



December 20, 2019

Project No. 19119232

Ms. Karen F. Scott

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

**RE: RESPONSE TO TCEQ ADDITIONAL COMMENTS LETTER DATED SEPTEMBER 6, 2019
PROPOSED VAPOR INTRUSION ASSESSMENT WORK PLAN
UNION PACIFIC RAILROAD COMPANY – HOUSTON WOOD PRESERVING WORKS
HOUSTON, HARRIS COUNTY, TEXAS
HAZARDOUS WASTE PERMIT/COMPLIANCE PLAN NO: 50343, ISWR NO 31547
EPA IDENTIFICATION NO TXD000820266; RN100674613/CN600131098**

Dear Ms. Scott:

Golder Associates Inc. (Golder), on behalf of Union Pacific Railroad Company (UPRR), provides this letter as a partial response to the Texas Commission on Environmental Quality (TCEQ) letter dated September 6, 2019 providing comments on UPRR's July 10, 2019 Response to 4th Technical Notice of Deficiency (TNOD) Letter for the UPRR Houston Wood Preserving Works Site (the Site). Golder prepared this response after discussions with the TCEQ at a meeting held on December 19, 2019 (referred hereafter as the TCEQ December meeting). The TCEQ December meeting was held to discuss the proposed vapor intrusion (VI) assessment activities detailed in the UPRR comment response letter (responses to Comment Nos 5a – 5d) dated October 23, 2019 and to agree on a scope of work for the VI assessment activities. Detailed below is the proposed work plan for conducting the VI assessment in certain locations adjacent to the Site to conservatively evaluate the VI pathway in the Site vicinity based on the procedures agreed to during the TCEQ December meeting.

Vapor Intrusion Investigation Procedures

Golder proposes to install 22 shallow, single-depth soil gas probes at multiple off-Site locations within the City of Houston right-of-way (ROW) using soil gas implants installed via hand auger methodology. The proposed soil gas probes are spaced roughly 75 feet apart to allow for a detailed VI assessment along Liberty Road between Lavender Road and Cushing Road. This section of Liberty Road was selected for the VI assessment since the historical operations at the Site were located on the south side of Liberty Road in the same general area and is immediately adjacent to the residential neighborhood located north of Liberty Road. Proposed locations are shown on Figure 1.

Prior to installing the soil gas probes, Golder will obtain the required permits from the City of Houston to install the soil gas probes within the City of Houston ROW. The proposed boring locations will be delineated with white paint

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for underground utility clearance. Utility notifications through the Texas 811 Call Before You Dig (CBUD) will be conducted a minimum of 72 hours prior to initiating the investigation activities. Additionally, a private utility locator using ground penetrating radar (GPR) will attempt to locate subsurface utilities within the investigation area. In the event there is a conflict with a proposed location and a located underground utility, the proposed location will be moved to a location cleared of utilities.

Soil Sample Collection and Analysis

Soil gas probe locations are proposed to be installed through the sidewalk within the City of Houston ROW by initially coring the sidewalk to allow access to the underlying soil. Golder will contract with a Texas licensed driller to conduct manual drilling (i.e., hand auger) methods to perform the coring and advance the soil borings to the desired depths. Hand auger methods were selected due to shallow overall depth of the borings and health and safety (H&S) concerns associated with the potential presence of underground utilities within the City ROW. Golder's field staff will log soils from the borings to the extent practical to confirm the lithology surrounding each probe. Soil stratigraphy will be logged using the Unified Soil Classification System [UCSC] Standard Practices for Soil Description. Soil from each logging location will be placed in a re-sealable plastic bag, and field screened for headspace organic vapor concentrations using a photoionization detector (PID) with 10.6 electrovolt (eV). Results of headspace vapor testing will be included on the soil boring logs.

Soil samples will be collected for analytical testing at the following depths to evaluate the thickness of unimpacted and biologically active soil:

- Immediately below the sidewalk, roughly 0.5 to 1.0 feet (ft) below ground surface (bgs); and
- 5 to 6 ft bgs.

