



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Remediation - Oak Ridge
761 Emory Valley Road
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January 22, 2025

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

RECEIVED
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COUNTY MAYOR'S OFFICE

Dear Mr. Petrie

Re: Addendum 6 (Attachment H-1 - Exposure Unit-4A Data Quality Objective Scoping Package) to the Remedial Design Report/Remedial Action Work Plan for Soils, Sediments, and Dynamic Characterization Strategy for Bethel Valley, Oak Ridge, Tennessee (DOE/OR/01-2378&D5/A6)

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation-Oak Ridge Office, received the above referenced submittal on September 25, 2024. The document has been reviewed pursuant to Section XXX of the Federal Facility Agreement (FFA) for the Oak Ridge Reservation.

The Bethel Valley Interim Record of Decision (BV IROD) was signed in 2002 to document interim goals and actions for approximately 1700 acres within the Oak Ridge National Laboratory (ORNL) to mitigate the ongoing contaminant releases to the environment. The IROD established the necessary administrative record to proceed with interim actions for the operable unit. As 23 years have passed since the BV IROD was established and with U.S. Department of Energy's current interest in remediating soils to protect groundwater in the area, the FFA parties should discuss re-evaluating the site expectations determined in the BV IROD and assess what path forward is most conducive to efficient completion of site cleanup and best supports the U.S. Department of Energy (DOE) Office of Science future plans for redevelopment within EU-4A. Characterizing to 2 feet (ft) using industrial screening levels does not provide sufficient data to determine protectiveness when contaminated soils are encountered during redevelopment or to evaluate the need to remediate those soils which act as contaminant sources to groundwater contamination.

TDEC understands that resource allocation and baseline cost must be considered when planning soil characterization and remediation actions at the site. However, TDEC maintains that characterizing to depth during initial assessments will support effective baseline planning

and more efficient use of resources for future remediation work. TDEC recommends a commitment from DOE to characterize and remediate accessible areas before any new construction commences. Such a commitment would allow DOE to provide an accurate baseline proposal and secure funding for future remediation efforts.

The following are the Scoping Package comments:

General Comments:

1. No soil sample locations are planned to evaluate soils to the top of rock/top of groundwater. The current plan has approximately 130 proposed Class 2 soil unit (SU) soil sample locations, of which approximately 20 extend below 2 ft, and zero (0) extend to top of rock/top of groundwater. Additionally, of the approximately 170 proposed Class 1 SU soil sample locations, zero (0) extend to the top of rock/top of groundwater. As determined during DQO Step 4 (page A-7), the vertical boundary is set to the top of rock/top of groundwater. The initial characterization efforts should include biased samples and unbiased samples to top of rock/top of groundwater to evaluate the threat to groundwater, especially within areas of known releases or high potential for release. The tri-parties should discuss the implications of not collecting deeper soil samples and develop the necessary future plans resulting from such a delay.
2. Limiting the depth of characterization to 2 ft will not fully delineate areas of contamination which potentially extend 10 ft or more within the Bethel Valley watershed. DOE has asserted that the excavation/penetration permit program (EPPP) will address soils/subsurface features below 2 ft as part of existing land use controls (LUC). As stated in the Bethel Valley IROD, the EPPP will inform the permit requestor on the extent of contamination and will prohibit or limit excavation/penetration activities as necessary. Without characterization below 2 ft, the extent of soil contamination will be unknown and subsurface features below 2 ft will not be evaluated. These data are imperative for evaluating construction worker risk, informing the EPPP, construction planning, managing waste, and allowing redevelopment to continue when contamination is encountered. Specifically, these characterization data would inform future remediation efforts for threat to groundwater using maximum contaminant level (MCL)-based soil screening levels (SSLs) under a final ROD.
3. Add text in the document that states if a considerable amount of time lapses between preparation of the Data Quality Objectives (DQO) scoping package and characterization field work, then the DQO package will be reassessed by the tri-parties. If tri-parties determine the DQO scoping package needs to be modified, then the changes will be documented appropriately.

