REGION 10
SEATTLE, WA 98101

April 30, 2024

Jen Woody, R.G.
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

SUBJECT: Revised EPA Review of the Umatilla County – Central Area Artificial Recharge Project Artificial Recharge Limited License Application; dated September 26, 2023

Dear Ms. Woody:

The United States Environmental Protection Agency (EPA) has completed its review of the *Umatilla County – Central Area Artificial Recharge Project Artificial Recharge Limited License Application* (application); dated September 26, 2023. The application was provided to EPA on October 9, 2023, but was missing the required numerical groundwater model. A separate technical memorandum, entitled *Numerical Groundwater Modeling to Evaluate the Effect of Artificial Recharge on a Groundwater Pump and Treat System, Former Umatilla Army Depot, Umatilla County, Oregon,* was provided on December 11, 2023, and the Oregon Water Resources Department (OWRD) established a review deadline of March 31, 2024. EPA originally provided comments on March 20, 2024. Since that time, EPA has published maximum contaminant levels and a proposed rulemaking for two types of per- and polyfluorinated substances (PFAS). These changes warrant a revision to EPA's previous comments.

The EPA Superfund and Emergency Management Division's primary interest in this project is its potential impact on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) work and contamination on the Umatilla Army Depot Superfund Site. There are three CERCLA operable units located near the area of the proposed artificial recharge project: a contaminated groundwater plume, the former Active Landfill, and the former QA Function Range. The contaminated groundwater plume is being actively remediated and is of most concern. Active remediation of the other two operable units is complete, but land use controls remain in effect.

As submitted, the application and model do not provide a scientifically defensible argument that the groundwater contaminant plume will not be impacted by the proposed artificial recharge project. The application also does not consider the other two operable units at all. Revisions to the model are needed to improve confidence in its conclusions. Additionally, any future changes to the recharge

strategy, including increasing the rate, must be supported with model updates and data. The Applicant must be made aware that if the recharge project does impact the groundwater plume or the other two operable units, spreading contamination beyond the existing extent, they will incur CERCLA liability on the site and may be held responsible for cleanup costs.

EPA comments are enclosed below. If you have any questions or concerns regarding these comments, please contact me by phone at (503) 326-2859 or by email at leake.benjamin@epa.gov.

Sincerely,

Benjamin Leake, PMP
Remedial Project Manager
Superfund and Emergency Management Division

Enclosure: EPA Comments

cc: Allen Clements, ODEQ
Ann Farris, ODEQ
Mark Leeper, BRAC
Kelly Toynton, OMD
Jeremy Haney, OMD

Enclosure 1: EPA Comments on the Numerical Groundwater Modeling Technical Memorandum

1) **General:** If the artificial recharge project impacts the groundwater plume, the former Active Landfill, or the former QA Function Range operable units at the Umatilla Army Depot Superfund site, spreading contamination beyond the existing extent, the Applicant will incur CERCLA liability on the site and may be responsible for costs associated with cleanup. EPA notes that CERCLA liability is retroactive, joint and several, and strict.

   Evaluation of potential impacts, including a monitoring strategy, must be coordinated with the agencies responsible for CERCLA cleanup before artifical recharge may begin at the site.

   The Explosives Washout Lagoon groundwater plume has several munitions contaminants and is being actively remediated through a pump and treat type system. The former Active Landfill is an unlined landfill of uncertain depth that previously required groundwater monitoring. Although not immediately adjacent to the proposed artifical recharge project, neither the application nor the model mentions this operable unit. Groundwater impacts to this area must be considered as part of this project. The former QA Function Range had soil munitions contamination that was cleaned up and exists in the path of the proposed recharge piping. Land use controls focus on the potential of encountering munitions during ground-disturbing work. For more information on the CERCLA operable units at this site, review the fifth Five-Year Review, available at https://semspub.epa.gov/work/10/100476936.pdf.