Based on the PID readings in a soil boring, the sample depths may be modified. The soil sample intervals listed above will be collected using a slide-hammer or similar device to drive a sample tube into the sample interval, with a sample collected from the sample tube/liner. To evaluate the vertical separation distance as outlined in EPA's 2015 *Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites* (EPA, 2015a), soil samples will be collected in the field and analyzed for the following chemicals of concern (COCs):

- Benzene, ethylbenzene, xylenes by US EPA Method 8260 (sampled using EPA Method 5035),
- Naphthalene by US EPA Method 8270, and
- Soil moisture by Method ASTM D2216.

These COCs were selected based on historical groundwater data from off-Site wells completed in the A-Transmissive Zone (A-TZ) where there had been at least one detection of a concentration above the conservative EPA-calculated vapor intrusion screening levels (VISLs). Soil samples will be placed in laboratory-supplied containers, preserved as appropriate, and immediately placed on ice. Chain-of-custody procedures will be maintained from the field through the reporting of laboratory results. Soil samples will be sent to ALS Laboratory in Houston, Texas for analysis.

Soil removed from the boreholes will be containerized and consolidated on the Site with other investigation derived wastes being generated during this phase of the investigation. Hand auger equipment will be decontaminated between holes. Decontamination will be done before and after the start of each soil gas probe installation using a non-phosphate cleaner or detergent and deionized or distilled water. The hand auger will be

washed and scrubbed with soapy water and finally rinsed with deionized or distilled water. Soil cuttings and decontamination water will be containerized in 55-gallon Department of Transportation (DOT)-rated drums for temporary storage on Site. UPRR's licensed waste contractor will sample and characterize the waste and coordinate final pick-up and delivery to an authorized waste disposal facility.

Soil Gas Probe Installation

Soil gas implants will be made of fritted plastic, ceramic, or metal and attached to small diameter sample tubing using secure, airtight fittings (press on or compression fittings). Each soil boring will be advanced to approximately 6 ft bgs. The soil gas implant will be lowered into the borehole to a depth approximately 6 inches above the total depth of the boring (approximately 5.5 ft bgs). Coarse sand will be added to the borehole until the implant is covered by approximately 6 inches of sand. Fine granular bentonite will be placed about one foot thick over the sand pack and then hydrated with a small amount of distilled water. The remainder of the borehole annulus will be filled with granular bentonite (hydrated) to the bottom of the concrete sidewalk (assumed to be about 4-6 inches below the sidewalk surface). Traffic-rated probe vaults (i.e., boxes) will be installed within the concrete sidewalk to protect the soil gas probes and allow for future sampling. A piece of tape will be attached to the sample tubing indicating the sample location ID and implant depth, and the tubing trimmed and sealed. Proposed construction details of the soil gas probes are shown on Figure 2.

Soil Gas Probe Sampling and Analysis

Following installation, soil gas implants will be allowed to equilibrate for a minimum of 24 hours prior to sampling. Golder personnel will conduct leak testing prior to sample collection by placing a shroud over the soil gas sample point and introducing helium into the shroud with a goal of achieving at least a 30% helium concentration in air within the shroud around the sample point. A portable helium meter will be attached to the sample point tubing to check for leaks around the sample point. If a helium concentration greater than 10% of the shroud concentration is detected the sample point may need to be re-sealed or reinstalled.

One-liter Summa canisters will be used for collection of soil gas samples. Each summa canister will be equipped with a flow regulator to provide a sample collection flow rate of approximately 200 ml/minute. Summa canisters will be individually certified clean by the laboratory prior to use. Prior to use, the serial number and/or laboratory ID number of each canister will be recorded, the vacuum measured and recorded, and the associated flow regulator serial number recorded. The sampling process will follow these steps:

- Assemble the sample train at the sample point, including attachment of the Summa canister and connection to the sample tubing;
- Isolate the sample train and induce a vacuum, monitor the vacuum to check for leaks;
- Place the leak test shroud over sample point and introduce helium gas into the shroud;
- Using a gas-tight syringe attached to the sample tubing, withdraw three purge volumes from the sample point and verify that vapor can be drawn from the point (may not be possible in tight soils) and to verify no water has infiltrated the sample point;
- Attach the sample line to the intake port of the helium meter to measure the helium concentration in the sample point and assess the potential for leaks around the sample point;
- If there are no apparent leaks at the sample point, proceed with collection of the soil gas sample;
- Slowly open the valve on the Summa canister and monitor the vacuum in the system to ensure sample collection is progressing appropriately;

