



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation, Oak Ridge Office
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COUNTY MAYOR'S OFFICE

July 6, 2023

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 Feedback to DOE Responses: 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/R1)

Dear Mr. Petrie

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation (DoR) - Oak Ridge Office, received the revised (R1) version of the subject work plan on June 9, 2023. Within the context of the [Federal Facility Agreement for the Oak Ridge Reservation \(FFA\)](#), this Remedial Design Report Addendum is a second draft (D2) primary document. TDEC is unable to approve this plan because it does not resolve [TDEC comments](#) on the [draft \(D1\) addendum](#). Therefore, TDEC invokes informal dispute in accordance with Section XXVI of the FFA.

Section XXI.G.5 of the FFA states, "While the resulting D2 report shall be the responsibility of the DOE, it shall be the product of consensus to the maximum extent possible...." Unfortunately, the U.S. Department of Energy (DOE) submitted the D2 document to TDEC and the U.S. Environmental Protection Agency (EPA) without holding the customary comment resolution meeting(s) that have proven helpful for producing approvable documents.

As noted in TDEC's December 19, 2022 [comment letter](#) on the D1 plan, 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 since at least June 25, 2015.¹ TDEC's recent letter, dated June 9, 2023, emphasizes the need for DOE install additional groundwater monitoring wells at the EMWMF as soon as possible to ensure compliance and protectiveness in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).²

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 \(DOE/OR/01-2683&D1\)](#).

² [TDEC Letter: Department of Energy Oak Ridge Environmental Management Fiscal Year 2025 Budget Request](#), June 9, 2023; See Item 4.

TDEC offers the following comments to support completion and approval of the work plan and enhance the protectiveness of onsite waste disposal in support of the Oak Ridge Reservation (ORR) environmental cleanup program. TDEC urges DOE to host a comment resolution meeting soon. Once the FFA parties achieve consensus, DOE should submit a revised document in a timely manner to avoid an unnecessary formal dispute over the protectiveness of the EMWMF.

Expedient 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 will support the ultimate goal of protective onsite disposal shared by the FFA parties. Toward that end, TDEC requests that DOE establish a milestone for the SAP/QAPP revision that will incorporate these wells into the detection monitoring program. TDEC also recommends DOE utilize funding already allocated for work proposed in the D1 addendum to sustain progress toward a compliant groundwater monitoring network while awaiting additional funding.

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.

Sincerely

Randy C Young

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

Enclosure

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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.

DOE Response: Agree. The 4th sentence in the 3rd paragraph was revised as follows: "The NT-5 surface water monitoring location EMWNT-05 collects shallow groundwater along the western boundary of EMWMF..."

TDEC Feedback: Consider revising the 4th sentence in the 3rd paragraph as follows: "Pending installation of bedrock monitoring wells in the area, the NT-5 surface water monitoring location EMWNT-05 is an appropriate interim 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 \(PCCR\)](#).

DOE Response: Agree. The paragraph was removed.

TDEC Feedback: Comment resolved.

3. **Page 2, Figure 1**

Add a legend, scale, and north arrow to the map.

DOE Response: Agree. The figure was revised as requested.

TDEC Feedback: Comment resolved.

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.

DOE Response: Agree in part. Redundant sentence was removed from 2nd paragraph.

TDEC Feedback: Comment resolved.

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

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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.

DOE Response: Clarification provided. The location of the middle well was changed per agreement between the FFA parties to be on the east side of NT-5 and closer to the landfill. As per the agreement, this monitoring well will be screened in shallow bedrock. The location will intercept groundwater flow from the landfill prior to influence from NT-5.

TDEC Feedback: The text revision adds "and to avoid impacts to sensitive resources." Change *avoid* to *minimize*.

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

DOE Response: Agree. Typo corrected.

TDEC Feedback: Comment resolved.

5. **Page 3, Section 2.3 [Section 2.2 in the R1 document]**

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?

