the southern right-of-way boundary line of 50 foot wide Lucille Street, same being the northern boundary line of Block 6 of said Fairground Park Annex, a distance of 214.01 feet, to the northwest corner of said Block 6 of Fairground Park Annex, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°13'09" East, coincident with the western boundary line of said Block 6 of Fairground Park Annex, a distance of 19.17 feet, to the northeast corner of Lot 8 of said Ballard Gardens Addition, located on the southern right-of-way boundary line of 60 foot wide Lucille Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 87°04'51" West, coincident with the southern right-of-way boundary line of 60 foot wide Lucille Street, same being the northern boundary line of Lot 8 and Lot 7 of said Ballard Gardens Addition, a distance of 114.00 feet to an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°13'09" West, a distance of 60.00 feet to a point located on the northern right-of-way boundary line of said 60 foot wide Lucille Street, same being the southern boundary line of Lot 15 of said Ballard Gardens Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°04'51" East, coincident with the northern right-of-way boundary line of said 60 foot wide Lucille Street, same being the southern boundary line of Lots 15 and 16 of said Ballard Gardens Addition, a distance of 115.34 feet, to an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°36'44" West, coincident with the eastern boundary line of said Lot 16 of Ballard Gardens Addition, a distance of 11.16 feet to the southwest corner of Block 5 of said Fairgrounds Park Annex, located on the northern right-of-way boundary line of said 50 foot wide Lucille Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°35'59" East, coincident with the northern right-of-way boundary line of said 50 foot wide Lucille Street, same being the southern boundary line of Block 5 of said Fairgrounds Park Annex and the southern boundary line of Block 2 of Fair Ground Park Addition, a distance of 412.65 feet to the southeast corner of said Block 2 of said Fair Ground Park Addition at the intersection of the northern right-of-way boundary line of said 50 foot wide Lucille Street with western right-of-way boundary line of 50 foot wide Fontinot Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°18'06" West, coincident with the western right-of-way boundary line of said 50 foot wide Fontinot Street, same being the eastern boundary line Block 2 of said Fair Ground Park Addition, a distance of 200.00 feet, to the intersection of the western right-of-way boundary line of said 50 foot wide Fontinot Street with the southern right-of-way boundary line of 50 foot wide Jewel Street, for angle corner;

**THENCE** North 87°48'32" East, coincident with the southern right-of-way boundary line of 50 foot wide Jewel Street, a distance of 50.40 feet, to a point located at the intersection of the southern right-of-way boundary line of said 50 foot wide Jewel Street with the eastern right-of-way boundary line of 50 foot wide Fontinot Street, for the northwest corner of Block 7 of said Fair Ground Park Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°24'01" East, coincident with the eastern right-of-way boundary line of 50 foot wide Fontinot Street, same being the western boundary line of Block 7 of said Fair Ground Park Addition, a distance of 200.28 feet to the southwest corner of said Block 7, at the intersection of the eastern right-of-way boundary line of 50 foot wide Fontinot Street with the northern right-of-way boundary line of said 50 foot wide Lucille Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°31'57" East, coincident with the northern right-of-way boundary line of 50 foot wide Lucille Street, same being the southern boundary line of Block 7 of said Fair Ground Park Addition, a distance of 199.11 feet to an angle corner of the herein described 11.6378 acre tract;

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**THENCE** South 3°23'23" East, a distance of 46.11 feet, to a point located southern right-of-way boundary line of 50 foot wide Lucille Street, same being the northern boundary line of Block 8 of said Fair Ground Park Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 86°40'09" West, coincident with the southern right-of-way boundary line of 50 foot wide Lucille Street, same being the northern boundary line of Block 8 of said Fair Ground Park Addition, and the northern boundary line of Block 1 as shown on the map of the Greater True Vine Missionary Baptist Church recorded in Film Code 599251 of the H.C.M.R., a distance of 184.90 feet the north corner of a cutback at the intersection of the southern right-of-way boundary line of said 50 foot wide Lucille Street with the eastern right-of-way boundary line of said 50 foot wide Fontinot Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 41°40'02" West, coincident with the said cutback, a distance of 21.21 feet, to a point located on the eastern right-of-way boundary line of said 50 foot wide Fontinot Street, same being the western boundary line of Block 1 of said Greater True Vine Missionary Baptist Church, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 3°20'11" East, coincident with the eastern right-of-way boundary line of said 50 foot wide Fontinot Street, same being the western boundary line of Block 1 of said Greater True Vine Missionary Baptist Church, a distance of 115.26 feet, to a point located at the North corner of a cutback at the intersection of the eastern right-of-way boundary line of said 50 foot wide Fontinot Street with the northern right-of-way boundary line of 50 foot wide Lelia Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 48°20'07" East, coincident with said cutback, a distance of 21.21 feet, to the intersection of the eastern right-of-way boundary line of said 50 foot wide Fontinot Street with the northern right-of-way boundary line of 50 foot wide Lelia Street, located on the southern boundary line of said Block 1 of said Greater True Vine Missionary Baptist Church, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 86°39'53" East, coincident with the northern right-of-way boundary line of called 30 foot wide Lelia Street, same being the southern boundary line of said Block 1 of said Greater True Vine Missionary Baptist Church, a distance of 135.00 feet, to a point located on the western boundary line of Lot 3, Block 8 of said Fair Ground Park Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 3°32'04" East, coincident with the western boundary line of said Lot 3, Block 8 of Fair Ground Park Addition, a distance of 5.22 feet, to a point located on the northern right-of-way boundary line of called 30 foot wide Lelia Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 86°39'22" East, coincident with the northern right-of-way boundary line of called 30 foot wide Lelia Street, same being the southern boundary line of Block 8, Fair Ground Park Addition, a distance of 152.41 feet to the southeast corner of said Block 8, located at the intersection of the northern right-of-way boundary line of called 30 foot wide Lelia Street, with the western right-of-way boundary line of called 50 foot wide Erastus Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 3°28'13" West, coincident with the western right-of-way boundary line of called 50 foot wide Erastus Street, same being the eastern boundary line of Block 8 of Fair Ground Park Addition, a distance of 96.31 feet, to an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 86°39'22" East, a distance of 48.05 feet, to a point located on the eastern right-of-way said called 50 foot wide Erastus Street, same being the western boundary line of Block 11 of said Fair Ground Park Addition, for an angle corner of the herein described 11.6378 acre tract;



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**THENCE** South 2°30'35" East, coincident with the eastern right-of-way of said called 50 foot wide Erastus Street, the western boundary line of Block 11 and the western boundary line of Block 10 of said Fair Ground Park Addition, a distance of 401.08 feet, to the southwest corner of said Block 10, located at the intersection of the eastern right-of-way boundary line of said called 50 foot wide Erastus Street with the northern boundary line of 50 foot wide Wylie Street, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°22'50" East, coincident with the northern right-of-way boundary line of said 50 foot wide Wylie Street, same being the southern boundary line of said Block 10, Fair Ground Park Addition, a distance of 249.79 feet, to a point located on the western right-of-way boundary line of Cushing Street, located on the eastern boundary line of Lot 11, Block 10 of Fair Ground Park Addition, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 2°23'24" West, coincident with the western boundary right-of-way boundary line of said Cushing Street, same being the eastern boundary line of Lot 11, Block 10 of Fair Ground Park Addition, a distance of 100.05 feet, to the northeast corner of said Lot 11, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°23'16" East, crossing said Cushing Street and Lockwood Drive, a distance of 304.42 feet, to a point located on the eastern right-of-way boundary line of Lockwood Drive, same being the western boundary line of the residual of Lot 1939 of Kashmere Gardens Annex, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 10°38'10" East, coincident with the eastern right-of-way boundary line of Lockwood Drive, same being the western boundary line of the residual of said Lot 1939 of Kashmere Gardens Annex, a distance of 5.08 feet, to the southwest corner of the residual of said Lot 1939 and the northwest corner of the residual of Lot 1938, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 6°16'50" East, coincident with the eastern right-of-way boundary line of Lockwood Drive, same being the western boundary line of the residual of said Lot 1938 of Kashmere Gardens Annex, and the western boundary line of all that certain called 0.3790 acre tract conveyed by deed recorded on August 31, 1979 from Larry Edward, et al to Martin Damian, Sr., et al as recorded in Clerk's File No. G222792 of the H.C.O.R., a distance of 75.22 feet to an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°06'20" East, coincident with the eastern right-of-way boundary line of Lockwood Drive, same being the western boundary line of said Martin Damian, Sr., et al called 0.3790 acre tract, a distance of 101.23 feet, to a point located on the northern right-of-way boundary line of said Liberty Road, right-of-way varies, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 62°01'40" East, coincident with the northern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the southern boundary line of said Martin Damian, Sr., et al called 0.3790 acre tract, a distance of 145.35 feet to the southeast corner of said Martin Damian, Sr., et al called 0.3790 acre tract, located at the intersection of the northern right-of-way boundary line of said Liberty Road with the western right-of-way boundary line of Old Lockwood Drive, right-of-way varies, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 1°22'20" West, coincident with the western right-of-way boundary line of Old Lockwood Drive, right-of-way varies, same being the eastern boundary line of said Martin Damian, Sr., et al called 0.3790 acre tract, a distance of 20.77 feet to an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 89°43'40" West, coincident with the northern boundary line of said Martin Damian, Sr., et al called 0.3790 acre tract, a distance of 30.03 feet, to a point located on the western right-of-way boundary line of said Old Lockwood Drive, right-of-way varies, for an angle corner of the herein described 11.6378 acre tract;



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**THENCE** North 2°32'15" West, coincident with the western right-of-way boundary line of said Old Lockwood Drive, right-of-way varies, same being the eastern boundary line of said Martin Damian, Sr., et al called 0.3790 acre tract and the residual of said Lot 1938 of Kashmere Gardens Annex, a distance of 92.46 feet, to an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 87°23'53" East, crossing said Old Lockwood Drive, right-of-way varies, a distance of 131.87 feet, to a point located on the eastern right-of-way boundary line of said Old Lockwood Drive, right-of-way varies, same being the western boundary line of all certain called 1.0467 acre tract, conveyed by deed recorded on October 20, 2006 from Elmer Preston, trustee to Rosendo H. Hernandez ass recorded in Clerk's File No. 2006-0140564 of the H.C.O.R., for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°48'39" East, coincident with the eastern right-of-way boundary line of said Old Lockwood Drive, right-of-way varies, same being the western boundary line of said Rosendo H. Hernandez called 1.0467 acre tract, a distance of 51.59 feet to an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 19°53'48" East, coincident with the eastern right-of-way boundary line of said Old Lockwood Drive, right-of-way varies, same being the western boundary line of said Rosendo H. Hernandez called 1.0467 acre tract, a distance of 12.60 feet to the southwest corner of said Rosendo H. Hernandez called 1.0467 acre tract, at the intersection of the eastern right-of-way boundary line of said Old Lockwood Drive right-of-way varies, with the northern right-of-way boundary line of Liberty Road, right-of-way varies, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** North 62°25'57" East, coincident with the northern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the southern boundary line of said Rosendo H. Hernandez called 1.0467 acre tract, a distance of 145.44 feet, to an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 2°50'20" East, crossing said Liberty Road, right-of-way varies, a distance of 111.49 feet, to a point located on the southern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the northern right-of-way boundary line of said 100 foot wide Texas and New Orleans Rail Road Company right-of-way, for an angle corner of the herein described 11.6378 acre tract;

**THENCE** South 62°10'18" West, coincident with the southern right-of-way boundary line of said Liberty Road, right-of-way varies, same being the northern right-of-way boundary line of said 100 foot wide Texas and New Orleans Rail Road Company right-of-way, a distance of 629.98 feet to the **POINT OF BEGINNING**, containing within this description 18.2271 acres of land, less and except the following tracts, being more particularly described as follow: Tract 1 – 0.4989 acre tract, Tract 2 – 1.1343 acre tract, Tract 3 – 1.1138 acre tract, Tract 4 – 1.4501 acre tract, Tract 5, 1.3385 acre tract, Tract 6 – 1.0537 acre tract, leaving a net acreage of 11.6378 acres, more or less.

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**LESS & EXCEPT TRACT 1 – 0.4989 ACRE**

**BEING ALL THAT CERTAIN 0.4989 ACRE** tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being a portion of Lot 1 and all of Lot 3 of Fair Ground Park Addition, according to the map or plat thereof recorded in Volume 81, Page 460 of the Harris County Deed Records (H.C.D.R.), and being all of Block 2 of the Greater True Vine Missionary Baptist Church according to the map or plat thereof recorded in Film Code 599251 of the Harris County Map Records, the herein described 0.4989 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**COMMENCING** at the southeast corner of Block 2 of said Fair Ground Park Addition, located on the intersection of the northern right-of-way boundary line 50 foot wide Lucille Street and the western boundary line of 50 foot wide Fontinot Street, said Point of Commencement being located at Texas State Plane coordinate position X=3135965.22 and Y=13853093.15;

**THENCE** South 2°57'04" East, crossing said 50 foot wide Lucille Street, a distance of 50.68 feet to the northeast corner of said Block 1 Fair Grounds Park Addition for the northeast corner and the **POINT OF BEGINNING** of the herein described 0.4989 acre tract, at position X=3135967.82 and Y=13853042.55;

**THENCE** South 3°20'56" East, coincident with the western boundary line of said 50 foot wide Fontinot Street, same being the eastern boundary line of said Block 1, Fair Ground Park Addition, and the eastern boundary line of said Block 2 of the subdivision of the Greater True Vine Missionary Baptist Church, a distance of 130.37 feet to the North corner of a cutback at the southeast corner of said Block 2, located at the intersection of the western boundary line of said 50 foot wide Fontinot Street with the northern right-of-way boundary line of Lelia Street, for an angle corner of the herein described 0.4989 acre tract;

**THENCE** South 41°35'58" West, coincident with said cutback, a distance of 21.21 feet to the intersection of the western right-of-way boundary line of said 50 foot wide Fontinot Street with the northern right-of-way boundary line of called 30 foot wide Lelia Street, for an angle corner of the herein described 0.4989 acre tract;

**THENCE** South 86°39'32" West, coincident with the northern right-of-way boundary line of called 30 foot wide Lelia Street, same being the southern boundary of said Block 2 of the subdivision of the Greater True Vine Missionary Baptist Church and the southern boundary line of Block 1 of said Fair Ground Park Addition, a distance of 135.28 feet to the southwest corner of said Block 1 of said Fair Ground Park, located at the intersection of the northern right-of-way boundary line of said called 30 foot wide Lelia Street, with the eastern right-of-way boundary line of 50 foot wide Clementine Street, for the southwest corner of the herein described 0.4989 acre tract;

**THENCE** North 3°13'55" West, coincident with the eastern right-of-way boundary line of 50 foot wide Clementine Street, a distance of 145.64 feet to the northwest corner of Block 1 of Fair Ground Park Addition, located at the intersection of the eastern right-of-way boundary line of said 50 foot wide Clementine Street with the southern right-of-way boundary line of said 50 foot wide Lucille Street, for the northwest corner of the herein described 0.4989 acre tract;

**THENCE** North 86°45'15" East, coincident with the southern right-of-way boundary line of said 50 foot wide Lucille Street, a distance of 149.97 feet to the **POINT OF BEGINNING**, containing 0.4989 acre of land, more or less.

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**LESS & EXCEPT TRACT 2 – 1.1343 ACRE TRACT**

**BEING ALL THAT CERTAIN** 1.1343 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being all of Block 2 as shown on the map of the Subdivision of Shares 2 & 3 of the Gagne Homestead, according to the map or plat thereof recorded in Volume 1, Page 55 of the Harris County Map Records, the herein described 1.1343 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.=0.99989548017) as follows:

**COMMENCING** at the northeast corner of Block 1 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, said point being the intersection of the southern right-of-way boundary line of called 30 foot wide Lelia Street, with the eastern right-of-way boundary line of 40 foot wide Clementine Street, said Point of Commencement being located at Texas State Plane coordinate position X=3135755.89 and Y=13852842.23;

**THENCE** North 88°54'44" East, crossing said 40 foot wide Clementine Street, a distance of 40.01 feet to the northwest corner of said Block 1 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, at the intersection of the southern right-of-way boundary line of called 30 foot wide Lelia Street, with the western right-of-way boundary line of 40 foot wide Clementine Street, for the northwest corner and the **POINT OF BEGINNING** herein described 1.1343 acre tract, at position X=3135795.90 and Y=13852842.99;

**THENCE** North 87°19'08" East, coincident with the southern boundary line of said called 30 foot wide Lelia Street, same being the northern boundary line of said Block 1, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 246.99 feet to the northeast corner of said Block 1, at the intersection of the southern boundary line of said called 30 foot wide Lelia Street, with the western boundary line of 40 foot wide Fontinot Street, for the northeast corner of the herein described 1.1343 acre tract

**THENCE** South 2°36'42" East, coincident with the western boundary line of 40 foot wide Fontinot Street, same being the eastern boundary line of said Block 1, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 200.05 feet to the southeast corner of said Block 1, located at the intersection of the western boundary line of 40 foot wide Fontinot Street with the northern right-of-way boundary line 50 foot wide Wylie Street, for the southeast corner of the herein described 1.1343 acre tract

**THENCE** South 87°19'08" West, coincident with the northern right-of-way boundary line 50 foot wide Wylie Street, same being the southern boundary line of said Block 1, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 246.99 feet to the southwest corner of said Block 1, at the intersection of the northern right-of-way boundary line of said 50 foot wide Wylie Street with the eastern right-of-way boundary line of 40 foot wide Clementine Street, for the southwest corner of the herein described 1.1343 acre tract

**THENCE** North 2°36'42" West, coincident with the eastern right-of-way boundary line of 40 foot wide Clementine Street, same being the western boundary line of said Block 1, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 200.05 feet to the **POINT OF BEGINNING**, containing 1.1343 acres of land, more or less.

**UNION PACIFIC RAILROAD COMPANY  
11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 10 OF 13**

**LESS & EXCEPT TRACT 3—1.1138 ACRE TRACT**

**BEING ALL THAT CERTAIN** 1.1138 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being all of Block 3 as shown on the map of the Subdivision of Shares 2 & 3 of the Gagne Homestead, according to the map or plat thereof recorded in Volume 1, Page 55 of the Harris County Map Records, the herein described 1.1138 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**COMMENCING** at the northeast corner of Block 2 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, said point being the intersection of the southern right-of-way boundary line of called 30 foot wide Lelia Street, with the eastern right-of-way boundary line of 40 foot wide Fontinot Street, said Point of Commencement being located at Texas State Plane coordinate position X=3136042.59 and Y=13852854.55;

**THENCE** North 87°19'08" East, crossing said 40 foot wide Fontinot Street, a distance of 40.00 feet to the northwest corner of said Block 3 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, at the intersection of the southern right-of-way boundary line of called 30 foot wide Lelia Street, with the western right-of-way boundary line of 40 foot wide Fontinot Street, for the northwest corner and the **POINT OF BEGINNING** herein described 1.1138 acre tract, at position X=3136082.54 and Y=13852856.42;

**THENCE** North 87°19'08" East, coincident with the southern boundary line of said called 30 foot wide Lelia Street, same being the northern boundary line of said Block 3, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 243.60 feet to the northeast corner of said Block 3, at the intersection of the southern boundary line of said called 30 foot wide Lelia Street, with the western boundary line of Erastus Street, right-of-way varies, for the northeast corner of the herein described 1.1138 acre tract

**THENCE** South 1°59'48" East, coincident with the western boundary line of Erastus Street, right-of-way varies, same being the eastern boundary line of said Block 3, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 200.06 feet to the southeast corner of said Block 3, located at the intersection of the western boundary line of Erastus Street, right-of-way varies, with the northern right-of-way boundary line 50 foot wide Wylie Street, for the southeast corner of the herein described 1.1138 acre tract

**THENCE** South 87°19'08" West, coincident with the northern right-of-way boundary line 50 foot wide Wylie Street, same being the southern boundary line of said Block 3, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 241.45 feet to the southwest corner of said Block 3, at the intersection of the northern right-of-way boundary line of said 50 foot wide Wylie Street with the eastern right-of-way boundary line of 40 foot wide Fontinot Street, for the southwest corner of the herein described 1.1138 acre tract

**THENCE** North 2°36'42" West, coincident with the eastern right-of-way boundary line of 40 foot wide Fontinot Street, same being the western boundary line of said Block 3, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 200.05 feet to the **POINT OF BEGINNING**, containing 1.1138 acres of land, more or less.

