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August 17, 2021

Laurie Gharis,
Chief Clerk, MC 105
Texas Commission on Environmental Quality
PO Box 13087
Austin TX 78711-3087

Re: Fourth Set of Public Comments, Request for a Second Public Meeting and Request for a Contested Case Hearing Submitted on Behalf of 5th Ward Impact and Community Action (“Impact”) and Anna Ortiz Regarding Draft Renewal Permit/Compliance Plan 50343/ISWR No. 31547, Authorizing Renewal of Hazardous Waste Permit.

Lone Star Legal Aid (“LSLA”) submits this fourth round of comments on behalf of its clients, 5th Ward Impact and Community Action (“Impact”) Anna Ortiz (collectively, “Commenters”), regarding Union Pacific Railroad Company’s Draft Renewal/Compliance Plan 50343/ISWR No. 31547 (“the Draft Permit”). The Union Pacific Railroad Company (“UPRR”) has applied to the Texas Commission on Environmental Quality (“TCEQ”) for a permit renewal with a major amendment to authorize the continuation of terms and conditions of the Permit and to submit the Response Action Plan (“RAP”) to address the facility-wide soil and groundwater contamination. Union Pacific owns the Houston Wood Preserving Works Facility (“the Site”) located at 4910 Liberty Road, Houston, Harris County, Texas 77026.

I. Request for Contested Case Hearing and Second Public Meeting

Both Impact and Mrs. Ortiz request that the TCEQ refer the matter to the State Office of Administrative Hearings (“SOAH”) for a Contested Case Hearing (“CCH”). Both Impact and Mrs. Ortiz request that they be designated as affected persons in that same CCH proceeding.

LSLA has previously submitted comments on behalf of Commenters on December 11, 2018 (“First Set of Public Comments”), on January 29, 2021 (“Second Set of Public Comments”) where multiple technical deficiencies with the permit materials were signaled for the TCEQ’s consideration. Additionally, Commenters submitted a Request for a Second Public Meeting and Extension to the Comment Period (“Request for Second Public Meeting” or “Third Set of Public Comments”) on June 6, 2021. Commenters’ First through Third Sets of Public Comments are hereinafter referred to as the “Prior Comments.”

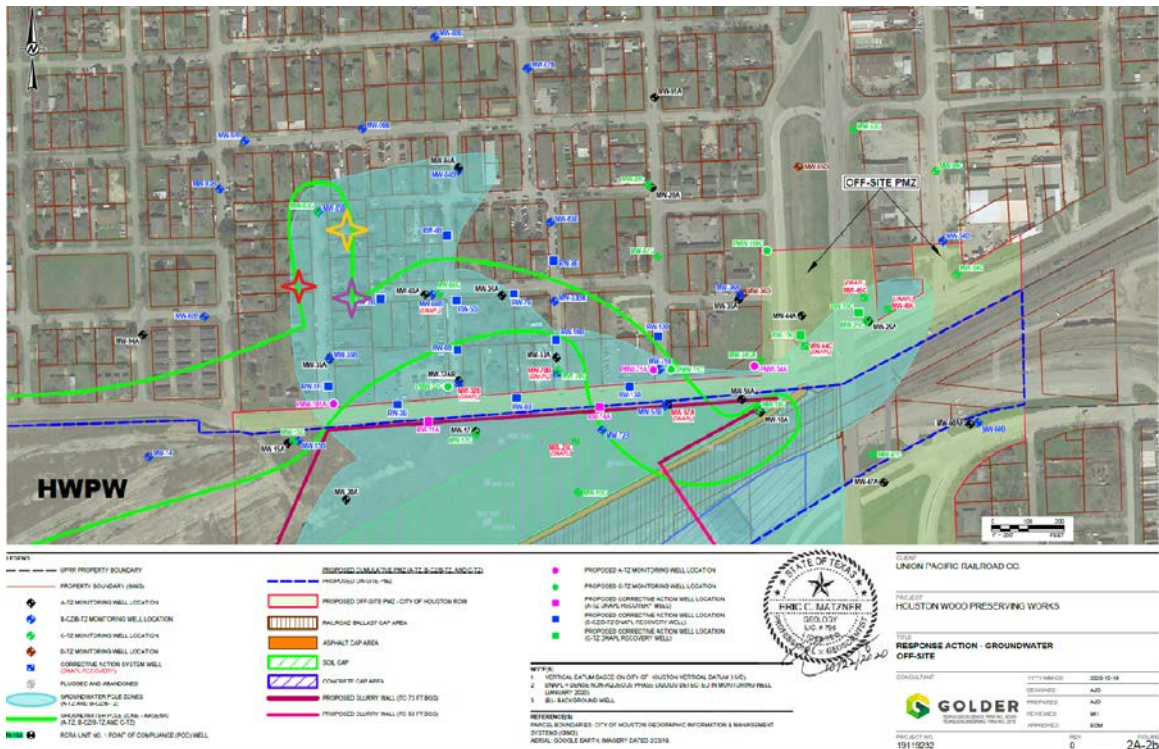
Impact requests a CCH based on the fact that several of its members currently reside on or own property that is recognized by both the TCEQ and UPRR as being affected by subterranean contamination. It is undisputed by either UPRR or TCEQ that this contamination is to be addressed by the Draft Permit in question. Additionally, these same group members are exceedingly worried about the long-term impacts to their health due to the vapor exposure pathways that have been documented by the City of Houston Health Department’s contractor, Beacon Environmental (“Beacon”), as a result of a Passive Soil Gas Survey conducted in November 2020. As far as Commenters can see UPRR has not put forth a remedy that is adequate to address these exposure pathways nor the valid concerns for their health and the integrity of their property.

A few members of Impact live above the well documented, though not fully characterized, groundwater plume which itself lies over a *deeper* creosote/dense non-aqueous phase liquid (“DNAPL”) plume. Thus, they are entitled to a CCH in their own right because of their justiciable interests which are to be affected by the Draft Permit. Map 1 below (the original made by Golder, UPRR’s contractor, showing the extent of the Protective Concentration Level Exceedance (“PCLE”) Zone, among other things) presents a bird’s-eye view of the affected residential neighborhood, surrounding residential blocks, and indicates the location of some of Impact’s members’ residences and or properties. These members include:

1. Sandra Edwards who resides at 2925 Lavender Street, and is the owner of said property, which lies along the western edge of the previously proposed off-site plume management zone (“PMZ”), directly above the PCLE Zone, and less than a tenth of a mile from the UPRR Site. Ms. Edwards was born in 1965 and raised at the home on 2925 Lavender until 1985. She returned to live permanently in her childhood home in 2010. Ms. Chamesha Randall, Ms. Edwards’ daughter, signed a restrictive covenant for this property on March 31, 2015 in the context of UPRR’s attempt to comply with the then proposed remediation plan. Ms. Edward’s property is represented by the red star on Map 1 below. Ms. Edwards is one of the spokeswomen and representatives of Impact and she may be contacted via Impact’s counsel with LSLA, Rodrigo Cantú.

2. Leisa Harris-Glenn is the owner of 2924 Lavender Street, a property inside the previously proposed off-site PMZ, above the PCLE zone and less than a tenth of a mile away from the UPRR Site. She moved to the home in 1984 when she was 27 years old and lived there with her mother and son until about the year 2000. Although she no longer resides in the area she often returns to her old home to visit her brother and nephew who continue to reside at 2924 Lavender. Ms. Harris Glenn signed a restrictive covenant for this property on June 27, 2015 in the context of UPRR’s attempt to comply with the then proposed remediation plan. Ms. Harris-Glenn’s property is represented by the purple star on Map below.

3. Mary Hutchins resides at 2938 Lavender, a property inside the previously proposed off-site PMZ, above the PCLE zone and less than a tenth of a mile away from the UPRR Site. She has resided at this address for over 50 years. Ms. Mary Hutchins signed a restrictive covenant for her property on April 7, 2015 in the context of UPRR’s attempt to comply with the then proposed remediation plan. Ms. Hutchin’s property is represented by the gold star on Map below.



Map 1-October 2020 Map of PCLE Zone with Location of Impact Members' Residences

One of the many justiciable interests at stake for each of Impact’s three members above includes UPRR’s failure to take into account volatile contaminant exposure pathways that originate at the creosote/DNAPL plume beneath their residential properties. UPRR has continuously denied the existence of any such exposure pathway. As evidenced in Commenters’ Second Set of Public Comments and further explained in these comments (*infra* II.B.1), UPRR’s conclusion that no exposure pathway exists has undeniably been called into question. As such these Impact members have an interest in assessing whether or not this evidence has been considered adequately by UPRR and the TCEQ. Additionally, these Impact members are left without any answer as to what is to become of the restrictive covenants that were signed for each of the properties in question now that UPRR plans to designate a much smaller PMZ than before. Additional justiciable interests include the very real possibility that UPRR’s remediation plan will not reduce contamination in and around their properties to residential levels in a reasonable timeframe and the collective concern of Impact’s members that UPRR should be implementing better technical plans that would allow for greater removal of DNAPL from underneath and around their properties. These justiciable interests would otherwise grant standing to each of these three members individually; and, thus, the group, Impact, is entitled to standing for a CCH.

Impact is an unincorporated organization based in the Fifth Ward/Kashmere Gardens neighborhoods of Houston that is primarily concerned with issues of environmental justice and public health that affect the residents of these neighborhoods. Advocating on behalf of the residents of these historically African-American communities, Impact's members are involved with environmental issues ranging from legacy contamination, to air quality, and environmental monitoring. Impact and its members originally organized around the issue of UPRR's contamination once they realized that the affected residential neighborhood and the wider community were almost universally unaware of what UPRR meant to accomplish through the permitting process. Since then, Impact's mission and work has expanded to include other environmental issues in these neighborhoods but the group remains committed to seeking a long-term solution to UPRR's creosote/DNAPL contamination. Such a solution would require more accountability on the part of the railroad company and the TCEQ. Such a solution would require bringing UPRR's Draft Permit into compliance with relevant laws and regulations.

Impact has also played a key role in disseminating information to residents about the Cancer Cluster that has been documented by the Department of State Health Services as of August 2019. As one of several groups that represent residents of the Fifth Ward and Kashmere Gardens, Impact has worked to bring awareness around the findings of the cancer cluster on local, state, and even national levels. Since the announcement of the Cancer Cluster, Impact has taken a keen interest in understanding how legacy contamination like the creosote/DNAPL plume might be contributing to the disproportionate health disparities that are being experienced by residents of the affected residential neighborhood and the greater Fifth Ward/Kashmere Gardens neighborhoods. Thus, the interests that Impact seeks to protect through a CCH proceeding are germane to the organization's purpose.

While the details of the type of relief that Impact is requesting will be explained in greater detail in these comments, it should be stated now that the relief centers around:

1. The need for increased environmental monitoring of toxic vapors in the affected residential neighborhood;
2. An improved monitoring system to better track the movement of the migrating creosote/DNAPL plume
3. An improved monitoring system to better track the movement of the migrating groundwater contamination plume;

4. An administrative solution to the uncertainty for those properties for which a restricted covenant has been signed in the past;
5. An improved technical solution for DNAPL recovery as UPRR's Draft Permit does not comply with its obligation to remove all readily coverable DNAPL;
6. A technical solution for the groundwater beneath the affected residential neighborhood that will achieve the appropriate levels in a reasonable timeframe;
7. Community Benefits in recognition of UPRR's long dereliction of its duty with regard to the health and safety of the residents of the affected residential neighborhood; and
8. Any other technical and legal relief so as to bring the Draft Permit into compliance with relevant regulations and ensure the health and safety of the public and the environment.

The awarding of this type of relief does not require the participation of the individual members of Impact in the case.

Mrs. Ortiz, who is not a member of Impact, resides at 4605 Lucille Street, just over three and a half blocks from the PCLE zone and under a third of a mile from the Site. In making her individual request for a contested case hearing, Mrs. Ortiz, like other similarly situated property owners and residents of the residential neighborhood, is extremely concerned that unless UPRR's Draft Permit is brought into compliance, her health and safety will be endangered and the integrity of her property will be compromised. Although there is no documented PCLE underneath Mrs. Ortiz's home her worry is that the creosote/DNAPL plume will continue to spread (the unchecked movement of which plays a role in the spread of the PCLE Zone, as will be explained further) and might reach her home at some point in the future. Mrs. Ortiz's trepidation is not unfounded—as will be seen below, the groundwater plume continues to migrate and even in a short number of years has come to affect an ever increasing number of offsite private properties—a fact that is uncontested by UPRR as per its Draft Permit documents. What is more, like other residents of her area, Mrs. Ortiz is concerned that UPRR has not done enough environmental monitoring to eliminate possible exposure pathways to COCs. This concern stems from her own experience gained over a lifetime in the neighborhood. Prior to the creosote operations being brought offline in the nineteen-eighties Mrs. Ortiz could smell the

creosote and was aware that it often ran into the neighborhood including into areas that are not currently over the PCLE zone. It is these areas that have not been tested as far as she and Impact know. There is nothing in UPRR's Draft Permit documents to indicate it has adequately tested these additional areas. This is a deficiency that needs to be addressed within the context of UPRR's requested Draft Permit.