DOE Response: Clarification provided. GW-942 was not a detection monitoring well. Instead, it provided groundwater elevation data for use in the landfill design. The project team had previously indicated that resuming groundwater elevation monitoring in the general area would be useful. GW-942 was 18 ft deep.

TDEC Feedback: For clarity, revise the text to clarify GW-942 well was a piezometer.

6. **Page 5 [Page 7 in R1 document], 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

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monitoring, particularly for radionuclides and metals, unless volatile organic compounds are expected to be present at very high concentrations.

DOE Response: Clarification provided. The EMWMF detection monitoring wells follows the requirements established for monitoring wells on the ORR. These requirements call for stainless steel casings and screens.

TDEC Feedback: Clarify where this requirement is documented. Sections 3.2.5 and 3.2.6 in *Standard Specifications For Well Drilling, Installation And Abandonment* (Technical Specification No.: SPG-00000-A005) indicate stainless steel or PVC are acceptable. As noted in the original comment, guidance and literature indicate PVC is better suited when monitoring groundwater for radionuclides and metals.

7. **Page 5 [Page 7 in R1 document], Section 3, 2nd paragraph**

For consistency, consider changing *Central Location* to *Middle Location*. *Central* is used only once, whereas *middle* is used four times.

DOE Response: Agree. Change was made as stated.

TDEC Feedback: Comment resolved.

8. **Page 5 [Page 7 in R1 document], 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.

DOE Response: See response to Specific Comment 4b.

TDEC Feedback: Remove "at or" from the revised text introduced in the third paragraph of Section 3. The well will be a bedrock well—i.e., below the bedrock/saprolite contact.

9. **Page 5 [Page 7 in R1 document], 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.

DOE Response: See response to Specific Comment 4b.

TDEC Feedback: The revised text does not resolve the comment because it states split spoon or core samples will be collected through the target interval. Use of split spoons is fine for collecting saprolite samples, but it is not applicable to the target screen interval of a bedrock well. Revise the text to clarify split spoon samples will be collected from the saprolite, and core samples will be collected from the bedrock.

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10. **Page 5 [Page 7 in R1 document], Table 1**

- a. Add the estimated bedrock surface elevation for each proposed well location.

DOE Response: a. Agree. Change was made.

TDEC Feedback: Add units (ft amsl) to the new column.

- 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.

DOE Response: Clarification provided. As per agreement with the FFA parties, this monitoring well has been eliminated.

TDEC Feedback: Comment resolved. Consider adding a sentence to the introductory paragraphs of Section 2 noting this agreement to explain why there is discussion of a southern location and a middle location but no northern location.

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

DOE Response: Agree. Change was made.

TDEC Feedback: Comment resolved; for consistency with the original comment, consider revising the response to italicize *top*.

11. **Page 6 [Page 4 in R1 document], Figure 2**

Remove items from the legend that are not illustrated on the figure, including underdrain and underdrain outfall.

DOE Response: Agree. Change was made.

TDEC Feedback: Comment resolved.

12. **Page 7 [Page 9 in the R1 document], 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, 2015.³ 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](#).

DOE Response: Clarification provided. The sequence of tasks discussed with the FFA parties Emerging Issue Team is included in a new Chapter (Chapter 5).

TDEC Feedback: On Page 11, Bullet 4 in the new Section 5, change *minimizes* to *minimize*.

³ 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 \(DOE/OR/01-2683&D1\)](#).

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Regarding the two sub-bullets and related language in Section 5, further discussion during the comment-resolution meeting is needed to determine whether text revisions are appropriate. During the site visit on June 15, 2023, DOE indicated a hydrologic determination (HD) had been completed. The DoR appreciates the timely completion of that effort and encourages DOE to submit the HD report to the TDEC Division of Water Resources (DWR) as soon as possible. Based on the discussion, DoR understands features to be impacted by the project are wet-weather conveyances. Pending concurrence by the DWR, DoR understands DOE anticipates no stream or wetlands will be impacted that might require mitigation.

