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

December 19, 2022

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

Comments: ***Addendum to the Remedial Design Report for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee*** **(DOE/OR/01-1873&D4/A2)**

Dear Mr. Petrie

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation-Oak Ridge Office, received the subject work plan on October 24, 2022. This letter provides comments based on TDEC's review.

Improving the detection monitoring network for the Environmental Management Waste Management Facility (EMWMF) remains a priority for complying with legal requirements in the *Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee* (DOE/OR/01-1791&D3) [ROD]. TDEC has highlighted the need to monitor groundwater in shallow bedrock along geologic strike from the landfill for several years. Therefore, TDEC urges prompt resolution of these comments in a revised document, expeditious well installation, revision of the Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) (DOE/OR/01-2734&D1), and initiation of detection monitoring at the new wells during Fiscal Year (FY) 2023.

Specific Comments

1. **Page 1, Section 1, 3rd paragraph, 4th sentence**
   Revise the sentence to state, as noted accurately in the previous sentence, that EMWNT-05 monitors surface water, not groundwater. In the absence of detection monitoring wells along the western edge of the landfill, TDEC agrees EMWNT-05 is an appropriate monitoring location because surface water at that location presumably includes a component of shallow groundwater discharged along the western edge of the landfill.

2. **Page 1, Section 1,4th paragraph**
   Consider removing this one-sentence paragraph, given the subsequent statement the wells are located to avoid influence from sources not related to the EMWMF landfill and the lack of contaminants in recent samples from the EMWMF groundwater monitoring network, as supported by Figure 11 in the FY 2022 Phased Construction Completion Report (PCCR).

3. **Page 2, Figure 1**
   Add a legend, scale, and north arrow to the map.

4. **Page 3, Section 2**
   a. Consider moving the first sentence of the third paragraph to the beginning of the second paragraph and eliminating one of the redundant sentences—i.e., the second sentence (about final cover) in each paragraph.

   b. Clarify the statement wells will be screened to avoid upwelling groundwater.

      TDEC agrees well screens are intended to monitor shallow groundwater. To be clear, doing so may warrant screen placement in shallow bedrock, where numerous U.S. Department of Energy (DOE) documents indicate strike-oriented groundwater flow is most likely to occur.

      While it is possible contamination from the westernmost part of the landfill (Cell 6) would be detected by wells screened in the unconsolidated material, the new wells are intended to monitor potential contamination released from any part of EMWMF that may subsequently migrate along strike in the shallow bedrock. This includes potential contamination released from Cell 1, which lies approximately 0.4 miles from the proposed middle well.

Further, the Federal Facility Agreement (FFA) parties agreed the middle well will extend below the elevation of NT-5 to increase the likelihood of monitoring landfill-related groundwater that may move beneath NT-5 in strike-oriented fractures. This is necessary because the planned well location lies on the opposite (western) side of the stream (NT-5) from the landfill. The conceptual site model suggests the shallowest groundwater in the unconsolidated material on the western side of NT-5 moves eastward (toward the landfill) to discharge into the stream. During a 2017 site visit to identify potential well locations, bedrock was observed in the NT-5 channel, indicating it will be necessary to drill into bedrock to achieve the monitoring objective.

c. Should *S2 Ponds* be *S3 Ponds*?

5. **Page 3, Section 2.3**
A search in the Oak Ridge Environmental Information System (OREIS) did not identify former well GW-942. How deep was the well? Were groundwater samples collected and analyzed? If so, what was detected?

6. **Page 5, Section 3, 1st paragraph**
What is the rationale for using stainless steel casings and screens? Available guidance and literature indicate polyvinyl chloride (PVC) materials are generally better suited for groundwater monitoring, particularly for radionuclides and metals, unless volatile organic compounds are expected to be present at very high concentrations.

7. **Page 5, Section 3, 2nd paragraph**
For consistency, consider changing *Central Location* to *Middle Location*. *Central* is used only once, whereas *middle* is used four times.

8. **Page 5, Section 3, 2nd paragraph**
Revise the statement the middle well is to be screened below NT-5 to avoid surface water influence. As explained in Comment 4b, the rationale is to increase the likelihood this well monitors landfill-related groundwater.

9. **Page 5, Section 3, 3rd paragraph**
The text states samples of the unconsolidated material will be collected using split spoons within the target screened interval. This implies the wells will be screened in unconsolidated material above the bedrock surface. As explained in Comment 4b, it will be necessary to drill into shallow bedrock at each location to achieve the objective of monitoring strike-oriented groundwater flow beneath the landfill.