4. **Figure 3, 4, 5, and 6:** Consider illustrating utility lines that are no longer active as "inactive" instead of "abandoned." Some of the waste lines on these figures are illustrated as abandoned, but the text does not support abandonment activities have occurred.
5. The Bethel Valley IROD did not select remedies for several utility systems, including the process waste, gaseous waste, and cooling water systems. Most, if not all, of the lines associated with these systems in EU-4A are inactive. Please clarify if these lines be evaluated and remediated as part of the soils work or if a future decision document will address these systems.
6. Revise the lead and nickel MCL values throughout the document (e.g., Tables 6 and 7) to reflect numerical criteria per TDEC 0400-40-03 (the MCL for lead is 5 µg/L and nickel is 100 µg/L).
7. Numerous contaminants have been identified in water samples collected from monitoring wells and tanks at concentrations greater than federal and state MCLs (Tables 6 and 7), but there are instances where a target groundwater (TGW) level has not been calculated for these constituents. Please identify if DOE intends to calculate TGW levels for contaminants not included in Appendix C of the Bethel Valley IROD.
8. DOE is moving ahead with soil remediation in Bethel Valley through implementation of the Bethel Valley IROD which was signed over 23 years ago. TDEC does not readily agree solely using the Bethel Valley IROD is the best plan to continue to remediate soil areas that are a threat to groundwater. Soil contaminant sources that prevent attainment of groundwater MCLs should be identified, and necessary plans established within the FFA for their remediation.
9. The trigger levels (TLs) for the tank W-1A site were provided in the Bethel Valley IROD as example values. As discussed in the Y-12 Project Team meetings, groundwater protection screening levels (either the Bethel Valley TLs or groundwater screening levels (GWSLs)) should not be calculated using a source area approximation based on an example scenario. Instead, the first source area approximation for the Summer's model calculation should be site-specific and based on process knowledge. Please include an explanation of how trigger levels will be defined for EU-4A in order to evaluate potential sources to groundwater contamination.
10. The remedial alternative selected in the IROD for the inactive liquid low level waste (LLLW) system is *grouting the piping, contain bedding material allowing discharge of contaminated groundwater to surface water with trench barriers or equivalent, and demolish structures*. Clarify if this selected remedy will be implemented as part of the soils remedial actions. Also, provide additional information pertaining to the sequencing of completion of the LLWS system remedy, implementation of the sampling plan described

herein, and completion of the necessary soil remedial actions. Consideration should also be given to releases that could occur as part of grouting of the LLLW system.

11. Discussions took place recently in Project Team Meetings regarding the No Further Action classification for soils. It was noted that while IROD goals may be met, further future actions may be required. Please add language to this document to make that clarification.

Specific Comments:

1. **Page 5, Section 2, third paragraph:** This paragraph states that EU-4A contains 28 sites listed in FFA Appendix C. The DQO states that EU-4A contains 29 Appendix C sites, but the text only describes 25 sites. Revise the paragraph such that it lists all 28 sites.
2. **Page 6, Section 2, Table 1:** Table 1 says that Solid Waste Storage Area (SWSA) 2 is not an FFA Site. However, the Oak Ridge National Laboratory (ORNL) Bethel Valley section of the FFA Appendix C does include SWSA 2. Please correct the table to show that SWSA 2 is an FFA Site and verify that the other sites listed are correctly represented.
3. **Page 11, Section 2.1.1, Table 2:** Given that SWSA 2 has no closure documentation, the inclusion of the area as a Class 1 SU, and the high degree of uncertainty regarding the nature and extent of waste remaining, the remedy status of this site in the table should be changed from "unknown if RA complete" to "RA incomplete".
4. **Page 16, Section 2.1.1.3, second paragraph:** If runoff from the roof did not go to the ground surface, where did the roof drains or gutters/downspouts lead?
5. **Page 22, Section 2.1.2.3:** Did any dredging take place in the ponds when they were pumped prior to filling or was any sediment left behind and buried?
6. **Page 23, Section 2.1.3:** Please move the acronym definition of (BSR) to follow the name of the facility "Bulk Shielding Reactor" in the section heading.
7. **Page 45, Section 2.1.6.1.2:** Figure 3 illustrates both abandoned process lines and process lines. Revise this section to include a discussion of what is meant by "abandoned" process lines. Will the process waste system be addressed under this scoping package, or will a future decision document address the process waste system? If a future decision document will address the process waste system, add a sentence on what decision document will evaluate and remediate the process waste system.
8. **Page 49, Section 2.1.6.2:** Figure 4 illustrates both abandoned gaseous lines and gaseous lines. Revise this section to include a discussion of what is meant by "abandoned" gaseous lines. Will the gaseous waste system be addressed under this scoping package, or will a future decision document address the gaseous waste system?

If a future decision document will address the gaseous waste system, add a sentence on what decision document will evaluate and remediate the gaseous waste system.

