



December 1, 2020

Mr. Greg Prom
Superior Water Light and Power Company
2915 Hill Avenue
Superior, WI 54880

SUBJECT: Draft Remedial Action Options Report,
Superior Water Light and Power Manufactured Gas Plant
Winter Street and USH 53, Superior, WI
BRRTS ID: 02-16-275446

Dear Mr. Prom,

The Wisconsin Department of Natural Resources (DNR) has completed a review of the November 2020 draft Remedial Action Options Report (RAOR), submitted to the DNR on your behalf by Foth Infrastructure and Environment, LLC (Foth). The RAOR was submitted with a \$700 review fee and evaluates remedial action options for the upland portion of the site only.

After reviewing the RAOR and a subsequent conference call with you and Foth on November 19, 2020 the DNR makes the following comments on the RAOR:

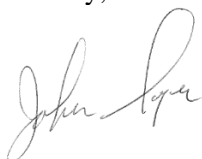
1. The RAOR describes the proposal to utilize air sparging to remediate the area of elevated benzene and polynuclear aromatic hydrocarbon (PAH) contamination northeast of the former manufactured gas plant (MGP). The DNR is concerned that the use of air sparging without a soil vapor extraction system will lead to uncontrolled vapor migration to receptors including sewer lines and other utility corridors as well as buildings in the area of the remedial action. Some of the nearby buildings include the City of Superior Garage and wastewater treatment plant (WWTP), Lakehead Concrete buildings, buildings on the CLM properties to the northwest and southeast of the former MGP, as well as the building on the former MGP site itself. The concentrations of VOCs in the area of proposed air sparging are such that potential vapor migration induced by the air sparging may be a significant human health risk and potentially a serious safety risk. A plan to recover soil gas in the area of the air sparging and a plan to monitor soil gas, utility corridors, and buildings will be necessary prior to the DNR approving an air sparging option.
2. The results of the Pre-Design Investigation (PDI) are not fully presented in the RAOR. If, as suggested during our conference call on November 19, 2020, a PDI investigation report is not going to be submitted to the DNR, the RAOR should contain soil boring logs, sampling methodology, discrepancies from the PDI plan, and comparison of the PDI results to the former site investigation activities. Additionally, the RAOR should include interpretation of the results of the PDI and any other site investigation information that is required in Wis. Adm. Code ch. NR716 for documentation of site investigation activities. The results of the PDI and analysis of the results are necessary to evaluate remedial action options for the areas of the site where the PDI was conducted.

3. The draft RAOR does not evaluate remedial action options for contamination beneath the City of Superior Wastewater Treatment Plant (WWTP) or the BNSF railroad tracks downgradient of the area where active remedial action is proposed in the RAOR. Remedial action options are necessary for all areas of contamination at the site.
4. The proposed air sparging area is composed of fill on top of Miller Creek formation clay. The DNR is concerned the heterogeneity of the fill material will cause preferential air flow resulting in an inefficient remedial action and is requesting an evaluation of the applicability of air sparging in this environment. To what extent have the soil and fill been characterized to show suitability for an air sparging option?
5. The RAOR does not specify the anticipated depths of the proposed air sparge system. If the air sparge system is to be installed in the fill material and soil above the Miller Creek formation this will leave high concentrations of contamination in groundwater that may not benefit from the air sparge system. Many of the site monitoring wells exhibiting high groundwater contaminant concentrations are screened within Miller Creek clay.
6. The DNR is unsure how the proposed remedial action will address soil contamination above the water table and below the proposed excavation for remediation of the direct contact risk. Even if the air sparging reduces the benzene concentration in groundwater, contamination above the water table will continue to act as a source of contamination to groundwater in the future. Following remedial action, confirmation soil samples and ongoing groundwater monitoring, potentially much longer than the 2 years estimated by Foth, will be needed to demonstrate the soil to groundwater contaminant pathway is not complete and any remaining contamination will not pose a threat to groundwater quality.
7. The RAOR proposes concentrations of 100mg/kg for benzene, naphthalene, and benzo(a)pyrene as clean-up goals for the excavation. The DNR does not understand the basis of the 100mg/kg goal and will evaluate the remedial action using the Wis. Adm. Code ch. NR720 RCLs for both direct contact and the soil to groundwater pathway.
8. The DNR believes the timeframes listed in Appendix B for operation and maintenance for remedial options 2, 3, and 5 are unrealistic and may be skewing the results of the analysis of remedial action options. The DNR feels the 2-year estimate for active remedial action using air sparging may be overly optimistic due to concerns expressed in this letter. The DNR also considers the 40 and 80-year monitoring for options 2 and 4 to be unrealistic, based on typical monitoring at other sites in Wisconsin.
9. The first order decay rate included in Appendix A of the RAOR calculated by Foth appears to assume homogeneous soil conditions and a perfect distribution of oxygen throughout the sparge area. There appear to be many opportunities for short circuiting of air flow to utilities as well as preferential air pathways through heterogeneous fill material that may make oxygen distribution difficult.
10. The first order decay rate calculated by Foth in Appendix A of the RAOR is for benzene only and not for all contaminants of concern at the site. Benzene is easily volatilized and bioremediated in comparison to other VOCs and especially PAHs. The timeframe for volatilization and bioremediation of the source area for all contaminants of concern utilizing air sparging and bioremediation may be significant.

11. Section 4.2.3 of the RAOR does not specify the depth of excavation in the area of the former Horton sphere. Monitoring well MW-4, which has the highest benzene found in groundwater at the site, is screened approximately 4 feet below the top of the Miller Creek formation clay. Additionally, very high concentrations of BETX and PAHs were detected in soil at depth in the area of the former gas holders. Excavation near the former gas holders and Horton sphere should extend to a depth to reduce the contaminant concentrations of these significant source areas to the extent practicable. The DNR also recommends the proposed excavation area near the Horton sphere and the other former gas holders be backfilled and compacted with a low permeability material and potentially capped with an impermeable cap following excavation to limit hydraulic head that could promote migration of any remaining contamination.
12. Currently, there are no groundwater monitoring wells in the area of the former gas holders. MW-3 is abandoned and there are no other wells between the former gas holders and the plume associated with the MGP area of contamination. Groundwater monitoring at the location of the former gas holders will be necessary to determine the effectiveness of the remedial actions. An assessment of the monitoring well network will be necessary to ensure the locations being monitored are appropriate for the site during and following remedial action.
13. The DNR requests a draft groundwater and soil gas monitoring plan be submitted along with a final RAOR in order for the DNR to evaluate if the level of monitoring is adequate and appropriate for the proposed remedial action. The draft monitoring plan should detail monitoring needs during remedy implementation and post-remedial action in order to assess effectiveness of the remedy.

The DNR appreciates the opportunity to comment on the RAOR. Please contact me at john.sager@wisconsin.gov or call me at 715-919-7239 if you have questions or if you would like to discuss the contents of this letter.

Sincerely,



John Sager
Hydrogeologist
Remediation and Redevelopment Program

C: File
Erin Hughes, Foth