STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation, Oak Ridge Office
761 Emory Valley Road
Oak Ridge, Tennessee 37830

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COUNTY MAYOR'S OFFICE

May 3, 2024

Mr. Roger Petrie
Federal Facility Agreement Manager
Oak Ridge Office of Environmental Management
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831

TDEC Comments: Fiscal Year 2024 Phased Construction Completion Report for the Oak Ridge Reservation Environmental Management Waste Management Facility (DOE/OR/01-2968&D1)

Dear Mr. Petrie

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation - Oak Ridge Office, received the draft (D1) Fiscal Year (FY) 2024 Phased Construction Completion Report (PCCR) on February 26, 2024. TDEC reviewed the document under the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR).

Concerns detailed in TDEC's approval letter for the FY 2023 PCCR regarding water quality standards for lead and polychlorinated biphenyls (PCBs) in groundwater remain unresolved (originally noted in Comment 66 in TDEC's comments on the FY 2023 PCCR). The FY 2024 PCCR notes that non-radiological discharge limits for surface water adhere to the ambient water quality criteria (AWQC) outlined in the Tennessee Water Quality Criteria from October 2007 for Fish and Aquatic Life (TDEC 1200-4-3), with the AWQC for aquatic life set at 0.014 µg/L for PCBs. As the FFA Parties recognized the 2007 regulation as an applicable or relevant and appropriate requirement, it remains in effect until the EMWMF Clean Water Act Explanation of Significant Differences (ESD) receives approval. The 2007 regulations allow a detection limit of 0.5 µg/L for PCBs to determine compliance when the AWQC is below the analytical method's capacity. However, technological advancements since 2007 enable detection limits far below 0.5 µg/L, enabling comparison against more protective numerical criteria using EPA-approved methods. Update Table D.2 to specify that the PCB AWQC is 0.014 µg/L, while the lowest detectable limit is 0.0358 µg/L (as detailed in Table D.2).

TDEC approved the DOE/OR/01-2734&D1 (UCOR-4156/R3) version of the SAP/QAPP *for interim use*. As stated in DOE's March 29, 2018, letter, "In the interim, the existing D1 version (UCOR-4156/R3)...has been approved by all parties and is being followed." However, the D1 FY 2024

PCCR incorrectly cites the DOE/OR/01-2734&D1/R1 (UCOR-4156/R4) version, which differs in content and lacks approval by TDEC or the U.S. Environmental Protection Agency (EPA). TDEC requests that the U.S. Department of Energy (DOE) amend the FY 2024 PCCR to cite the correct reference.

TDEC encourages timely submission of the revised Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) as an appendix to the Remedial Action Work Plan for operations. Approval of an updated SAP/QAPP should help address some comments on recent PCCRs. The project team resolved issues to finalize the SAP/QAPP in 2016, and the EPA Administrator's dispute resolution decision was issued more than three years ago (December 31, 2020). Despite completion of these efforts, DOE continues to operate the Environmental Management Waste Management Facility (EMWMF) under the 2016 SAP/QAPP approved in 2017 *for interim use*. TDEC's approval of the interim plan was based on the milestone to finalize the SAP/QAPP later that year, which never happened.

Resolution of the enclosed comments will facilitate TDEC approval of the document. Questions or comments concerning the contents of this letter should be directed to Brad Stephenson at the above address, by phone at 865-352-1235, or by e-mail at brad.stephenson@tn.gov.

Sincerely

Randy Young Digitally signed by Randy Young
Date: 2024.05.01 15:24:38 -04'00'

Randy C. Young
FFA Project Manager
Division of Remediation – Oak Ridge Office

Enclosure

ec: Brian Henry, DOE
Dennis Mayton, DOE
Sam Scheffler, DOE
Erin Sutton, DOE
Carl Froede, EPA
John Sayer, EPA
Samantha Urquhart- Foster, EPA
Sid Garland, UCOR
Doug Hanahan, UCOR
Tanya Salamacha, UCOR
Colby Morgan, TDEC
Ethan Sweet, TDEC
Chris Thompson, TDEC
OREM Mailroom
ORSSAB

xc: Wade Creswell, ORRCA
Amanda Daugherty, ORRCA
Terry Frank, ORRCA
Amy Fitzgerald, ORRCA

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Enclosure - Comments

1. **Page 10, Section 3.3, 2nd paragraph, 2nd sentence**
   Revise the sentence to add that additional waste capacity needs also depend on the volume of waste that can be discarded in the permitted onsite landfills, as well as the volume of waste that must be placed in offsite facilities.

2. **Page 11, Section 3.4, last sentence**
   Add the proposed timeline for the annual closure discussion with the project team or include it in Appendix C.

3. **Page 14, Section 3.7, 2nd sentence**
   Consider revising the sentence to state: "...generated by diverting stormwater directly back into the local ecosystem."