**UNION PACIFIC RAILROAD COMPANY  
11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 11 OF 13**

**LESS & EXCEPT TRACT 4- 1.4501 ACRE TRACT**

**BEING ALL THAT CERTAIN** 1.4501 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being all of Block 5 as shown on the map of the Subdivision of Shares 2 & 3 of the Gagne Homestead, according to the map or plat thereof recorded in Volume 1, Page 55 of the Harris County Map Records, the herein described 1.4501 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**COMMENCING** at the northeast corner of Block 6 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, said point being the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street with the eastern right-of-way boundary line of 40 foot wide Clementine Street, said Point of Commencement being located at Texas State Plane coordinate position X=3135767.79 and Y=13852581.43;

**THENCE** North 87°19'08" East, crossing said 40 foot wide Clementine, a distance of 37.63 feet to the northwest corner of said Block 5 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, at the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street, with the western right-of-way boundary line of 40 foot wide Clementine Street, for the northwest corner and the **POINT OF BEGINNING** herein described 1.4501 acre tract, at position X=3135805.06 and Y=13852583.18;

**THENCE** North 87°19'08" East, coincident with the southern boundary line of said 50 foot wide Wylie Street, same being the northern boundary line of said Block 5, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 249.36 feet to the northeast corner of said Block 5, at the intersection of the southern boundary line of said 50 foot wide Wylie Street, with the western boundary line of 40 foot wide Fontinot Street, for the northeast corner of the herein described 1.4501 acre tract;

**THENCE** South 2°36'42" East, coincident with the western boundary line of 40 foot wide Fontinot Street, same being the eastern boundary line of said Block 5, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 249.24 feet to the southeast corner of said Block 5, located at the intersection of the western boundary line of 40 foot wide Fontinot Street with the northern right-of-way boundary line Liberty Road, right-of-way varies, for the southeast corner of the herein described 1.4501 acre tract;

**THENCE** South 85°26'51" West, coincident with the northern right-of-way boundary line Liberty Road, right-of-way varies, same being the southern boundary line of said Block 5, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 249.50 feet to the southwest corner of said Block 5, at the intersection of the northern right-of-way boundary line of said Liberty Road, right-of-way varies, with the eastern right-of-way boundary line of 40 foot wide Clementine Street, for the southwest corner of the herein described 1.4501 acre tract;

**THENCE** North 2°36'42" West, coincident with the eastern right-of-way boundary line of 40 foot wide Clementine Street, same being the western boundary line of said Block 5, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 257.38 feet to the **POINT OF BEGINNING**, containing 1.4501 acres of land, more or less.



**UNION PACIFIC RAILROAD COMPANY  
11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 12 OF 13**

**LESS & EXCEPT TRACT 5 – 1.3385 ACRE TRACT**

**BEING ALL THAT CERTAIN** 1.3385 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being all of Block 4 as shown on the map of the Subdivision of Shares 2 & 3 of the Gagne Homestead, according to the map or plat thereof recorded in Volume 1, Page 55 of the Harris County Map Records, the herein described 1.3385 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99989548017) as follows:

**COMMENCING** at the northeast corner of Block 5 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, said point being the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street with the eastern right-of-way boundary line of 40 foot wide Fontinot Street, said Point of Commencement being located at Texas State Plane coordinate position X=3136054.43 and Y=13852594.86;

**THENCE** North 87°19'08" East, crossing said 40 foot wide Fontinot Street, a distance of 39.68 feet to the northwest corner of said Block 4 of said Subdivision of Shares 2 & 3 of the Gagne Homestead, at the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street, with the western right-of-way boundary line of 40 foot wide Fontinot Street, for the northwest corner and the **POINT OF BEGINNING** herein described 1.3385 acre tract, at position X=3136094.07 and Y=13852596.71;

**THENCE** North 87°19'08" East, coincident with the southern right-of-way boundary line of said 50 foot wide Wylie Street, same being the northern boundary line of said Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 243.60 feet to the northeast corner of Lot 5 of said Block 4, at the intersection of the southern right-of-way boundary line of said 50 foot wide Wylie Street, with the western right-of-way boundary line of Erastus Street, right-of-way varies, for the northeast corner of the herein described 1.3385 acre tract

**THENCE** South 1°59'48" East, coincident with the western right-of-way boundary line of Erastus Street, right-of-way varies, same being the eastern boundary line of said Lot 5, Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 125.01 feet to an angle point;

**THENCE** South 87°19'08" West, coincident with the southern boundary line of said Lot 5, Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 7.04 feet to a point located in the northern boundary line of said Lot 6, Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, for an angle corner of the herein described 1.3385 acre tract,

**THENCE** South 1°59'48" East, coincident with the western right-of-way boundary line of Erastus Street, right-of-way varies, a distance of 115.29 feet to a point located on the northern right-of-way boundary line Liberty Road, right-of-way varies, same being the southern boundary line of said Lot 6, Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, for the southeast corner of the herein described 1.3385 acre tract;

**THENCE** South 85°26'51" West, coincident with the northern right-of-way boundary line Liberty Road, right-of-way varies, same being the southern boundary line of said Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 234.11 feet to the southwest corner of said Block 4, at the intersection of the northern right-of-way boundary line of said Liberty Road, right-of-way varies, with the eastern right-of-way boundary line of Fontinot Street, right-of-way varies, for the southwest corner of the herein described 1.3385 acre tract

**THENCE** North 2°36'42" West, coincident with the eastern right-of-way boundary line of 40 foot wide Fontinot Street, same being the western boundary line of said Block 4, of said Subdivision of Shares 2 & 3 of the Gagne Homestead, a distance of 247.93 feet to the **POINT OF BEGINNING**, containing 1.3385 acres of land, more or less.

**UNION PACIFIC RAILROAD COMPANY  
11.6378 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 13 OF 13**

**LESS & EXCEPT TRACT 6 – 1.0537 ACRE TRACT**

**BEING ALL THAT CERTAIN** 1.0537 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being a portion of Block 9 as shown on the map of the Fair Ground Park Addition, according to the map or plat thereof recorded in Volume 81, Page 460 of the Harris County Deed Records, the herein described 1.0537 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F. = 0.99989548017) as follows:

**COMMENCING** at the southwest corner of Block 10 of said Fair Ground Park Addition, said point being the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street with the eastern right-of-way boundary line of Erastus Street, right-of-way varies, said Point of Commencement being located at Texas State Plane coordinate position X=3136388.03 and Y=13852610.99;

**THENCE** South 2°09'23" East, crossing said 50 foot wide Wylie Street, a distance of 50.54 feet to the northwest corner of said Block 9 of said Fair Ground Park Addition, at the intersection of the southern right-of-way boundary line of 50 foot wide Wylie Street, with the western right-of-way boundary line of Erastus Street, right-of-way varies, for the northwest corner and the **POINT OF BEGINNING** herein described 1.0537 acre tract, at position X=3136390.09 and Y=13852561.66;

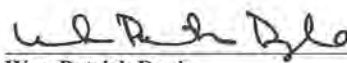
**THENCE** North 87°22'50" East, coincident with the southern boundary line of said 50 foot wide Wylie Street, same being the northern boundary line of said Block 9 of said Fair Ground Park Addition, a distance of 249.25 feet to the northeast corner of Lot 5 of said Block 9, at the intersection of the southern boundary line of said 50 foot wide Wylie Street, with the western boundary line of Cushing Street, right-of-way varies, for the northeast corner of the herein described 1.0537 acre tract

**THENCE** South 2°23'24" East, coincident with the western boundary line of Cushing Street, right-of-way varies, same being the eastern boundary line of said Lots 2 and 11, Block 9 of said Fair Ground Park Addition, a distance of 179.95 feet to a point located on the northern right-of-way boundary line Liberty Road, right-of-way varies, same being the southern boundary line of said Block 9 of said Fair Ground Park Addition, for the southeast corner of the herein described 1.0537 acre tract;

**THENCE** South 85°26'51" West, coincident with the northern right-of-way boundary line Liberty Road, right-of-way varies, same being the southern boundary line of said Block 9 of said Fair Ground Park Addition, a distance of 249.42 feet to the southwest corner of said Block 9, at the intersection of the northern right-of-way boundary line of said Liberty Road, right-of-way varies, with the eastern right-of-way boundary line of Erastus Street, right-of-way varies, for the southwest corner of the herein described 1.0537 acre tract

**THENCE** North 2°23'24" West, coincident with the eastern right-of-way boundary line of Erastus Street, right-of-way varies, same being the western boundary line of said Block 9 of said Fair Ground Park Addition, a distance of 188.36 feet to the **POINT OF BEGINNING**, containing 1.0537 acres of land, more or less.



  
**Wm. Patrick Doyle**  
**Registered Professional Land Surveyor**  
**Texas Registration Number 4467**  
**September 10, 2016**  
**Revised September 14, 2016**



***Doyle & Wachtstetter, Inc***  
Surveying and Mapping • GPS/GIS

**UNION PACIFIC RAILROAD COMPANY  
0.3199 ACRE CITY OF HOUSTON OFFSITE PMZ TRACT 2  
HARRIS AND WILSON 2 LEAGUE GRANT, ABSTRACT 32  
HARRIS COUNTY, TEXAS  
PAGE 1 OF 1**

**BEING ALL THAT CERTAIN** 0.3199 acre tract of land, lying and situated in the Wilson and Harris 2 League Grant, Abstract 32, Harris County Texas, being a portion of 60 foot wide Kashmere Street, a portion of 60 foot wide 15<sup>th</sup> Street and 60 foot wide 16<sup>th</sup> Street, as shown on the plat of Augusta Addition, according to the map or plat thereof recorded in Volume 56, Page 139 of the Harris County Deed Records (H.C.D.R.), the herein described 0.3199 acre tract land hereby conveyed being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F. = 0.99989548017) as follows:

**COMMENCING** at a 5/8" iron rod found marking the northwest corner of all that certain called 4.274 acre tract conveyed by deed recorded on October 29, 1901, from Ida Japhet to Texas and New Orleans Rail Road Company as recorded in Volume 131, Page 453 of the H.C.D.R., located on the northern boundary line of 60 foot wide 16<sup>th</sup> Street (not open), said Point of Commencement being located at Texas State Plane coordinate position X=3134260.64 and Y=13851449.15;

**THENCE** North 87°40'19" East, coincident with the northern boundary line of said Texas and New Orleans Rail Road company called 4.274 acre tract, same being the southern right-of-way boundary line of said 60 foot wide 16<sup>th</sup> Street, a distance of 110.36 feet to the southwest corner and the **POINT OF BEGINNING**, of the herein described 0.3199 acre tract, at position X=3134370.90 and Y=13851453.63;

**THENCE** North 32°17'25" West, a distance of 82.79 feet to a point located on the eastern boundary line of Block 61 of said Augusta Addition, same being the western right-of-way of said 60 foot wide Kashmere Street, for an angle corner of the herein described 0.3199 acre tract;

**THENCE** North 2°28'22" West, coincident with the eastern boundary line of Block 61 of said Augusta Addition, same being the western right-of-way of said 60 foot wide Kashmere Street, a distance of 151.51 feet to an angle corner of the herein described 0.3199 acre tract;

**THENCE** North 38°24'15" East, a distance of 91.48 feet to a point located on the eastern right-of-way of said 60 foot wide Kashmere, within the right-of-way of said 60 foot wide 15<sup>th</sup> Street (Eddie Street), for the northeast corner of the herein described 0.3199 acre tract;

**THENCE** South 2°26'03" East, coincident with the eastern right-of-way of said Kashmere Street and the western boundary line of Block 62 of said Augusta Addition, a distance of 292.55 feet to a point located on the northern boundary line of said Texas and New Orleans Rail Road company called 4.274 acre tract, same being the southern right-of-way boundary line of said 60 foot wide 16<sup>th</sup> Street for the southeast corner of the herein described 0.3199 acre tract;

**THENCE** South 87°40'19" West, coincident with the northern boundary line of said Texas and New Orleans Rail Road company called 4.274 acre tract, same being the southern right-of-way boundary line of said 60 foot wide 16<sup>th</sup> Street, a distance of 18.51 feet to the **POINT OF BEGINNING**, containing 0.3199 acre of land, more or less.

**Wm. Patrick Doyle**  
Registered Professional Land Surveyor  
Texas Registration Number 4467  
September 15, 2016

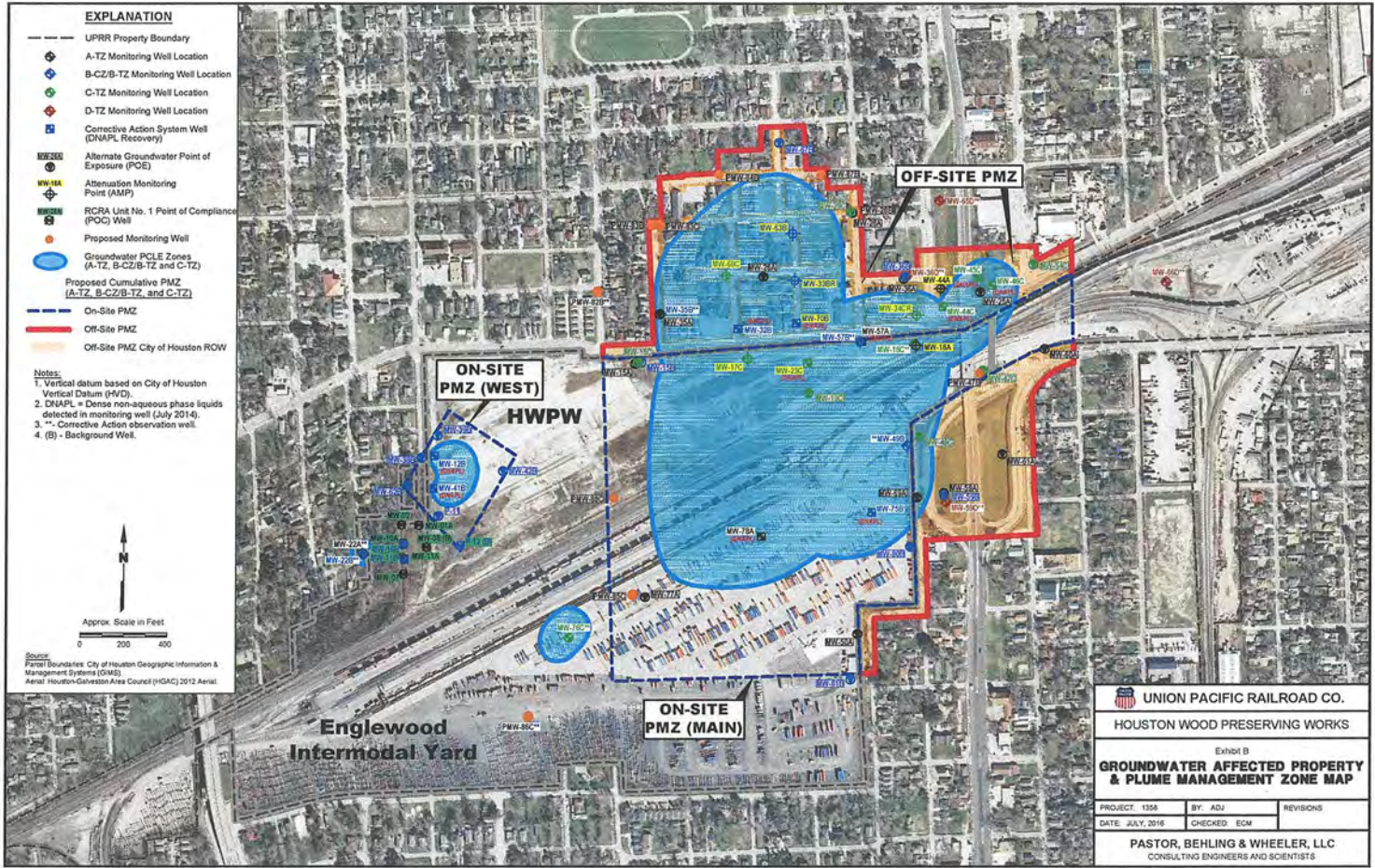


*This description is based on a plat dated June 30, 2016 is on file in the office of Doyle & Wachtstetter, Inc.  
V:\Pat\Pastor Behling & Wheeler\UPPR, Englewood Yard OffSite PMZ C.O.H. Right-of-way 0.3199 acre.doc*



**EXHIBIT B**

**AFFECTED PROPERTY AND PLUME MANAGEMENT ZONE 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
- ⊕ Corrective Action System Well (DNAPL Recovery)
- ⊕ Alternate Groundwater Point of Exposure (PCE)
- ⊕ Attenuation Monitoring Point (AMP)
- ⊕ RCRA Unit No. 1 Point of Compliance (POC) Well
- ⊕ Proposed Monitoring Well
- ⊕ Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
- ⊕ Proposed Cumulative PMZ (A-TZ, B-CZ/B-TZ, and C-TZ)
- On-Site PMZ
- Off-Site PMZ
- Off-Site PMZ City of Houston ROW

- 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. "C" - Corrective Action observation well.
  4. (B) - Background Well.



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

**Englewood Intermodal Yard**

<b>UNION PACIFIC RAILROAD CO.</b>		
HOUSTON WOOD PRESERVING WORKS		
Exhibit B		
<b>GROUNDWATER AFFECTED PROPERTY &amp; PLUME MANAGEMENT ZONE MAP</b>		
PROJECT: 1358	BY: ADJ	REVISIONS
DATE: JULY, 2016	CHECKED: ECM	
PASTOR, BEHLING & WHEELER, LLC CONSULTING ENGINEERS AND SCIENTISTS		

**EXHIBIT C**

**PLUME MANAGEMENT ZONE MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "C"**  
**MAINTENANCE AND MONITORING REQUIREMENTS**

Union Pacific Railroad (UPRR), listed as the Responder under this Restrictive Covenant, will conduct regular sampling of monitoring wells located within the City of Houston Right-Of-Way and listed in the table below (Table C-1) for chemicals of concern (COCs) (see Table C-2) in accordance with the groundwater monitoring requirements established under the Texas Commission on Environmental Quality (TCEQ) Hazardous Waste Permit/Compliance Plan No. 50343. Monitoring and reporting activities are detailed in the Groundwater Sampling and Analysis Plan (SAP) and related compliance tables within the TCEQ Hazardous Waste Permit/Compliance Plan No. 50343.

Monitoring wells listed below will be inspected for signs of damage, including well pads, casing, locks, and, protective covers. Repairs will be made as necessary to ensure the integrity of the monitoring wells.

**TABLE C-1**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-28A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-35A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-36A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-44A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-59A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-60A</i>	<i>MW-70B</i>	<i>MW-68C</i>
<i>MW-61A</i>	<i>PMW-28B (proposed)</i>	<i>PMW-83C (proposed)</i>
<i>MW-69A</i>	<i>PMW-82B (proposed)</i>	
	<i>PMW-83B (proposed)</i>	
	<i>PMW-84B (proposed)</i>	
	<i>PMW-87B (proposed)</i>	

Note: Additional monitoring wells may be added or subtracted from the list above as necessary to satisfy the TCEQ Plume Management Zone (PMZ) monitoring requirements. Any changes to the list of monitoring wells, sampling procedures, and management of investigation-derived wastes (IDW) as part of the Groundwater SAP will be provided to the TCEQ as part of the annual reporting requirements.

**EXHIBIT "C"**  
**MAINTENANCE AND MONITORING REQUIREMENTS**

**TABLE C-2**

Chemicals of Concern (COCs)	Groundwater Protection Standards (GWPS) at Alternate Point of Exposure (POE) <sup>GW</sup> GW <sub>Ing</sub> (mg/L) (Res)
Benzene	0.005 <sup>PCL</sup>
2,4-Dimethylphenol	0.49 <sup>PCL</sup>
2 Methyl-naphthalene	0.098 <sup>PCL</sup>
Dibenzofuran	0.098 <sup>PCL</sup>
Naphthalene	0.49 <sup>PCL</sup>
Vinyl Chloride	0.002 <sup>PCL</sup>

Note:  
<sup>GW</sup>GW<sub>Ing</sub> Protective Concentration Levels (PCLs), Residential land use assuming Class 2 Groundwater.

The list of COCs may be revised as necessary to satisfy the Plume Management Zone (PMZ) monitoring requirements and will be provided to the TCEQ as part of the annual reporting requirements.

**MAP ID - 23**

**HCAD ID - 0140410000007**

# Restrictive Covenant

STATE OF TEXAS

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.

*Lots Seven (7) in Block Nine (9), of Fairground Park Addition, subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, page 357 of the Deed Records of Harris County, Texas.*

Portions of the soils and/or groundwater of the Property contain certain 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 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 57so 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 Geneva Crump (Owner) with an address of 5301 Liberty Road, Houston, Texas 77026. 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 4 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.

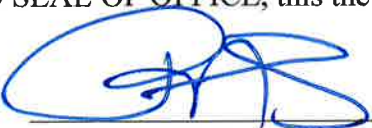
Executed this 10<sup>th</sup> day of March, 2015.