In addition to the above requests for a CCH, Commenters wish to reiterate many of the points made in their Request for Second Public Meeting and highlight several deficiencies with the Virtual Public Meeting held on June 21, 2021. While Commenters are glad that the TCEQ extended the comment period to August 30, 2021, there are reasons that a Second Public Meeting is warranted.

First, the representatives of the TCEQ failed to put together a visual presentation which would have been advantageous for those watching from their home computers or smartphones. A visual presentation would have also been extremely helpful for those who had gathered in community group spaces so that they could have better understood the points that were being made during the Virtual Public Meeting, either by residents of the area, advocates, or representatives of the TCEQ and UPRR. Without such a visual aid attendees' ability to understand the nature of the Draft Permit and the creosote/DNAPL contamination was extremely hindered.

Second, the Question and Answer portion of the Virtual Public Meeting was cut short in order to quickly turn to the Formal Oral Comment portion of the meeting. Commenters do not take issue with an extended Oral Comment Period but do take issue with an abbreviated Question and Answer portion. Commenters had several technical, legal, and practical questions prepared for representatives of both the TCEQ and UPRR that went unanswered because of the shortened Question and Answer portion of the meeting. Without having these questions answered, Commenters' ability to efficiently comment on UPRR's Draft permit has been inhibited.

Furthermore, the Virtual Public Meeting was plagued by multiple technological issues including poor audio quality and unstable internet issues that impacted connectivity.

Finally, several attendees to the meeting were unable to participate in either the Question and Answer portion or Formal Oral Comment portion of the Virtual Public Meeting because either

they were not called upon by the meeting facilitator to do so or because they were unfamiliar with the technology needed to participate.

For the reasons above, Commenters insist that the TCEQ host a Second Public Meeting. This Second Public Meeting should, at the minimum, have a visual component, avoid a truncated Question and Answer portion, and ensure that all attendees who wish to pose a question or render an oral comment are called upon to do so. Additionally, the TCEQ should coordinate with local leaders to organize in-person viewing options assuming that doing so is prudent at that time given local restrictions pertaining to the ongoing COVID-19 Pandemic.

II. UPRR'S DRAFT PERMIT FOR RENEWAL WITH A MAJOR AMENDMENT OF ITS HAZARDOUS WASTE PERMIT/COMPLIANCE PLAN CONTAINS MULTIPLE DEFICIENCIES THAT REQUIRE ITS DENIAL

Commenters highlight major deficiencies with UPRR's requested Draft Permit and its RAP that require its denial. These deficiencies stem from UPRR's less than precise understanding of the subterranean conditions and contaminant transport. UPRR errs in identifying the groundwater plume (as represented by the PCLE Zone) as the only plume. UPRR is attempting to convince the TCEQ of this mistaken understanding regarding the subsurface. But UPRR's position is not the whole story.

In actuality, there is a *creosote/DNAPL plume* that has yet to be fully characterized as it remains mobile since DNAPL moves deeper and deeper into the Earth as time passes by. Above that uncharacterized creosote/DNAPL plume, a *separate and dynamic groundwater plume* exists, one which has been formed, at least partially, by the vapors that rise up from the deeper creosote/DNAPL plume. UPRR chooses to ignore the importance of the uncharacterized, deeper creosote/DNAPL plume in all of its reports that make up its RAP and other supporting documents for the Draft Permit. In so doing, it downplays the role that the creosote/DNAPL plume has on the groundwater plume. This mistake informs many of the deficiencies that Commenters wish to challenge. These include: UPRR's failure to eliminate the possibility that there is a vapor exposure pathway from the creosote/DNAPL plume to the surface directly over the PCLE and in and around the affected residential neighborhood; UPRR's failure to demonstrate that both the creosote/DNAPL plume and the groundwater plume are no longer

mobile; UPRR's failure to plan to extract all readily removable DNAPL; outstanding questions regarding UPRR's plans for Restrictive Covenants which were signed in the past but are no longer needed as the properties won't be included in the now much reduced offsite PMZ; and finally, concerns about the complete lack of any environmental monitoring or environmental medium testing whatsoever on or underneath certain residential blocks of the affected neighborhood that *do not overlay* the PCLE but that were nevertheless exposed to creosote contamination prior to the operations shutting down on the Site in the nineteen-eighties.

Commenters assert that the deficiencies mentioned above, which are expounded upon throughout the remainder of these public comments, are of such a nature that they show UPRR is unable to comply with either of the two Remedy Standards of the Texas Risk Reduction Program ("TRRP"). UPRR's Draft Permit does not comply with the requirements of either Remedy Standard A or Remedy Standard B of the TRRP as specified in 30 Tex. Admin. Code § 350 so the Draft permit must be denied. Commenters provide a brief overview of relevant portions of both Remedy Standards immediately below before moving on to considering each of the identified deficiencies more in depth.

A. GENERAL REQUIREMENTS OF REMEDY STANDARDS A AND B WITH WHICH UPRR IS UNABLE TO DEMONSTRATE COMPLIANCE

In order to qualify under Remedy Standard A UPRR's Draft Permit must, within a reasonable timeframe given the particular circumstances of the affected property:

- (1) Remove any listed hazardous waste as defined in 40 Code of Federal Regulations Part 261, Subpart D, as amended, which is contained within a waste management facility component (e.g., tank, surface impoundment, etc.) or which is separable from environmental media using simple mechanical removal processes;
- (2) Remove and/or decontaminate any waste or environmental media which is characteristically hazardous due to ignitability, corrosivity, reactivity, or toxicity characteristic as defined in 40 Code of Federal Regulations Part 261, Subpart C, as amended;

(3) Remove and/or decontaminate the surface soil, subsurface soil, and groundwater PCLE zones, other environmental media, and non-hazardous waste to achieve COC concentration levels below the residential or commercial/industrial critical PCLs, as applicable; and

(4) Demonstrate the affected property is protective for ecological receptors.

30 Tex. Admin. Code §350.32(a). Commenters assert that at the very minimum UPRR's Draft Permit fails to comply with elements (3) and (4) to the extent that UPRR intends to implement Remedy Standard A across the offsite affected residential neighborhood. As will be seen, UPRR's Draft Permit fails to demonstrate how it will remove or decontaminate environmental media below the affected residential neighborhood to achieve concentration levels below residential critical PCLs in a reasonable timeframe. Further, as will be seen, the Draft Permit fails to demonstrate that the volatile exposure pathways of COCs that originate at the creosote/DNAPL plume and that have been documented by the City of Houston are protective for ecological receptors.

UPRR's Draft Permit fails to meet additional requirements of Remedy Standard A, which include:

(1) The person shall not use physical controls under Remedy Standard A.

(2) The person shall remediate the affected property such that the concentration of COCs in surface soil, subsurface soil, groundwater, and other environmental media do not exceed the applicable critical PCLs.

(3) Remedial alternatives, including the use of monitored natural attenuation as a decontamination remedy, must be capable of achieving the Remedy Standard A objectives within a reasonable time frame, given the particular circumstances at the affected property; and must be appropriate considering the hydrogeologic characteristics of the affected property, COC characteristics, and the potential for unprotective exposure conditions to continue or result during the remedial period. The executive director may require a demonstration of the appropriateness of a remedy in the context of the above-mentioned criteria for any remedy, regardless of the status of self-implementation as

allowed in subsection (d) of this section. If the executive director requires such a demonstration, the person is not required to await executive director approval to proceed with self-implementation; however, if the executive director determines that the self-implementing response action is inappropriate based on these criteria, then the executive director shall require appropriate response actions to be taken.

30 Tex. Admin. Code §350.32(b). Commenters assert that UPRR’s Draft Permit fails to comply with, at the very least, elements (2) and (3) above for the same reasons that UPRR fails to demonstrate compliance with 30 Tex. Admin. Code §350.32(a)—the inability to remediate affected properties to the proper protective level in a reasonable time frame and the fact that UPRR has failed to consider that COC’s in the form of volatiles originating at the creosote/DNAPL plume have the *potential for unprotective exposure conditions* for those residents living above the plume.

However, UPRR has failed to demonstrate that it qualifies for Remedial Standard B as well. Generally, Remedy Standard B allows the use of control measures to prevent COC exposure to human or ecological receptors, without necessarily requiring removal of the waste. Both *physical and institutional* controls are allowed. Under Remedy Standard B, there is the option to choose to remove, decontaminate, or control COCs present on the site.¹ Whichever measures are used, the cleanup must achieve the following goals:

- (1) humans will not be exposed to concentrations of COCs in excess of the applicable PCLs, and
- (2) leachate from surface and subsurface soil will not increase the concentration of COCs in class 2 groundwater.²

Commenters’ First Set of Public Comments submitted on December 11, 2018 go into great detail regarding Remedy Standard B’s requirements. Commenters’ current set of comments

¹ 30 Tex. Admin. Code § 350.33(b). There is, however, an exception for Class I groundwater PCLE zones, in which COCs must be removed and/or decontaminated to the critical groundwater PCL for each COC.

² 30 Tex. Admin. Code § 350.33(a). Note that the cleanup must address the ecological receptors for COCs what exceed the ecological PCLs but not the human health PCLs or where residual concentrations of COCs that exceed the ecological PCLs will remain following completion of a human health response action. See 30 Tex. Admin. Code § 350.33(a)(3).

will further address the Draft Permit's deficiencies that demonstrate it does not meet the necessary requirements for Remedy Standard B.

B. UPRR HAS FAILED TO DEMONSTRATE THAT THERE IS NO POTENTIAL EXPOSURE PATHWAY FOR VOLATILES ORIGINATING AT THE SUBTERRANEAN CREOSOTE/DNAPL PLUME TO THE SURFACE, CONSTITUTING A VIOLATION OF THE TRRP.

To date, UPRR has failed to provide any data that demonstrates it has complied with various rules regarding protecting the health of residents living above the creosote/DNAPL plume from the *inhalation of volatile emissions*. One of the primary reasons for this lack of proper testing on the part of UPRR has to do with its mistaken understanding of the subsurface source of contaminants.

In analyzing years' worth of documents it is evident that UPRR continues to assume *that the source of any vapors would be the groundwater plume* beneath the Site and the affected residential neighborhood. In actuality, the source of the vapors is the *creosote/DNAPL plume* which has already released and continues to release COCs in the form of vapors over time. Those vapors move up vertically towards the atmosphere *where a portion of the chemical constituents dissolve in the groundwater* that they must pass through before reaching the surface. The significant contribution of dissolved concentrations of COCs in the groundwater plume—as well as the contribution to the vapors that have been detected at the surface level—from the subterranean creosote/DNAPL plume should not be ignored. UPRR has chosen to do so.

This faulty understanding on the part of UPRR has informed not only its very limited placement of samples for its Vapor Intrusion Assessment but also the methodology it chose to implement in the first place when deciding how to monitor for vapors (*infra* II.B.2). These errors, combined with data collected by the City of Houston's contractor Beacon as well as UPRR's own historical data, are enough to show that UPRR has not complied with relevant rules regarding inhalation of volatile emissions when developing its Draft Permit. TCEQ should therefore review, with a skeptical eye, any and all data, statements, and conclusions by UPRR concerning vapors given its faulty understanding regarding the source of the vapors.

First, consider 30 Tex. Admin. Code §350.71(c) which states that UPRR shall develop PCLs for class 3 groundwater bearing units for those exposure pathways that are complete or

reasonably anticipated to be complete. This rule is applicable, “when a plume management zone is established in accordance with § 350.33(f)” in other words, in the case where UPRR has opted for Remedy Standard B. UPRR’s Draft Permit calls for the designation of a PMZ across a discrete area of the offsite affected residential neighborhood—though it is to be a much smaller PMZ than had originally been proposed in 2014. Specifically UPRR shall, at a minimum, consider inhalation of volatile emissions in outdoor air from COCs to be complete or reasonably anticipated to be complete when a plume PMZ is established. UPRR does not have to consider the exposure pathways to be complete if UPRR:

(A) demonstrates with representative and appropriate vapor monitoring data or other technically appropriate method that volatile emissions from groundwater are protective; or

(B) otherwise demonstrates that the pathway is incomplete at the affected property. A competent, existing physical control which prevents the release of COCs from groundwater into air above the PCLs may be considered in accordance with subsection (d) of this section.

30 Tex. Admin. Code §350.71(c)(3). As will be shown below, neither of the above conditions have been satisfied, meaning that the Draft Permit fails under Remedy Standard B. However, even where UPRR has opted for Remedy Standard A, it is unable to demonstrate compliance with rules regarding inhalation of volatiles, including those which state that PCLs should be developed for:

(6) Inhalation of volatile emissions from COCs in subsurface soils. Other than below a waste control unit, the person shall consider this to be a complete or reasonably anticipated to be completed exposure pathway unless the person demonstrates with representative and appropriate vapor monitoring data, or other technically appropriate method that the exposure pathway is incomplete. A competent existing physical control which prevents the release of COCs from subsurface soils to air above the PCLs may be considered in accordance with subsection (d) of this section;

...

(8) Other complete or reasonably anticipated to be completed exposure pathways. The person shall reasonably evaluate other potentially applicable exposure pathways and identify the ones which are complete or are reasonably anticipated to be completed.