10. **Page 5, Table 1**
    a. Add the estimated bedrock surface elevation for each proposed well location.

    b. Figures 16 and 17 in the FY 2022 PCCR illustrate the potentiometric surface near the northern location as approximately 985 feet above mean sea level.

    c. Remove *top* from column heading for potentiometric surface.

11. **Page 6, Figure 2**
    Remove items from the legend that are not illustrated on the figure, including underdrain and underdrain outfall.

12. **Page 7, Section 4, 1st paragraph**
    TDEC urges DOE to install the planned wells during FY 2023. TDEC has highlighted the need to improve the EMWMF detection monitoring network since at least June 25, 2015.[1] Doing so is necessary for compliance with the ROD, specifically Resource Conservation and Recovery Act (RCRA) requirements for detection monitoring in paragraphs (a) through (g) of 40 CFR §264.98 and substantive requirements in rules included by reference—e.g., 40 CFR §264.97 and 40 CFR §264.99.

13. **Page 7, Section 4, 3rd paragraph**
    a. Change *Federal Facility Act* to *Federal Facility Agreement*.

    b. TDEC expects all three wells to be integrated into the detection monitoring network. DOE should evaluate the analytical results in accordance with the latest SAP/QAPP just like any other detection monitoring data. The current version of that plan (DOE/OR/01-2734&D1), which TDEC approved for interim use, includes contingency actions (Fig. 1) that address the management of results above threshold values.

    The purpose of installing the new wells is to improve the detection monitoring network. Specifically, the objective is to monitor groundwater flow in shallow bedrock along strike from EMWMF, where waste disposal began in May 2002, not just the recently opened Cell 6.

    Text on pages 1 and 3 states the wells are located to avoid influence from contaminant sources other than the landfill. Moreover, the conceptual site model indicates it is unlikely contaminant plumes from sources in the valley bottom, like the Boneyard/Burnyard and the S3 Ponds, would impact the new wells, which are to be screened in updip geologic units under the slopes of Pine Ridge. Available

[1] Specific Comments 5 and 6 in *TDEC Comments: Fiscal Year 2015 Phased Construction Completion Report for the Oak Ridge Reservation Environmental Management Waste Management Facility (DOE/OR/01-2683&D1)*.

groundwater data supports the lack of recent contamination in EMWMF detection monitoring wells.

In any case, the ROD requires compliance with the following.

- TDEC 1200-2-11.-17(4)(c) [now TDEC 0400-20-11-.17(4)(c)] states the monitoring system must be capable of providing early warning of releases of radionuclides from the disposal unit.
- TDEC 1200-2-11.-17(1)(b) [now TDEC 0400-20-11-.17(1)(b)] states the disposal site shall be capable of being monitored. This means the monitoring program must be capable of distinguishing any contamination that may be derived from EMWMF from contamination sourced elsewhere.

- TDEC 1200-1-11-.06(6)(i)(6) [now TDEC 0400-12-01-.06(i)(6)] and 40 CFR §264.98(f) require periodic determinations whether there is statistically significant evidence of contamination from the landfill.

14. **Page 9, Section 5**

a. Provide the Standard Specification for Well Drilling, Installation, and Abandonment (SPG-00000-A005) to the public by posting it on the DOE Information Center (DOEIC) or another suitable site and providing a link. As of TDEC's review, this cited reference is not publicly available.

b. Since the subject addendum is a public document, consider supporting stakeholder access to cited information by providing a uniform resource locator (URL) for each reference. Given that the document is distributed primarily in electronic form, each reference should also be linked to the source information. An example of this approach is provided in the references section of *DOE's Hanford Site Groundwater Monitoring Report for 2020* (DOE/RL-2020-60 Revision 0).

It can be difficult for a stakeholder to locate the cited reference information. In the case of DOE documents, conventional internet searches do not always find the DOEIC. Even if someone knows how to find and search that resource, it can be challenging to locate the specific reference cited. For example, searching the DOEIC for *DOE/OR/01-1873&D2* to find the 2001 Remedial Design Report returns three pages of information about 30 documents, requiring considerable additional effort to locate the cited reference.

TDEC looks forward to working with the FFA parties to complete the planned well installation as soon as possible. It is our understanding routine collection and analysis of groundwater samples from these wells will be specified in a revised SAP/QAPP for EMWMF detection monitoring. Implementation of that monitoring will support compliance with the EMWMF ROD.

Questions or comments concerning this letter should be directed to Brad Stephenson at the above address, by email at brad.stephenson@tn.gov, or by phone at (865) 352-1235 (*new*).

Sincerely

Randy CYoung Digitally signed by Randy C Young
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