  
Name: Geneva Crump, Owner

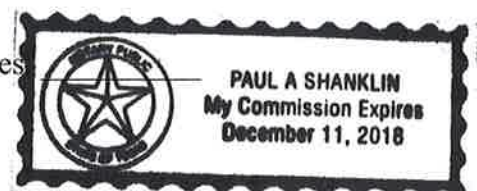
STATE OF TEXAS  
HARRIS COUNTY

BEFORE ME, on this the \_ day of March, 2015, personally appeared Geneva Crump, 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 10<sup>th</sup> day of March, 2015.

  
Notary Public in and for the State of Texas,  
County of Harris

My Commission Expires





Executed this 14<sup>th</sup> day of June, 2017.

**Union Pacific Railroad [RESPONDER]**

By: Tony Love

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 14<sup>th</sup> day of June, 2017 Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation **[RESPONDER]**, 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 in the capacity therein expressed on behalf of said corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 14<sup>th</sup> day of June, 2017.

David C. Laplante



Notary Public in and for the State of Nebraska  
County of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS            §  
TRAVIS COUNTY            §

BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, personally appeared \_\_\_\_\_, \_\_\_\_\_, 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 \_\_ day of \_\_\_\_\_, 20\_\_.

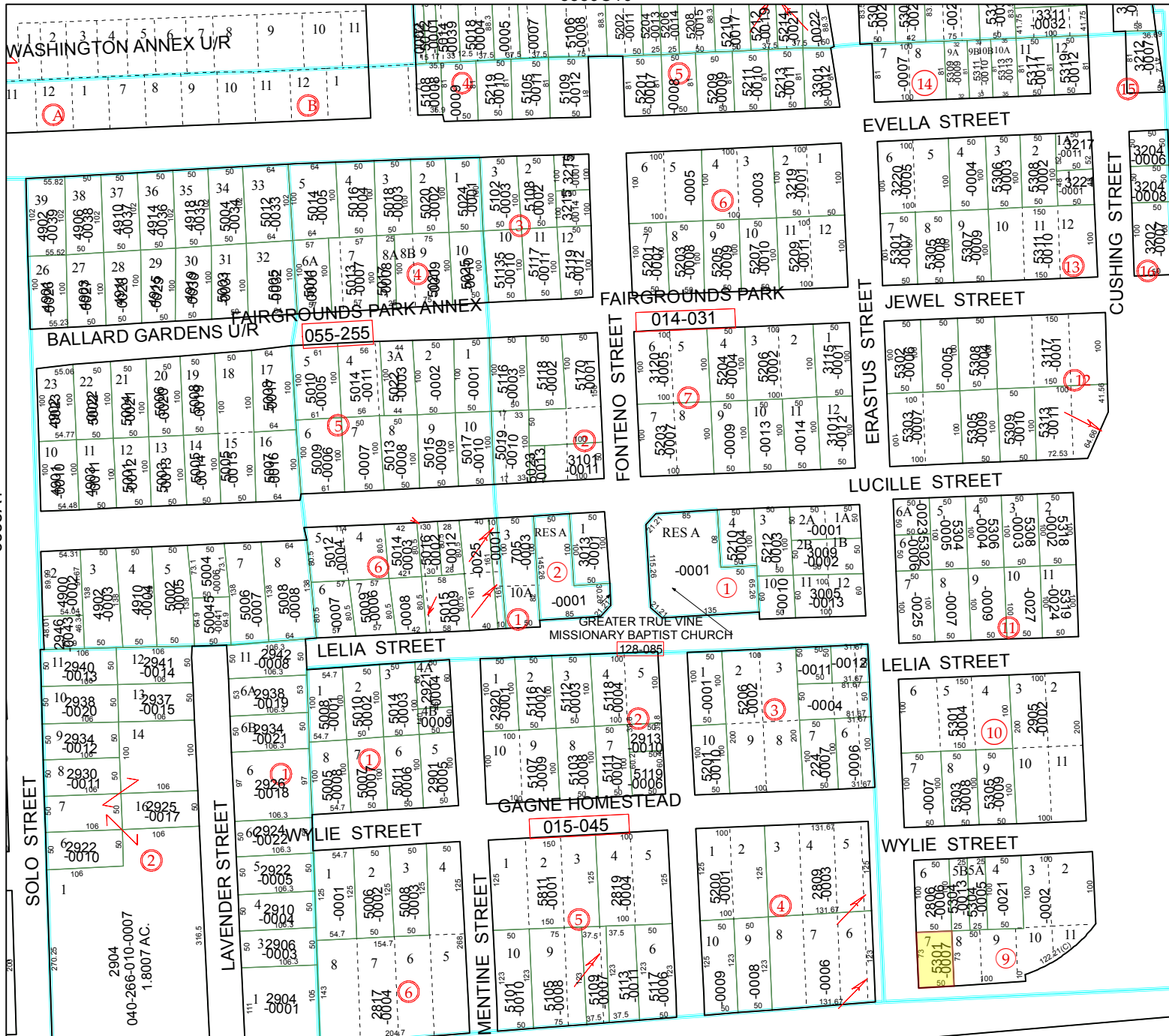
Notary Public in and for the State of Texas,  
County of Travis  
My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**

# EXHIBIT 1

5559C10



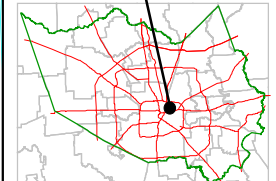
# Harris County Appraisal District



0 100 200  
PUBLICATION DATE:  
1/29/2014

Geospatial or map data maintained by the Harris County Appraisal District is for informational purposes and may not be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents the approximate location of property boundaries.

### MAP LOCATION



# FACET 5558A

1	2	3	4
5	6	7	8
9	10	11	12

5558A6

5558A1

5558A3

2904  
040-266-010-0007  
1.8007 AC.

**Texas American Title Company  
2000 Bering, Suite 1000  
Houston, Texas 77057  
713-988-9999**

## **Title Report**

GF Number: 7910-12-9064  
Date: December 5, 2012

Texas American Title Company ("Title Company") certifies that a diligent search of the real property records of Texas American Title Company's title plant has been made, as to the herein described property, and as of 8:00 AM on the 3<sup>rd</sup> day of December, 2012, we find the following:

### **Title Vested In:**

Geneva Henry, a/k/a Geneva Crump (by Deed filed for record under Harris County Clerk's File No. C159988)

### **Property Description: (Map ID# 23) (Tax ID# 014-041-000-0007)**

Lot Seven (7) in Block Nine (9), of Fairground Park, a subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, Page 357 of the Deed Records of Harris County, Texas, SAVE AND EXCEPT the South 3 feet thereof as conveyed to Harris County by deed filed for record under Volume 959, Page 357 of the Deed Records of Harris County, Texas.

SUBJECT TO: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for Labor or Material in connection with recent repairs or new improvements; Unpaid Taxes; changes in Marital or Corporate Status of owner(s) since date of purchase; Homestead Rights or Claims.

### **Restrictions:**

None of record.

### **Exceptions:**

- a) Subject property is located within the City of Houston or within its extra territorial jurisdiction (within 5 miles of the city limits but outside another municipality) and is subject to the terms, conditions, and provision of City of Houston Ordinance No. 85-1878 and 99-262, pertaining to, among other things the platting and re-platting of real property and to the establishment of building lines. A certified copy of said ordinance was filed of record on August 1, 1991, under Harris County Clerk's File No. N253886.

**Property Liens:**

- 1) Notice of Public Hearing filed December 12, 2011, under Harris County Clerk's File No. 20110517152, pursuant of said notice a "Building and Standards Commission Order" dated January 11, 2012 and filed for record January 13, 2012, under Harris County Clerk's file No. 20120018233, it was determined that subject property be posted as a dangerous building and must be either repaired or demolished. Pursuant thereto, the following: Notice of Intent to File Lien in connection with demolition, filed on August 28, 2012 , under Harris County Clerk's file No. 20120395123.

**Involuntary Liens:**

- 1) We find reference to Cause No. 2009-42807, in the District Court of Harris County, Texas, styled Houston ISD, etal vs. Geneva Henry, etal. It is assumed that said cause of action is for delinquent taxes due on subject property.
- 2) Abstract of Judgment filed May 12, 2009, under Harris County Clerk's File No. 20090200226, styled Reed Credit Union, vs. Geneva Crump, in the principal amount of \$4,012.00, plus cost, interest and attorney's fees.
- 3) Abstract of Judgment filed December 22, 2010, under Harris County Clerk's File No. 20100543048, styled Houston ISD, etal, vs. Geneva Henry, in the principal amount as set out therein, plus cost, interest and attorney's fees.

CAUTION: PROTECTION IS AFFORDED ONLY UNDER THE TERMS OF THE PROPOSED TITLE INSURANCE POLICY. TEXAS AMERICAN TITLE COMPANY (AND ITS UNDERWRITERS OF TITLE INSURANCE) ASSUME NO LIABILITY FOR ERRORS OR OMISSIONS IN HIS REPORT OR FOR VERBAL STATEMENTS.

This is a copy of a preliminary report made for the use of Texas American Title Company only, to determine whether a title insurance policy can be issued. If a copy is furnished to the parties to the transaction, it is to facilitate preparation of the necessary instruments, to point out curative requirements, if any, and to show the results of the Company's title search (upon which only the Company may rely.) None of the information contained herein, or the absence of other information, constitutes a representation to any party, other than the Company, as to the status of the title. If a title defect or encumbrance should exist which is not disclosed hereon, the Company should not be liable by reason of furnishing this report or for any verbal statements related thereto. Neither the Company nor its underwriters shall be liable for any title defect unless a title insurance policy is issued by the Company insuring against such defect, and the applicable premium paid therefore. The liability shall then exist only under the terms of the policy (as prescribed by the State Board of Insurance of the State of Texas) and as measured and limited thereby.

**Notice:** Texas American Title Company disclaims any warranties, expressed or implied, concerning this information. This information is solely for the use of the party requesting it and no one else. Texas American Title Company liability for errors and/or omissions in this information shall be limited to the amount paid for this report. By accepting this form the party requesting the information agrees that the disclaimer of warranties, and liability limitation contained in this paragraph is a part of its contract with Texas American Title Company and shall cover all actions whether arising hereunder by statue, in contract, or in tort.

**Texas American Title Company**

*Darrell Stone*

---

Darrell Stone  
Title Examiner

**EXHIBIT 2**

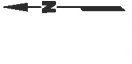
**AFFECTED PROPERTY MAP**



- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - 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)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

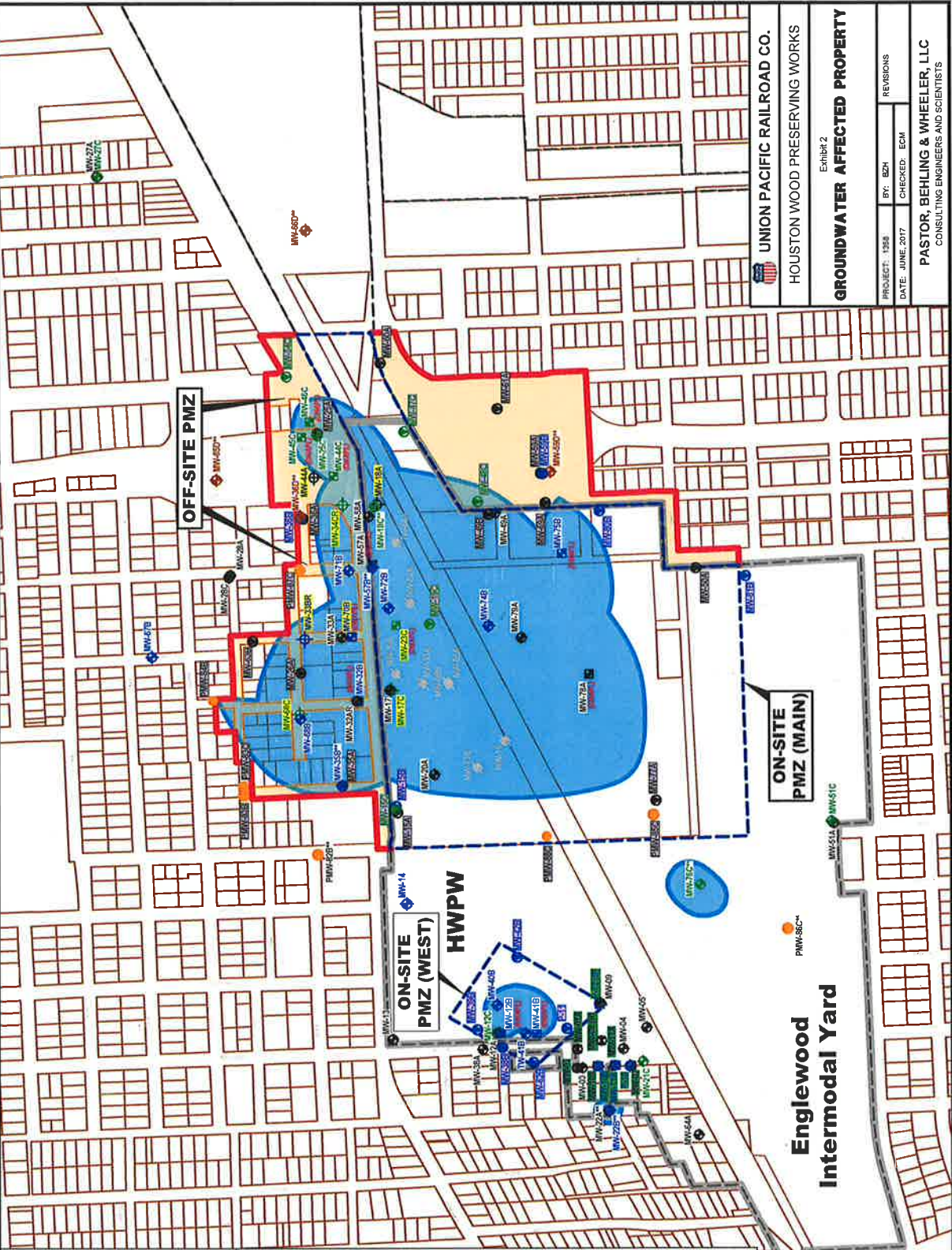
**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Approx. Scale in Feet  
0 200 400

Source: City of Houston Geographic Information & Mapping System  
 Author: Houston-Clayton Area Council (HAC) 2012 Aerial



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**





**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-44A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-59A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	

**MAP ID - 24**

**HCAD ID - 0140410000002**





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 4 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 26<sup>th</sup> day of June, 2017.

James Singleterry as the representative for the Elmer Preston Trust

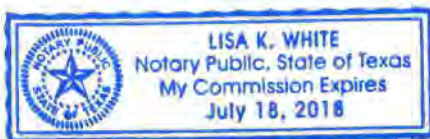
  
Title: Trustee

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the 26<sup>th</sup> day of June, 2017, personally appeared James Singleterry as the representative for the Elmer Preston Trust, 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 26<sup>th</sup> day of June, 2017.





Notary Public in and for the State of Texas,  
County of Harris  
My Commission Expires: 7-18-18



Executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Union Pacific Railroad [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 \_\_\_\_\_, 20\_\_\_\_ Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation **[RESPONDER]**, 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 in the capacity therein expressed on behalf of said corporation.

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: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 2017.

Texas Commission on Environmental Quality

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 2017, personally appeared \_\_\_\_\_, 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 \_\_\_\_\_, 2017.

\_\_\_\_\_  
Notary Public in and for the State of Texas,  
County of Harris

My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**



**Texas American Title Company  
2000 Bering, Suite 1000  
Houston, Texas 77057  
713-988-9999**

## **Title Report**

GF Number: 7910-16-8950  
Date: October 17, 2016

Texas American Title Company has examined the real property records, the state district court, and the county court records for the county in which the real property is located. The time period examined extended from September 15, 1967 to October 10, 2016. If you desire different or additional examination, please contact us immediately.

### **Title Vested In:**

Elmer Preston Trust of Texas (by Warranty Deed filed for record under Harris County Clerk's File No. Y825900)

### **Property Description: (Map ID# 24) (Tax ID# 014-041-000-0002)**

Lots Two (2), Three (3), Eight (8), Nine (9), Ten (10) and Eleven (11), in Block Nine (9), of Fairground Park Addition, a subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, Page 460 of the Deed Records of Harris County, Texas, SAVE AND EXCEPT those portions as conveyed to Harris County by deeds filed for record under Volume 961, Page 108 and Volume 2308, Page 434, both of the Deed Records of Harris County, Texas.

SUBJECT TO: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for Labor or Material in connection with recent repairs or new improvements; Unpaid Taxes; changes in Marital or Corporate Status of owner(s) since date of purchase; Homestead Rights or Claims.

### **Restrictions:**

None of record.

### **Easements and other Encumbrances:**

- a) Subject property is located within the City of Houston or within its extra territorial jurisdiction (within 5 miles of the city limits but outside another municipality) and is subject to the terms, conditions, and provision of City of Houston Ordinance No. 85-1878 and 99-262, pertaining to, among other things the platting and re-platting of real property and to the establishment of building lines. A certified copy of said ordinance was filed of record on August 1, 1991, under Harris County Clerk's File No. N253886.

**Property Liens:**

We find no outstanding mortgage liens of record affecting the subject property. An inquiry should be made concerning the existence of any unrecorded lien or other indebtedness, which could give rise to any security interest in the subject property.

**Involuntary Liens:**

None of record.

**NOTICE:** Texas American Title Company (the "Company") has provided this report or certificate to you under the terms set forth below. By accepting this report or certificate, you agree to these terms and you agree that the Company has no liability to you, except as expressly limited herein. To the maximum extent allowed by law, the Company disclaims any and all warranties, express or implied, concerning this report or certificate and the information contained therein. Your only remedy for any mistake, misstatement, inaccuracy, error, or omission made or occurring in this report or certificate, or made or occurring in its delivery or non-delivery, is expressly limited to an action to recover damages, which damages you expressly agree are limited to an amount equal to the sum actually paid for this report or certificate plus the sum of \$100.00. You further agree that: the Company is not liable for consequential or special damages; the limitation of damages set forth herein is reasonable considering the amount paid, the limited services requested, and the intended use of this report or certificate; the Company would not provide the requested report or certificate without this limitation of damages; the limitation of damages applies to all claims, whether the claim arises under contract, tort or other law; and the Company has no liability to any third person arising from or related to this report or certificate. **This report or certificate is not a title insurance policy or title opinion and is not a guaranty or warranty of title.** In its role as a title insurance agent, the Company sells policies of title insurance. If you desire protection against title defects, you should purchase a title insurance policy. Liability will then exist only under the terms of the policy, will be measured and limited by the policy, and the liability will be that of the title insurance company named in the policy. No representative of the Company has the authority to make any oral statements correcting, contradicting, revising, amending or supplementing this report or certificate, including the terms of this notice.

When preparing this report or certificate the Company used only the information contained in the public records specifically identified above. (If none is identified, the Company used only the Real Property Records of the county in which the property is located.) Documents not recorded and events and other matters not reflected in the public records may affect ownership and title but will not be reflected on this report or certificate. No inspection has been made of the property. Matters that may be shown by an inspection or on a survey may also affect ownership and title but will not be reflected on this report or certificate.

The Company may identify a document listed above by a term commonly used to describe similar documents. By way of illustration, a document titled "Restrictive Covenants" may be referred to as "Deed Restrictions" or as "Covenants, Conditions and Restrictions." The Company may also identify a document using its actual title. The Company, however, makes no warranty or representation that the term, title or other name used to describe the document accurately reflects the legal effect of the document. For example, a document titled "Restrictive Covenants" may also establish a lien, an easement, or some other interest.

In order to determine the effect of a document, the document must be carefully reviewed. The Company does not provide legal advice concerning the effect or significance of documents shown on this report or certificate. If you have a question as to the effect or significance of a document, you should obtain the assistance of a qualified professional.

**Texas American Title Company**

*Darrell Stone*

---

Darrell Stone  
Title Examiner

Texas American Title Company

WD  
20  
S

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

GENERAL WARRANTY DEED

Y825900  
10/13/05 200776719

\$20.00

THE STATE OF TEXAS :  
: KNOW ALL MEN BY THESE PRESENTS:  
COUNTY OF HARRIS :

THAT I/WE, JESUS THE LIGHT OF THE WORLD MINISTRIES, INC., a Louisiana Non-Profit Corporation, for and in consideration of the sum of TEN AND NO/100 DOLLARS (\$10.00) and other valuable consideration to the undersigned paid by the Grantee herein named, the receipt of which is hereby acknowledged, have GRANTED, SOLD AND CONVEYED, and by these presents do GRANT, SELL AND CONVEY, unto the ELMER PRESTON TRUST OF TEXAS, 3319 Liberty Road, Houston, of the County of Harris, State of Texas 77026, all that certain real property in Harris County, Texas, to-wit:

lee

Lots Two (2), Three (3), and Four (4) and Tracts Eight (8), Nine (9), Ten (10), and Eleven (11) in Block Nine (9) of FAIRGROUND PARK ADDITION, a subdivision in Harris County, Texas, according to the map thereof recorded in Volume 81, Page 460 of the Deed Records of Harris County, Texas. SAVE AND EXCEPT that part conveyed to Harris County in instruments recorded in Volume 961, Page 108, Deed Records and Volume 2308, Page 434, Deed Records of Harris County, Texas.