- When the vacuum in the sample train approaches zero the sampling is complete, close the valve on the Summa canister;
- Disconnect the Summa canister from the sample tubing and cap the sample port with the provided fitting; and
- Following sampling, disconnect the sample train from the sample tubing and cap the tubing.

Summa canisters will be labeled using the tags provided by the laboratory. Summa canister information, flow regulator information, and sample collection information will all be recorded on the chain-of-custody and submitted with the samples to the laboratory. Soil gas samples will be analyzed by US EPA Method TO-15 for benzene, ethylbenzene, xylenes, and naphthalene.

One soil gas sample will be collected from each soil gas probe plus the following quality control/quality assurance (QA/QC) samples:

- Field Duplicates: one per 10 samples (3 samples for the 22 locations), and
- Field Blank: An ambient air sample will be collected once per day during sampling activities to assess background conditions.

Analytical data from the soil and soil gas samples will be reviewed for adherence to established QA/QC criteria, and Data Usability Summaries (DUSs) will be prepared to evaluate the quality of the laboratory analytical data and present any deviations from the established QA/QC criteria.

Data Evaluation

Analytical data for the soil samples collected from each soil gas boring will be compared to the lesser value between the Texas Risk Reduction Program (TRRP) Residential (30 acre) $TotSoil_{Comb}$ Protective Concentration Level (PCL) and the $^{GW}Soil_{ing}$ PCL (Tier 1 or 2) for surface soils to evaluate for potential releases within the study area. Given that previous soil sampling activities on the north side of Liberty Road have not indicated concentrations of Site-related COCs in the surface soils above PCLs (details provided in the Affected Property Assessment Report (APAR) Addendum, (PBW, 2010)), we do not anticipate encountering COC concentrations above PCLs in the proposed soil borings. However, other source areas not related to the Site could be present in the area (i.e., former gas station at Liberty Road and Fontinot Street).

Soil gas analytical results will be compared to the TRRP Residential Risk-Based Exposure Limits (RBELs) for inhalation ($^{Air}RBEL_{inh}$) with an attenuation factor of 0.03 (US EPA, 2015b) for soil gas. The inhalation RBELs apply to sites under TRRP and are considered protective concentrations for a COC in air at the point of exposure (POE) for human inhalation. The purpose of comparing the soil gas data to the RBEL with the inclusion of an attenuation factor is in recognition that the soil gas sample does not represent an indoor air sample (i.e. POE sample) and that COC attenuation through multiple processes (e.g., dispersion, biodegradation, etc.) would be anticipated as vapors were to move from the sample depth within the vadose zone to an indoor air receptor. The $^{Air}RBEL_{inh}$ RBELs with the attenuation factor for each COC to be evaluated are summarized on Table 1 based on the TRRP PCL Tables issued November 8, 2019.

Schedule and Reporting

Upon the TCEQ's concurrence with the scope of work detailed in this work plan, Golder will begin implementing the field activities associated with the vapor intrusion assessment. The field work schedule will be affected by multiple factors including, but not limited to, obtaining permits in a timely manner from the City of Houston,

availability of equipment from vendors and subcontractors, and weather conditions. We anticipate beginning the field activities either in late January or February 2020 and project that the field activities will take approximately two weeks to complete.

Following review of the soil gas sample analytical results, Golder will, on behalf of UPRR, prepare a letter report summarizing the findings of the VI assessment. We anticipate having the VI assessment summary ready for submittal to the TCEQ within three weeks of receiving the final laboratory analytical results and DUS. The findings will also be included in the Revised Response Action Plan (RAP).

Please feel free to give me or Kevin Peterburs of UPRR at 414-267-4164 a call if you have any questions or comments.