4. **Page 18, Table 6**
   Provide the detection limits in Table 6 for the parameters that have discharge limits.

5. **Page 30, Figure 11**
   Label the underdrain.

6. **Page 35, Section 4, 2nd paragraph**
   Confirm that DOE/OR/01-1884&D2 is the most recent approved version of the Land Use Control Implementation Plan (LUCIP). TDEC was unable to locate this document on DOIEC and when requested, a D3 version was provided. Revise this reference as necessary.

7. **Page 36, Table 14**
   The DOE's response to TDEC Comment 27 on the FY 2023 draft (D1) PCCR indicates that the FY 2024 PCCR will include documentation of the April 2023 execution of the Consent Order amendment. However, this year's report lacks that documentation; this report should document the amendment, whether in Table 14 or elsewhere.

8. **Page 37, Section 5.2.1, 3rd paragraph**
   This paragraph states that DOE is currently evaluating baseline values intended to replace the threshold values (TVs) currently used for comparison. Add a sentence to this paragraph that states which document will present the updated baseline values.

9. **Page 38, Figure 12**
   a. Revise the map to show wells used to delineate the three plume types, using a suitable symbology to distinguish them from the EMWMF detection monitoring wells.

Alternatively, add text to explain how these plumes were delineated and why no wells are shown in the plume areas.

b. Remove the geologic contact label in the legend, this figure does not illustrate geologic contacts.

10. **Page 42, 1st & 2nd paragraphs**
    a) If chromium and nickel are not expected to be mobile in the environment being monitored, consideration should also be given to identifying parameters that would better indicate a release from EMWMF.
    b) The hypothesized contamination of a detection monitoring sample (and others around the ORR) by well construction materials highlights the rationale for considering the use of polyvinyl chloride (PVC) wells when key contaminants of concern include metals monitoring groundwater. As noted in a TDEC comment on the *Field Sampling Plan for Baseline Groundwater and Surface Water Characterization at the Proposed Environmental Management Disposal Facility, Oak Ridge, Tennessee* (DOE/OR/01-2812&D1), guidance and literature indicate PVC materials are generally better suited when monitoring radionuclides and metals, unless volatile organic compounds are expected to be present at very high concentrations.

11. **Page 44, 1st paragraph**
    TDEC appreciates the inclusion of the summary statistics in Appendix D. However, there is a lack of clarity regarding the relationships between the tables in Appendix D and those presented in the main body of the report. It is recommended to organize the analytical results consistently and logically by media (e.g., contact water, surface water, and groundwater), and to clarify how various summary tables are derived from the data. Below are examples of tables that could benefit from these revisions, along with specific instances of questions raised by the current format of these tables.

- Table 5. FY23 contact water characterization results for key COCs
- Table 6. FY23 annual COC extended list contact water characterization results
- Table 7. FY23 annual COC extended list contact water characterization results
- Table 17. Key contaminants of concern for groundwater detection monitoring
- Table 18. Detected results for key COCs that exceed threshold values
- Table 19 EMWMF summary statistics for unfiltered groundwater water data...for key COCs
- Table 20. EMWMF summary statistics for unfiltered surface water data...for key COCs
- Table 21. Detected results for other analytes that exceed threshold values
- Table 26. Summary of FY23 monthly surface water monitoring results

a) Tables 6 and 7 have the same title, and it's unclear how they differ. What does each table present?
b) Tables 6 and 7 summarize results for contact water, but there is no corresponding summary in Appendix D like those for groundwater and surface water.
c) Tables D.1 and D.3 summarize results for groundwater, and it's unclear how they differ. What does each table present? Is the intent of Table D.3 to focus on constituents with detection monitoring criteria?
d) Table 17 lists key COCs for groundwater detection monitoring. Do these same contaminants serve as COCs for surface water and contact water? If not, where are those COCs listed?
e) It is difficult for the reader to connect each table of summary statistics listed above to the list of key COCs. Consider indicating which parameters are COCs on each table.
f) Tables 18 and 21 combine results from different media, such as contact water, surface water, and groundwater. However, threshold values intended for groundwater are being applied to surface water as well. Please clarify why the same threshold values are being applied across these media.

12. **Page 44, Table 19**

This document and the *Baseline Groundwater Monitoring Report* (DOE/OR/01-2021&D3) use "threshold values" or TV instead of "background threshold values" (BTV). Remove the term "background" from all references to threshold values.

13. **Page 45, Table 20**

The SAP/QAPP identifies the threshold values and action levels for groundwater. Explain why surface water data are being compared to threshold values and action levels established for groundwater and not surface water-specific criteria. On page 64 in Section 5.3.3, the text mentions a comparison of surface water quality to AWQCs as specified in the SAP/QAPP.