D

THIS CONVEYANCE is made and accepted expressly subject to any and all restrictions, covenants, conditions, agreements, assessments, maintenance charges, leases, easements, and previously conveyed or reserved mineral and royalty interest, if any, relating to the hereinabove described property, but only to the extent they are still in effect and shown of record and the regulations, and ordinances of municipal and/or governmental authorities, if any, but only to the extent they are still in effect relating to the hereinabove described property.

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Grantee, its successors and assigns forever and it do(es) hereby bind itself, its successors, to WARRANT AND FOREVER DEFEND, all and singular the said premises unto the said Grantee, its successors and assigns, against every person whomsoever lawfully claiming, or to claim the same, or part thereof.

Executed this 5<sup>th</sup> day of October, 2005.

JESUS THE LIGHT OF THE WORLD  
MINISTRIES, INC.

tor



NOBLE ENIME, Pastor/President

FILED

2005 OCT 13 PM 2:20

County Clerk  
Harris County, Texas

2005 OCT 13 PM 2:20

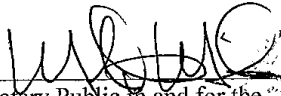


STATE OF LOUISIANA

PARISH OF East Baton Rouge

BEFORE ME, the undersigned authority, on this day personally appeared NOBLE ENIME, Pastor/President, of JESUS THE LIGHT OF THE WORLD MINISTRIES, INC., known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same as his/her free act and deed and for the purposes and consideration therein expressed and as the act and deed of said non-profit corporation.

Given under my hand and seal of office this 5<sup>th</sup> day of October, 2005.

  
Notary Public in and for the  
State of LOUISIANA

MARK D. MILEY  
Notary Public, LSBA #27576  
My Commission is for Life

RETURN TO:  
ELMER PRESTON TRUST OF TEXAS  
3319 LIBERTY RD.  
HOUSTON, TX 77026  
GP 578438-A

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW.  
THE STATE OF TEXAS  
COUNTY OF HARRIS  
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped hereon by me; and was duly RECORDED in the Official Public Records of Real Property of Harris County, Texas on

OCT 13 2005



  
COUNTY CLERK  
HARRIS COUNTY, TEXAS

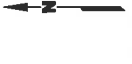
212-45-210

**EXHIBIT 2**  
**AFFECTED PROPERTY MAP**

- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - 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)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

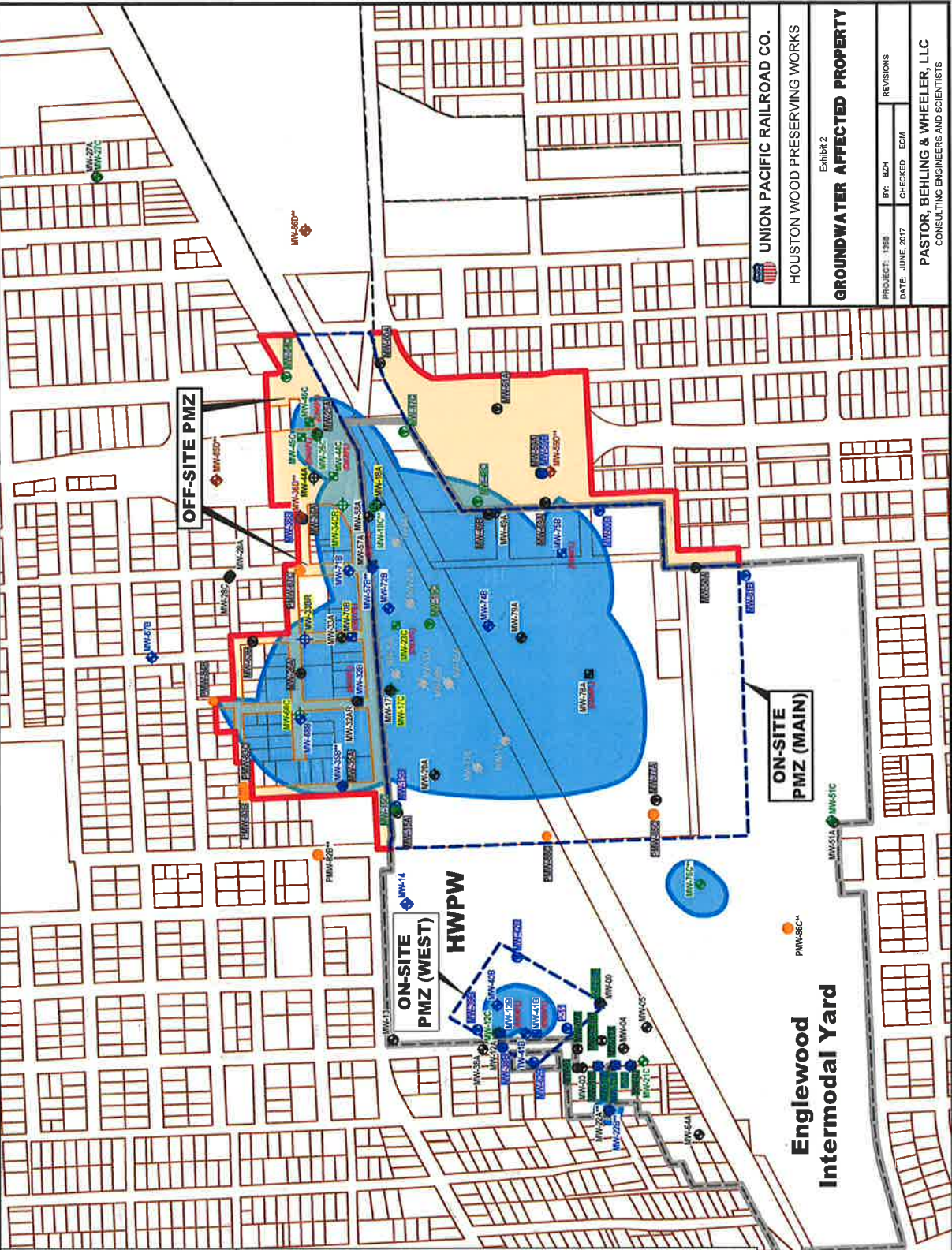
**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Approx. Scale In Feet  
0 200 400

Source: City of Houston Geographic Information & Mapping System  
Aerial, Topographic, and Aerial Imagery (2012)  
Aerial, Topographic, and Aerial Imagery (2012) Aerial.



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**



**EXPLANATION**

- UPRR Property Boundary
- Property Boundary (GIMS)
- City of Houston-Owned ROW
- Off-Site PMZ
- Off-Site PMZ
- Monitoring Well Location
- Proposed Monitoring Well
- On-Site PMZ
- Off-Site PMZ

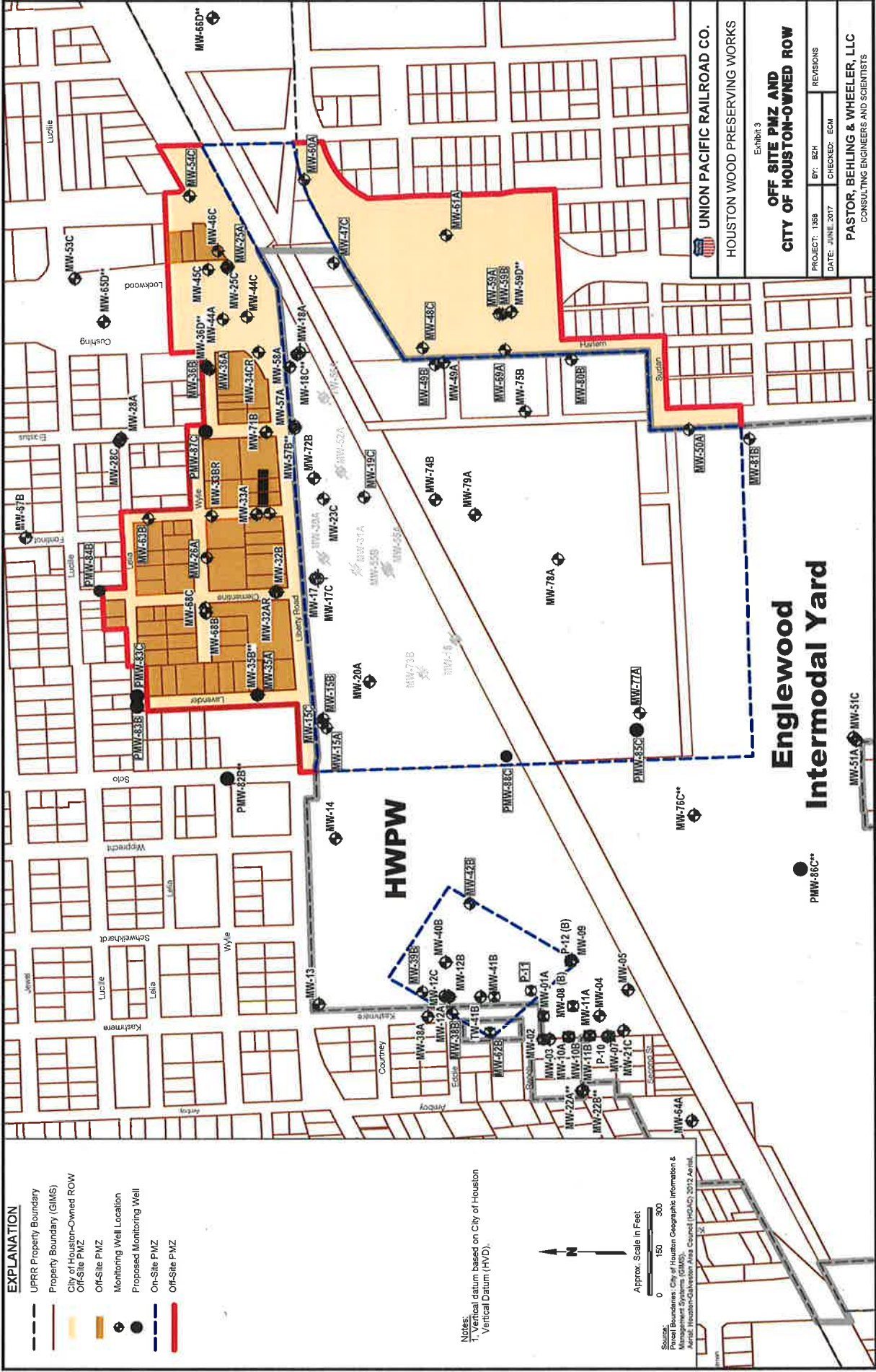
Notes:  
 1. Vertical datum based on City of Houston Vertical Datum (HVD).



Approx. Scale in Feet



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	
Exhibit 3 <b>OFF SITE PMZ AND CITY OF HOUSTON-OWNED ROW</b>	
PROJECT: 158	BY: BZH
DATE: JUNE 2017	CHECKED: EGM
REVISIONS	
PASTOR, BEHLING & WHEELER, LLC CONSULTING ENGINEERS AND SCIENTISTS	

**Englewood Intermodal Yard**

MW-51A MW-51C

PMW-86C\*\*

MW-76C\*\*

PMW-83C MW-77A

MW-78A

MW-74B

MW-48C

MW-59A MW-59B MW-59D\*\*

MW-51A MW-51B

MW-53C MW-65D\*\*

MW-66D\*\*

**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-44A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-59A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	

**MAP ID - 42**

**HCAD ID - 0140410000006**





# Restrictive Covenant

STATE OF TEXAS

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.

*Lot Six (6) in Block (9) one, of Fairground Park a Subdivision, a subdivision I n Harris County, Texas according to the Map or Plat records thereof.*

Portions of the soils and/or groundwater of the Property contain certain 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 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 Clara Scruggs (Owner) with an address of 5151 CR 181, Alvin, Texas 77511. 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 4 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 7<sup>th</sup> day of April, 2015.

By:   
Clara Scruggs

STATE OF TEXAS  
HARRIS COUNTY

BEFORE ME, on this the 7<sup>th</sup> day of April, 2015, personally appeared Clara Scruggs, 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 7th day of April, 2015.

  
Notary Public in and for the State of Texas,  
County of Harris  
My Commission Expires   
December 11, 2018

Executed this 14<sup>th</sup> day of June, 2017.

**Union Pacific Railroad [RESPONDER]**

By: Tony Love

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 14<sup>th</sup> day of June, 2017 Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation [RESPONDER], 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 in the capacity therein expressed on behalf of said corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 14<sup>th</sup> day of June, 2017.  
David C. Laplante



Notary Public in and for the State of Nebraska  
County of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS            §  
TRAVIS COUNTY            §

BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, personally appeared \_\_\_\_\_, \_\_\_\_\_, 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.

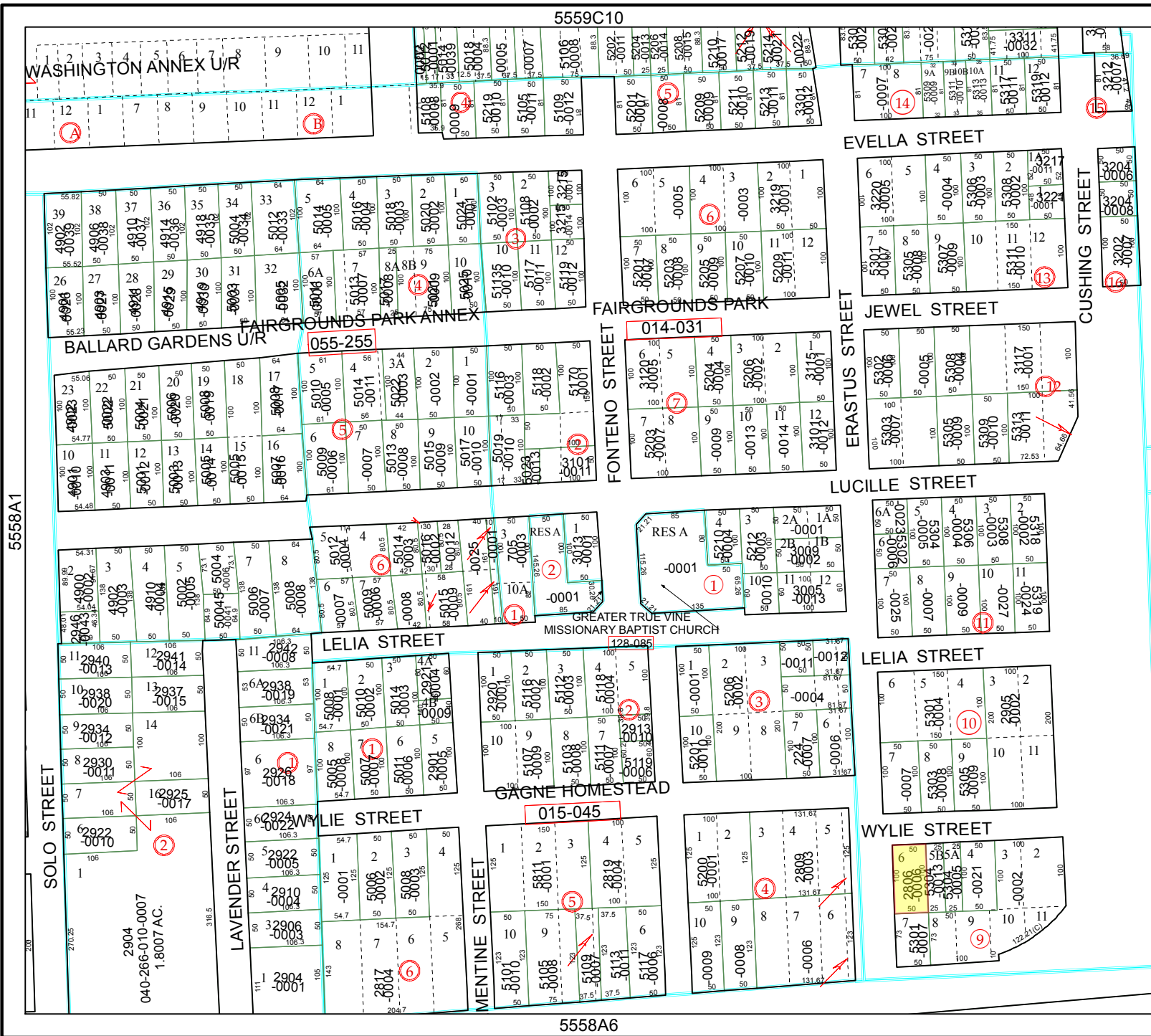
GIVEN UNDER MY HAND AND SEAL OF OFFICE, this \_\_ day of \_\_\_\_\_, 20\_\_.

Notary Public in and for the State of Texas,  
County of Travis  
My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**

# EXHIBIT 1



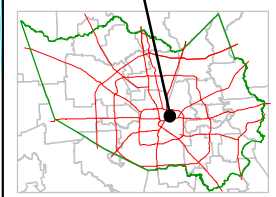
## Harris County Appraisal District



0 100 200  
**PUBLICATION DATE:**  
 1/29/2014

Geospatial or map data maintained by the Harris County Appraisal District is for informational purposes and may not be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents the approximate location of property boundaries.

### MAP LOCATION



# FACET 5558A

1	2	3	4
5	6	7	8
9	10	11	12

5558A1

5558A3

5558A6

5559C10

**Texas American Title Company  
2000 Bering, Suite 1000  
Houston, Texas 77057  
713-988-9999**

## **Title Report**

GF Number: 7910-12-9065

Date: December 5, 2012

Texas American Title Company ("Title Company") certifies that a diligent search of the real property records of Texas American Title Company's title plant has been made, as to the herein described property, and as of 8:00 AM on the 3<sup>rd</sup> day of December, 2012, we find the following:

### **Title Vested In:**

Margaret Roberts, Clara Scruggs, Leroy Mock and Charles Mock (by Warranty Deed filed for record under Harris County Clerk's File No. U754245)

### **Property Description: (Map ID# 42) (Tax ID# 014-041-000-0006)**

Lot Six (6), in Block Nine (9), of Fairground Park, a subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, Page 460 of the Deed Records of Harris County, Texas.

SUBJECT TO: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for Labor or Material in connection with recent repairs or new improvements; Unpaid Taxes; changes in Marital or Corporate Status of owner(s) since date of purchase; Homestead Rights or Claims.

### **Restrictions:**

None of record.

### **Exceptions:**

- a) Subject property is located within the City of Houston or within its extra territorial jurisdiction (within 5 miles of the city limits but outside another municipality) and is subject to the terms, conditions, and provision of City of Houston Ordinance No. 85-1878 and 99-262, pertaining to, among other things the platting and re-platting of real property and to the establishment of building lines. A certified copy of said ordinance was filed of record on August 1, 1991, under Harris County Clerk's File No. N253886.

### **Property Liens:**

None of record.



**Involuntary Liens:**

- 1) We find reference to Cause No. 2011-14300, in the District Court of Harris County, Texas, styled Harris County, etal vs. Margaret Roberts, Clara Scruggs, Leroy Mock and Charles Mock. It is assumed that said cause of action is for delinquent taxes due on subject property. Said suit includes a Final Judgment dated December 13, 2011.

CAUTION: PROTECTION IS AFFORDED ONLY UNDER THE TERMS OF THE PROPOSED TITLE INSURANCE POLICY. TEXAS AMERICAN TITLE COMPANY (AND ITS UNDERWRITERS OF TITLE INSURANCE) ASSUME NO LIABILITY FOR ERRORS OR OMISSIONS IN HIS REPORT OR FOR VERBAL STATEMENTS.

This is a copy of a preliminary report made for the use of Texas American Title Company only, to determine whether a title insurance policy can be issued. If a copy is furnished to the parties to the transaction, it is to facilitate preparation of the necessary instruments, to point out curative requirements, if any, and to show the results of the Company's title search (upon which only the Company may rely.) None of the information contained herein, or the absence of other information, constitutes a representation to any party, other than the Company, as to the status of the title. If a title defect or encumbrance should exist which is not disclosed hereon, the Company should not be liable by reason of furnishing this report or for any verbal statements related thereto. Neither the Company nor its underwriters shall be liable for any title defect unless a title insurance policy is issued by the Company insuring against such defect, and the applicable premium paid therefore. The liability shall then exist only under the terms of the policy (as prescribed by the State Board of Insurance of the State of Texas) and as measured and limited thereby.