30 Tex. Admin. Code §350.71(c)(6) and (8). A combination of UPRR's own data going back more than twenty years and more recent data collected by the City of Houston Health Department's contractor, Beacon (at the behest of Commenters), shows that UPRR has failed to eliminate the possibility that COCs in the form of vapors originating at the creosote/DNAPL plume have completed an exposure pathway to the land surface of the affected residential neighborhood just to the north of the site.

For these reasons, the Draft Permit must be denied until a new solution is put forward, one which protects the health of those living above the creosote/DNAPL plume from the inhalation of volatile emissions, intends to monitor the vaporization of the documented COCs for several years into the future, and that does not allow UPRR to rely on faulty sampling to put forth the mistaken conclusion that no exposure pathway or possible exposure pathway in the form of volatiles exists.

1. Passive Soil Gas Survey Conducted by the City of Houston Has Established An Exposure Pathway to the Surface For Dozens of Chemicals in the Form of Volatiles That Must Originate At The Creosote/DNAPL Plume

As Commenters demonstrated in their Second Set of Public Comments, a November 2020 Passive Soil Gas Survey ("the Survey") conducted by the City of Houston's contractor, Beacon Environmental, has demonstrated that more than fifty chemicals in the form of vapors are detectable in quantifiable amounts in a discrete area of the affected residential neighborhood to the north of the Site enclosed roughly by Liberty Road to the south, Solo Street to the west, Lucille Street to the north and East Lockwood Drive to the east. See Map 2 below, an isopleth map of toluene produced as a result of the Survey conducted by Beacon.



Map 2 – Isopleth Map Depicting Extent of Toluene in the Form of Vapors as a Result of November 2020 Survey

Toluene, isopropyl toluene and a class of chemicals known as Total Petroleum Hydrocarbons (“TPH”) were all detected in reportable amounts in at least one of the samplers that were installed in the above described residential area. Additionally, the more than fifty other chemicals below were detected in at least one of the samplers. See Table 1 below, Summary of the Most Pertinent COC Readings from the Passive Soil Gas Survey.

Table 1: Summary of the Most Pertinent COC Readings from the Passive Soil Gas Survey

Chemical #	Chemical of Concern	Sampler(s)	Residential Sampler/City ROW Sampler/Both	Maximum Amount Detected (ng)
1	Acetone	SG-337	City ROW	57
2	Benzene, 1 methyl-4-(1,2,2-trimethylcyclopentyl)-, (R)-	SG-322	Residential	199
3	.beta.-copaene	SG-322	Residential	72
4	Butane	SG-319, SG-320, SG-341	Both	355
5	Camphene	SG-307, SG-322	Residential	180
6	Chloromethane	SG-301-SG-317, SG-319, SG-320, SG-322-SG-343	Both	880
7	Cyclohexane, 1,2-dimethyl-, trans-	SG-338	City ROW	109
8	Cyclohexane, 1,2,4-trimethyl-	SG-338	City ROW	84
9	Cyclohexane, 1,2,4-trimethyl- (1.alpha., 2.beta., 4.beta.)-	SG-338	City ROW	56
10	Cyclohexane, 1,4-dimethyl-, trans-	SG-320, SG-341	Both	80
11	Cyclohexane, 1,4-dimethyl-, cis-	SG-338	City ROW	79
12	Cyclohexane, 1,1,3-trimethyl-	SG-320, SG-338, SG-341	Both	112
13	Cyclohexane, ethyl-	SG-338, SG-	City ROW	117

Chemical #	Chemical of Concern	Sampler(s)	Residential Sampler/City ROW Sampler/Both	Maximum Amount Detected (ng)
		341		
14	Cyclohexane, methyl	SG-322, SG-337	Both	168
15	Cis -Thujopsene	SG-322	Residential	137
16	Cyclotrisiloxane, hexamethyl-	SG-326, SG-341	Both	81
17	Decane, 2,5-dimethyl-	SG-337	City ROW	127
18	Decane, 3,7-dimethyl-	SG-337	City ROW	134
19	Decane, 5-methyl-	SG-337	City ROW	99
20	Dimethyl ether	SG-301-SG-305, SG312, SG-315, SG-320, SG-322-SG-325, SG-327, SG-328, SG-330-SG-332, SG-337, SG-338, SG-340	Both	382
21	Di-epi.alpha.-cedrene	SG-322	Residential	496
22	Dodecane	SG-325, SG-337	Both	386
23	Dodecane, 2,6,11-trimethyl	SG-337	City ROW	74
24	Formic Acid	SG-311, SG-314, SG-321	Residential	222

Chemical #	Chemical of Concern	Sampler(s)	Residential Sampler/City ROW Sampler/Both	Maximum Amount Detected (ng)
25	.gamma.-HIMACHALENE	SG-322	Residential	217
26	Geijerene	SG-340	City ROW	77
27	Heptane, 2,4-dimethyl-	SG-315, SG-322, SG-323, SG-337, SG-338, SG-343	Both	122
28	Heptane, 2,2,3,3,5,6,6,-heptamethyl-	SG-337	City ROW	102
29	Heptane, 2,2,4,6,6-pentamethyl-	SG-315, SG-322, SG-323, SG-337	Both	130
30	Longifolene	SG-322	Residential	459
31	n-Hexane	SG-337	City ROW	50
32	Nonane	SG-312	Residential	1,099
33	Octane, 2-methyl-	SG-337	City ROW	244
34	Octane, 4-methyl-	SG-322, SG-337, SG-338	Both	79
35	Pentane	SG-322, SG-332, SG-337	Both	113
36	Pentane, 2-methyl-	SG-301, SG-302, SG-305-SG-307, SG-315, SG-321, SG-322, SG-323, SG-326, SG-327, SG-	Both	485

Chemical #	Chemical of Concern	Sampler(s)	Residential Sampler/City ROW Sampler/Both	Maximum Amount Detected (ng)
		330, SG-337, SG-338, SG-340, SG-341, SG-343		
37	Spiro[5.5]undec-2-ene, 3,7,7-trimethyl-11-methylene-, (-)-	SG-322	Residential	114
38	Trichloromethane	SG-306	Residential	106
39	Tricyclo[2.2.1.0(2,6)]heptane, 1,7,7-trimethyl-	SG-307	Residential	55
40	Tricyclo[3.2.1.0(2,7)]oct-3-ene, 2,3,4,5-tetramethyl-	SG-340	City ROW	54
41	Tridecane	SG-325	Residential	206
42	Undecane	SG-325	Residential	278
43	Undecane, 2-methyl-	SG-315, SG-337	Both	129
44	Undecane, 2,6-dimethyl-	SG-315	Residential	104
45	Undecane, 4-methyl-	SG-337	City ROW	120
46	Undecane, 5-methyl-	SG-322, SG-337	Both	84
47	Undecane, 6-methyl-	SG-337	City ROW	52
48	3-isopropyl-6,8a-dimethyl-1,2,4,5,8,8a-hexahydroazulene	SG-322	Residential	51
49	1,4-methano-1H-indene, octahydro-4-methyl-8-	SG-322	Residential	66

Chemical #	Chemical of Concern	Sampler(s)	Residential Sampler/City ROW Sampler/Both	Maximum Amount Detected (ng)
	methylene-7-(1-methylethyl)-, [1S- (1.alpha., 3a.beta., 4.alpha., 7.alpha., 7a.beta.)]-			
50	1,5-Hexadiene, 2,5-dimethyl-3-methylene-	SG-307	Residential	57
51	(1R, 4S, 5S)-1,8-Dimethyl-4-(prop-1-en-2-yl)spiro[4.5]dec-7-ene	SG-322	Residential	295
52	1,2,4,-methenoazulene, decahydro-1,5,5,8a-tetramethyl-, [1S- (1.alpha., 2.alpha., 3a.beta., 4.alpha., 8a.beta., 9R*)]-	SG-322	Residential	81
53	2,6-Dimethyldecane	SG-337	City ROW	126
54	3-Carene	SG-307	Residential	57

The data contained in Commenters' Second Set of Public Comments and highlighted in Table 1 and Map 2 above preclude any assertion or conclusion by UPRR that no exposure pathway or possible exposure pathway exists. In fact, the Survey shows that volatile emissions from the subsurface are at the very least *unstudied*. While this data set represents the results from a *single* Passive Soil Gas Survey, neither the TCEQ nor UPRR should disregard the findings. As was mentioned in the Second Set of Public Comments, the amount detected by this mechanism of sampling can be affected by factors such as temperature and atmospheric pressure, meaning that if this sampling event were to be conducted under different conditions then even greater values for the contaminants might be measured.

Because of this unpredictability and variability in vapors TCEQ and UPRR should assume that volatile emissions are unprotective. The Survey shows that 30 Tex. Admin. Code

§350.71(c)(3)(A) regarding *representative and appropriate* vapor monitoring has not been satisfied. Similarly, UPRR cannot show compliance with 30 Tex. Admin. Code §350.71(c)(3)(B) because the Survey clearly shows that the exposure pathway is complete and there are no competent, existing controls that will prevent the release of COCs into the air, possibly above PCLs. As such, UPRR’s Draft Permit fails to satisfy relevant requirements for Remedy Standard B.

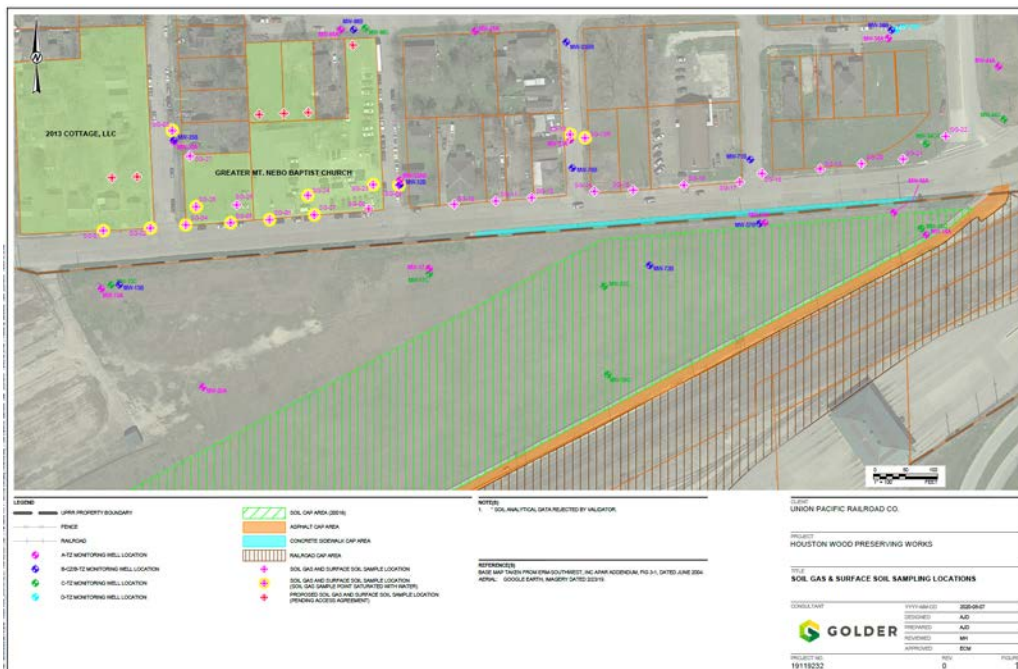
Further, compliance with 350.71(c)(6) and (8) regarding inhalation of volatile emissions has not been demonstrated given that UPRR has not developed PCLs based on the results of the Survey or any other similar survey. Without having done this there is no guarantee that UPRR will be able to remove/decontaminate the substrate with a reasonable timeframe. There is no guarantee that the various affected properties are safe for ecological receptors. 30 Tex. Admin. Code §350.32(a)(3) and (4). Having also failed to consider that the Survey shows that there is “the potential for unprotective exposure conditions to continue or result during the remedial period” as mentioned in 30 Tex. Admin. Code §350.32(b)(3), UPRR has failed to show compliance with Remedy Standard A.

To summarize, UPRR’s Draft Permit fails to protect residents from inhalation of volatile emissions under both Remedy Standards A and B given the Survey. As far as Commenters can see the Draft Permit does not call for any type of periodic vaporization monitoring of the creosote/DNAPL plume whatsoever. This absence of required monitoring is unacceptable given the results from the City’s Survey. The Draft Permit must be changed so as to require UPRR to conduct the type of Passive Soil Gas Survey that was carried out by the City of Houston several more times. This modification is necessary to protect human health and the environment. Such monitoring would measure and document any variances from the original November 2020 data set, whether there be increases or decreases in the amounts of chemicals measured. This consistent monitoring would ensure that the residents and property owners of the affected residential neighborhood can track exposure levels throughout the years.

2. UPRR’s Soil Vapor Intrusion Assessment Testing Does Not Demonstrate Compliance With Relevant Rules Pertaining to Inhalation of Volatile Emissions

The Passive Soil Gas Survey explained above, and in Commenters' previous comments, were in fact carried out by the City of Houston's contractor Beacon at the behest of LSLA, Impact, and Mrs. Ortiz. The volatilization testing that UPRR has performed in response to the TCEQ's NOD #4 is inadequate for demonstrating compliance with 30 Tex. Admin. Code §350.71(c)(3), (6) and (8) for multiple reasons. This includes UPRR's Vapor Intrusion Assessment that was conducted all throughout 2020.