9. **Page 87, Section 2.2.7:** Does "Full results have not been identified" mean the data cannot be found, or was the data not collected in the first place? Please clarify.
10. **Page 87, Section 2.2.7:** Where is the data for sediment sample S176 presented? Table 7 only includes the summary for filtrate.
11. **Page 87, Section 2.2.7, first paragraph:** Revise the TGW criterion for tritium to 220,000 pCi/L.
12. **Page 87, Section 2.2.7, third paragraph:** Revise the MCL for gross beta to 50 pCi/L.
13. **Page 94, Section 3, bullet list:** Evaluate if emerging contaminants (e.g., PFAs) should be listed as a potential contaminant of concern.
14. **Page 104, Section 4.2.2:** Figure 2 illustrates an inactive subsurface structure/tank labeled 3078 between Building 3000 and former Building 3095. This section does not appear to discuss this subsurface feature. Please revise the text accordingly. Also, confirm if 3111 has a remaining concrete slab or if it should be symbolized as a removed structure with a green dashed line.
15. **Page 109, Section 4.3.1, LLLW System Class 1 SU:** The LLLW system Class 1 SU is not illustrated on Figure 9, and it appears this is the only Class 1 SU that is not included on this figure. Revise Figure 9 to show the location of the LLLW system Class 1 SU.
16. **Page 121, Section 4.3.1, first paragraph:** The objectives of the SWSA 2 characterization should include determining if buried waste is present such that appropriate LUCs can be identified under this IROD until a final remedy is determined for the buried waste. Revise the last sentence to include evaluation of the nature and extent of buried waste.
17. **Page 123, Section 5.1, second bullet:** The text outlines the process for inspecting and surveying subsurface structures. More specifically it discusses inspecting floor drains and pits/sumps. Please clarify if floor drains and pits/sumps will be inspected in existing buildings and/or in areas where these features have been plugged during D&D activities.
18. **Page 124, Section 5.2, General Comment:** The DQO and this document identified process waste lines as underground utilities of concern.
 - a. It does not appear that biased soil samples are planned for all the process waste lines in the Class 1 SUs. For example, the process waste lines illustrated in Figure 3 are not included on Figures 11 and 12, nor does it appear biased samples are

- targeting these process waste lines. Are biased samples planned to target for the process waste system?
- b. Figure 13 includes the location of the process waste lines and it appears that biased soil samples are planned to evaluate the process waste line in the Low Intensity Test Reactor (LITR) Complex Class 1 SU. The reasoning listed in Appendix B for these biased samples is to evaluate cooling water lines. Confirm what type of lines are being evaluated, process waste lines or cooling water lines, and revise the text, table, and figures as necessary.
 - c. Evaluate if there are other Class 1 SUs or areas within the Class 2 SU where evaluation of soil around the process waste lines may have been omitted.
19. **Page 124, Section 5.2.1:** There are several LLLW tanks (e.g., 3001-B, 3002-1, 3003-A, 3004-B) discussed in this document that are part of the LLLW system but are not evaluated within LLLW system Class 1 SU. Table 9 suggests that LLLW tanks 3004-B and 3001-B will be evaluated as part the LLLW system Class 1 SU. Revise the text to state what Class 1 SU(s) will evaluate the LLLW tanks.
 20. **Page 124, Section 5.2.1, second bullet:** Will the LLLW system soil sampling target bedding materials or will it target native soil?
 21. **Page 125, Figure 10:** The LLLW system Class 1 SU area is not shaded similarly to the other figures, revise figure to illustrate the spatial extent of the LLLW system Class 1 SU area.
 22. **Page 127, Section 5.2.1, fourth bullet:** The bullet states, "*metals and conditional radionuclides will be analyzed for all samples at a minimum, with conditional radionuclides analysis based on field screening exceeding two times background.*" This statement seems to suggest that all samples will be analyzed for conditional radionuclides but then contradicts this first statement by indicating that samples will be analyzed for conditional radionuclides only if field screening is two times background. Revise text to clarify when samples will be analyzed for conditional radionuclides. Also, provided clarification on what is meant by conditional. This comment should be addressed globally.
 23. **Page 135, Section 5.2.4, fourth bullet:** It does not appear that sample location B-1028 is a sample location within the LITR Complex Class 1 SU. Confirm if B-1028 is the correct sample location referenced in this bullet.
 24. **Page 137, Figure 13:** Confirm if there is a biased sample planned to evaluate soil impacts from the 3004-B LLLW Tank. Figure 13 does not have a sample location near this tank and the text in Section 5.2.4 does not discuss this tank. If historical sampling is

assumed to be sufficient, provide additional details on why it is sufficient (depth, analytical data).