**Notice:** Texas American Title Company disclaims any warranties, expressed or implied, concerning this information. This information is solely for the use of the party requesting it and no one else. Texas American Title Company liability for errors and/or omissions in this information shall be limited to the amount paid for this report. By accepting this form the party requesting the information agrees that the disclaimer of warranties, and liability limitation contained in this paragraph is a part of its contract with Texas American Title Company and shall cover all actions whether arising hereunder by statue, in contract, or in tort.

**Texas American Title Company**



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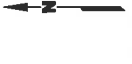
Darrell Stone  
Title Examiner

**EXHIBIT 2**  
**AFFECTED PROPERTY MAP**

- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - 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)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

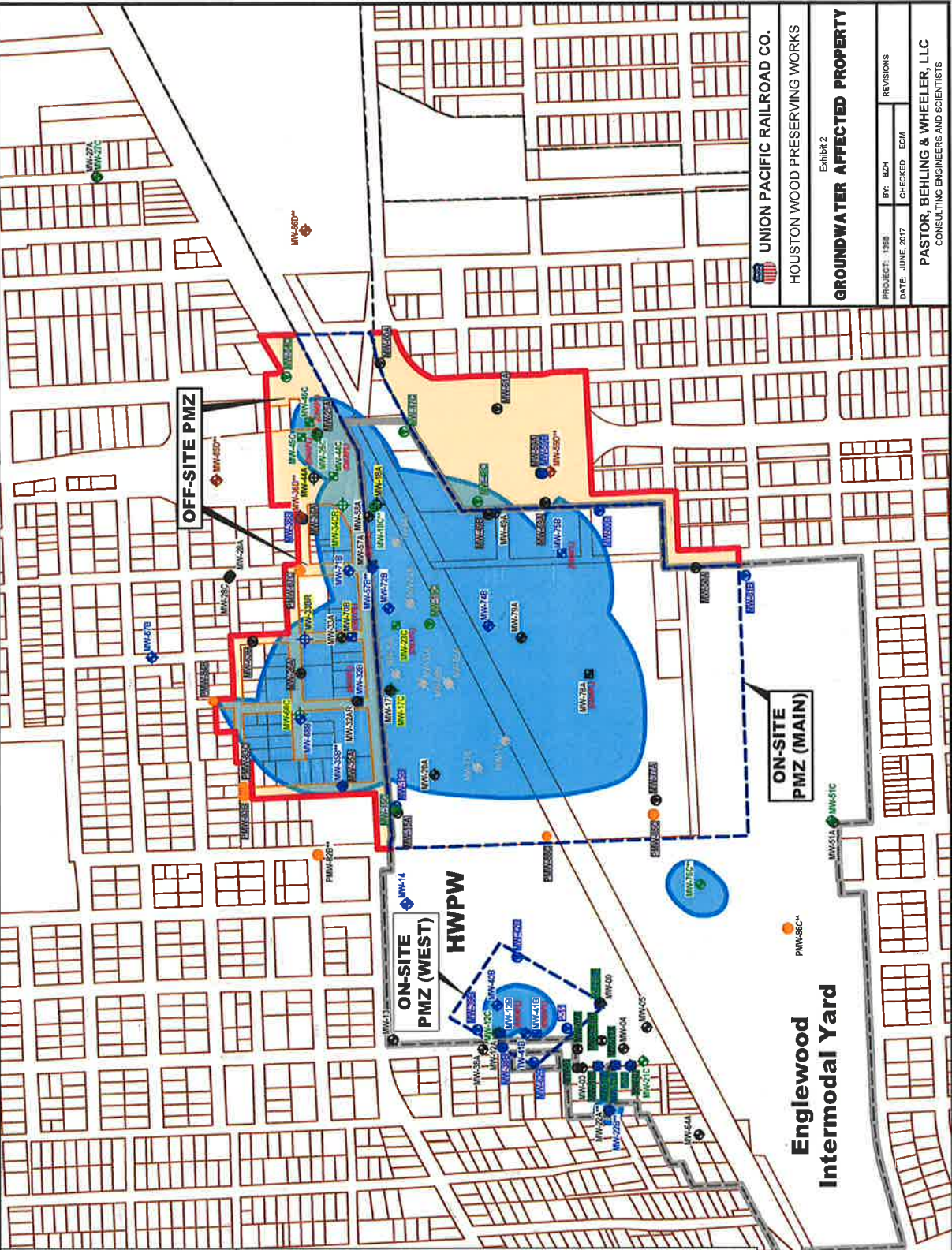
**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non-aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Approx. Scale in Feet  
0 200 400

Source: City of Houston Geographic Information & Mapping System  
 Author: Houston-Clayton Area Council (HAC) 2012 Aerial



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**



**EXPLANATION**

- UPRR Property Boundary
- Property Boundary (GIMS)
- City of Houston-Owned ROW
- Off-Site PMZ
- Off-Site PMZ
- Monitoring Well Location
- Proposed Monitoring Well
- On-Site PMZ
- Off-Site PMZ

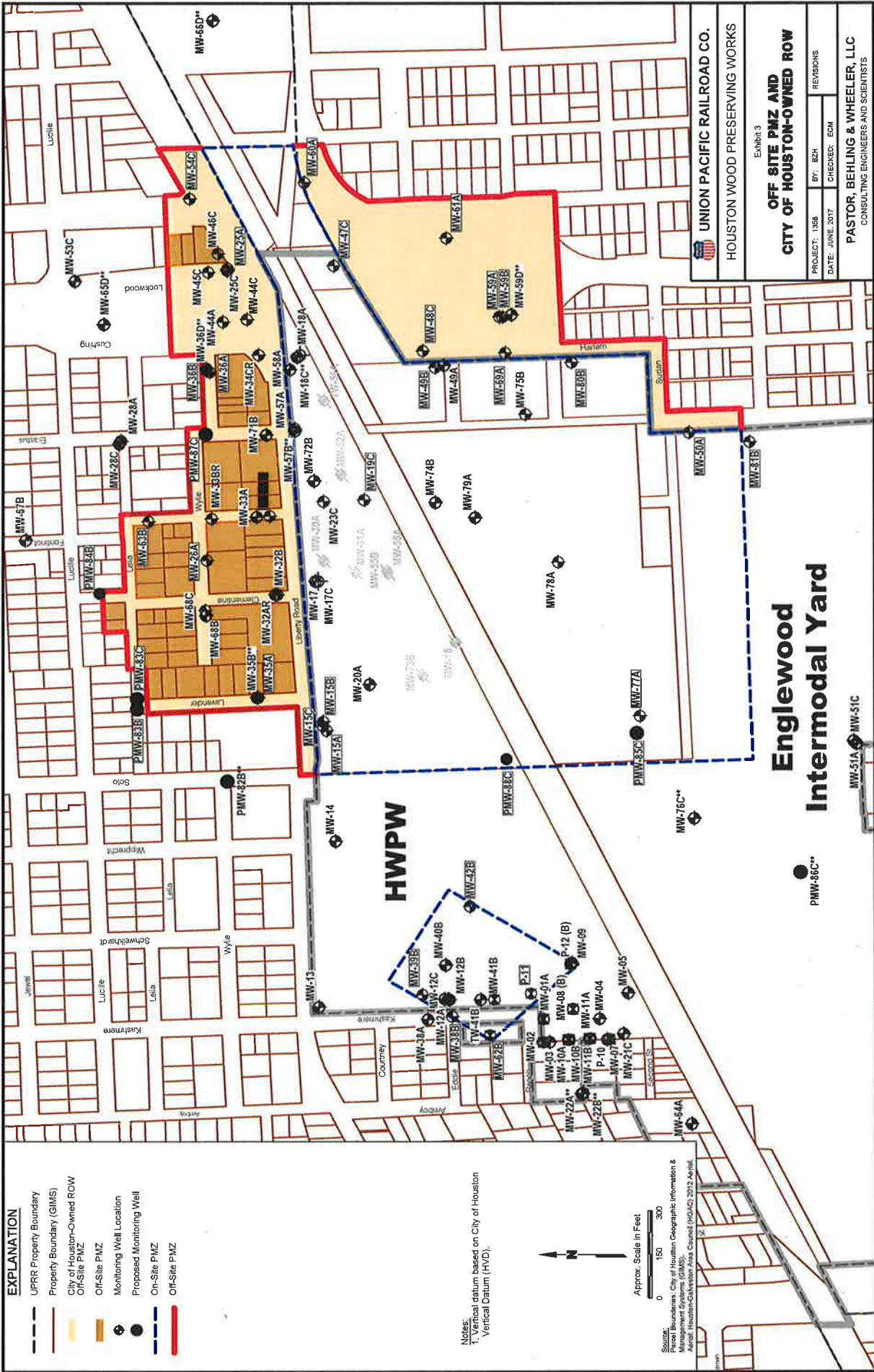
Notes:  
 1. Vertical datum based on City of Houston Vertical Datum (HVD).



Approx. Scale in Feet



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



<b>UNION PACIFIC RAILROAD CO.</b> HOUSTON WOOD PRESERVING WORKS		
Exhibit 3 <b>OFF SITE PMZ AND CITY OF HOUSTON-OWNED ROW</b>		
PROJECT: 158	BY: BZH	REVISIONS
DATE: JUNE 2017	CHECKED: ECM	
<b>PASTOR, BEHLING &amp; WHEELER, LLC</b> CONSULTING ENGINEERS AND SCIENTISTS		

**Englewood Intermodal Yard**

**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-44A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-59A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	

**MAP ID - 43**

**HCAD ID - 0140410000013**







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 4 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 31<sup>st</sup> day of March, 2015.

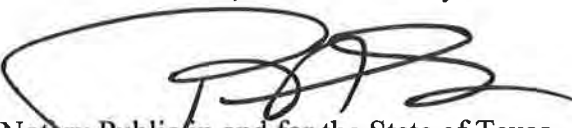
By: Irene Juarez  
Name: Irene Juarez

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the 31st day of March, 2015, personally appeared Irene Juarez, 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 31st day of March, 2015.

  
Notary Public in and for the State of Texas,  
County of Harris

My Commission Expires.



Executed this 14<sup>th</sup> day of June, 2017.

**Union Pacific Railroad [RESPONDER]**

By: Tony Love

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 14<sup>th</sup> day of June, 2017 Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation **[RESPONDER]**, 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 in the capacity therein expressed on behalf of said corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 14<sup>th</sup> day of June, 2017.

David C. Laplante



Notary Public in and for the State of Nebraska  
County of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS            §  
TRAVIS COUNTY            §

BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, personally appeared \_\_\_\_\_, \_\_\_\_\_, 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.

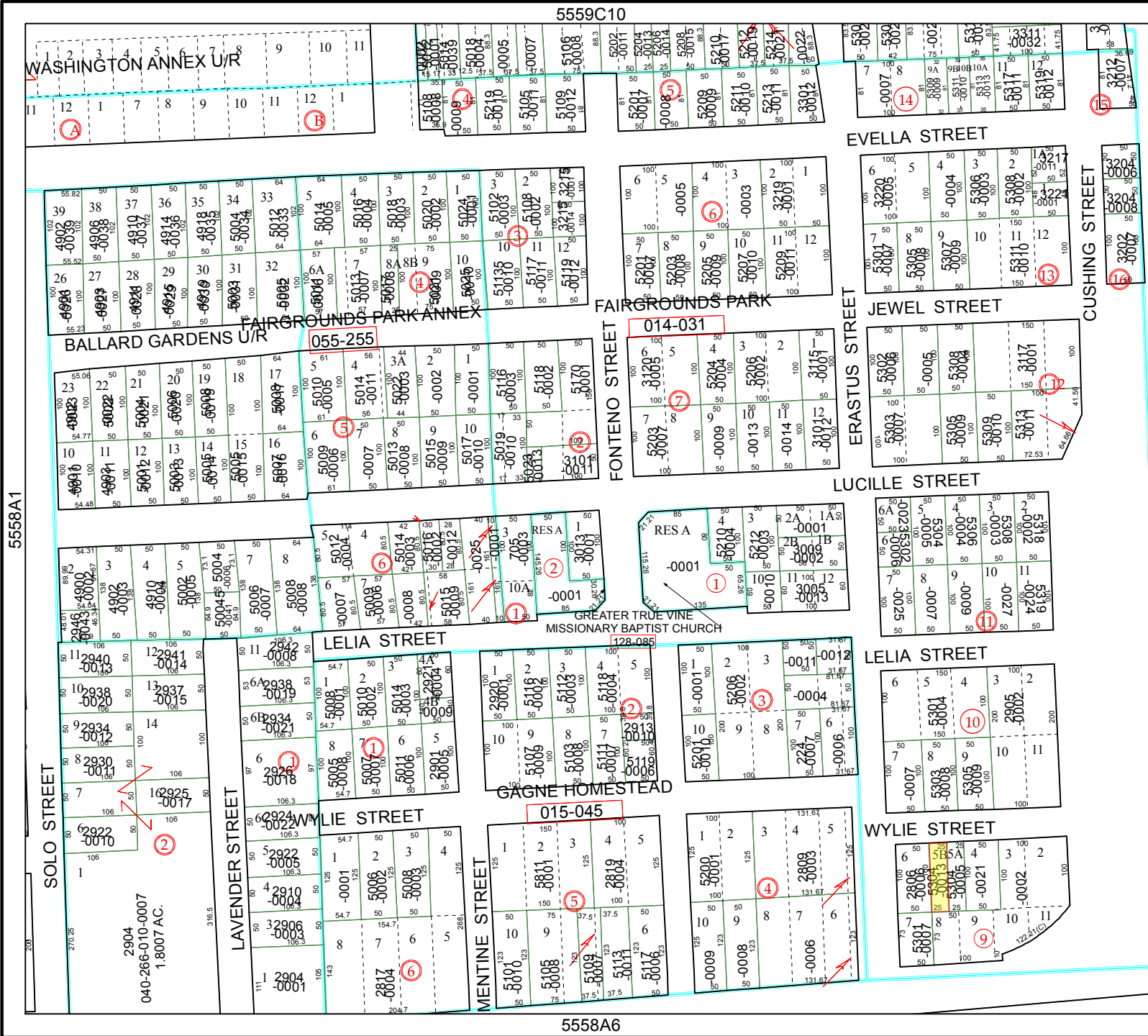
GIVEN UNDER MY HAND AND SEAL OF OFFICE, this \_\_ day of \_\_\_\_\_, 20\_\_.

Notary Public in and for the State of Texas,  
County of Travis  
My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**

# EXHIBIT 1



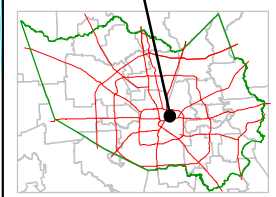
# Harris County Appraisal District



0 100 200  
**PUBLICATION DATE:**  
 1/29/2014

Geospatial or map data maintained by the Harris County Appraisal District is for informational purposes and may not be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents the approximate location of property boundaries.

### MAP LOCATION



# FACET 5558A

1	2	3	4
5	6	7	8
9	10	11	12

5558A1

5558A3

5558A6

5559C10

2904  
 040-266-010-0007  
 1.8007 AC.

**Texas American Title Company  
2000 Bering, Suite 1000  
Houston, Texas 77057  
713-988-9999**

## **Title Report**

GF Number: 7910-12-9210  
Date: December 5, 2012

Texas American Title Company ("Title Company") certifies that a diligent search of the real property records of Texas American Title Company's title plant has been made, as to the herein described property, and as of 8:00 AM on the 3<sup>rd</sup> day of December, 2012, we find the following:

**Title Vested In:**

Irene Perez Juarez (by Warranty Deed filed for record under Harris County Clerk's File No. L292177)

**Property Description: (Map ID# 43) (Tax ID# 014-041-000-0013)**

The West One-half (W ½) of Lot Five (5), in Block Nine (9), of Fairground Park, a subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, Page 461 of the Map Records of Harris County, Texas.

SUBJECT TO: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for Labor or Material in connection with recent repairs or new improvements; Unpaid Taxes; changes in Marital or Corporate Status of owner(s) since date of purchase; Homestead Rights or Claims.

**Restrictions:**

None of record.

**Exceptions:**

- a) Subject property is located within the City of Houston or within its extra territorial jurisdiction (within 5 miles of the city limits but outside another municipality) and is subject to the terms, conditions, and provision of City of Houston Ordinance No. 85-1878 and 99-262, pertaining to, among other things the platting and re-platting of real property and to the establishment of building lines. A certified copy of said ordinance was filed of record on August 1, 1991, under Harris County Clerk's File No. N253886.



**Property Liens:**

- 1) Paving Lien Notice filed on January 31, 1977, (topping project no. 303), filed under Harris County Clerk's File No. F029142, (Film Code No. 157-20-1662), executed by City of Houston, showing portions of Wylie Street, and assessing a portion of the cost thereof, against the owners of the property abutting thereon.

**Involuntary Liens:**

- 1) Abstract of Judgment filed November 24, 2009, under Harris County Clerk's File No. 20090534997, styled Freddy's Auto Sales, vs. Irene Juarez, in the principal amount of \$1,225.00, plus cost, interest and attorney's fees.

CAUTION: PROTECTION IS AFFORDED ONLY UNDER THE TERMS OF THE PROPOSED TITLE INSURANCE POLICY. TEXAS AMERICAN TITLE COMPANY (AND ITS UNDERWRITERS OF TITLE INSURANCE) ASSUME NO LIABILITY FOR ERRORS OR OMISSIONS IN HIS REPORT OR FOR VERBAL STATEMENTS.

This is a copy of a preliminary report made for the use of Texas American Title Company only, to determine whether a title insurance policy can be issued. If a copy is furnished to the parties to the transaction, it is to facilitate preparation of the necessary instruments, to point out curative requirements, if any, and to show the results of the Company's title search (upon which only the Company may rely.) None of the information contained herein, or the absence of other information, constitutes a representation to any party, other than the Company, as to the status of the title. If a title defect or encumbrance should exist which is not disclosed hereon, the Company should not be liable by reason of furnishing this report or for any verbal statements related thereto. Neither the Company nor its underwriters shall be liable for any title defect unless a title insurance policy is issued by the Company insuring against such defect, and the applicable premium paid therefore. The liability shall then exist only under the terms of the policy (as prescribed by the State Board of Insurance of the State of Texas) and as measured and limited thereby.

**Notice:** Texas American Title Company disclaims any warranties, expressed or implied, concerning this information. This information is solely for the use of the party requesting it and no one else. Texas American Title Company liability for errors and/or omissions in this information shall be limited to the amount paid for this report. By accepting this form the party requesting the information agrees that the disclaimer of warranties, and liability limitation contained in this paragraph is a part of its contract with Texas American Title Company and shall cover all actions whether arising hereunder by statute, in contract, or in tort.

