HydroAnalysis

TECHNICAL MEMORANDUM

To: Jim Orr, Oregon Department of Environmental Quality

From: Peter Shanahan, HAI

Subject: **Review of Source Control Evaluation for Northwest Pipe**

Date: March 16, 2020

This review of the Source Control Evaluation (Jacobs, 2020) for the Northwest Pipe upland parcel has been prepared on behalf of the Five Tribes[1]. The document by Jacobs (2020) comprises two separate reports, one entitled "Remedial Investigation in Support of Site-wide No Further Action Determination" and one entitled "Source Control Evaluation in Support of No Further Action Source Control Decision." This review focuses on the Source Control Evaluation (SCE) but includes a few comments on the Remedial Investigation (RI) as well.

General Comments on the SCE

1. Overall, we find that controls put in place for the stormwater pathway are extensive and likely effective. We believe this pathway has been adequately addressed.

2. With respect to the groundwater pathway we are concerned that volatile organic compounds (VOCs) in the Southeast Area are present at concentrations indicative of the presence of dense non-aqueous phase liquids (DNAPLs), an issue that is not addressed in the SCE (or RI). While we concur that there is evidence of reductive dechlorination in the Southeast Area, reductive dechlorination is ineffective against non-aqueous phase liquids. The likely presence of DNAPL implies a long-term source of contamination to groundwater that has not been addressed or even acknowledged in the SCE or RI.

3. We do not believe that the downgradient groundwater pathway has been adequately investigated. This pathway has unknown potential to convey VOCs to the Willamette River. The SCE fails to adequately evaluate potential offsite transport of VOCs from the Southeast Area. The groundwater elevation contours and VOC concentration measurements reported in Figure 5-9 suggest a VOC plume that extends from MW-05 to MW-06 and MW-01, and which then misses MW-03 and narrowly misses MW-04. There are no further downgradient wells on this trajectory. Offsite well T4S1MW-23 is too far west and T4S1MW-22 is too far east to intercept the core of any plume. Additional wells are needed to demonstrate that there is not a

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[1] The five tribes are the Confederated Tribes of The Grand Ronde Community of Oregon, the Nez Perce Tribe, the Confederated Tribes of Siletz Indians, the Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of the Warm Springs Reservation of Oregon.

high-concentration plume of VOCs leaving the site in this unmonitored corridor and to trace the plume to where it presumably discharges to the river.

Detailed Comments on the SCE

4. Pg. 2-2, the text states “coarse bedding material that could provide a preferential pathway for flow is absent at the Site.” The phrase “…is absent…” is an overstatement given that not all underground utilities have been uncovered. It would be more correct to substitute “…appears to be absent…” or “…has not been found…”

5. Table 3-4 has blank results for many analytes and many samples. Presumably these indicate that the sample was not analyzed for this constituent but that is not indicated in the table notes. A note should be added to the table to clarify the meaning of a blank result.

6. Also with respect to Table 3-4, recent results for wells in the Southeast Area report cis-1,2-dichloroethene but not trans-1,2-dichloroethene. Since some analyses do not differentiate these two forms, the presentation in Table 3-4 creates ambiguity as to what is actually being reported. Moreover, the ratio of the cis to the trans isomer is an indicator of biodegradation and it seems an oversight to have not analyzed for the trans isomer. The text should clarify if the trans isomer was included in the analyses and if not, why not.

7. Page 4-2, final paragraph, the SCE states “Additional BMPs implemented at the site include weekly road sweeping and jet-cleaning of stormwater lines.” This phrasing can reasonably be interpreted to mean that both road sweeping and jet-cleaning are conducted weekly, whereas only road sweeping is actually conducted weekly. This sentence should be rephrased for clarity (e.g., “Additional BMPs implemented at the site include jet-cleaning of stormwater lines and weekly road sweeping”).

8. Section 5.2.2 of the SCE inappropriately minimizes the presence of tetrachloroethylene (PCE) and trichloroethylene (TCE) in site groundwater. Concentrations of PCE are high enough in groundwater in the Southeast Area to indicate the likely presence of DNAPL PCE in the subsurface according to a criterion given in EPA guidance (Newell and Ross, 1992) that concentrations greater than 1% of pure phase solubility indicate the likely presence of DNAPL. The pure-phase solubility of PCE is about 200,000 µg/L (Pankow and Cherry, 1996). Figure 5-9a shows numerous results in which PCE exceeds 1% of this value (2,000 µg/L) in monitoring well MW-05, providing strong evidence that DNAPL is present near this well. The SCE does not address this issue despite the fact that the presence of DNAPL would imply a persistent VOC source that is unlikely to attenuate naturally.