Sincerely,

Golder Associates Inc.



Tim Nickels
Senior Consultant



Eric C. Matzner, P.G.
Principal / Practice Leader



CC: Maureen Hatfield, TCEQ Corrective Action

Attachments: Table 1 – TRRP Residential Risk-Based Exposure Limits (RBELs) and Target Soil Gas Assessment Levels
Figure 1 – Proposed Soil Gas Sampling Locations
Figure 2 – Soil Gas Probe Diagram

References:

- Pastor, Behling & Wheeler, LLC. (PBW), 2010. *Affected Property Assessment Report (APAR) Addendum, Houston Wood Preserving Works*, October.
US EPA, 2015a. *Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites* (EPA 510-R-15-001), June
US EPA, 2105b. *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (OSWER Publication 9200.2-154), June

[https://golderassociates.sharepoint.com/sites/116841/project files/6 deliverables/rap/rap revision 5/houston tx - wood preserving works - vi soil gas assessment letter 20191220.docx](https://golderassociates.sharepoint.com/sites/116841/project%20files/6%20deliverables/rap/rap%20revision%205/houston%20tx%20-%20wood%20preserving%20works%20-%20vi%20soil%20gas%20assessment%20letter%2020191220.docx)

TABLE

Table 1

TRRP Residential Risk-Based Exposure Limits (RBELs) and Target Soil Gas Assessment Levels

Chemical of Concern	^{Air} RBEL _{Inh} (ug/m ³)	Target Soil Gas Assessment Level (ug/m ³)
Benzene	11	367
Ethylbenzene	2000*	66,667
Xylenes	640*	21,333
Naphthalene	3.1 *	103

Notes:

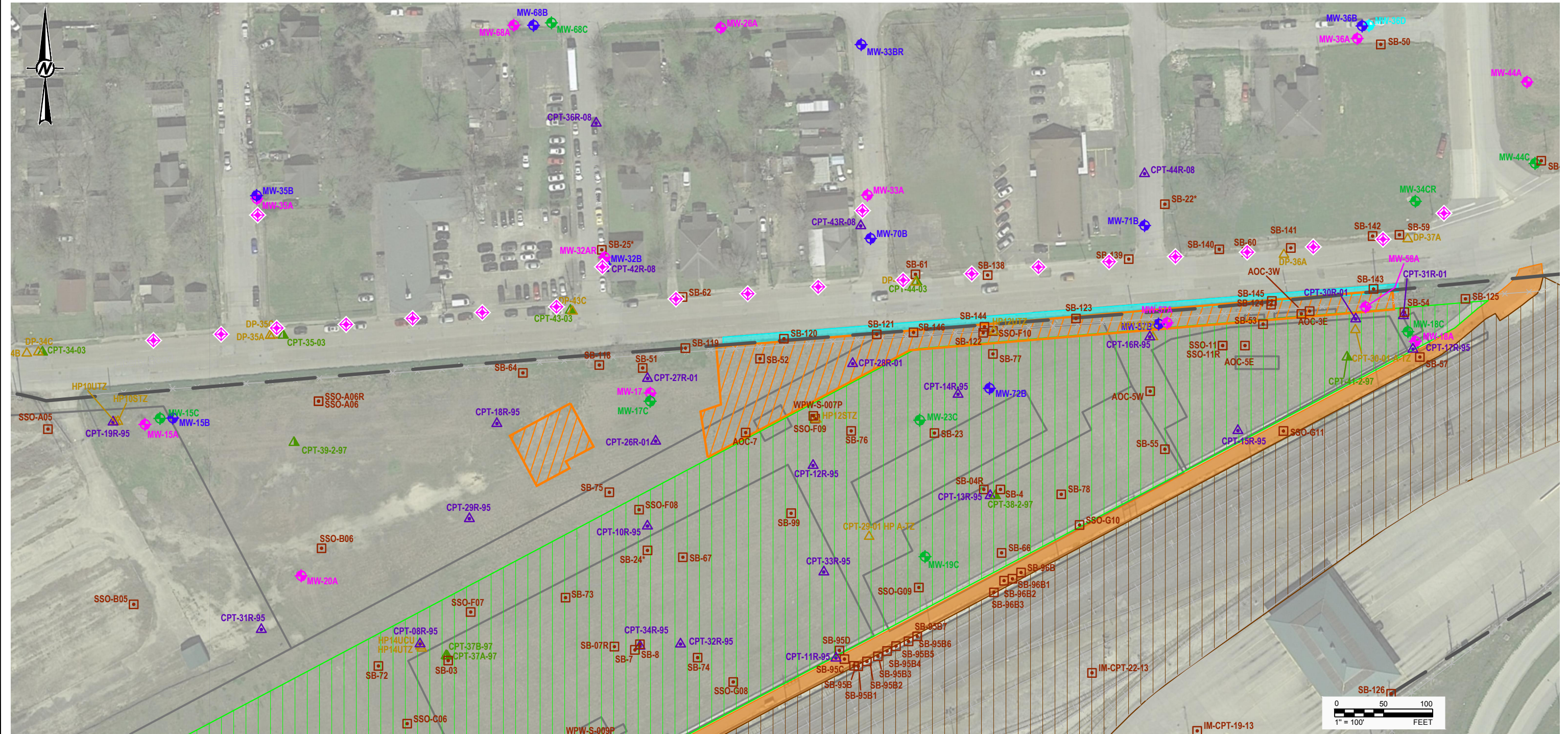
^{Air}RBEL_{Inh} values from Table 9 of TRRP PCL Tables last revised November 8, 2019