**Texas American Title Company**



---

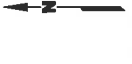
Darrell Stone  
Title Examiner

**EXHIBIT 2**  
**AFFECTED PROPERTY MAP**

- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - 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)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

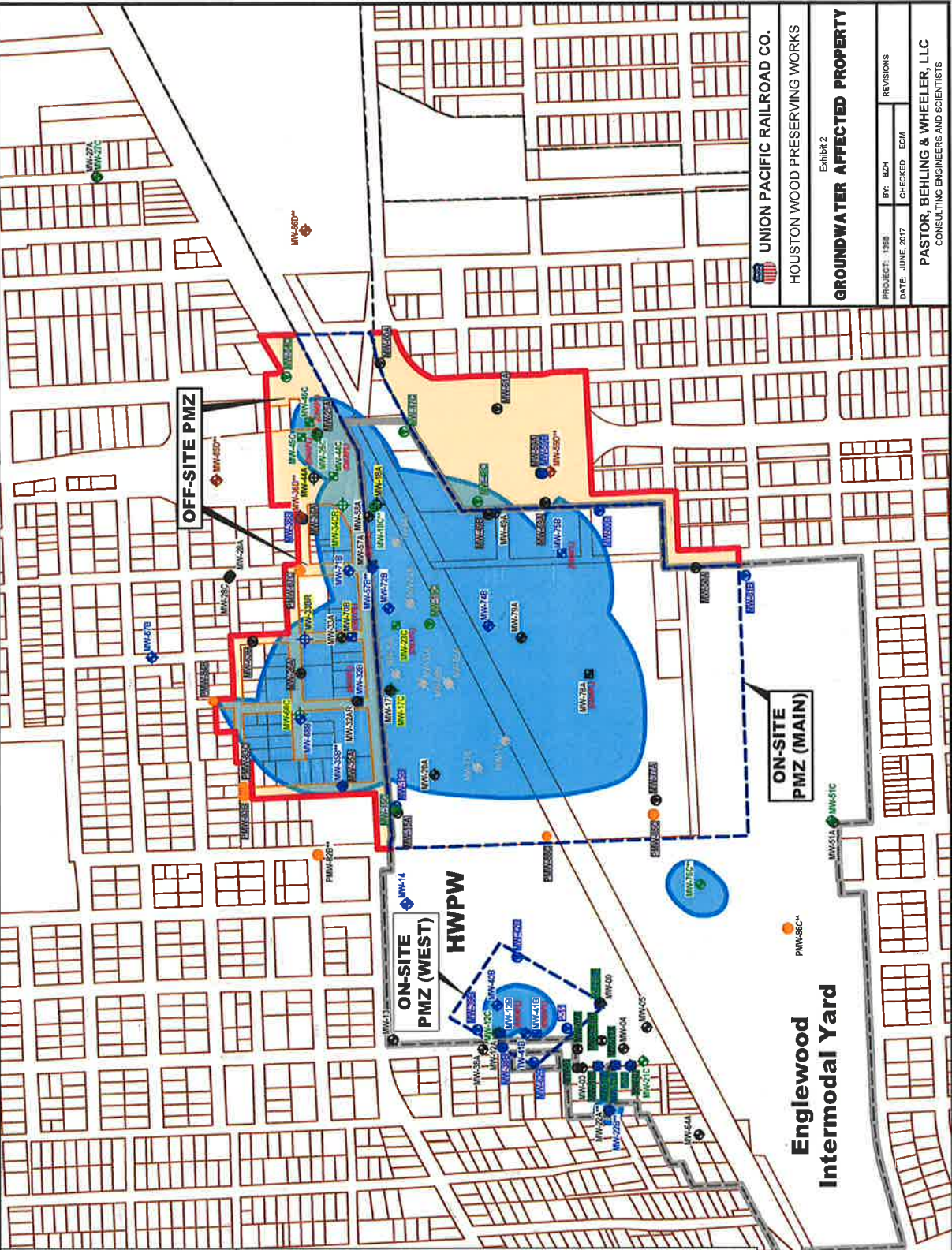
**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Approx. Scale in Feet  
0 200 400

Source: City of Houston Geographic Information & Mapping System  
Aerial, Topographic, and Aerial Imagery (2012)  
Aerial, Topographic, and Aerial Imagery (2012)



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**Englewood Intermodal Yard**

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**





**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-44A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-59A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	

**MAP ID - 44**

**HCAD ID - 0140410000005**





# Restrictive Covenant

STATE OF TEXAS

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.

*The East one half (E1/2) of Lot five Of Fairground Park Addition Subdivision, A subdivision in Harris County, Texas according to the map or plat thereof.*

Portions of the soils and/or groundwater of the Property contain certain 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 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 Ernest I. Delgado heir and devisee of the estate of Susie Delgado with an address of 5304 ½ Wylie, Houston, Texas 77026. 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 4 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 22 day of April, 2015.

[OWNER]

By: Ernest I. Delgado  
Name: Ernest I. Delgado

STATE OF TEXAS  
HARRIS COUNTY

BEFORE ME, on this the 22nd day of April, 2015, personally appeared , Ernest I. Delgado, 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 22nd day of April, 2015.

Paul A. Shanklin  
Notary Public in and for the State of Texas,  
County of Harris

My Commission Expires



Executed this 14<sup>th</sup> day of June, 2017.

**Union Pacific Railroad [RESPONDER]**

By: Tony Love

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 14<sup>th</sup> day of June, 2017 Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation [RESPONDER], 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 in the capacity therein expressed on behalf of said corporation.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this 14<sup>th</sup> day of June, 2017.

David C. Solante



Notary Public in and for the State of Nebraska  
County of \_\_\_\_\_  
My Commission Expires: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS            §  
TRAVIS COUNTY            §

BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, personally appeared \_\_\_\_\_, \_\_\_\_\_, 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.

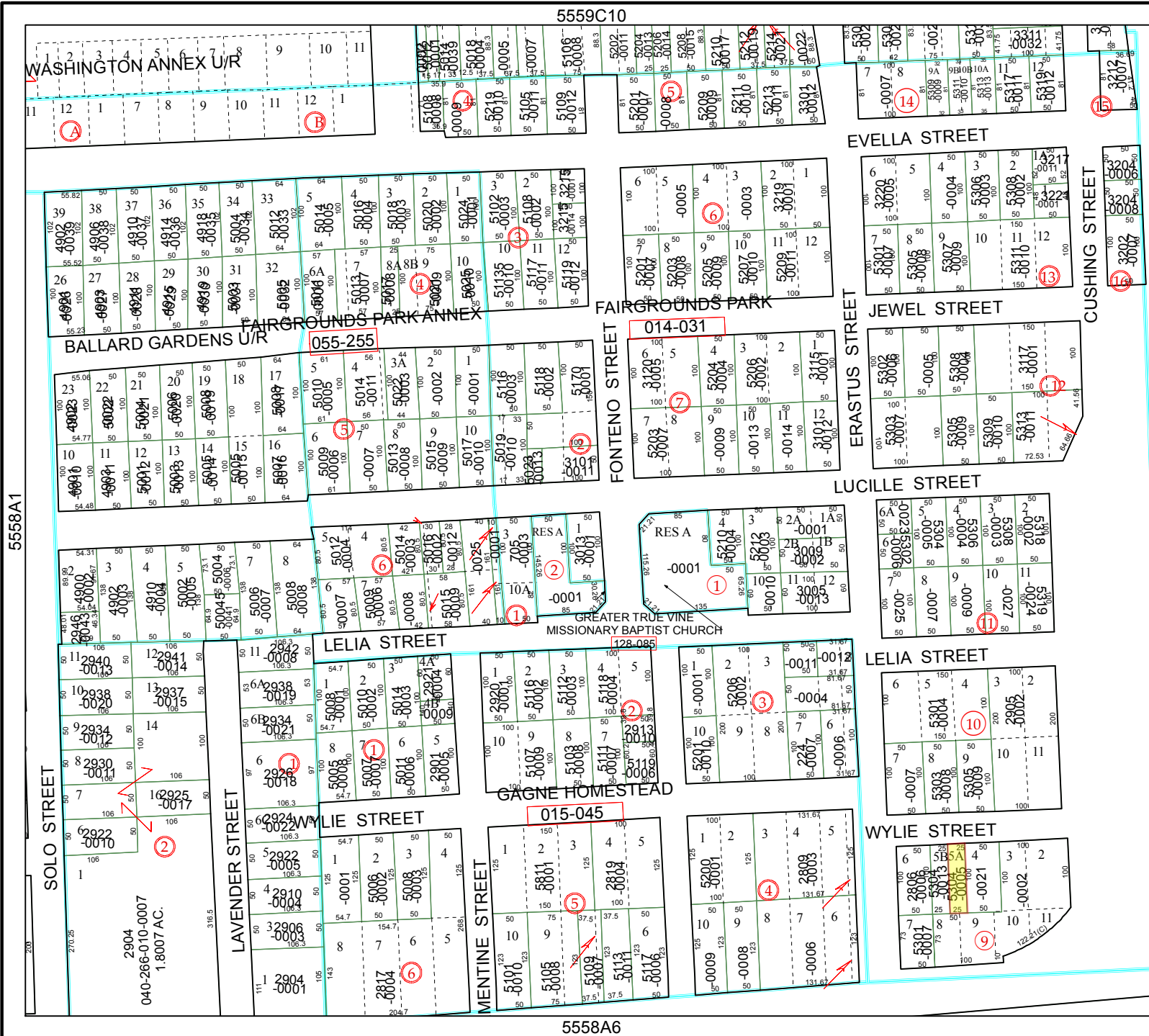
GIVEN UNDER MY HAND AND SEAL OF OFFICE, this \_\_ day of \_\_\_\_\_, 20\_\_.

Notary Public in and for the State of Texas,  
County of Travis  
My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**

# EXHIBIT 1



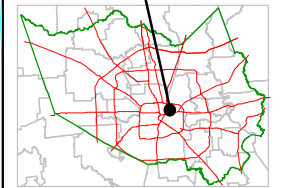
# Harris County Appraisal District



0 100 200  
**PUBLICATION DATE:**  
 1/29/2014

Geospatial or map data maintained by the Harris County Appraisal District is for informational purposes and may not be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents the approximate location of property boundaries.

### MAP LOCATION



# FACET 5558A

1	2	3	4
5	6	7	8
9	10	11	12

5558A1

5558A3

5558A6

**Texas American Title Company  
2000 Bering, Suite 1000  
Houston, Texas 77057  
713-988-9999**

## **Title Report**

GF Number: 7910-12-9211  
Date: December 5, 2012

Texas American Title Company ("Title Company") certifies that a diligent search of the real property records of Texas American Title Company's title plant has been made, as to the herein described property, and as of 8:00 AM on the 3<sup>rd</sup> day of December, 2012, we find the following:

### **Title Vested In:**

Saturnino P. Delgado and wife, Susie Delgado (by Warranty Deed filed for record under Harris County Clerk's File No. C769798)

### **Property Description: (Map ID# 44) (Tax ID# 014-041-000-0005)**

The East One-half (E ½) of Lot Five (5), in Block Nine (9), of Fairground Park, a subdivision in Harris County, Texas according to the map or plat thereof, recorded in Volume 81, Page 461 of the Map Records of Harris County, Texas.

SUBJECT TO: Claims of present occupants; discrepancies in area and boundaries; unpaid bills for Labor or Material in connection with recent repairs or new improvements; Unpaid Taxes; changes in Marital or Corporate Status of owner(s) since date of purchase; Homestead Rights or Claims.

### **Restrictions:**

None of record.

### **Exceptions:**

- a) Subject property is located within the City of Houston or within its extra territorial jurisdiction (within 5 miles of the city limits but outside another municipality) and is subject to the terms, conditions, and provision of City of Houston Ordinance No. 85-1878 and 99-262, pertaining to, among other things the platting and re-platting of real property and to the establishment of building lines. A certified copy of said ordinance was filed of record on August 1, 1991, under Harris County Clerk's File No. N253886.



**Property Liens:**

- 1) Paving Lien Notice filed on January 31, 1977, (topping project no. 303), filed under Harris County Clerk's File No. F029142, (Film Code No. 157-20-1662), executed by City of Houston, showing portions of Wylie Street, and assessing a portion of the cost thereof, against the owners of the property abutting thereon.

**Involuntary Liens:**

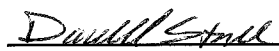
None of record.

CAUTION: PROTECTION IS AFFORDED ONLY UNDER THE TERMS OF THE PROPOSED TITLE INSURANCE POLICY. TEXAS AMERICAN TITLE COMPANY (AND ITS UNDERWRITERS OF TITLE INSURANCE) ASSUME NO LIABILITY FOR ERRORS OR OMISSIONS IN HIS REPORT OR FOR VERBAL STATEMENTS.

This is a copy of a preliminary report made for the use of Texas American Title Company only, to determine whether a title insurance policy can be issued. If a copy is furnished to the parties to the transaction, it is to facilitate preparation of the necessary instruments, to point out curative requirements, if any, and to show the results of the Company's title search (upon which only the Company may rely.) None of the information contained herein, or the absence of other information, constitutes a representation to any party, other than the Company, as to the status of the title. If a title defect or encumbrance should exist which is not disclosed hereon, the Company should not be liable by reason of furnishing this report or for any verbal statements related thereto. Neither the Company nor its underwriters shall be liable for any title defect unless a title insurance policy is issued by the Company insuring against such defect, and the applicable premium paid therefore. The liability shall then exist only under the terms of the policy (as prescribed by the State Board of Insurance of the State of Texas) and as measured and limited thereby.

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**Texas American Title Company**

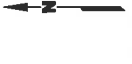
  
\_\_\_\_\_  
Darrell Stone  
Title Examiner

**EXHIBIT 2**  
**AFFECTED PROPERTY MAP**

- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - 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)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

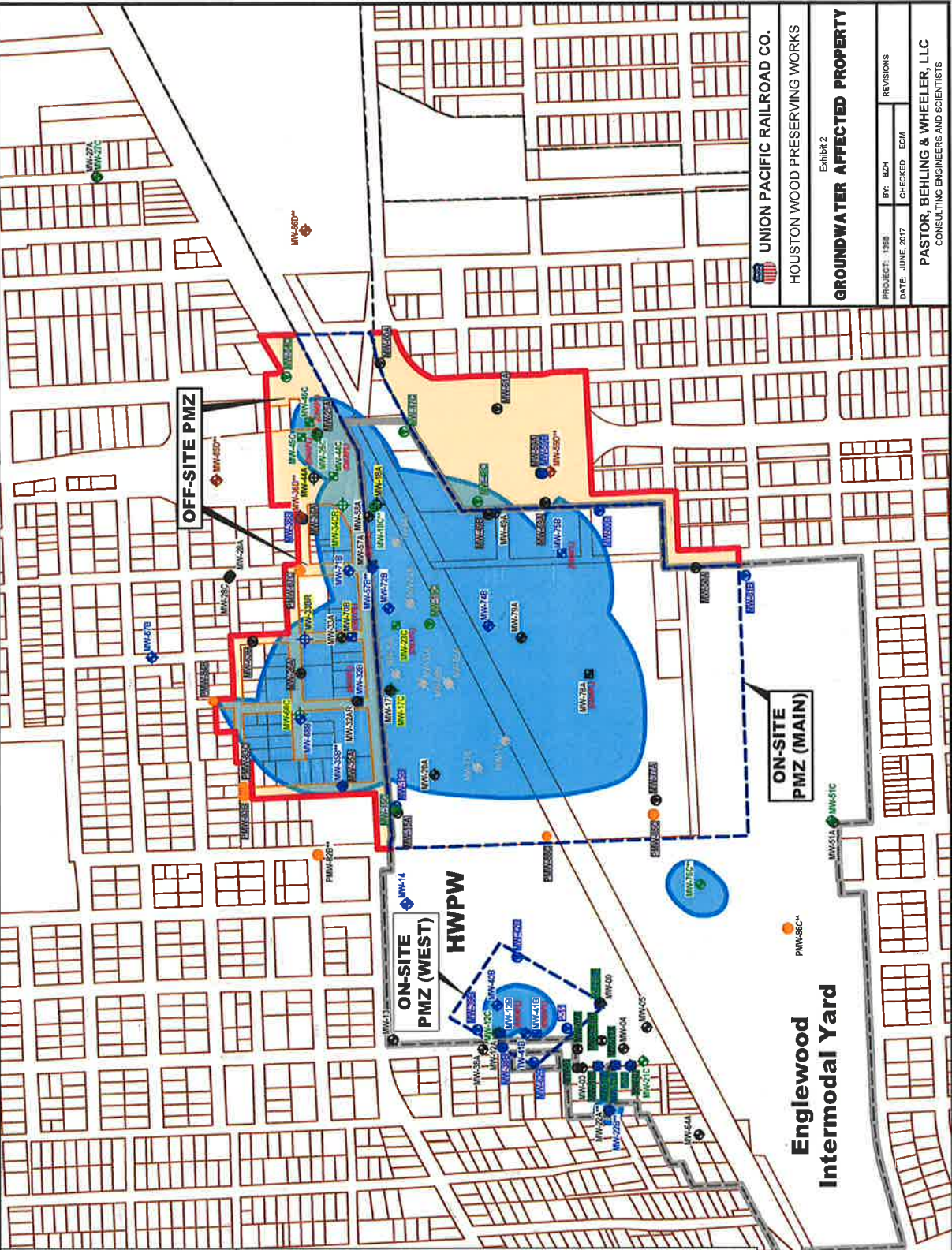
**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Approx. Scale in Feet  
0 200 400

Source: City of Houston Geographic Information & Mapping System  
 Author: Houston-Clayton Area Council (HAC) 2012 Aerial



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**Englewood Intermodal Yard**

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**



**EXPLANATION**

- UPRR Property Boundary
- Property Boundary (GIMS)
- City of Houston-Owned ROW
- Off-Site PMZ
- Off-Site PMZ
- Monitoring Well Location
- Proposed Monitoring Well
- On-Site PMZ
- Off-Site PMZ

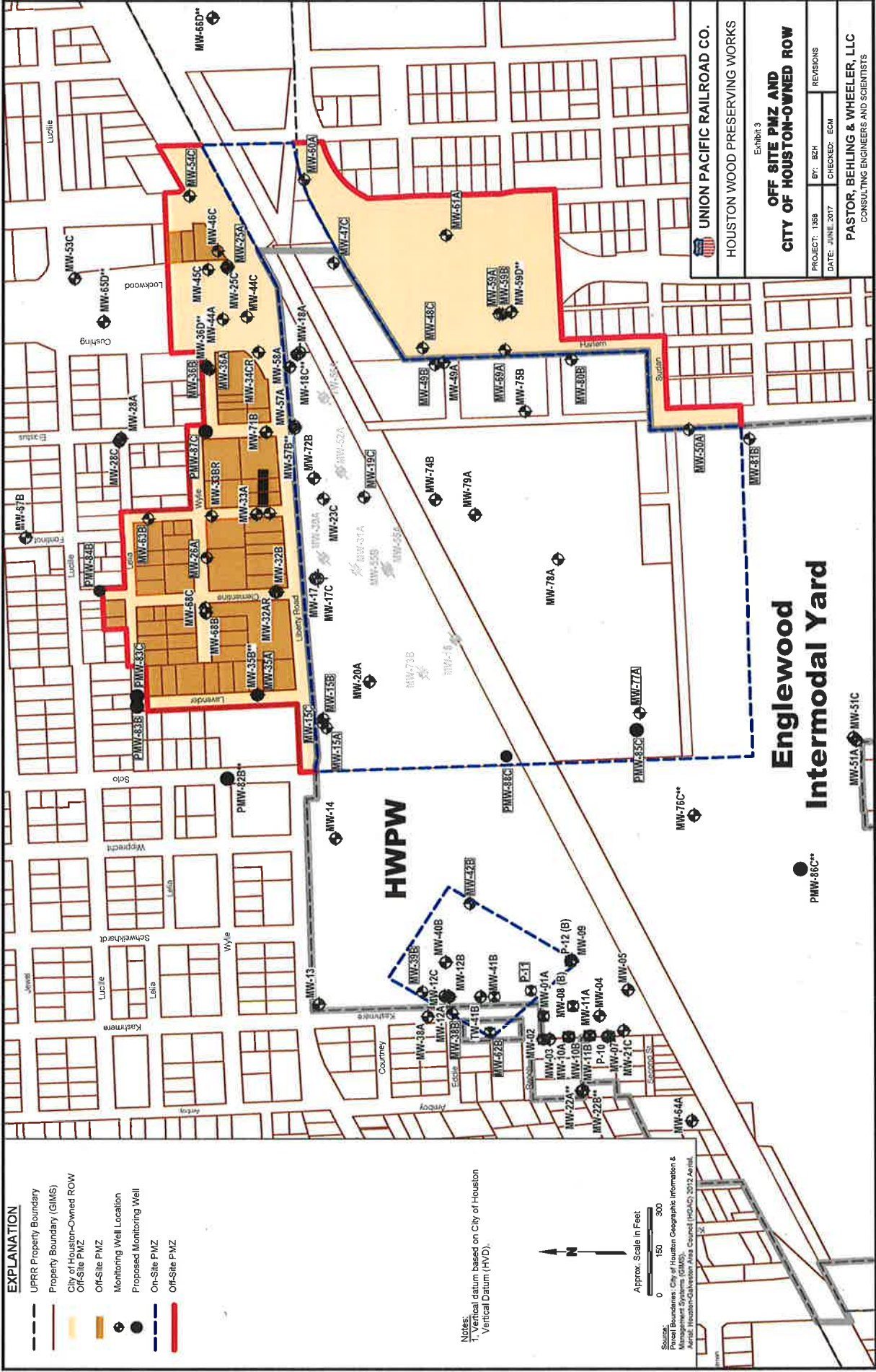
Notes:  
 1. Vertical datum based on City of Houston Vertical Datum (HVD).



Approx. Scale in Feet



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



<b>UNION PACIFIC RAILROAD CO.</b> HOUSTON WOOD PRESERVING WORKS	
Exhibit 3 <b>OFF SITE PMZ AND CITY OF HOUSTON-OWNED ROW</b>	
PROJECT: 158	BY: BZH
DATE: JUNE 2017	CHECKED: ECM
REVISIONS	
<b>PASTOR, BEHLING &amp; WHEELER, LLC</b> CONSULTING ENGINEERS AND SCIENTISTS	

**Englewood Intermodal Yard**

**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
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<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	

**MAP ID - 101**

**HCAD ID - 0140410000021**





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 4 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 21 day of June, 2017.