First, UPRR's testing was performed only on a *very limited portion* of the offsite affected residential neighborhood that overlays the creosote/DNAPL plume. Instead of placing its samplers across the entirety of the footprint of the plume UPRR chose to place its samplers very near its own property line. Map 3 below shows the points where UPRR installed its samplers, in pink.



Map 3-Location of UPRR's Samplers as of Aug., 25 2020 for Soil Vapor Intrusion Assessment

UPRR placed most of its samplers along Liberty Road. Only three samplers were placed along streets other than Liberty Road despite the creosote/DNAPL plume extending much farther north. UPRR has purposely avoided the placement of samplers across the entirety of the plume in order to avoid detecting COCs within the affected residential neighborhood. The limited geographic extent of the samplers is enough to call into question any conclusion from UPRR's Soil Vapor Intrusion Assessment stating that there is no completed exposure pathway to the

surface. The placement also betrays UPRR's *erroneous belief* that the contaminants in groundwater are only due to horizontal flow and that vapors originate in the groundwater itself. UPRR's conceptual understanding of the Site substrate and contamination transportation methods are incredibly flawed. For this reason, neither 30 Tex. Admin. Code §350.71(c)(3)(A) nor (B) has been satisfied. UPRR's Soil Vapor Intrusion Assessment does not meet the requirements of Remedy Standard B.

Second, the method that was employed by UPRR in its Soil Vapor Intrusion Assessment is *unrepresentative and inappropriate* specifically because the method was developed for conditions that are not present at the site in question. UPRR even admits that the method is most representative and appropriate for vapor intrusion from *leaking Underground Storage Tanks*, which is not the condition that are under review for the UPRR site.³ The method employed by UPRR is best used where free-floating product, lighter than water Non-Aqueous Liquid volatilizes organic compounds. Benzene, Ethylbenzene, Xylene, and Naphthalene were all measured in both vapor and soils however, these are typical chemical constituents that would be expected to volatilize from *fresh* creosote. UPRR has failed to justify why it didn't test for other volatile organic compounds ("VOCs") and semi-VOCs of the type that would be associated with an older creosote/DNAPL plume like the one underneath the affected residential neighborhood. The organic compounds that were detected by UPRR become less likely as time goes on to volatilize from the *aged* creosote like we have at the site in question. This creosote/DNAPL plume in question has been in existence for *more than thirty years*. What is more, this method erroneously assumes that the source of vapors is the groundwater; in fact, the source of the vapors is the creosote/DNAPL plume itself, which is underneath the groundwater. This faulty assumption leads UPRR to show that the assumed calculated concentration of toxic vapor is less than that actually found to be dissolved in the groundwater beneath the affected residential neighborhood. There are other sites with leaking underground gasoline tanks where the source of vapors is shown to be groundwater. UPRR seems to have applied the sampling protocol and calculations designed for sites where there are leaking underground storage tanks. This methodology further calls into question the reliability of the results of UPRR's Soil Vapor Assessment. Accordingly,

³ Letter from Golder to Maureen Hatfield, *Updated Soil Vapor Intrusion Assessment Interim Report*, August 4th, 2020, pg.3.

30 Tex. Admin. Code §350.71(c)(3)(A), which requires the use of representative and appropriate vapor monitoring data, has not been satisfied.

Additionally, the practices employed by UPRR only produce a result that is merely a “snapshot in time” as opposed to other methodologies which measure volatilization *over the course of time* and would thus provide a more accurate picture of what is actually volatilizing from the creosote/DNAPL plume. It is important to note that vapor transport is dependent on ever changing factors like temperature and atmospheric pressure, meaning that from day to day, different temperature and atmospheric conditions can result in different rates of vapor transport. Stated another way, weather conditions can drastically alter vapor transport in any one spot. UPRR did not even bother to report weather conditions in their field sampling activities. UPRR’s assessment only captured samples over a 5—minute period, using a vacuum extraction process. A longer course of time that would have allowed for variations in the all-important atmospheric conditions. As such, UPRR’s results are not representative of actual conditions. As such no credence can be given to UPRR’s assertion that “the vapor intrusion pathway offsite is incomplete.” As before, 30 Tex. Admin. Code §350.71(c)(3)(A) has not been satisfied.

Finally, irregularities associated with UPRR’s testing call the conclusions drawn from it into serious doubt. As reported by Golder, nine of the twenty-two locations chosen for sampling were not even evaluated due to water in the probes.⁴ UPRR then proposed a total of six alternative soil gas probe locations and even still a total of 13 of the 28 soil gas probes were infiltrated with water, leaving UPRR unable to incorporate any results from them into its Soil Vapor Assessment.⁵ Yet UPRR intends to use an assessment that wasn’t even fully completed to convince the TCEQ that it has definitively shown that there is no possibility of a vapor exposure pathway from the creosote/DNAPL plume to the atmosphere above.

For of the reasons outlined in this section, the TCEQ must reject the findings of UPRR’s Soil Vapor Intrusion Assessment. Specifically, the Soil Vapor Intrusion Assessment which UPRR has put forward does not demonstrate compliance with either Remedy Standard A or Remedy Standard B.

⁴ Letter from Golder on behalf of Union Pacific Railroad to Ms. Maureen Hatfield, TCEQ, *Updated Soil Vapor Intrusion Assessment Interim Report*, August 4, 2020 pg. 2

⁵ Letter from Golder on behalf of Union Pacific Railroad to Ms. Maureen Hatfield, TCEQ, *Soil Gas Probe Water Source Evaluation*, October 23, 2020 pg. 1

3. UPRR's Own Well Boring Data Shows Vapors at Depth

Nearly every single one of UPRR's well boring logs, since the first installations began in 1997, shows measureable vapors *at depth*. Why UPRR did not implement a comprehensive vapor detection sampling regime after the collection of that data is unknown. As was mentioned in Commenters' Second Set of Comments, the TCEQ considered the need for vapor intrusion testing as early as 2004 yet never followed through by requesting or requiring that the testing be performed by UPRR. This is especially unacceptable in light of the results of Passive Soil Gas Survey presented in Commenters' Second Set of Comments and highlighted at in Table 1.

In order to illustrate this point, Commenters examined the well boring logs and produced graphs for a select number of wells that plot out the amount of VOCs detected (expressed in parts per million, ppm) at specific points throughout the depth of well. Total VOCs were measured using a photoionization detector ("PID") from soils at different depths at a specific moment in time—the date of the well's installation. The PID measured for total VOCs rather than for any one individual compound.

Figure 1 below illustrates the ppm for VOCs at various depths for well 32B which is a DNAPL extraction well located on Lavender Street just north of the intersection with Liberty Road, on the day of its installation, December 15, 2011. At a depth of roughly 32 ft. total VOCs were detected at around 105 ppm and then dropped to around 15 ppm at a depth of approximately 35 ft. This suggests that there were significant amounts of creosote/DNAPL plume moving through this monitoring well at that date in time. Not only is the total VOC at a shallow depth concerning but UPRR failed to collect any readings for total VOCs beyond a depth of approximately 45 ft. despite the deepest point reporting VOCs at 10 ppm.

Amount of PID (ppm) per Depth in Wells
GRAPHS

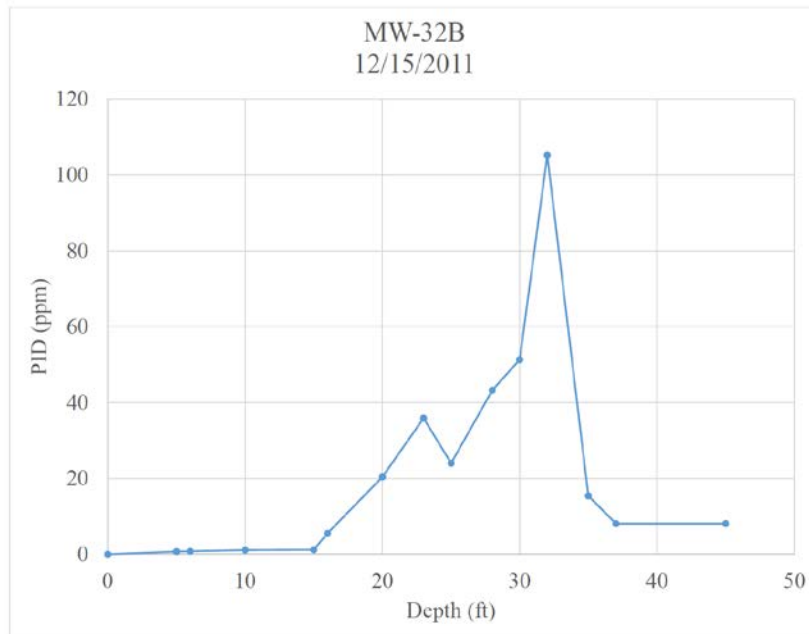


Figure 1 PPM of VOCs at Depth for MW-32B

On Figure 2 below, which depicts MW-34CR, no PID readings were taken any deeper than 70 ft., despite the final reading showing that VOCs were detected at just under 15 ppm at that same depth. UPRR should have continued to take readings at greater depths. The data suggests that the source of the VOCs, the creosote/DNAPL plume, was deeper than 70 ft. at that time.

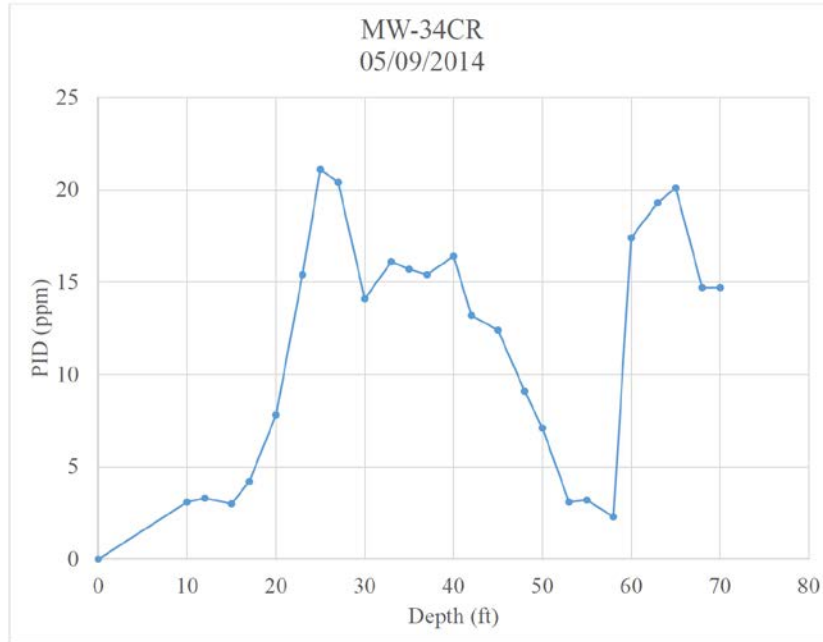


Figure 2 PPM of VOCs at Depth for MW-34CR

On Figure 3 below for MW57A, VOCs were detected around 875 ppm at an *extremely shallow* 7 ft. depth, approximately 725 ppm at a *very shallow* 9 ft., 600 ppm at a *very shallow* depth of 14 ft. and 250 ppm around 22 ft. This data is particularly concerning because it shows consistently high readings for VOCs across shallow depths for a monitoring well that is along the border of UPRR’s property, just south of the intersection of Liberty Road and Erastus Street. The data suggests that at least as of January 2009, the source of the VOCs, were very near the surface. This result could also be indicative of creosote/DNAPL moving horizontally through MW 57A at that same point in time.

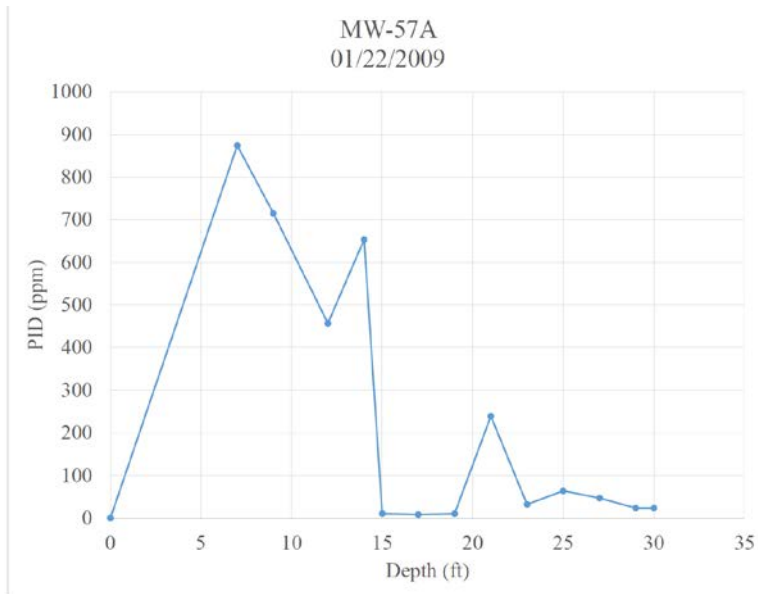


Figure 2 PPM of VOCs at Depth for MW-57A

MW59D in Figure 4 below and what is most concerning is that no VOC readings were taken for soils from depths between 35 and 125 feet. Therefore, it is impossible to know if there might have been VOCs at depth from within that same depth range.