*Only non-carcinogenic values available

Target soil gas assessment levels calculated using soil gas attenuation factor of 0.03 (EPA, 2015b)

FIGURES

Path: \\uswest\erand\at\Projects - Round Rock\2019\19119232 - HWPW\2019\9-Sep\1 - Proposed Soil Gas Sampling Locations.dwg | File Name: FIG 1 - Proposed Soil Gas Sampling Locations.dwg | Last Edited By: addendum | Date: 2019-12-19 Time: 2:27:58 PM | Printed By: addendum | Date: 2019-12-19 Time: 2:28:58 PM



- LEGEND**
- UPRR PROPERTY BOUNDARY
 - x-x- FENCE
 - +—+— RAILROAD
 - ◆ A-TZ MONITORING WELL LOCATION
 - ◆ B-CZ/B-TZ MONITORING WELL LOCATION
 - ◆ C-TZ MONITORING WELL LOCATION
 - ◆ D-TZ MONITORING WELL LOCATION
 - △ CPT WITH ROST LOCATION
 - △ CPT LOCATION
 - △ HYDROPUNCH SAMPLE LOCATION

- SOIL BORING LOCATION
- ▨ SOIL CAP AREA (20016)
- ▨ ASPHALT CAP AREA
- ▨ CONCRETE SIDEWALK CAP AREA
- ▨ RAILROAD CAP AREA
- ▨ SURFACE SOIL EXCAVATION AREA (2016)
- ◆ PROPOSED SOIL GAS AND SURFACE SOIL SAMPLE LOCATION

NOTE(S)
 1. * SOIL ANALYTICAL DATA REJECTED BY VALIDATOR.

REFERENCE(S)
 BASE MAP TAKEN FROM ERM-SOUTHWEST, INC APAR ADDENDUM, FIG 3-1, DATED JUNE 2004.
 AERIAL: GOOGLE EARTH, IMAGERY DATED 2/23/19.

CLIENT
 UNION PACIFIC RAILROAD CO.