Audrey M. Brown

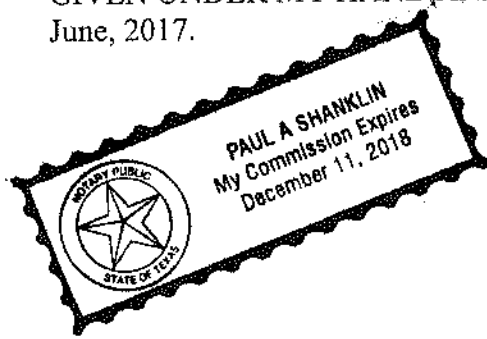
*Audrey M. Brown*  
Title: Owner

STATE OF TEXAS

HARRIS COUNTY

BEFORE ME, on this the \_\_\_\_ day of June, 2017, personally appeared Audrey Brown, 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 21 day of June, 2017.



*[Signature]*  
Notary Public in and for the State of Texas,  
County of Harris

My Commission Expires: \_\_\_\_\_

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Union Pacific Railroad [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 \_\_\_\_\_, 20\_\_\_\_ Mr. Tony Love, Assistant Vice President of Real Estate, a representative of Union Pacific Railroad Company, a Delaware Corporation **[RESPONDER]**, 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 in the capacity therein expressed on behalf of said corporation.

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: \_\_\_\_\_

Accepted as Third Party Beneficiary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

**Texas Commission on Environmental Quality**

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

STATE OF TEXAS            §  
TRAVIS COUNTY            §

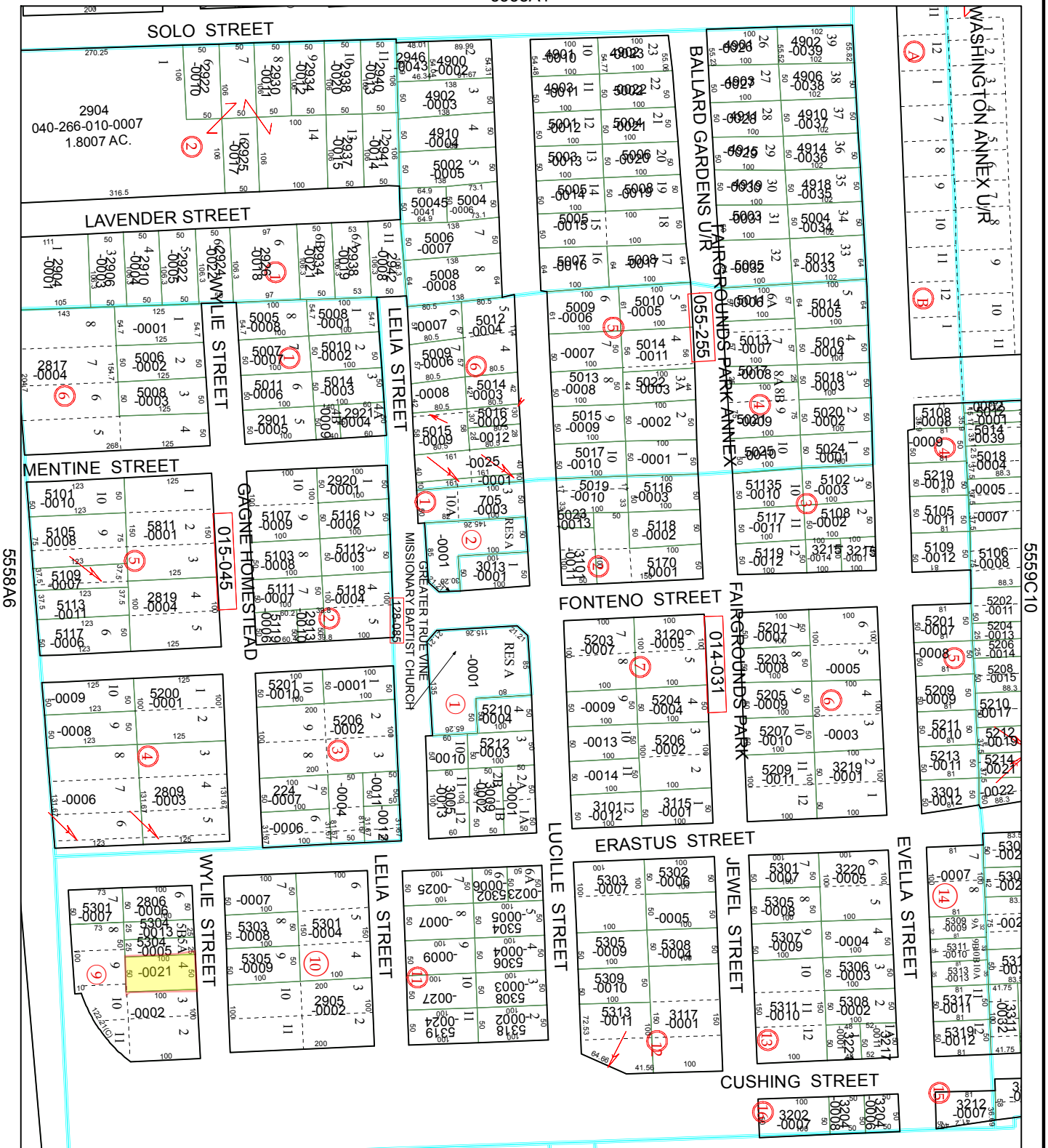
BEFORE ME, on this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, personally appeared \_\_\_\_\_, \_\_\_\_\_, of the Texas Commission on Environmental Quality, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this \_\_ day of \_\_\_\_\_, 20\_\_.

Notary Public in and for the State of Texas,  
County of Travis  
My Commission Expires: \_\_\_\_\_

**EXHIBIT 1**

**PROPERTY LEGAL DESCRIPTION AND TITLE INFORMATION**



5558A6

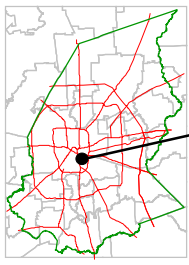
5558C10

# Harris County Appraisal District



Geospatial or map data maintained by the Harris County Appraisal District is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents the approximate location of property boundaries.

**MAP LOCATION**



1	2	3	4
5	6	7	8
9	10	11	12

## FACET 5558A

2904  
040-266-010-0007  
1.8007 AC.

HARRIS COUNTY APPRAISAL DISTRICT  
 REAL PROPERTY ACCOUNT INFORMATION  
 014041000021

Tax Year: 2017



Owner and Property Information							
Owner Name & Mailing Address: BROWN AUDREY M 5308 WYLIE ST HOUSTON TX 77026-5322				Legal Description: LT 4 BLK 9 FAIRGROUNDS PARK Property Address: 5308 WYLIE ST HOUSTON TX 77026			
State Class Code	Land Use Code	Land Area	Total Living Area	Neighborhood	Neighborhood Group	Map Facet	Key Map®
A1 -- Real, Residential, Single-Family	1001 -- Residential Improved	5,000 SF	1,850 SF	7081	1540	5558A	494C

Value Status Information		
Value Status	Notice Date	Shared CAD
Noticed	03/31/2017	No

Exemptions and Jurisdictions						
Exemption Type	Districts	Jurisdictions	Exemption Value	ARB Status	2016 Rate	2017 Rate
Residential Homestead	001	HOUSTON ISD	53,880	Not Certified	1.206700	
	040	HARRIS COUNTY	28,880	Not Certified	0.416560	
	041	HARRIS CO FLOOD CNTRL	28,880	Not Certified	0.028290	
	042	PORT OF HOUSTON AUTHY	28,880	Not Certified	0.013340	
	043	HARRIS CO HOSP DIST	28,880	Not Certified	0.171790	
	044	HARRIS CO EDUC DEPT	28,880	Not Certified	0.005200	
	048	HOU COMMUNITY COLLEGE	14,440	Not Certified	0.100263	
	061	CITY OF HOUSTON	28,880	Not Certified	0.586420	

Texas law prohibits us from displaying residential photographs, sketches, floor plans, or information indicating the age of a property owner on our website. You can inspect this information or get a copy at [HCAD's information center at 13013 NW Freeway.](#)

Valuations					
Value as of January 1, 2016			Value as of January 1, 2017		
	Market	Appraised		Market	Appraised
Land	13,750		Land	16,250	
Improvement	123,959		Improvement	128,151	
<b>Total</b>	<b>137,709</b>	<b>137,709</b>	<b>Total</b>	<b>144,401</b>	<b>144,401</b>

Land												
Market Value Land												
Line	Description	Site Code	Unit Type	Units	Size Factor	Site Factor	Appr O/R Factor	Appr O/R Reason	Total Adj	Unit Price	Adj Unit Price	Value
1	1001 -- Res Improved Table Value	SF5	SF	5,000	1.00	1.00	1.00	--	1.00	3.25	3.25	16,250.00

Building						
Building	Year Built	Type	Style	Quality	Impr Sq Ft	Building Details
1	2007	Residential Single Family	Residential 1 Family	Average	1,850 *	Displayed

\* All HCAD residential building measurements are done from the exterior, with individual measurements rounded to the closest foot. This measurement includes all closet space, hallways, and interior staircases. Attached garages are not included in the square footage of living area, but valued separately. Living area above attached garages is included in the square footage living area of the dwelling. Living area above detached garages is not included in the square footage living area of the dwelling but is valued separately. This method is used on all residential properties in Harris County to ensure the uniformity of square footage of living area measurements district-wide. There can be a reasonable variance between the HCAD square footage and your square footage measurement, especially if your square footage measurement was an interior measurement or an exterior measurement to the inch.

Building Details (1)

Building Data
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Building Areas
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Element	Detail
Foundation Type	Slab
Exterior Wall	Frame / Concrete Blk
Exterior Wall	Brick / Veneer
Heating / AC	Central Heat/AC
Cost and Design	New / Rebuilt
Grade Adjustment	C+
Physical Condition	Average
Cond / Desir / Util	Average
Element	Units
Room: Bedroom	3
Room: Total	6
Room: Full Bath	2

Description	Area
OPEN FRAME PORCH PRI	50
MAS/BRK GARAGE PRI	420
BASE AREA PRI	1,850

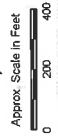


**EXHIBIT 2**  
**AFFECTED PROPERTY MAP**

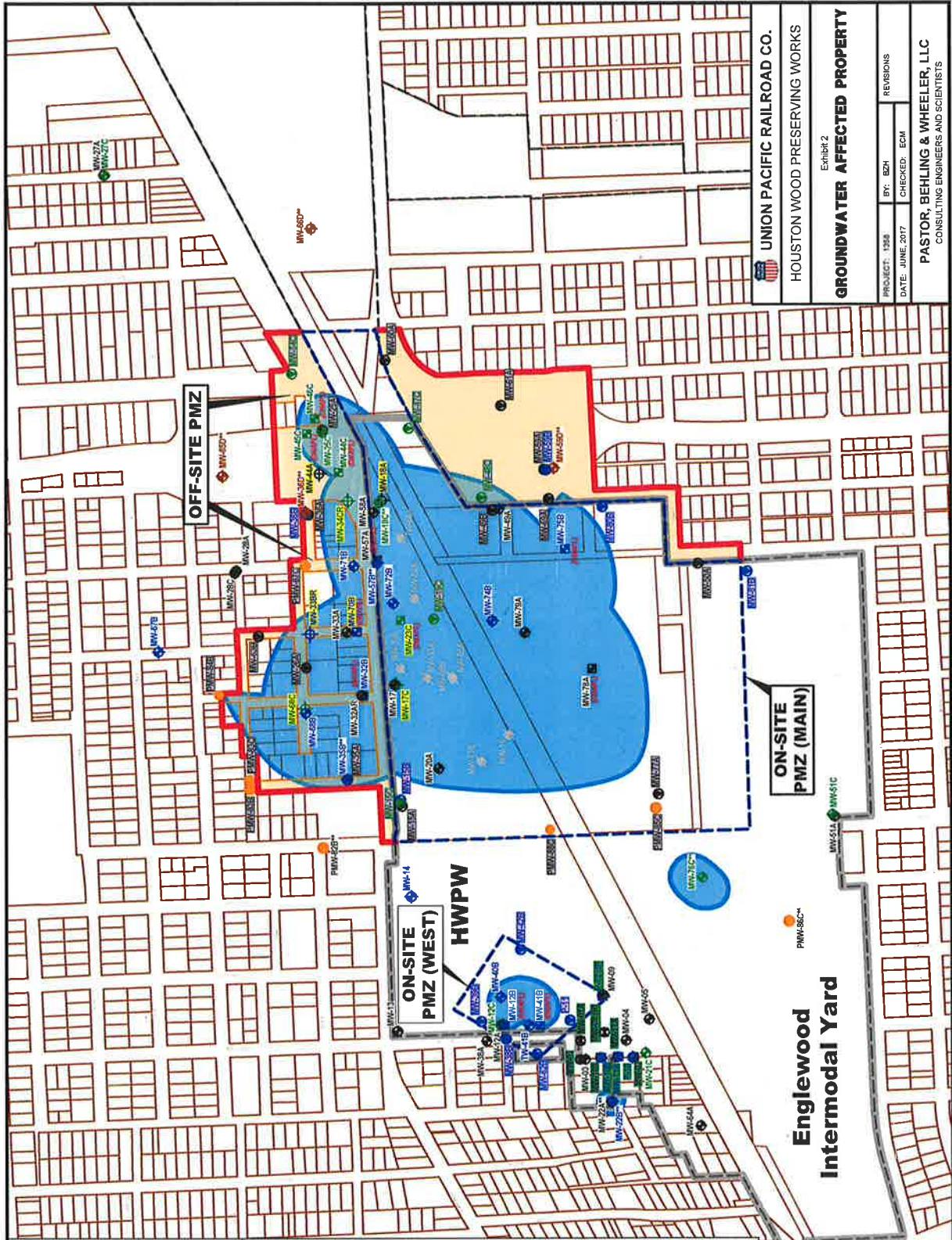
- EXPLANATION**
- UPRR Property Boundary
  - Property Boundary (GISMS)
  - A-TZ Monitoring Well Location
  - B-CZ/B-TZ Monitoring Well Location
  - C-TZ Monitoring Well Location
  - D-TZ Monitoring Well Location
  - Groundwater PCLE Zones (A-TZ, B-CZ/B-TZ and C-TZ)
  - Alternate Groundwater Point of Exposure (POE)
  - Attenuation Monitoring Point (AMP)
  - RCRA Unit No. 1 Point of Compliance (POC) Well
  - Proposed Monitoring Well
  - On-Site PMZ
  - Off-Site PMZ
  - Off-Site PMZ City of Houston ROW

**Notes:**

1. Vertical datum based on City of Houston (POC).
2. DNAPL = dense non aqueous phase liquids detected in monitoring well (July 2014).
3. \*\*, Corrective Action Observation Well.



Source: City of Houston Geographic Information & Mapping System  
 Author: Houston-Geographic Area Council (HGAC) 2012 Aerial



**UNION PACIFIC RAILROAD CO.**

HOUSTON WOOD PRESERVING WORKS

Exhibit 2

**GROUNDWATER AFFECTED PROPERTY**

PROJECT: 1559	BY: BZN	REVISIONS
DATE: JUNE, 2017	CHECKED: ECM	

**PASTOR, BEHLING & WHEELER, LLC**  
CONSULTING ENGINEERS AND SCIENTISTS

**EXHIBIT 3**

**PLUME MANAGEMENT ZONE MAP**



**EXPLANATION**

- UPRR Property Boundary
- Property Boundary (GIMS)
- City of Houston-Owned ROW
- Off-Site PMZ
- Off-Site PMZ
- Monitoring Well Location
- Proposed Monitoring Well
- On-Site PMZ
- Off-Site PMZ

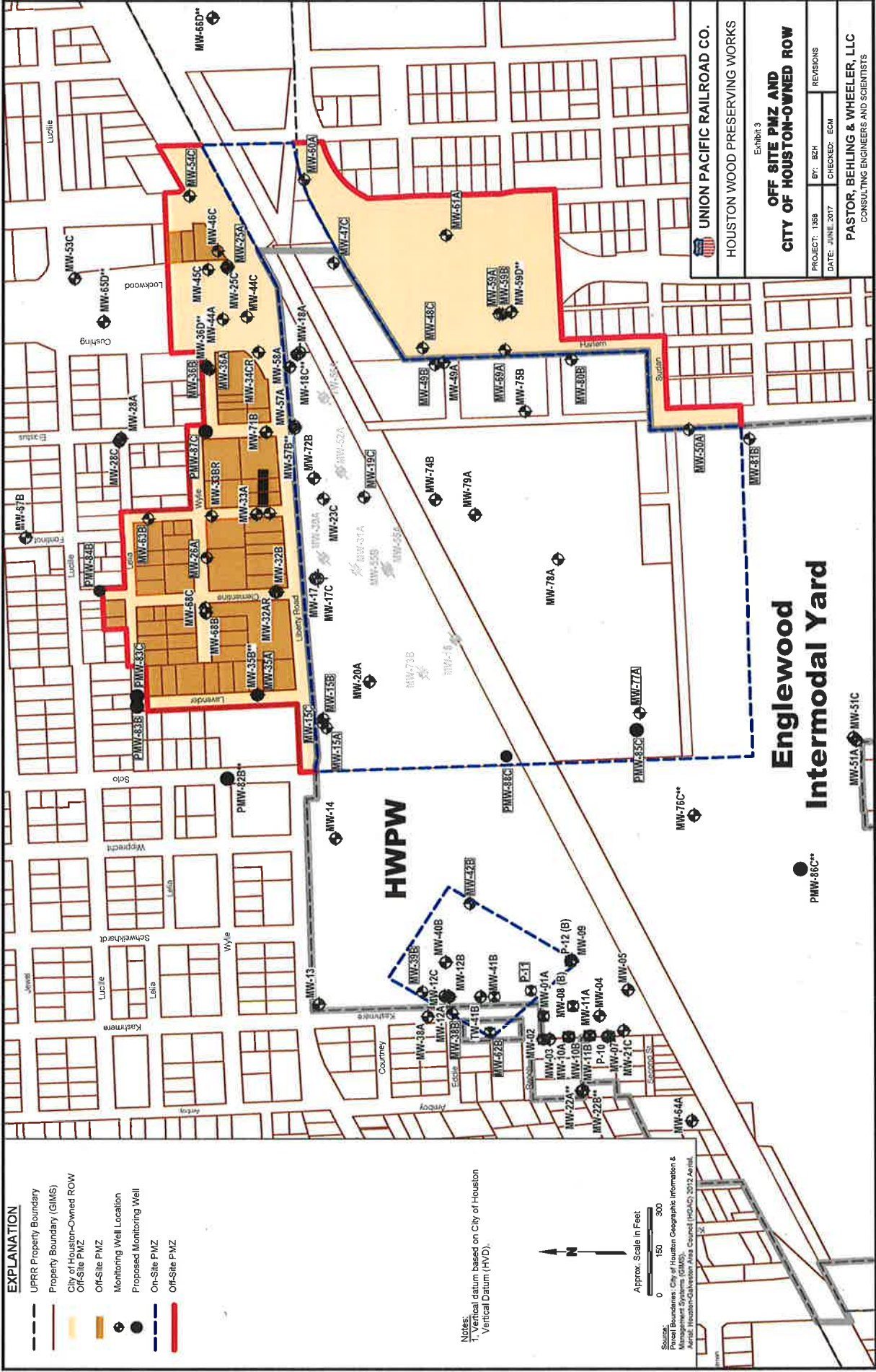
Notes:  
 1. Vertical datum based on City of Houston Vertical Datum (HVD).