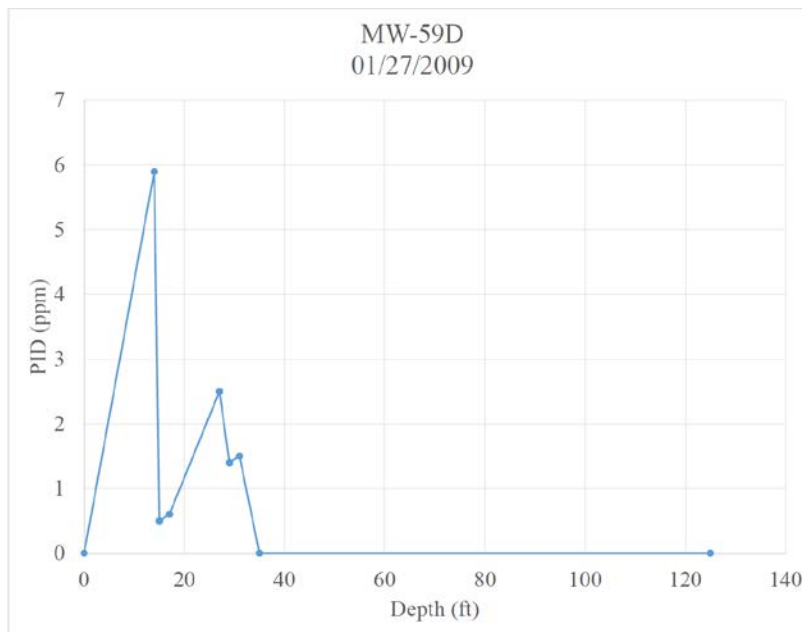


Figure 3 PPM of VOCs at Depth for MW-59D

Just as with MW-59D above, MW-66D below in Figure 5 has a large range of depth for which no PID samples were taken to allow detection of VOCs. In this case, no PID readings were performed for soils from between approximately 45 ft. and 105 ft. of depth.

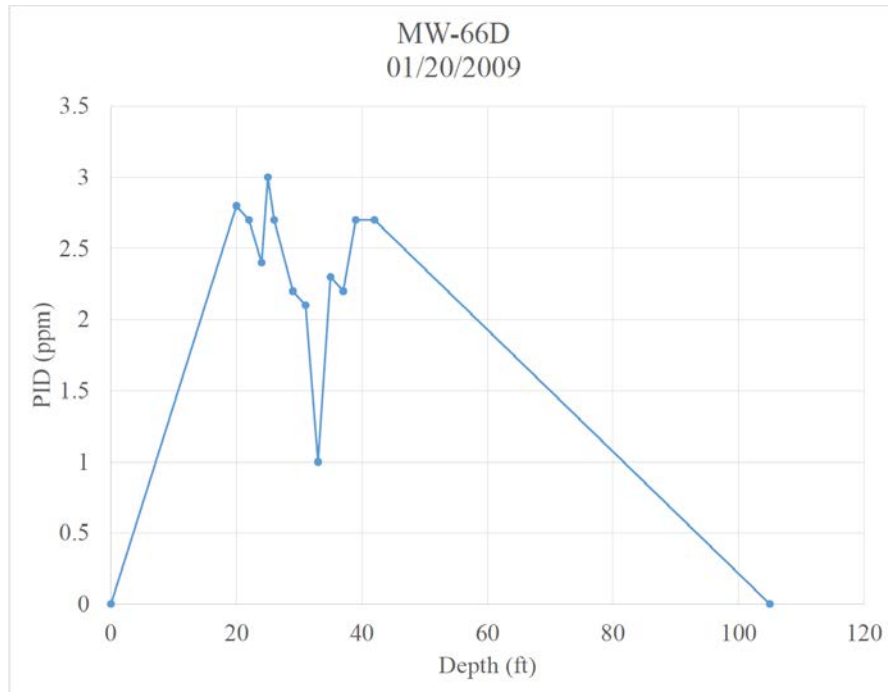


Figure 4 PPM of VOCs at Depth for MW-66D

MW-79A, depicted in Figure 6 below, a very concerning 800 ppm of VOCs were detected at the relatively shallow depth of approximately 13 ft. While samples were taken consistently deeper after this peak, samples stopped, inexplicably, at a 30 foot depth even though 75 ppm were there detected.

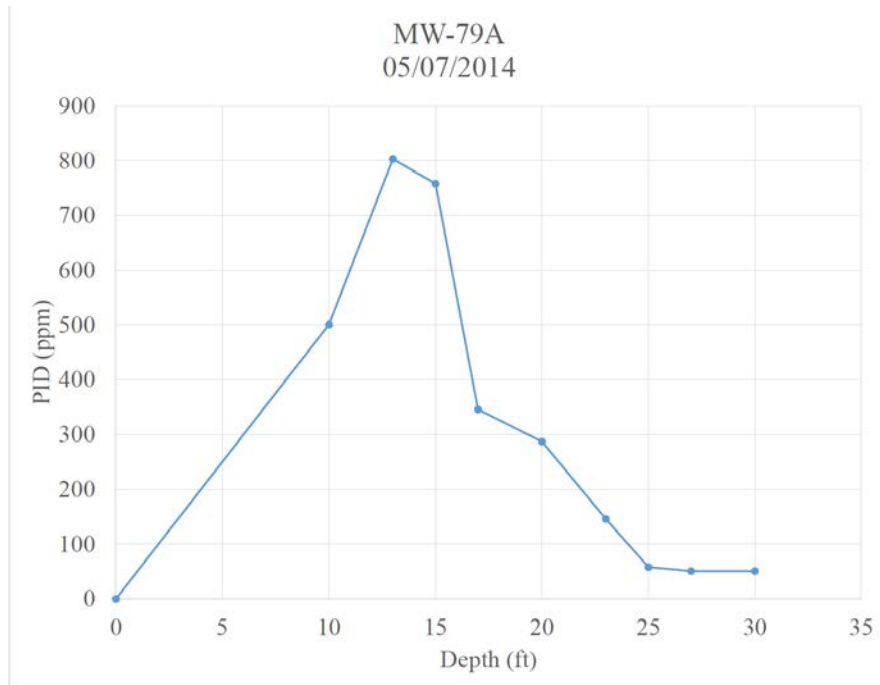


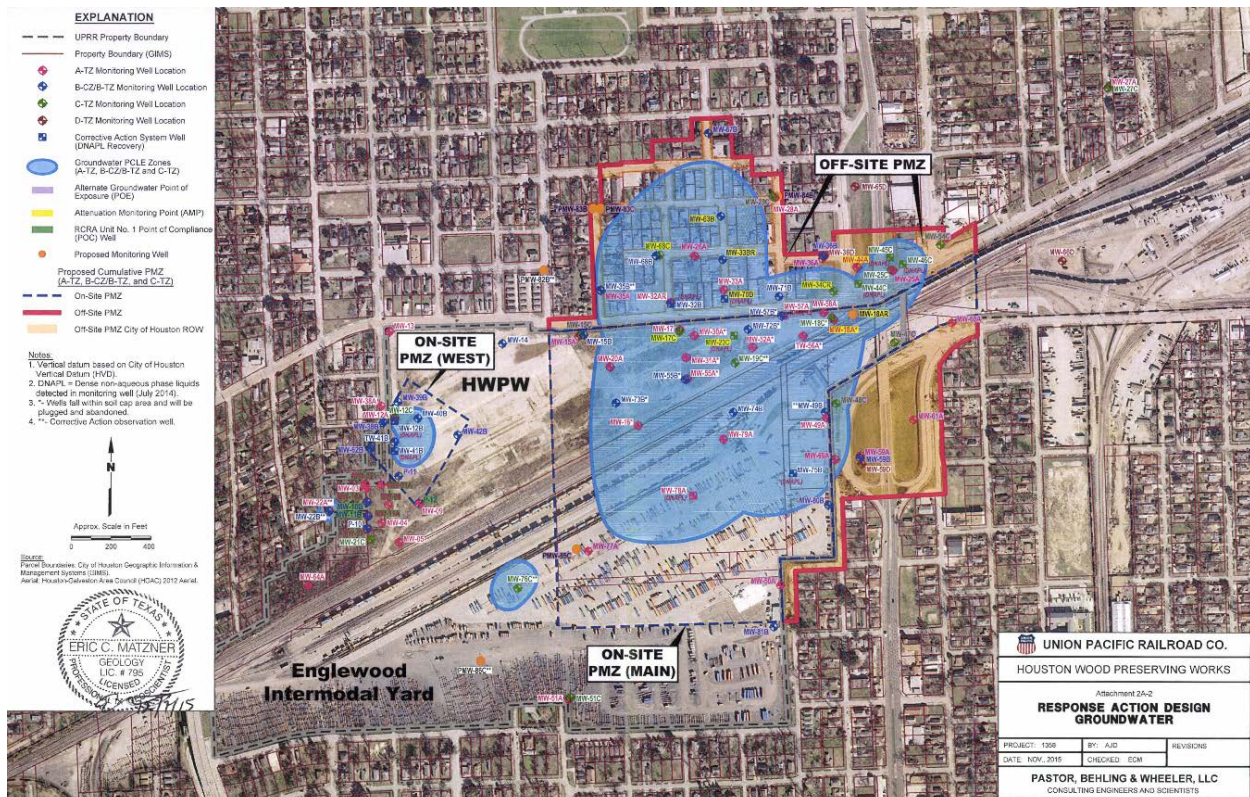
Figure 5 PPM of VOCs at Depth for MW-79A

C. UNION PACIFIC'S OWN DATA DEMONSTRATES THAT THE OFFSITE CREOSOTE/DNAPL AND OFFSITE GROUNDWATER PLUMES BOTH REMAIN MOBILE

UPRR continues to maintain that the offsite contamination plume is stable. However, the data that TCEQ has put in front of the TCEQ for several years suggests the opposite. As was mentioned earlier, UPRR is attempting to represent to the TCEQ that the subsurface is plagued by a groundwater plume only. What UPRR finds convenient to leave unexplained is that the offsite groundwater plume is influenced by a deeper creosote/DNAPL plume. That is, there is actually an uncharacterized creosote/DNAPL plume that is *underneath* the documented (though still not fully characterized) groundwater plume. Volatiles from the deeper creosote/DNAPL plume dissolve into the groundwater bearing units above as they make their way to the surface, likely contributing to the ever in motion groundwater plume and by the ever enlarging PCLE Zone. Well monitoring data that tracks the existence of vertical water gradients in addition to DNAPL extraction data gathered over numerous years also illustrate this point that UPRR has sought to underemphasize. UPRR would have the TCEQ ignore this data in favor of its conclusion that the contamination plume is stable.

Goldner's Data Shows that Both the PCLE Zone and Extent of Affected Properties Continue to Expand, Demonstrating that Both the Groundwater Plume and the Creosote/DNAPL Plume Remain Mobile

UPRR's own maps of the offsite affected properties show just how much the groundwater plume has migrated in a handful of years and continues to affect more and more properties with each passing year. Map 4 below, from December 2014, shows what UPRR believed to be the extent of the PCLE zone represented by the area colored in blue. The area outlined in red and shaded in orange represents what UPRR planned on designating at the time as the PMZ. In other words, the area shaded in orange represented the extent of the *offsite affected properties* as of December 2014.



Map 4 December 2014 Map of PCLE and Affected Properties

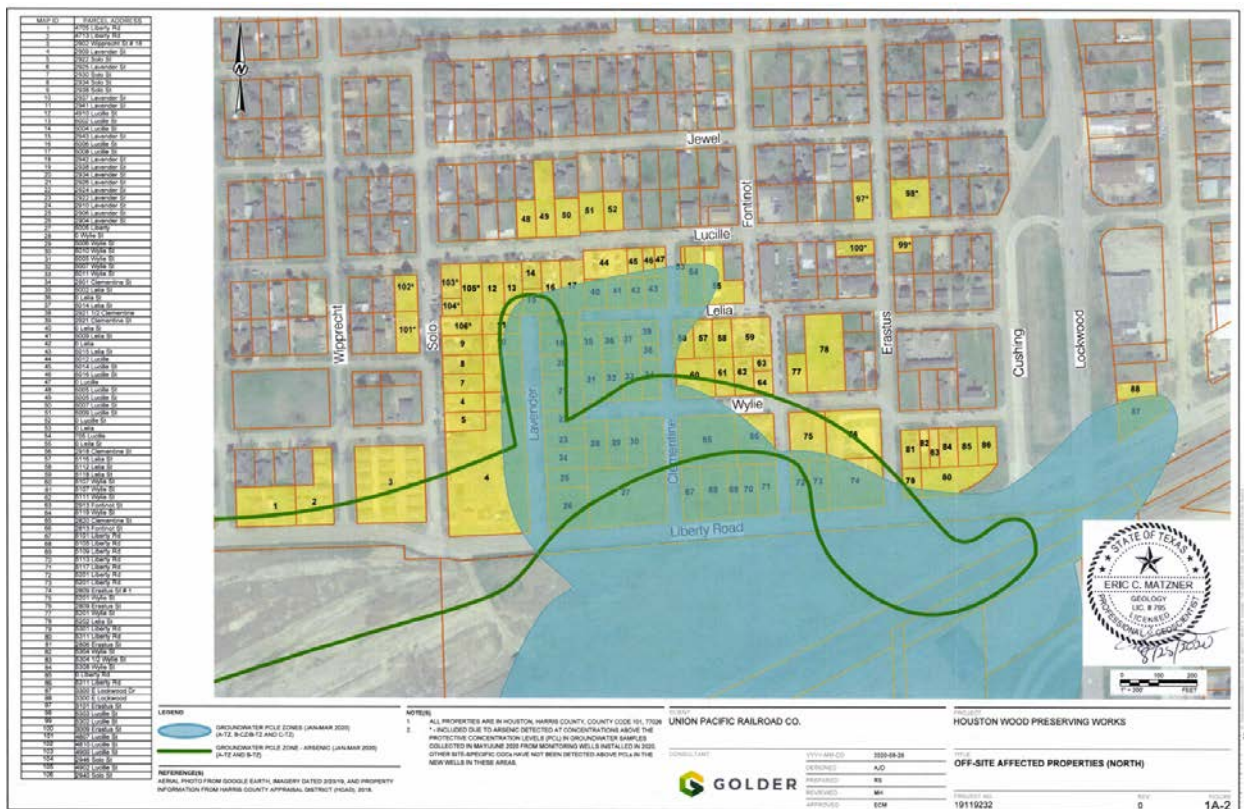
Compare those areas with the two images below. First, Map 5 below shows the affected properties as of April 2019, all shaded in yellow. As can be seen the amount of affected properties increased in number and the extent of the affected properties increased in size. One only need examine the border of the 2014 proposed PMZ to the outer edges of the 2019 affected properties to understand that the groundwater plume remains mobile. For example, the western