2) **General:** On April 10, 2024, EPA announced the final National Primary Drinking Water Regulation for six PFAS compounds, establishing legally enforceable levels, called Maximum Contaminant Levels (MCLs), for these compounds in drinking water. Additionally, on April 19, 2024, EPA issued a proposed final rule making designating two PFAS compounds (PFOA and PFOS) as hazardous substances under CERCLA. These rulemakings significantly alter the regulatory landscape of PFAS. The Army is currently investigating PFAS under CERCLA at the Umatilla Army Depot. PFAS must be considered in the artifical recharge project. At a minimum, PFAS must be added to the groundwater and Columbia River analyte monitoring lists. The applicant needs to engage with the CERCLA regulatory agencies to ensure it does not impact PFAS contamination in the area.

3) **Section 1.1:** This section states that the "*County has applied to initially infiltrate 5,000 acre-feet (AF)…annually*.", but the Application expands on that, indicating that infiltration may be increased to 18,000 AF per year provided the response and performance indicate additional capacity. A revision to the model must be made and considered along with actual data from the field before the infiltration rate can be increased. An updated model and data must be reviewed by at least OMD, ODEQ, and EPA, for potential impacts by the groundwater plume before increasing infiltration rates.

4) **Section 1.2:** In addition to RDX, TNT, and DNT, the groundwater contaminant plume also contains DNB, NB, tetryl, and HMX. EPA agrees that RDX and TNT are the most mobile in groundwater.

5) **Section 2.1:** Provide some additional information about the selection of 800 ft x 800 ft grid cells. It seems that a smaller grid size would improve resolution of the model.

6) **Section 2.2:** Provide additional details about how hydraulic conductivity was initially interpolated across the site, including whether anisotropy was considered.

7) **Section 2.3:** Rates for precipitation, irrigation return flows, and canal leakage are based on published estimates from Grondin et al. (1995), which suggests that recharge occurs seasonally. These values and any seasonal fluctuations should be clearly stated in the model report. It is possible that these rates have changed in the 28 years since the cited document was published. The model report must demonstrate that these values are representative of current conditions.

8) **Table 2:**

   a. Clarify if the stage elevation presented in this table indicates that the rivers are only 8 or 9 feet deep. This does not appear to match the NOAA depth charts available for the Columbia River.

   b. Present the basis or source of the river conductance estimates and clarify whether these estimates were calibrated to baseflow.

9) **Section 2.4:**

   a. This section states that Figure B-2 does not indicate any temporal bias. However, the sinusoidal shape of the residuals presented in this figure appear to indicate a very real temporal bias. Steps must be taken to identify and correct the causes of this bias.

   b. A model aimed at predicting the influence of a new groundwater extraction or infiltration project should be calibrated to a transient data set (preferably a pumping test). The use of a model calibrated to different hydraulic stresses than those predicted, (e.g., use of a steady state baseline model to predict pit inflow) results in greater uncertainty in model predictions and requires additional sensitivity analyses and/or more conservative assumptions.

   c. As discussed in this section, the calibration of the model was discontinued before the calibration targets could be met, and the relative error of the model was 15.1 percent. The report defends this method noting that the calibration statistics reflect the immediate vicinity of the Depot wellfield. Due to the closely spaced calibration targets and seasonal averaging, the calibration statistics do not represent a basin-wide model calibration. This point should be emphasized in the Conclusions section of the report under a “Model Limitations” sub-section.

10) **Section 3:** Especially given the relatively flat hydraulic gradient in the area, a detailed evaluation of groundwater mounding induced by the Artificial Recharge Project would help determine whether residual contamination in the vadose zone could be flushed by the recharged water.

11) **Section 4:** Based on the presentation of the model in this technical memorandum, EPA cannot agree with the conclusions in this section and is not confident that the artificial recharge project will not impact the Umatilla Army Depot groundwater plume.

12) **Figure 2:** Provide an explanation about why no particles pathways are shown from Infiltration Field IF-3 in the Recharge Scenario, but they are evident in the Baseline Scenario.

13) **Figure 3:** It is unclear where the cross section displayed in this figure is located on the site. Please provide an additional figure or an inset map to properly establish the geographical setting for the cross section displayed. The figure must include all relevant wells and features and include labels for the defined zones.

14) **Attachment B:** EPA recommends that the report include a residuals plot with predicted values on the x-axis and residuals on the y-axis. A plot like this would make it easier to interpret the data for imbalance, heteroscedasticity, and nonlinear trends.