Approx. Scale in Feet



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



<b>UNION PACIFIC RAILROAD CO.</b> HOUSTON WOOD PRESERVING WORKS	
Exhibit 3 <b>OFF SITE PMZ AND CITY OF HOUSTON-OWNED ROW</b>	
PROJECT: 158	BY: BZH
DATE: JUNE 2017	CHECKED: EGM
REVISIONS <b>PASTOR, BEHLING &amp; WHEELER, LLC</b> CONSULTING ENGINEERS AND SCIENTISTS	

**Englewood Intermodal Yard**

MW-51A MW-51C

PMW-86C\*\*

MW-76C\*\*

PMW-83C MW-77A

MW-78A

MW-74B

MW-48C

MW-59A MW-59B MW-59D\*\*

MW-51A MW-51B MW-51C

MW-53C MW-65D\*\* MW-66D\*\*

MW-57B

PMW-83B

MW-28C

MW-28A

MW-57B\*\* MW-57C\*\* MW-57D\*\* MW-57E\*\* MW-57F\*\* MW-57G\*\* MW-57H\*\* MW-57I\*\* MW-57J\*\* MW-57K\*\* MW-57L\*\* MW-57M\*\* MW-57N\*\* MW-57O\*\* MW-57P\*\* MW-57Q\*\* MW-57R\*\* MW-57S\*\* MW-57T\*\* MW-57U\*\* MW-57V\*\* MW-57W\*\* MW-57X\*\* MW-57Y\*\* MW-57Z\*\*

MW-13 MW-14 MW-15A MW-15B MW-15C MW-15D MW-15E MW-15F MW-15G MW-15H MW-15I MW-15J MW-15K MW-15L MW-15M MW-15N MW-15O MW-15P MW-15Q MW-15R MW-15S MW-15T MW-15U MW-15V MW-15W MW-15X MW-15Y MW-15Z

MW-17C MW-17D MW-17E MW-17F MW-17G MW-17H MW-17I MW-17J MW-17K MW-17L MW-17M MW-17N MW-17O MW-17P MW-17Q MW-17R MW-17S MW-17T MW-17U MW-17V MW-17W MW-17X MW-17Y MW-17Z

MW-23C MW-23D MW-23E MW-23F MW-23G MW-23H MW-23I MW-23J MW-23K MW-23L MW-23M MW-23N MW-23O MW-23P MW-23Q MW-23R MW-23S MW-23T MW-23U MW-23V MW-23W MW-23X MW-23Y MW-23Z

MW-29A MW-29B MW-29C MW-29D MW-29E MW-29F MW-29G MW-29H MW-29I MW-29J MW-29K MW-29L MW-29M MW-29N MW-29O MW-29P MW-29Q MW-29R MW-29S MW-29T MW-29U MW-29V MW-29W MW-29X MW-29Y MW-29Z

MW-35A MW-35B MW-35C MW-35D MW-35E MW-35F MW-35G MW-35H MW-35I MW-35J MW-35K MW-35L MW-35M MW-35N MW-35O MW-35P MW-35Q MW-35R MW-35S MW-35T MW-35U MW-35V MW-35W MW-35X MW-35Y MW-35Z

MW-41A MW-41B MW-41C MW-41D MW-41E MW-41F MW-41G MW-41H MW-41I MW-41J MW-41K MW-41L MW-41M MW-41N MW-41O MW-41P MW-41Q MW-41R MW-41S MW-41T MW-41U MW-41V MW-41W MW-41X MW-41Y MW-41Z

MW-47A MW-47B MW-47C MW-47D MW-47E MW-47F MW-47G MW-47H MW-47I MW-47J MW-47K MW-47L MW-47M MW-47N MW-47O MW-47P MW-47Q MW-47R MW-47S MW-47T MW-47U MW-47V MW-47W MW-47X MW-47Y MW-47Z

MW-53A MW-53B MW-53C MW-53D MW-53E MW-53F MW-53G MW-53H MW-53I MW-53J MW-53K MW-53L MW-53M MW-53N MW-53O MW-53P MW-53Q MW-53R MW-53S MW-53T MW-53U MW-53V MW-53W MW-53X MW-53Y MW-53Z

MW-59A MW-59B MW-59C MW-59D MW-59E MW-59F MW-59G MW-59H MW-59I MW-59J MW-59K MW-59L MW-59M MW-59N MW-59O MW-59P MW-59Q MW-59R MW-59S MW-59T MW-59U MW-59V MW-59W MW-59X MW-59Y MW-59Z

MW-65A MW-65B MW-65C MW-65D MW-65E MW-65F MW-65G MW-65H MW-65I MW-65J MW-65K MW-65L MW-65M MW-65N MW-65O MW-65P MW-65Q MW-65R MW-65S MW-65T MW-65U MW-65V MW-65W MW-65X MW-65Y MW-65Z

MW-71A MW-71B MW-71C MW-71D MW-71E MW-71F MW-71G MW-71H MW-71I MW-71J MW-71K MW-71L MW-71M MW-71N MW-71O MW-71P MW-71Q MW-71R MW-71S MW-71T MW-71U MW-71V MW-71W MW-71X MW-71Y MW-71Z

MW-77A MW-77B MW-77C MW-77D MW-77E MW-77F MW-77G MW-77H MW-77I MW-77J MW-77K MW-77L MW-77M MW-77N MW-77O MW-77P MW-77Q MW-77R MW-77S MW-77T MW-77U MW-77V MW-77W MW-77X MW-77Y MW-77Z

MW-83A MW-83B MW-83C MW-83D MW-83E MW-83F MW-83G MW-83H MW-83I MW-83J MW-83K MW-83L MW-83M MW-83N MW-83O MW-83P MW-83Q MW-83R MW-83S MW-83T MW-83U MW-83V MW-83W MW-83X MW-83Y MW-83Z

MW-89A MW-89B MW-89C MW-89D MW-89E MW-89F MW-89G MW-89H MW-89I MW-89J MW-89K MW-89L MW-89M MW-89N MW-89O MW-89P MW-89Q MW-89R MW-89S MW-89T MW-89U MW-89V MW-89W MW-89X MW-89Y MW-89Z

MW-95A MW-95B MW-95C MW-95D MW-95E MW-95F MW-95G MW-95H MW-95I MW-95J MW-95K MW-95L MW-95M MW-95N MW-95O MW-95P MW-95Q MW-95R MW-95S MW-95T MW-95U MW-95V MW-95W MW-95X MW-95Y MW-95Z

MW-101A MW-101B MW-101C MW-101D MW-101E MW-101F MW-101G MW-101H MW-101I MW-101J MW-101K MW-101L MW-101M MW-101N MW-101O MW-101P MW-101Q MW-101R MW-101S MW-101T MW-101U MW-101V MW-101W MW-101X MW-101Y MW-101Z

MW-107A MW-107B MW-107C MW-107D MW-107E MW-107F MW-107G MW-107H MW-107I MW-107J MW-107K MW-107L MW-107M MW-107N MW-107O MW-107P MW-107Q MW-107R MW-107S MW-107T MW-107U MW-107V MW-107W MW-107X MW-107Y MW-107Z

MW-113A MW-113B MW-113C MW-113D MW-113E MW-113F MW-113G MW-113H MW-113I MW-113J MW-113K MW-113L MW-113M MW-113N MW-113O MW-113P MW-113Q MW-113R MW-113S MW-113T MW-113U MW-113V MW-113W MW-113X MW-113Y MW-113Z

MW-119A MW-119B MW-119C MW-119D MW-119E MW-119F MW-119G MW-119H MW-119I MW-119J MW-119K MW-119L MW-119M MW-119N MW-119O MW-119P MW-119Q MW-119R MW-119S MW-119T MW-119U MW-119V MW-119W MW-119X MW-119Y MW-119Z

MW-125A MW-125B MW-125C MW-125D MW-125E MW-125F MW-125G MW-125H MW-125I MW-125J MW-125K MW-125L MW-125M MW-125N MW-125O MW-125P MW-125Q MW-125R MW-125S MW-125T MW-125U MW-125V MW-125W MW-125X MW-125Y MW-125Z

MW-131A MW-131B MW-131C MW-131D MW-131E MW-131F MW-131G MW-131H MW-131I MW-131J MW-131K MW-131L MW-131M MW-131N MW-131O MW-131P MW-131Q MW-131R MW-131S MW-131T MW-131U MW-131V MW-131W MW-131X MW-131Y MW-131Z

MW-137A MW-137B MW-137C MW-137D MW-137E MW-137F MW-137G MW-137H MW-137I MW-137J MW-137K MW-137L MW-137M MW-137N MW-137O MW-137P MW-137Q MW-137R MW-137S MW-137T MW-137U MW-137V MW-137W MW-137X MW-137Y MW-137Z

MW-143A MW-143B MW-143C MW-143D MW-143E MW-143F MW-143G MW-143H MW-143I MW-143J MW-143K MW-143L MW-143M MW-143N MW-143O MW-143P MW-143Q MW-143R MW-143S MW-143T MW-143U MW-143V MW-143W MW-143X MW-143Y MW-143Z

MW-149A MW-149B MW-149C MW-149D MW-149E MW-149F MW-149G MW-149H MW-149I MW-149J MW-149K MW-149L MW-149M MW-149N MW-149O MW-149P MW-149Q MW-149R MW-149S MW-149T MW-149U MW-149V MW-149W MW-149X MW-149Y MW-149Z

MW-155A MW-155B MW-155C MW-155D MW-155E MW-155F MW-155G MW-155H MW-155I MW-155J MW-155K MW-155L MW-155M MW-155N MW-155O MW-155P MW-155Q MW-155R MW-155S MW-155T MW-155U MW-155V MW-155W MW-155X MW-155Y MW-155Z

MW-161A MW-161B MW-161C MW-161D MW-161E MW-161F MW-161G MW-161H MW-161I MW-161J MW-161K MW-161L MW-161M MW-161N MW-161O MW-161P MW-161Q MW-161R MW-161S MW-161T MW-161U MW-161V MW-161W MW-161X MW-161Y MW-161Z

MW-167A MW-167B MW-167C MW-167D MW-167E MW-167F MW-167G MW-167H MW-167I MW-167J MW-167K MW-167L MW-167M MW-167N MW-167O MW-167P MW-167Q MW-167R MW-167S MW-167T MW-167U MW-167V MW-167W MW-167X MW-167Y MW-167Z

MW-173A MW-173B MW-173C MW-173D MW-173E MW-173F MW-173G MW-173H MW-173I MW-173J MW-173K MW-173L MW-173M MW-173N MW-173O MW-173P MW-173Q MW-173R MW-173S MW-173T MW-173U MW-173V MW-173W MW-173X MW-173Y MW-173Z

MW-179A MW-179B MW-179C MW-179D MW-179E MW-179F MW-179G MW-179H MW-179I MW-179J MW-179K MW-179L MW-179M MW-179N MW-179O MW-179P MW-179Q MW-179R MW-179S MW-179T MW-179U MW-179V MW-179W MW-179X MW-179Y MW-179Z

MW-185A MW-185B MW-185C MW-185D MW-185E MW-185F MW-185G MW-185H MW-185I MW-185J MW-185K MW-185L MW-185M MW-185N MW-185O MW-185P MW-185Q MW-185R MW-185S MW-185T MW-185U MW-185V MW-185W MW-185X MW-185Y MW-185Z

MW-191A MW-191B MW-191C MW-191D MW-191E MW-191F MW-191G MW-191H MW-191I MW-191J MW-191K MW-191L MW-191M MW-191N MW-191O MW-191P MW-191Q MW-191R MW-191S MW-191T MW-191U MW-191V MW-191W MW-191X MW-191Y MW-191Z

MW-197A MW-197B MW-197C MW-197D MW-197E MW-197F MW-197G MW-197H MW-197I MW-197J MW-197K MW-197L MW-197M MW-197N MW-197O MW-197P MW-197Q MW-197R MW-197S MW-197T MW-197U MW-197V MW-197W MW-197X MW-197Y MW-197Z

MW-203A MW-203B MW-203C MW-203D MW-203E MW-203F MW-203G MW-203H MW-203I MW-203J MW-203K MW-203L MW-203M MW-203N MW-203O MW-203P MW-203Q MW-203R MW-203S MW-203T MW-203U MW-203V MW-203W MW-203X MW-203Y MW-203Z

MW-209A MW-209B MW-209C MW-209D MW-209E MW-209F MW-209G MW-209H MW-209I MW-209J MW-209K MW-209L MW-209M MW-209N MW-209O MW-209P MW-209Q MW-209R MW-209S MW-209T MW-209U MW-209V MW-209W MW-209X MW-209Y MW-209Z

MW-215A MW-215B MW-215C MW-215D MW-215E MW-215F MW-215G MW-215H MW-215I MW-215J MW-215K MW-215L MW-215M MW-215N MW-215O MW-215P MW-215Q MW-215R MW-215S MW-215T MW-215U MW-215V MW-215W MW-215X MW-215Y MW-215Z

MW-221A MW-221B MW-221C MW-221D MW-221E MW-221F MW-221G MW-221H MW-221I MW-221J MW-221K MW-221L MW-221M MW-221N MW-221O MW-221P MW-221Q MW-221R MW-221S MW-221T MW-221U MW-221V MW-221W MW-221X MW-221Y MW-221Z

MW-227A MW-227B MW-227C MW-227D MW-227E MW-227F MW-227G MW-227H MW-227I MW-227J MW-227K MW-227L MW-227M MW-227N MW-227O MW-227P MW-227Q MW-227R MW-227S MW-227T MW-227U MW-227V MW-227W MW-227X MW-227Y MW-227Z

MW-233A MW-233B MW-233C MW-233D MW-233E MW-233F MW-233G MW-233H MW-233I MW-233J MW-233K MW-233L MW-233M MW-233N MW-233O MW-233P MW-233Q MW-233R MW-233S MW-233T MW-233U MW-233V MW-233W MW-233X MW-233Y MW-233Z

MW-239A MW-239B MW-239C MW-239D MW-239E MW-239F MW-239G MW-239H MW-239I MW-239J MW-239K MW-239L MW-239M MW-239N MW-239O MW-239P MW-239Q MW-239R MW-239S MW-239T MW-239U MW-239V MW-239W MW-239X MW-239Y MW-239Z

MW-245A MW-245B MW-245C MW-245D MW-245E MW-245F MW-245G MW-245H MW-245I MW-245J MW-245K MW-245L MW-245M MW-245N MW-245O MW-245P MW-245Q MW-245R MW-245S MW-245T MW-245U MW-245V MW-245W MW-245X MW-245Y MW-245Z

MW-251A MW-251B MW-251C MW-251D MW-251E MW-251F MW-251G MW-251H MW-251I MW-251J MW-251K MW-251L MW-251M MW-251N MW-251O MW-251P MW-251Q MW-251R MW-251S MW-251T MW-251U MW-251V MW-251W MW-251X MW-251Y MW-251Z

MW-257A MW-257B MW-257C MW-257D MW-257E MW-257F MW-257G MW-257H MW-257I MW-257J MW-257K MW-257L MW-257M MW-257N MW-257O MW-257P MW-257Q MW-257R MW-257S MW-257T MW-257U MW-257V MW-257W MW-257X MW-257Y MW-257Z

MW-263A MW-263B MW-263C MW-263D MW-263E MW-263F MW-263G MW-263H MW-263I MW-263J MW-263K MW-263L MW-263M MW-263N MW-263O MW-263P MW-263Q MW-263R MW-263S MW-263T MW-263U MW-263V MW-263W MW-263X MW-263Y MW-263Z

MW-269A MW-269B MW-269C MW-269D MW-269E MW-269F MW-269G MW-269H MW-269I MW-269J MW-269K MW-269L MW-269M MW-269N MW-269O MW-269P MW-269Q MW-269R MW-269S MW-269T MW-269U MW-269V MW-269W MW-269X MW-269Y MW-269Z

MW-275A MW-275B MW-275C MW-275D MW-275E MW-275F MW-275G MW-275H MW-275I MW-275J MW-275K MW-275L MW-275M MW-275N MW-275O MW-275P MW-275Q MW-275R MW-275S MW-275T MW-275U MW-275V MW-275W MW-275X MW-275Y MW-275Z

MW-281A MW-281B MW-281C MW-281D MW-281E MW-281F MW-281G MW-281H MW-281I MW-281J MW-281K MW-281L MW-281M MW-281N MW-281O MW-281P MW-281Q MW-281R MW-281S MW-281T MW-281U MW-281V MW-281W MW-281X MW-281Y MW-281Z

MW-287A MW-287B MW-287C MW-287D MW-287E MW-287F MW-287G MW-287H MW-287I MW-287J MW-287K MW-287L MW-287M MW-287N MW-287O MW-287P MW-287Q MW-287R MW-287S MW-287T MW-287U MW-287V MW-287W MW-287X MW-287Y MW-287Z

MW-293A MW-293B MW-293C MW-293D MW-293E MW-293F MW-293G MW-293H MW-293I MW-293J MW-293K MW-293L MW-293M MW-293N MW-293O MW-293P MW-293Q MW-293R MW-293S MW-293T MW-293U MW-293V MW-293W MW-293X MW-293Y MW-293Z

MW-299A MW-299B MW-299C MW-299D MW-299E MW-299F MW-299G MW-299H MW-299I MW-299J MW-299K MW-299L MW-299M MW-299N MW-299O MW-299P MW-299Q MW-299R MW-299S MW-299T MW-299U MW-299V MW-299W MW-299X MW-299Y MW-299Z

MW-305A MW-305B MW-305C MW-305D MW-305E MW-305F MW-305G MW-305H MW-305I MW-305J MW-305K MW-305L MW-305M MW-305N MW-305O MW-305P MW-305Q MW-305R MW-305S MW-305T MW-305U MW-305V MW-305W MW-305X MW-305Y MW-305Z

MW-311A MW-311B MW-311C MW-311D MW-311E MW-311F MW-311G MW-311H MW-311I MW-311J MW-311K MW-311L MW-311M MW-311N MW-311O MW-311P MW-311Q MW-311R MW-311S MW-311T MW-311U MW-311V MW-311W MW-311X MW-311Y MW-311Z

MW-317A MW-317B MW-317C MW-317D MW-317E MW-317F MW-317G MW-317H MW-317I MW-317J MW-317K MW-317L MW-317M MW-317N MW-317O MW-317P MW-317Q MW-317R MW-317S MW-317T MW-317U MW-317V MW-317W MW-317X MW-317Y MW-317Z

MW-323A MW-323B MW-323C MW-323D MW-323E MW-323F MW-323G MW-323H MW-323I MW-323J MW-323K MW-323L MW-323M MW-323N MW-323O MW-323P MW-323Q MW-323R MW-323S MW-323T MW-323U MW-323V MW-323W MW-323X MW-323Y MW-323Z

MW-329A MW-329B MW-329C MW-329D MW-329E MW-329F MW-329G MW-329H MW-329I MW-329J MW-329K MW-329L MW-329M MW-329N MW-329O MW-329P MW-329Q MW-329R MW-329S MW-329T MW-329U MW-329V MW-329W MW-329X MW-329Y MW-329Z

MW-335A MW-335B MW-335C MW-335D MW-335E MW

**EXHIBIT 4**

**MAINTENANCE/MONITORING REQUIREMENTS**

**EXHIBIT "4"**  
**MAINTENANCE AND MONITORING**

Monitoring wells located near the property in the City of Houston right of way (ROW) listed in the table below will be sampled for chemicals of concern (COCs) (see Table C-1) on a semi-annual basis. At each well, the presence of light and dense non-aqueous phase liquids (LNAPL and DNAPL, respectively) will be measured using a decontaminated oil-water interface probe, or equivalent measuring device. The probe will be lowered into the well until the instrument indicates contact of the probe with the NAPL surface, if present, then the top of the water surface, and to the total depth of the well to evaluate for the presence of DNAPL. The depth to NAPL and water measurements will be referenced to the surveyed reference point at the top of the well casing. Levels will be measured to the nearest 0.01 foot and recorded on the water level measurement form. A peristaltic pump with dedicated tubing will be used to purge groundwater from each monitoring well using micro-purging techniques (anticipated purge rate of 0.1 L/min or less). Purge water will be monitored for specific conductance, pH, temperature, dissolved oxygen, oxidation-reduction potential (Redox), and turbidity. Purging will be continued until the field parameters have stabilized per the sampling plan, after which a groundwater sample will be collected for laboratory analysis. Groundwater purged from monitoring wells will be containerized and removed from the property and stored on the Union Pacific Railroad Company property at 4910 Liberty Road. Laboratory analysis will be performed for the COCs on a standard turnaround basis. Analytical results from the groundwater sampling will be submitted to the TCEQ on an annual basis.

Monitoring wells will be inspected on a semi-annual basis for signs of damage, including well pads, casing, locks, and, protective covers.

**List of Monitoring Wells Located within City of Houston ROW**

<i>MW-25A</i>	<i>MW-32B</i>	<i>MW-28C</i>
<i>MW-26A</i>	<i>MW-33BR</i>	<i>MW-34CR</i>
<i>MW-36A</i>	<i>MW-35B</i>	<i>MW-44C</i>
<i>MW-44A</i>	<i>MW-36B</i>	<i>MW-45C</i>
<i>MW-59A</i>	<i>MW-59B</i>	<i>MW-46C</i>
<i>MW-60A</i>	<i>MW-63B</i>	<i>MW-48C</i>
<i>MW-61A</i>	<i>MW-67B</i>	<i>MW-54C</i>
<i>MW-69A</i>	<i>MW-70B</i>	<i>MW-68C</i>
	<i>PMW-83B (proposed)</i>	<i>PMW-83C (proposed)</i>
	<i>PMW-84B (proposed)</i>	