edge of the planned 2014 PMZ was the properties on the eastern side of Lavender Street. By 2019, the western edge of the affected properties had moved to encompass all properties on both sides of Lavender and continued further west to stop alongside Wipprecht Street. When looking at the northern edge of both the proposed 2014 PMZ and the 2019 Affected Properties map the same trend is visible: properties along Lucille and Erastus that had not been affected in 2014 were recognized as such by 2019. The eastern edge shows a similar trend. In fact, the entire block enclosed by Wylie to the south, Lelia to the north, Erastus to the west and Cushing on the east is considered affected property by 2019 but had not been within the proposed PMZ earlier in 2014. Two additional properties east of Lockwood Drive were affected. This increase in the affected properties footprint took place in just four-and-a-half years.



Map 5 April 2019 Map of Offsite Affected Properties

Map 6 below shows affected properties as of September 2020, and the results are not any more encouraging. The affected properties boundary has continued its westward movement and now encompasses properties on the western side of Wipprecht. Additionally, properties on the western edge of Solo and north of Lelia Street are recognized as affected properties. The properties on the southeast corner of the intersection of Lucille and Solo Streets are now affected as well. There are at least five additional properties north of Lucille that have been affected between April 2019 and September 2020.



Map 6 September 2020 Map of Offsite Affected Properties

But it isn't just the affected properties that demonstrate that there are dynamic substrate conditions. The ever-changing shape, size and extent of the PCLE zone itself demonstrates this mobility, too. Comparing this zone between Maps 4 and 6, which is the blue mass on both maps, shows that the PCLE is amorphous, dynamic, and ever expansive. UPRR's own data contradicts any assertion made that it has stabilized the offsite contamination. What UPRR has failed to clearly convey to the TCEQ is that the PCLE Zone's expansion is more than likely due to the vertical vapors traveling to the surface from the deeper creosote/DNAPL plume. That is, the

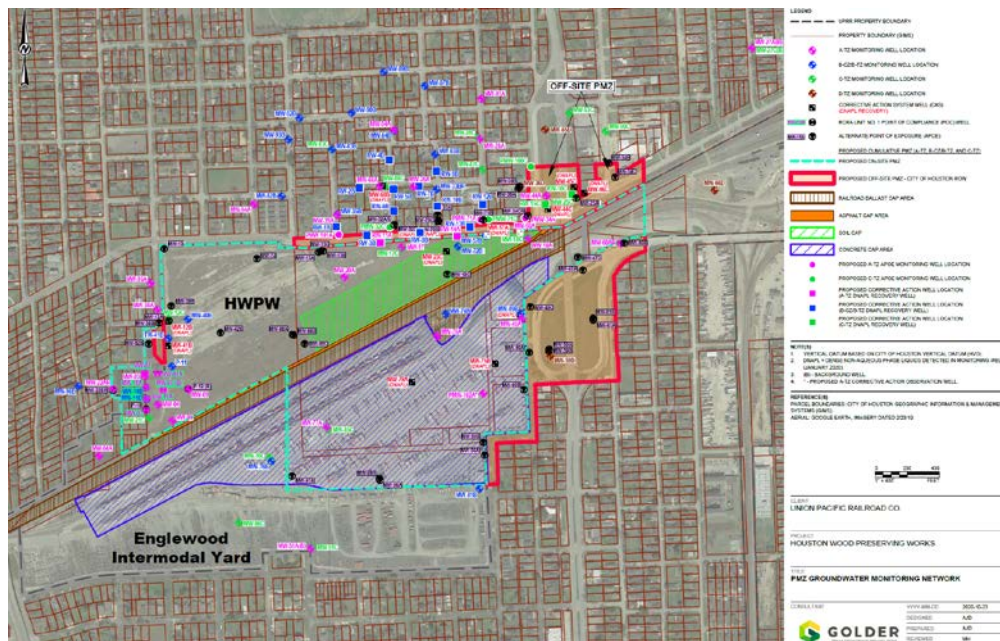
groundwater plume and PCLE Zone will continue to remain mobile and dynamic until the deeper creosote/DNAPL plume is under control. So long as it remains mobile the PCLE Zone is likely to continue to expand, meaning that there will only be more and more affected properties. The PCLE Zone data also demonstrates that UPRR is unable to comply with Remedy Standard A's requirements about achieving removal and decontamination goals within a reasonable timeframe. 30 Tex. Admin. Code §350.32(a)(3) and (4).

UPRR Continues to Ignore Vertical Gradients in Groundwater that Show There is Communication Between the Different Groundwater Bearing Units Which Helps Explain Why the Groundwater Plume and PCLE Zone Remains Mobile and Dynamic

In order to arrive at the faulty conclusion that the groundwater plume is stable and that, therefore, the resulting PCLE Zone is static, UPRR continues to rely on its oversimplified presentation of subsurface conditions being made up of four distinct layers—A, B, C, and D—which are, supposedly, not in communication with one another whatsoever. As Commenters stated in their previous comments, this conceptual understanding of the subsurface is mistaken. Instead, the subsurface is best understood as one unit made of many distinct soil types as opposed to alternating, layered cohesive and transmissive zones that are not in communication with one another. Stated another way, the geology does not consist of horizontal layers of soils of known characteristics that are uniform across any one depth. Instead, at any one consistent depth across the Site's subsurface there are lenses of clay, silt, and sand. That is, there is no uniformity in the subsurface as UPRR would have TCEQ believe. It is important to keep this in mind because that lack of uniformity explains how the creosote/DNAPL plume has found preferential pathways to continue its downward movement. The TCEQ is correct when it states that there is communication between the distinct groundwater bearing units, having taken note that, "it is likely there is some degree of connectivity between the A-TZ, B-CZ/B-TZ, and C-TZ." Commenters encourage the TCEQ to consider all data in light of this fact. Doing so will show that UPRR has failed to comply with Remedy Standard A's requirements including those regarding potential for unprotective exposures, ensuring that affected properties are safe for ecological vectors and the obligation to achieve COC residential PCLs in a reasonable timeframe, 30 Tex. Admin. Code §350.32(a) and (b). Further, with regard to the reduced proposed PMZ, UPRR has failed with its "continuing obligation to assess whether changes to

local hydraulic gradients would increase the likelihood that COCs can migrate beyond the plume management zone at concentrations above the critical groundwater PCLs.” 30 Tex. Admin. Code §350.33(f)(4)(F). To the extent that UPRR intends to use Remedy Standard B, UPRR cannot satisfy its requirements because both the groundwater plume and the PCLE Zone remain mobile.

First, in order to observe the vertical gradients that have been ignored by UPRR, it is important to analyze “well clusters” that is, wells that are in the same location but are installed to different depths at the same location. The data from UPRR’s “Table 5D Groundwater Measurements” included the depth to groundwater, groundwater elevation, the depth to DNAPL in the well and the measured DNAPL thickness. Analyzing the data at these well clusters allows us to observe the existence of a vertical gradient at that point. Below, are four graphics (Figures 7 – Figure 10) that depict some of the different data sets from Table 5D. Map 7 shows the location of all monitoring wells installed as of October 2022. All the wells that are analyzed below can be located on this same map except for MW 33B which was brought offline.



Map 7 Proposed Groundwater Monitoring Network October 26, 2020

The expected flow of water in a well cluster is from the shallow well to the deeper well, that is, from a shallow depth to a deeper depth. In the data that UPRR has provided to the TCEQ, the wells are categorized from shallow, to deep, and then to deeper wells, with A being the shallowest well and D being the deepest. The letters also denote what UPRR considers to be

distinct zones or groundwater bearing units within the subsurface that UPRR assumes are not capable of communication with one another. As will be seen, the existence of vertical gradients shows this to be untrue, and the groundwater bearing units are in communication with one another.

When analyzing the data at any one well cluster, we are looking for a flip in the vertical gradient from downward to upward and vice-versa, over time. In the series of figures that follow, the Y-Axis on the left represents the groundwater elevation in feet; the colored lines show the groundwater elevation for a particular groundwater bearing unit that was recorded at a particular date in time, with A being from the shallowest groundwater bearing unit and D being from the deepest. The X-Axis represents the dates of that particular sampling event at the monitoring well in question and the Y-Axis on the right measures the DNAPL thickness on that same date which is represented by the height of blue and red bars.

In the case of a very typical downward gradient of groundwater the colored lines from the different depths should never cross as time goes on. When the flow of groundwater goes from a deeper well to a shallower well, then we know that there exists an *upward vertical gradient*. This is represented on the figures below by the colored line belonging to a deeper well crossing the colored line belonging to a shallower well.

Figure 7 below depicts Monitoring Well 25 which is located offsite within the residential area roughly at the intersection of Lockwood and Liberty Road. In the case of Monitoring Well 25, an expected downward gradient of groundwater is observed. This trend can be seen as the black line (indicating the groundwater elevation of the shallow well down to groundwater bearing unit A) and the yellow line (indicating the groundwater elevation of the deeper well down to groundwater bearing unit C) never meet or cross.

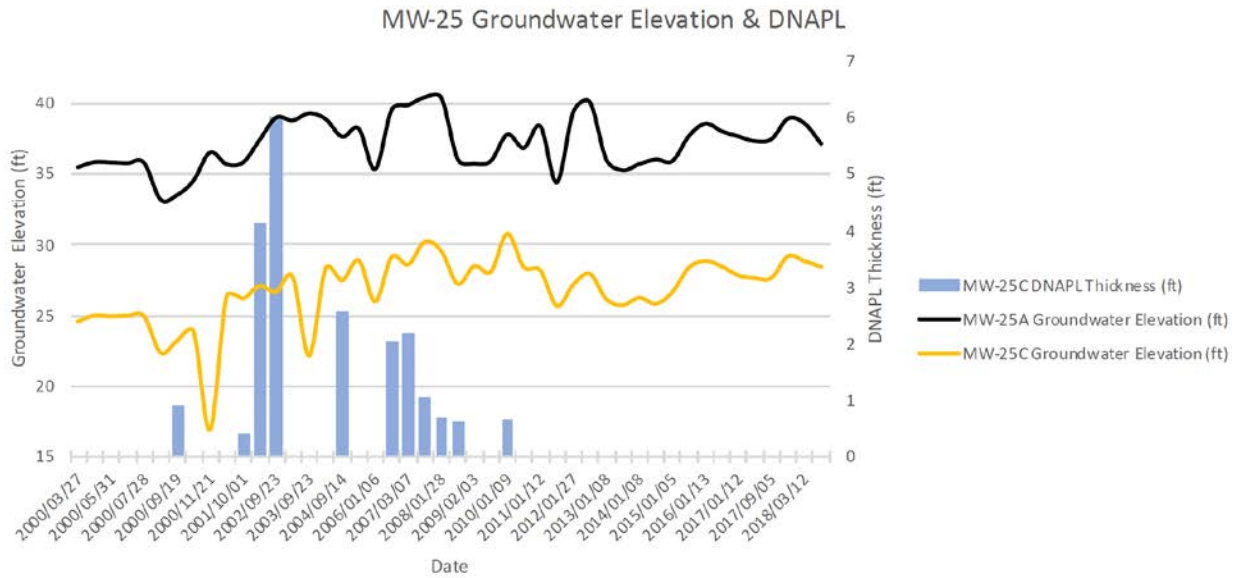


Figure 7 Depicting MW-25 Groundwater Elevation and DNAPL Thickness

Next, Figure 8 below depicts Monitoring Well 33. This well is located along Fontinot Street just north of Liberty Road, within the affected residential neighborhood. Well 33B was located at the same spot before being removed towards the end of 2011. Well 33BR is currently located along Fontinot but is farther north near the intersection with Wylie Street, likewise within the affected residential neighborhood. First, the placement of MW 33BR is highly irregular-it is standard practice to place wells that are similarly named in the same spot. Commenters would like to draw the TCEQ’s attention to UPRR and Golder’s deviation from the standard practice of placing similarly numbered wells in the same location. One can observe that before 33B was brought offline, there was a consistent flipping of the vertical gradient throughout the duration of the available data. MW-33A (black line) is seen to cross over MW-33B (yellow line) multiple times, each time an indication of change in the vertical flow. The groundwater levels of both wells stay close at all times, even after MW-33B was replaced with MW-33BR (green line) at the end of 2011. This trend line indicates a very dynamic vertical gradient over the course of time. UPRR and Golder’s error in placing MW 33BR away from MW 33A makes it difficult for those reviewing the permit materials to have an accurate understanding of the groundwater gradient conditions at these points. Additionally, it allows UPRR to avoid its duty to accurately present the subsurface conditions and plays a part in UPRR’s general assertion that the groundwater plume and resulting PCLE Zone are stable, which has been shown to be untrue.