13. **Page 7 [Page 9 in the R1 document], Section 4, 3rd paragraph**

- a. Change *Federal Facility Act* to *Federal Facility Agreement*.

DOE Response: Agree. Change was made.

TDEC Feedback: Consider revising the response because the comment and response appear to have been superseded by other changes.

Additionally, the revised text in the last paragraph of Section 4 needs to clarify only one well will be replaced if a suitable spring is identified. As written, the text refers to *the well*, which is unclear since the plan calls for installing two wells.

- 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 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

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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.

DOE Response: Clarification provided. In accordance with the tri-party agreement on this topic, two wells will be installed to capture groundwater at the top of shallow bedrock. However, Sect 5.1 of the current SAP/QAPP states the following: "... If a new well is required, it must be added by a SAP/QAPP addendum and will undergo quarterly baseline sampling and analysis per the technical approach described in the EMWMF Baseline Monitoring Report. After at least four quarters of baseline sampling, the new well will be incorporated into the next scheduled Detection Monitoring groundwater sampling event." The first sentence in the third paragraph was deleted although that was meant to describe that wells with serious construction issues would not be incorporated but would need to be replaced.

- Clarification provided. The existing groundwater monitoring system is compliant with the ROD. As described in the PCCRs, the 15 groundwater wells and 3 surface water stations monitor both the primary groundwater flow path and the lesser flow path to the west. These 18 locations cover upgradient, downgradient, and side gradient locations and meet the applicable 40 CFR §264.97ARARs for EMWMF. The additional detection monitoring wells are being added to augment the existing network.
- See above.
- Clarification provided. This evaluation is conducted as part of the annual PCCR development.

TDEC Feedback (first bullet in the response): Given DOE's commitment to improve the detection monitoring network by adding two locations downgradient along strike, TDEC agrees the monitoring network *will be* compliant with the ROD when data from those wells are integrated into the monitoring program. TDEC does not agree the existing network is compliant.

14. **Page 9, Section 5 [Page 13, Section 6 in the R1 document]**

- 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.

DOE Response: Clarification provided. The DOEIC is a repository of CERCLA technical documents used to make decisions and does not contain the lower-level field instructions that implement the decision.

TDEC Feedback: TDEC requests that DOE elaborate on the rationale for keeping the standard specification off the DOEIC. TDEC facilitates public access to information through various data viewers and web pages, in an effort to minimize the need for community members to request

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access to public records pursuant to [Tenn. Comp. R. & Regs. § 0400-01-01-.01](#) and the [Tennessee Public Records Act \(T.C.A 10-7-5\)](#). DOE should consider promoting transparency and minimizing the need for citizens to [request public records](#) through the [Freedom of Information Act \(FOIA\)](#).

- 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.

DOE Response: Clarification provided. A similar comment on a different EMWMF document was previously discussed with the FFA Managers and agreement was reached that the URLs will not be added. This agreement was briefed to the Project Team at the 12/14/22 meeting.

TDEC Feedback: Comment resolved; consider revising response to preserve the hyperlinks in TDEC's comments.

15. **Page 11, Section [in the R1 document], 1st sentence**

This newly added section cites an agreement from "the tri-party Emerging Issues Team Meeting."

- a. Add the date of the meeting at which the agreement was documented by the Emerging Issues Team.
- b. Delete *the tri-party*. The Emerging Issues Team includes more than three parties.
- c. As discussed during the June 15 site visit, TDEC recommends DOE utilize funding already allocated for work proposed in the [D1 addendum](#) to install one of the wells while awaiting funding for the second well. Alternatively, DOE could move forward with the additional activities added to the revised plan, such as a perennial spring investigation, sensitive resource evaluation, and associated white paper(s). TDEC advocates for sustained progress toward a compliant groundwater monitoring network with minimal delays.

End of Comments