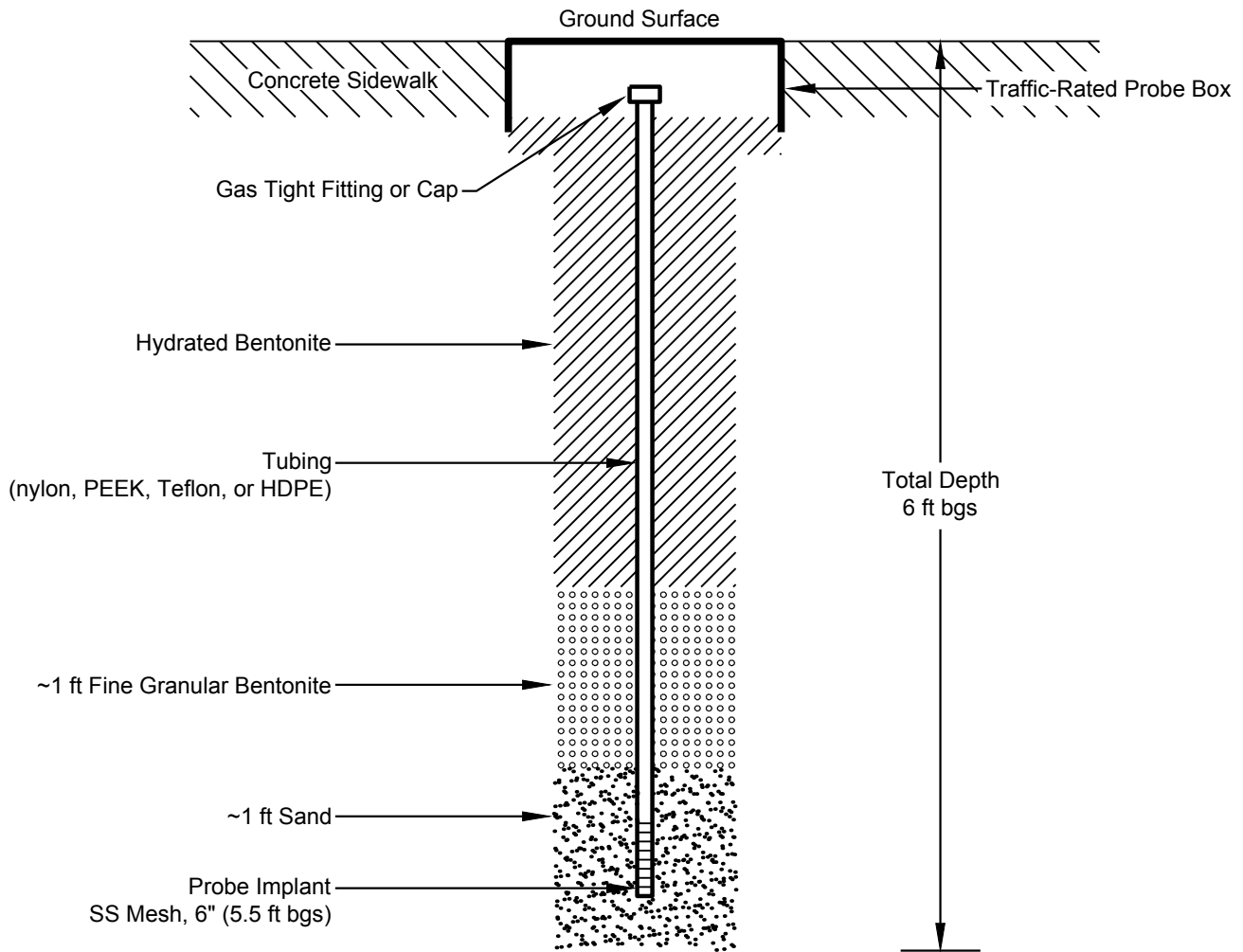
PROJECT
 HOUSTON WOOD PRESERVING WORKS

TITLE
PROPOSED SOIL GAS & SURFACE SOIL SAMPLING LOCATIONS

CONSULTANT	YYYY-MM-DD	2019-12-19
DESIGNED	AJD	
PREPARED	AJD	
REVIEWED	MH	
APPROVED	ECM	

PROJECT NO. 19119232 REV. 0 FIGURE 1

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PROJECT
HOUSTON WOOD PRESERVING WORKS

TITLE
SOIL GAS PROBE CONSTRUCTION DIAGRAM

CONSULTANT	YYYY-MM-DD	2019-12-20
	DESIGNED	AJD
	PREPARED	AJD
	REVIEWED	ECM
	APPROVED	ECM



PROJECT NO.
19119232

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FIGURE
2