



MEMORANDUM | March 18, 2022

TO Erin McDonnell and David Lacey, Oregon Department of Environmental Quality (DEQ)

FROM Peter Shanahan, HydroAnalysis, Inc. (HAI); Jennifer Hart and Gail Fricano, Industrial Economics, Inc. (IEc)

SUBJECT Five Tribe review of “Quarter 3 & 4, 2021 Groundwater Source Control Measure Performance Monitoring Report (August through December 2021), MMGL / Premier Edible Oils Site,” dated February 4, 2022

This memorandum, submitted on behalf of the Five Tribes,¹ reviews the *Quarter 3 & 4, 2021 Groundwater Source Control Measure Performance Monitoring Report (August through December 2021) MMGL/Premier Edible Oils Site*, prepared by ERM on behalf of Burgard, A Series of MMGL LLC (ERM 2022). The Five Tribes have reviewed previous quarterly and semiannual reports and submitted comments to DEQ.

GENERAL COMMENTS

1. This latest groundwater monitoring report concludes “that concentrations of contaminants are generally decreasing across the wells within the air sparge treatment system area” (page 11). However, the trend plots in Appendix D show concentrations are variable, but neither increasing nor decreasing consistently during the period of air sparging. Based on these data, it appears the air sparge system is not achieving the reduction in contaminant concentrations as intended.
2. This report highlights two new issues: (1) that “groundwater mounding”² may cause contaminants to move around the groundwater barrier wall (GWBW), and (2) that injected air is “short-circuiting”³ into the adjacent International Slip site. This suggests that not only is the air sparge system not achieving the intended reduction in concentrations, but it may also be adversely impacting the GBW’s containment function.
3. Based on these findings, we recommend that DEQ consider two fundamental questions with respect to source control for the Premier Edible Oils site: (1) does the GBW need to be extended laterally to achieve containment, and (2) is air sparging an appropriate technology for this site.

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.

² “Groundwater mounding” refers to a localized rise of the groundwater table into unsaturated soils.

³ “Short-circuiting” refers to air escaping the air sparging system’s intended pathway.

SPECIFIC COMMENTS

4. Page 2 of the report indicates that flow was reduced in order to decrease mounding and potential migration of contaminants around the north and east end of the GWBW. The Q1 & Q2, 2021 report (ERM, 2021) describes this mounding effect as “increasing” and states, without reference to supporting data, that it is causing mobilization of dissolved arsenic and manganese towards the ends of the GWBW. This is a potentially significant development, which was insufficiently described in ERM (2021) and received only limited discussion in ERM (2022). Our review of the data and comparison with past reports does not provide a clear indication that mounding has in fact increased, and we recommend that the discussion in this report (or a separate report) provide a complete description of water level trends that indicate increasing mounding, including references to specific data and contour or time-series plots. Further, we recommend that a quantitative measure of mounding be provided. Data provided by ERM show groundwater elevations but do not quantify mounding (i.e., the difference between the groundwater elevation with sparging and what the elevation would be without air sparging). For example, mounding could be calculated as the difference between measured groundwater elevations and the coincident elevation in the river.
5. Page 2 of the report also states that air is short-circuiting into the International Slip. Other than a brief mention in ERM (2021), this issue was not described in earlier reports. We recommend that this report (or a separate report) provide a more complete discussion of the nature and magnitude of this problem, how it was identified, and, most importantly, the implications for source control. Are the air bubbles releasing non-aqueous phase liquid (NAPL) and causing sheens in the adjacent slip? Without this additional context, we are unable to evaluate how air bubbles in the International Slip could be problematic to a degree that would require the air sparge system’s operation to be modified.
6. Page 9 states “The analytical data indicates that dissolved arsenic is still mobile within the subsurface and is moving horizontally towards the ends of the GWBW, particularly towards the north end of the GWBW.” We recommend that that this report (or a separate report) provide a more complete explanation of this important observation. What specific data at which specific wells support this conclusion? To this point, we fail to see how it is possible to observe “horizontal movement” towards the north end of the GWBW when there are no intermediate wells inside the GWBW between MW-02 at the edge of the light non-aqueous phase liquid (LNAPL) zone and MW-32 near the end of the wall.
7. Page 13 states “The water levels of MW-34 and MW-11 continue to be high throughout the reporting period” to support the contention that the air sparge system is causing increased groundwater mounding. The statement that water levels in MW-34 and MW-11 are high does not appear to be supported by the Cluster 1 graph in Attachment A, which shows the water levels in those wells to vary consistently with the water levels in the Willamette River and upgradient

well MW-21. We recommend the report cite the specific data that support conclusions regarding groundwater mounding.

8. Page 13 also states “These results indicate that during higher groundwater level conditions the air sparge system causes additional mounding of groundwater that then remains trapped above the thin silt layers present.” We recommend that the report cite the specific data that support this statement.
9. The water levels in Figures 3 through 8 do not appear to be consistent with those in Attachment A. For example, Figure 6 shows the water levels in MW-11 and MW-34 at 7.65 and 7.48 feet, respectively, and indicates the data were collected on October 12. The Cluster 1 graph in Attachment A shows water levels on October 12 at approximately 9 and 10 feet for those wells. Please explain this apparent discrepancy. Further, Table C-3 shows transducer calibration offsets of about 0.7 feet for MW-11. Please confirm that plotted data were corrected for any calibration errors.
10. Page 14 recommends what seem to be significant changes in the operation of the air sparging system (e.g., air sparge cycle timing, flow rate modifications) based on “groundwater mounding and horizontal movement of contaminants that is being observed.” As explained above, the report does not provide adequate justification for these conclusions. We recommend that the requested changes to system operation not be approved until the observations are supported by data.

EDITORIAL COMMENTS

11. The International Slip is not labeled in any of the figures in the report. To the extent that the International Slip site is impacted by activities at the Premier Edible Oils site, we recommend including relevant location information (in text and on maps) for context.

REFERENCES

- ERM. 2021. Quarter 1 & 2, 2021 Groundwater Source Control Measure Performance Monitoring Report (January through June 2021), MMGL / Premier Edible Oils Site. ERM, Portland, Oregon. July 30, 2021.
- ERM, 2022. Quarter 3 & 4, 2021 Groundwater Source Control Measure Performance Monitoring Report (August through December 2021), MMGL / Premier Edible Oils Site. ERM, Portland, Oregon. February 2, 2022.