14. **Page 46, Table 21**

Include action levels in Table 21 for the analytes that have action levels and discuss as appropriate in the text within this section. This will further support the statements in Section 5.5 and Section 6.0 that all results for the extended annual list and the comprehensive biennial suite were below the action levels.

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15. **Page 48, Section 5.2.6,**
    a. Include a bullet that discusses the results of the biennial suite sampling results.
    b. In the second bullet, cite the white paper, project team meeting presentation, or previous PCCR that documents the determination that uranium at EMWNT-03A is not sourced by EMWMF. It is important to document this for future reference.

16. **Page 48, Section 5.3.2**
    Pneumatic Piezometer (PP) data for water levels have been missing from the EMWMF PCCRs since FY2018, with the last reported measurement dated 08/14/2017.
    a. Is there documentation capturing these data, or was there an agreement by the project team to exclude it? If so, explain in Section 5.3.2 – Potentiometric Monitoring. Specifically, PP-08 and PP-09 may be valuable for interpreting water levels on the western side of EMWMF until detection monitoring wells are installed in that area.
    b. Include a qualification explaining why certain piezometric data were not explicitly used, if applicable.
    c. The purpose of the sentence "Pneumatic piezometer (PP)-08 data suggests it is recording water levels" is not fully explained. Provide further clarification on the broader significance of this statement within the context of this section.

17. **Page 51, Figure 15**
    Further explanation would be helpful regarding the development of the contour map(s) in this figure. The graphic appears to show a separate contour map for each cell, but the overall pattern suggests the contours within each cell were derived from a single set of contours for the landfill as a whole. This suggestion is supported by the scarcity of data in some cells. In some cases, the contour lines for a given cell align well with those in an adjacent cell. In other cases, they do not. For example, there are no *-8* or *-10* contours between the *-6* and the *-12* contours in the southern parts of Cells 3 and 4.

18. **Pages 55-56, Figures 16-17**
    TDEC recommends posting the groundwater elevation values from the piezometers/ monitoring wells used to generate the potentiometric surface and removing any piezometers not contributing data for this surface.

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19. **Page 53, 1st paragraph**
    Add a sentence at the end of the paragraph noting additional potentiometric surface data will be available following the installation of two bedrock wells along the western boundary of Cell 6.

20. **Page 58, Section 5.3.2.2**
    Cite the document containing details about the installation of pneumatic piezometers (PP-01 through PP-09), including their specific elevations above mean sea level and other relevant construction details.

21. **Page 58, Table 24**
    Include a column specifying the corresponding gradient for each calculated velocity.

22. **Page 58, last paragraph & Page 59, 1st partial sentence**
    a. TDEC suggests clarifying the rationale behind the assertion regarding 'increased amounts of precipitation over the past several years,' considering the cited UCOR document (UCOR-4517, *Engineering Feasibility Plan for the Elevated Groundwater Levels in the Vicinity of PP-01, EMWMF, Oak Ridge, Tennessee*) is from 2013, which is more than a decade old.
    b. Reconsider or revise the last sentence of this paragraph, as the 'new' piezometers were installed in 2017, approximately seven years ago.

23. **Page 63, Figure 21**
    This figure presents water level data for several wells (e.g., GY-015, GY-012, etc.) which are currently not illustrated on any maps within the FY 2024 PCCR. Provide a map that shows the location of these wells or add them to Figure 3.

24. **Page 66, Table 27**
    Confirm that samples were collected in FY 2023 Q2 (January-March 2023) but not collected in Q1 (October-December 2022) or Q3 (April-June 2023) due to COVID temporary shutdown.

25. **Page 68, Section 5.3.5, 1st paragraph**
    This paragraph discusses compliance with approved discharge limits specified in the SAP/QAPP. Cite the specific section, table, etc. where these approved discharge limits are found in the existing 2016 SAP/QAPP. The report referenced needs to explicitly reference language which includes the term "discharge limits".

26. **Page 80, References, and Page B-5, Waste Acceptance**
    Correct the date of the *Attainment Plan for Risk/Toxicity-Based Waste Acceptance Criteria*. It should be October 2001 instead of October 2002.

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27. **Page C-3, 2nd paragraph, 1st sentence**
    Clarify the sentence for better understanding. It's unclear how the word "construction" fits within the sentence structure.

28. **Page D-3, Table D.1**
    Ensure the units for constituents and their corresponding Maximum Contamination Levels (MCLs) match. For instance, the table lists antimony's MCL as 6 mg/L, but the table should specify 6 µg/L for the MCL.

29. **Page D-8, Table D.2**
    a. TDEC recommends evaluating surface water values against AWQCs for fish and aquatic life instead of, or in addition to, comparing them to groundwater MCLs.
    b. The text mentions two PCB detections, yet the table lists none. Update the table to include these detections and ensure the accuracy of all other data.

End of Comments