25. **Page 139, Section 5.2.4, second dash:** Due to the uncertainty of impacts to soils and the high potential for an RA in the area around 3085-W, soil samples should be collected to the top of water/top of rock to evaluate threat to groundwater.
26. **Page 140, Section 5.2.5, second bullet:** Are there biased samples planned for the OGR Storage Canal Overflow (SWMU 1.8) site listed in Appendix C? Revise text to discuss sampling for this site.
27. **Page 143, Section 5.2.6:** One sample, each to 2 ft bgs, from each Class 1 SU area is insufficient to evaluate the absence/presence of soil contamination. Furthermore, the one sample location associated with each of the soil Class 1 SUs does not appear to be illustrated on any of the figures. Additional sample locations and deeper samples should be considered, and the figures should be revised.
28. **Page 144, Section 5.2.7, third bullet:** The text states that if anomalies are noted during the geophysical survey, soil samples will be collected to 2 ft below the anomaly. Soil samples should be collected to the top of rock/top of groundwater at all the anomaly locations to evaluate threat to groundwater.
29. **Page 144, Section 5.2.7, third bullet:** The text states that if anomalies are not noted during the geophysical survey, then gridded samples will be collected *from 0 to 5 ft for field observation only to determine the presence of the prescribed 2-ft soil cover*. It has been documented that SWSA 2 is a burial ground and there is uncertainty with respect to what removal actions, if any, have been completed. Regardless of whether subsurface anomalies are noted, soil samples must be advanced to top of rock/top of groundwater within the footprint of SWSA 2 to evaluate the absence/presence of buried waste and the nature and extent of buried waste and soil contamination. Please revise this section to include sample locations specific to evaluating the nature and extent of buried waste and soil contamination.
30. **Page 144, Section 5.2.7, fourth bullet:** The text states that *after the concrete or asphalt sample has been collected, samples of the underlying materials/soil will be collected, as specified above, from the bottom of the slab/asphalt to the appropriate depth*. There may be non-native material that was placed to facilitate construction of the asphalt-paved parking lot. Please clarify if the soil samples will target native soils beneath the asphalt-paved parking lot and revise the text as necessary.
31. **Page 145, Section 5.3:** Are there any areas of concern that are not covered under the Class 1 SUs, statistical Class 2 SUs, or the biased Class 2 SUs such as any process waste manholes/lines (e.g., between building 3012 and 3044)?

32. **Page 149, Section 5.5:** This section states, *"After samples are analyzed and validated, the results will be compared to evaluation criteria for controlled industrial land use presented in BVSS RDR/RAWP Appendix E...Exceedances of maximum RLs, BV TLs, and/or groundwater SSLs will be evaluated within each SU."* The ORNL Project Team is currently working on modifying Appendix E of the Bethel Valley Soils and Sediments (BVSS) Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) to fix outstanding issues and better reflect the process for implementing Appendix C of the Bethel Valley IROD. This section as written does not capture the necessary changes which have yet to be inserted and approved in the CERCLA decision document. In order for this document to be approvable, these changes need to be acknowledged within this document.
33. **Page 151, Section 6:** This section states that upon approval of this document, field planning will commence. Please confirm if this statement is accurate and provide a table of the anticipated schedule for field planning and commencement of field activities.
34. **Appendix B:** The RDR/RAWP states, "To support the risk assessment, a random 20 percent of the class 2 SU soils will also be analyzed for VOC, SVOC, and radionuclides as part of the base program." Please update the Dynamic Work Plan (DWP) in Appendix B to account for the additional random samples to be taken in each soil class per the RDR/RAWP.
35. **Appendix B:** What is the Old ID column referencing?
36. **Appendix B:** Please clarify on the usage of "C" in the DWP? Does the "C" in the RAD and VOC columns mean that the samples are conditional? As mentioned in comment 22, clarification is needed throughout the document regarding conditional samples. The State is concerned that samples will be conditional upon field screening, even in Class 1 areas. While this is more understandable for a Class 3 or perhaps Class 2 area, this does not seem appropriate for a Class 1 area. The RDR/RAWP states that for Class 1 areas, "With RA Core Team concurrence, field screening for VOCs and radiation may be used in lieu of laboratory analytical data to delineate horizontal and vertical RABs." The State feels that at a minimum, a random subset of samples should be collected in Class 1 areas regardless of the field screening outcome. While field screening may be reliable for radiological contaminants, it is not nearly as reliable for VOCs, especially when not using a closed headspace method such as *SW-846 USEPA 3815* for PID scans.
37. **Page B-3, Appendix B, ORRR Cooling Water System Class 1 SU:** There appears to be insufficient samples for the Appendix C sites ORRR Decay Tank Rupture and ORRR water line at 3085.
- a. Which sample(s) will evaluate soil impacts from the 1975 cooling water release north of building 3085?

- b. Due to the known release at 3165 and the potential uncertainty with respect to depth of samples and soil disposition, an additional soil sample location should be added, and additional soil samples should be collected to the top of water/top of rock to evaluate threat to groundwater.
38. **Page B-3, Appendix B, LITR Complex Class 1 SU:** Due to the known release between 3005 and 3077 additional soil samples should be collected to the top of water/top of rock to evaluate threat to groundwater.
39. **Page B-8, Appendix B, EU-4A Class 2 SU:** Are any biased samples targeting the drain field associated with the septic tank (3078) in the 3000 Area? The biased samples associated with the septic tank and drain field should be advance to top of rock/top of groundwater.

This document has a review cycle protocol of 90 days. TDEC requested an additional 30 days to complete the review. Questions or comments concerning the contents of this letter should be directed to Jessica Core at the above address or by phone at (865) 895-0795.

Sincerely



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