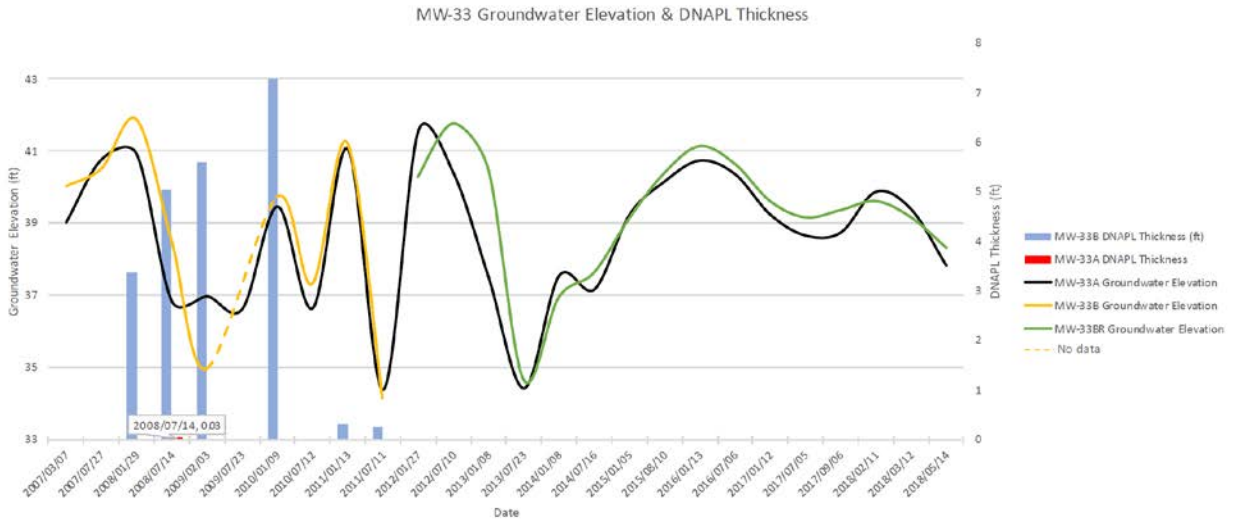


Figure 8 Depicting MW-33 Groundwater Elevation and DNAPL Thickness

Below is Figure 9 which depicts Monitoring Well 32 located just north of the intersection of Liberty Road and Clementine Street within the affected residential neighborhood. A clear change between a downward gradient and an upward gradient can be seen, when the black line (representing the elevation of groundwater bearing unit A) crosses the yellow line (representing the elevation of groundwater bearing unit B). Again these changes in the vertical gradient, from downward to upward then back to downward, cannot be denied. Yet UPRR has ignored them entirely.

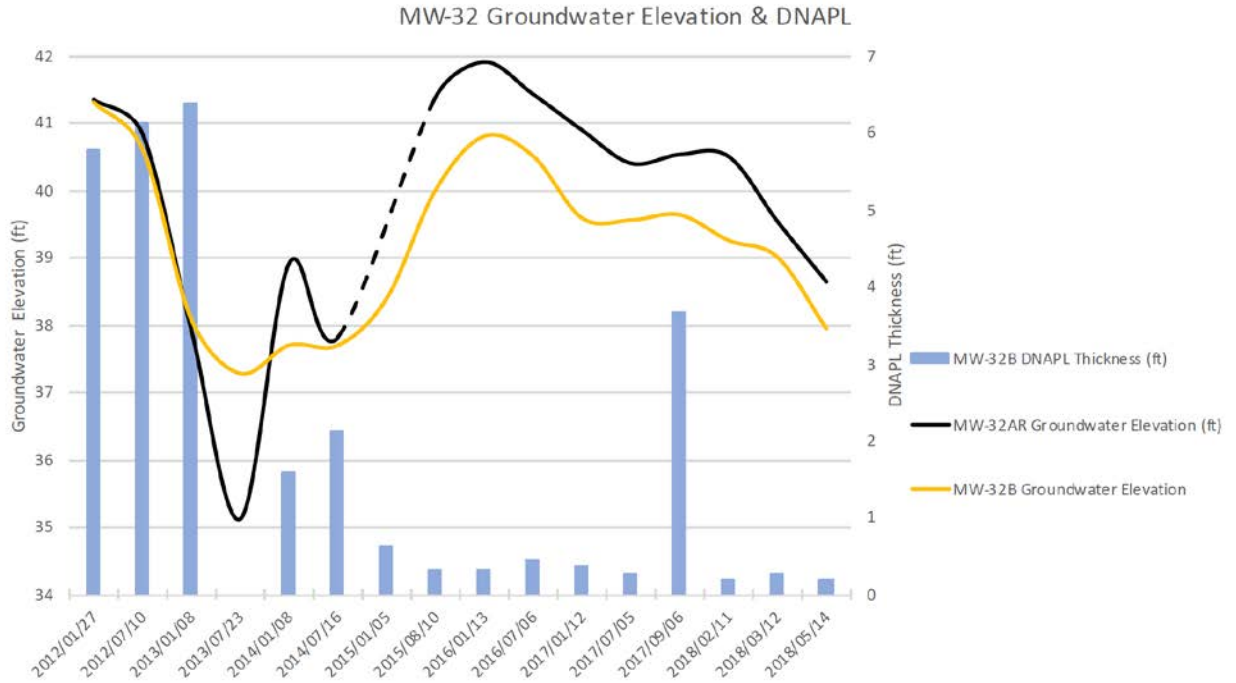


Figure 9 Depicting MW-32 Groundwater Elevation and DNAPL Thickness

Figure 10 below depicts MW 57 located on the *edge of UPRR’s property* just south of where Erastus meets Liberty Road. This MW had an unusual hike in groundwater elevation in MW-57B between January and July of 2013 and then flips from a downward vertical gradient to an upward vertical gradient. The groundwater elevation then returns to a downward vertical gradient and remains in that status even through the last few readings where the elevation between the two wells comes very close to flipping but stays at a downward vertical gradient.

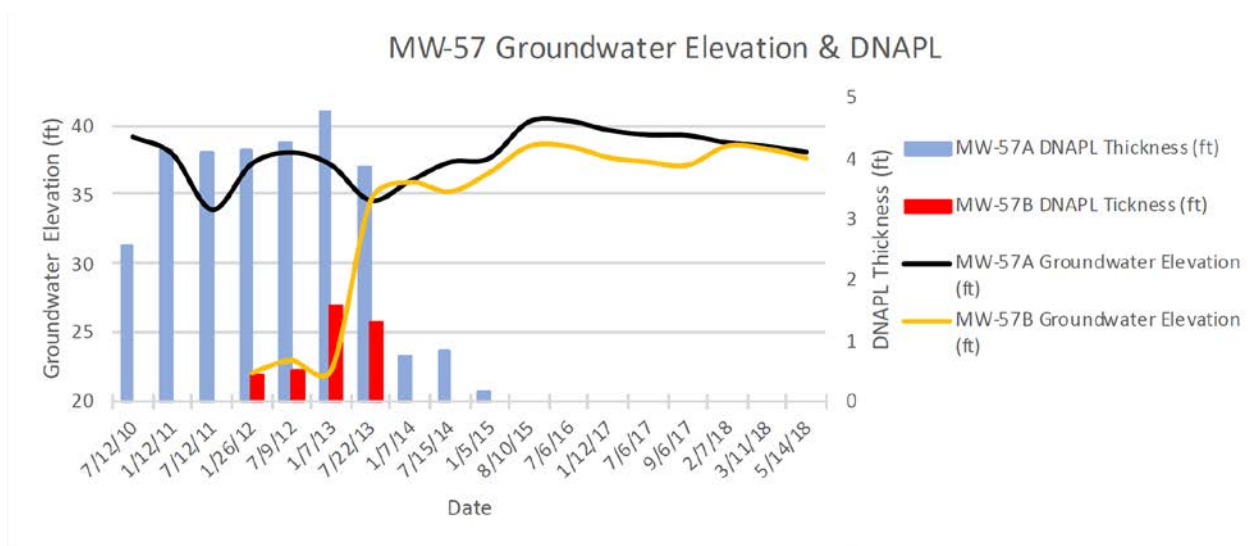


Figure 10 Depicting MW-57 Groundwater Elevation and DNAPL Thickness

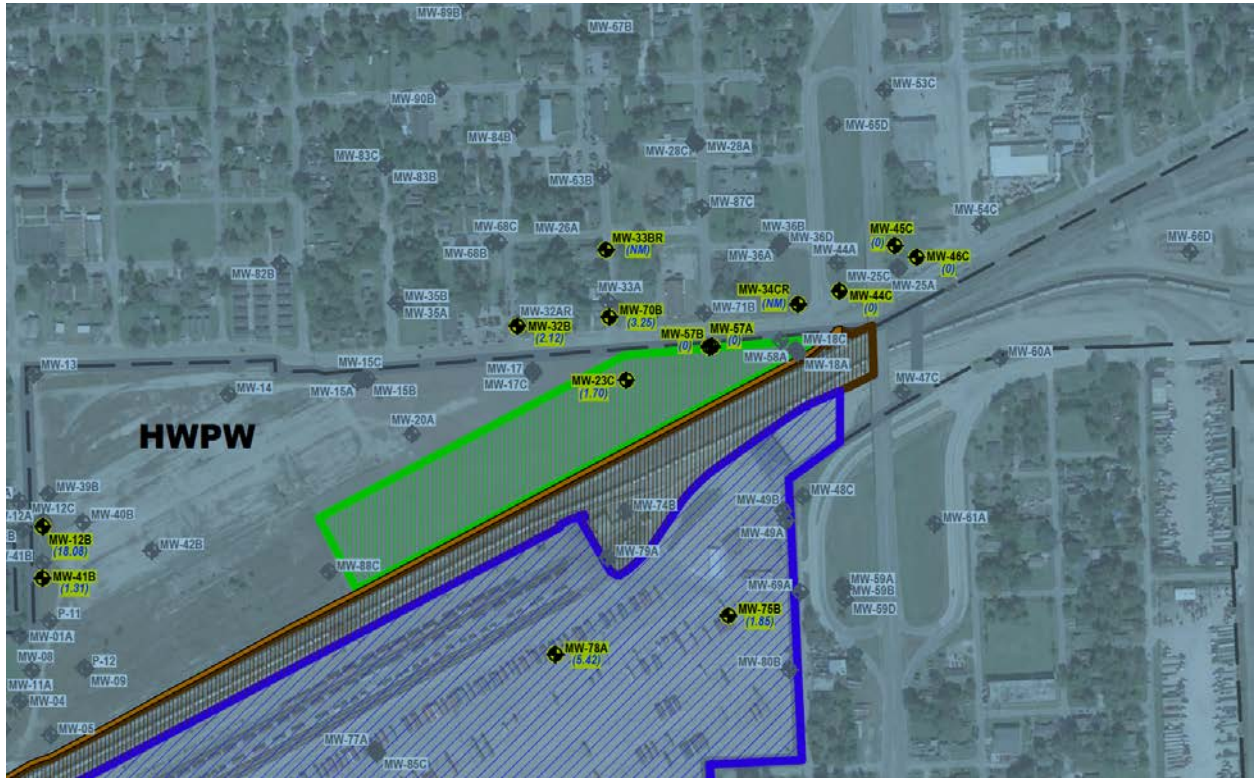
Commenters emphasize that they have not conducted a similar analysis of all wells across the affected residential neighborhood, much less across the entirety of the site. Nevertheless, the above examples show that there exist vertical gradients in certain areas across the PCLE. Up until now, these vertical gradients have been ignored by UPRR in an effort to convince the TCEQ that the contamination plume is stable. But UPRR’s own data contradicts this assertion. Any conclusion by either UPRR or the TCEQ that the plume is stable is therefore false. UPRR must take additional technical measures to control the PCLE Zone. UPRR has failed to satisfy requirements under both Remedy Standards A and B due, in part, to its ignoring these documented vertical gradients.