9. On page 5-8, the SCE minimizes the potential for preferential flow via historical Gatton Creek because the former creek was east of the site. However, page 5-8 also reports that well MW-05 is in a zone of higher hydraulic conductivity. As shown in Figure 2-3, the historical alignment of Gatton Creek is in fact very near the site (and MW-05) and the site historically was almost entirely marsh. The SCE’s implicit assumption is that the mapped historical alignment of Gatton Creek was a permanent alignment and that Gatton Creek never crossed the site. Such an assumption is inconsistent with the historical character of the area; the stream alignment is likely to have meandered over time through the marshland that became the site. Thus, other historical stream deposits could underlie the site and provide preferential flow pathways.

Unfortunately, as illustrated in Figure 5-8, on-site wells and probes are not deep enough to identify historical channels if they do indeed exist; subsurface exploration did not extend beyond the fill materials except in isolated probes. The higher hydraulic conductivity at MW-05 is thus unexplained: it could be due to sandier dredge fill in that particular location or the well could be situated at an historical stream channel. Either situation contradicts the SCE's dismissal of the possibility of preferential flow pathways. The SCE should be revised to indicate that the potential for preferential flow is unknown but such potential exists.

10. The statement in the first incomplete paragraph of page 5-8 that "These characteristics are consistent with a stable or decreasing plume that is effectively controlled by natural attenuation processes" lacks credibility in the absence of wells that actually monitor the plume downgradient of the site. The lack of downgradient wells is further discussed in general comment 3 above.

11. On page 8-1, the RI states that groundwater at the site has "low concentrations of hydrocarbons and VOCs at scattered locations at the Site." This statement is not supported by the data. Concentrations of PCE and TCE in groundwater in the Southeast Area remain well above the EPA's maximum contaminant levels (U.S. EPA, 2009) that are the typical standards for groundwater cleanup. The Southeast Area is highly contaminated by VOCs.

12. Page 8-2 states that "An MNA [monitored natural attenuation] program is the adequate measure to assure source control continues in the future." In fact, MNA addresses management of migration but not source control, and particularly not if DNAPL is present. EPA guidance (U.S. EPA, 1997) highlights that MNA may not be effective for chlorinated solvents because of the presence of DNAPL. EPA states "Because of the nature and the distribution of [chlorinated solvents], natural attenuation may not be effective as a remedial option. If they are not adequately addressed through removal or containment measures, source materials can continue to contaminate groundwater for decades or even centuries." Given the nature of chlorinated solvents, the burden is on Northwest Pipe to demonstrate that source control (i.e., cleanup of DNAPL) is not required for a successful MNA remedy at this site. This burden has not been met, despite the evidence that DNAPL is likely present at the site.

Comments on the RI

13. On page 6-3, the RI dismisses high PCE concentrations observed in the company's deep production well as due to a "regional VOC plume." This statement lacks credibility in light of the indications of on-site DNAPL and the absence of any rigorous analysis in the RI of the relationship of the site to the "regional plume."

14. On page 6-8, the RI ascribes contamination at MW-05 to "possible onsite migration of an upgradient, offsite VOC plume." The RI should acknowledge that the data in Figure 6-2 do not support this hypothesis and that despite near-offsite groundwater samples, an offsite source has not been positively identified.

15. Chapter 8, the risk screening evaluation, ignores potential ecological risk to the Willamette River.

Cited References

Jacobs, 2020. Remedial Investigation and Source Control Evaluation, Northwest Pipe Company, 12005 North Burgard Road, Portland, Oregon 97203, ECSI No. 138. Jacobs Engineering Group. February 2020.

Newell, C. J., and R. R. Ross, 1992. Estimating potential for occurrence of DNAPL at Superfund sites (OSWER Directive 9355.4-07FS). Report Number OSWER 9355.4-07FS. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Ada, Oklahoma. January 1992. (https://semspub.epa.gov/work/11/174833.pdf)

Pankow, J. F., and J. A. Cherry, 1996. *Dense chlorinated solvents and other DNAPLS in groundwater.* Waterloo Press, Portland, Oregon.

U.S. EPA, 1997. Use of Monitored Natural Attenuation at Superfund, RCRA Correction Action, and Underground Storage Tank Sites (OSWER Directive 9200.4-17). Report Number OSWER Directive 9200.4-17. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. November 1997.

U.S. EPA, 2009. National Primary Drinking Water Regulations. Report No. EPA 816-F-09-004. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water, Washington, D.C. May 2009.