DNAPL is Actively Mobile, as Suggested by UPRR’s Own DNAPL Extraction Data

UPRR claims that it has the removal and contamination of DNAPL under control. UPRR has also stated that, “offsite DNAPL is no longer recoverable.”⁶ The DNAPL extraction data provided to TCEQ shows that this is not true. Twenty one of the seventy-seven wells located in the offsite, affected residential neighborhood contain traceable amounts of DNAPL, which has been measured to be as thick as 29 feet in some locations in the past. Map 8 below shows the location of UPRR’s DNAPL extraction wells that are within or very close to the affected

⁶ Additional Information for the TCEQ Initial Draft Permit (letter dated January 15, 2021 from Kevin Peterburs to Karen Scott) Post-Response Action Care, RAP Worksheet 5.0, pg. 1 of 6.

residential neighborhood as of March 2020. Figures 7-10 above also depict the DNAPL that was present in each of those wells at certain points in time.



Map 8 Location of UPRR's DNAPL Extraction Wells

As indicated by the different length of the blue bars (DNAPL thickness) in Figure 7 (MW 25) the DNAPL has a tendency to move in and out of wells quickly. Within a one-year period there was a showing of nearly 6 feet of DNAPL and none the next year. The year after that there was another reading of over 2.50 feet of DNAPL present in the well. While MW-25 is not a DNAPL extraction well, the data that has been collected there regarding the DNAPL thickness is nevertheless very telling.

The same trend presents itself in Figure 8 (MW-33). As indicated by the length of the blue bars, the readings go from nearly 6 feet of DNAPL, no traceable DNAPL five months later, and six months later over 7 feet of DNAPL is recorded. UPRR would have the TCEQ ignore the possibility that DNAPL can pop back up in any one extraction well from month to month.

Again, this trend presents itself in Figure 9 (MW 32). Every single sampling event save one recorded the presence of DNAPL over the six-year period that data was collected from this well.

LSLA takes this opportunity to emphasize that it has not graphed the DNAPL data from after May of 2018. However, UPRR's DNAPL extraction logs that from May of 2018 until December of 2019, DNAPL thickness in well 32B has varied from as little as 0.10 ft. thickness to as much as 4.54 ft. thickness.⁷ This variability is proof that the creosote/DNAPL plume remains mobile underneath the affected residential neighborhood.

This data supports Commenters' assertion that UPRR is not dealing with a stable creosote/DNAPL plume. Additionally, UPRR cannot claim that it has removed all readily recoverable DNAPL simply because DNAPL is no longer being removed from any one particular well. It is well known that the DNAPL follows the path of least resistance over the course of time in addition to sinking farther into the subsurface due to gravity. Therefore, when UPRR states that the DNAPL is no longer recoverable it is not because the DNAPL is now too far out of reach or because the extraction wells have removed all the DNAPL that there is to remove. Instead, it is because the DNAPL continues to remain mobile and has migrated beyond the reach of any one particular well. In order to account for this mobility, UPRR should be made to install additional DNAPL extraction/groundwater gradient control wells (as mentioned in UPRR's Draft Permit) that are designed to extract DNAPL more efficiently. The DNAPL extraction wells that are currently being used were not initially designed for extraction as they are not of the appropriate diameter. Whatever combination DNAPL extraction/groundwater gradient control wells do get installed; they must be properly designed for the purpose of extraction.

UPRR has submitted a report assembled by its contractor, Golder, which makes the observation that the DNAPL at the site is "mobile...within the complex network of fractures and thin carbonate seams"⁸ that lay beneath the residential properties. What then follows is a narrative explanation by Golder which attempts to downplay the implications of the word 'mobile' or somehow affirm that the word does not at the same time imply a 'migration' of the DNAPL plume. In its own document, UPRR states that "cyclical NAPL fluctuations in impacted wells...indicate NAPL is mobile."⁹

⁷ DNAPL Recovery Activities Quarterly Report – 4th Quarter 2019, March 16, 2020, Pg 2.

⁸ Risk Based NAPL Management, Houston WOOD Preserving Works, Houston, Texas by Golder, Aug 20, 2020 Pg. 8

⁹ Id. at pg. 4

It is here that UPRR's analysis of the site conditions strays from reality. It is generally known that creosote/DNAPL obeys gravity along the *paths* of least resistance which is often provided by the type of complex network of fractures in the soils and thin carbonate seams that UPRR acknowledges are present in the substrate. As time goes on the DNAPL begins to pool throughout this system of fractures until finally the head, or pressure, reaches such a point that it will exceed the side wall friction of these fractures and then break through, allowing the creosote/DNAPL to plunge even deeper.

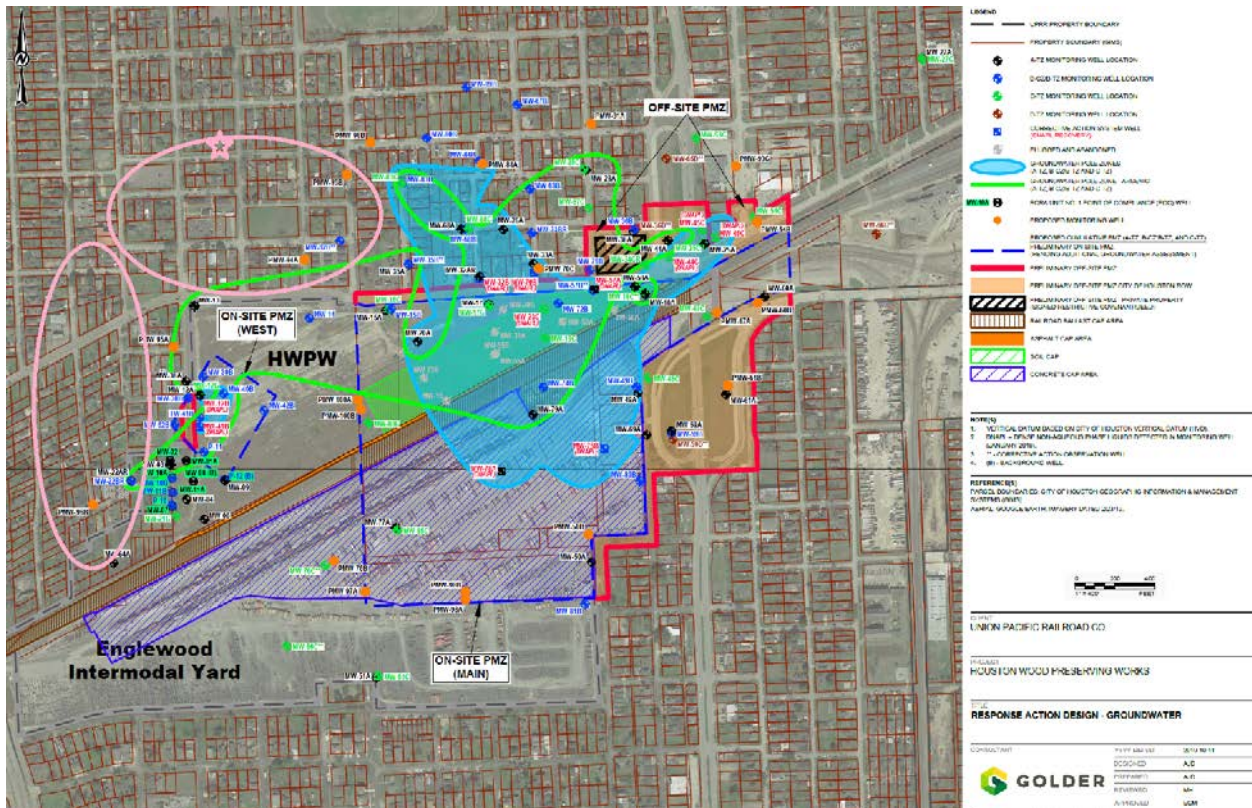
D. GENERAL DEFICIENCIES IN NEED OF RESOLUTION BEFORE THE DRAFT PERMIT CAN BE GRANTED

Lack of Clarity for Property Owners Whose Properties Will Not Be Included in the now Reduced PMZ

Currently, the Draft Permit does not spell out for the benefit of numerous private property owners, much less the public, what is to happen with the dozens of Restrictive Covenants that UPRR had private property owners sign beginning in 2014. At the time, UPRR was planning on designating a large swath of the affected residential neighborhood as part of the PMZ. UPRR has since scaled back on its proposed PMZ yet has not provided any account as to what is to be done with the signed Restrictive Covenants. As such, property owners are left without any assurance as to whether or not UPRR will attempt to file the Restrictive Covenants in the future in the event it is unable to comply with other obligations of its Draft Permit and Remedy Standard A. UPRR must formulate a plan to address these Restrictive Covenants which are signed but now are not to be filed in the real property records. Such a plan must give these residents the kind of assurance surrounding their property title that they deserve.

Concerns That Not Enough Environmental Monitoring Has Been Conducted In Areas Near But Not Directly Over the PCLE

Commenters also wish to express their worry that there are areas of the affected residential neighborhood that have largely been ignored by UPRR and TCEQ for years with regard to the development of site characterization and the extent of the offsite contamination. These areas of concern include, but are not limited to, the areas enclosed in the pink circles below on Map 9, with the pink star representing the residence and property belonging to Mrs. Ortiz.



Map 9 - Additional Areas of Concern and Location of Mrs. Ortiz's Property

Commenters have heard from numerous members of the community over several years about what *they* believe to be the *possible* extent of the contamination. The lived experiences of these residents must be heard and acted upon.

These residents, after having learned that UPRR represents the extent of the contamination to be limited to the PCLE zone, are quick to point out that there are other areas very near the PCLE Zone that were exposed to creosote in the past. They can recall when Southern Pacific's creosoting operations were still up and running prior to the nineteen-eighties and the types of exposures that took place over the course of many decades.

Because the creosote pits were unlined, creosote was often carried off of Southern Pacific's Property and into the residential neighborhood via runoff. Numerous other residents have memories of how they are someone they knew would often play in gullies and ditches filled with water that had a multi-colored almost rainbow tinted sheen to it, not knowing that they were unwittingly being exposed to this creosote contaminated runoff from the Site. Children were known to pull crawdads from these same water gullies conveying creosote contaminants, and still others recall how fellow residents often kept wooden railroad ties that originated at the

Southern Pacific site as planters on their property, growing untold amounts of vegetables and/or fruit in creosote-soaked wood. These types of exposures were not limited to the streets that form the periphery of UPRR's property but took place within a few blocks to the north, northeast, northwest and west of the current Site.

The most shocking exposures however are from environmental disasters that were known to take place from time to time at the Southern Pacific Creosoting Site. In one such instance an explosion or other mishap caused material to be thrown into the air before it rained down on the residential neighborhood to the north, northeast and northwest, blanketing parts of these private properties in a black tar like substance that can now only be assumed to have been the creosote itself. Long-time residents can remember how their homes, yards, gardens, private property and in some instances, their physical person, came into contact with the creosote in this manner. It is true, some of these residents lived on property that is now over the PCLE—but many of these residents lived elsewhere, more towards the west, along north-south running streets like Wipprecht, Schweikhardt, Kashmere, Amboy and Wayne. Current residents of these streets with deep roots in the community, or those residents who have moved away from the area but who are keenly watching this permit matter unfold, are shocked that these areas are not part of UPRR's PCLE Zone given their past exposure to the creosote. As such, Commenters urge the TCEQ to take a more holistic and comprehensive view towards environmental testing and require that as part of UPRR's Draft Permit it be made to conduct environmental sampling and monitoring in these areas. It is possible that some of the subterranean media beneath these properties will creosote/DNAPL or other COCs that have gone completely undetected and thus unaddressed by UPRR. It is possible that there are exposure pathways that have not been studied.

TCEQ and UPRR must take into consideration this community sourced and held knowledge and resolve this gap in data points in order to ensure that all possible physical points of exposure and contamination have been discovered, documented, and thoroughly studied. Until this is done there is a large segment of the affected residential community that is convinced that both TCEQ and UPRR have chosen to ignore their very valid concerns regarding possible contamination spread and by extension, their health and well-being.

III. Conclusion and Request for Relief

For the reasons stated in these comments and the Prior Comments, UPRR has failed to demonstrate that its Permit Renewal/Modification No. 50343 will comply with the TRRP. The TCEQ should deny the Permit that UPRR seeks because of the risks that will be borne by the affected residential neighborhood that plays host to the former Houston Wood Preserving Works Facility. These risks are due to many deficiencies with the RAP as currently proposed by UPRR most of which stems from UPRR's faulty understanding of the subsurface conditions. UPRR has not yet characterized the subterranean creosote/DNAPL plume that plays a part in the characterization of groundwater plume that is *above* the creosote/DNAPL plume. Instead, UPRR chooses to ignore much of the DNAPL data to underestimate both its movement and its relationship to the ever-expanding PCLE Zone. With regard to other deficiencies, first and foremost amongst these is UPRR's failure to consider the existence of COCs in the form of vapors reaching the surface from the subsurface; its failure to demonstrate that both the creosote/DNAPL plume and the groundwater plume are stable; its failure to plan to extract all readily removable DNAPL; outstanding questions regarding UPRR's plan for signed Restrictive Covenants for properties that will not be included in the offsite PMZ; and the lack of environmental testing and monitoring in areas of concern beyond the offsite PCLE.

Further, Impact and Mrs. Anna Ortiz request that the TCEQ refer the matter to SOAH for a Contested Case Hearing and that each of them being granted party status. Finally, Commenters also reiterate their request that the TCEQ organize a Second Public Meeting, one that would resolve the host of issues experienced during the Virtual Public Meeting held on June 21, 2021 and elaborated upon in these comments. Please feel free to contact the undersigned counsel with any questions.

Respectfully submitted,
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