



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

RECEIVED  
MAY 20 2024  
COUNTY MAYOR'S OFFICE

May 16, 2024

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

Dear Mr. Petrie

**RE: TDEC Comment Letter for Remedial Investigation Work Plan for White Wing Scrap Yard (Waste Area Grouping 11), Oak Ridge Reservation, Oak Ridge, Tennessee (DOE/OR/01-2970&D1)**

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation-Oak Ridge Office (DoR-OR), received the U.S. Department of Energy (DOE) letter transmitting the above referenced document on February 22, 2024. The document has been reviewed pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR).

The Remedial Investigation Work Plan (RIWP) as submitted addresses all environmental media within the White Wing Scrap Yard (WWSY). In an April 4, 2024, meeting between the tri-parties, DOE stated that soil characterization and remediation would no longer be conducted under the RIWP but rather these soil actions would be conducted as a Time-Critical Removal Action (TcRmA) to facilitate early property transfer of the WWSY. Although soil actions will be completed as a Removal Action (RmA), which does not require regulatory approval, TDEC has provided comments on the soil characterization efforts described within this RIWP. TDEC supports the potential early property transfer of WWSY and requests DOE consider incorporating TDEC's comments into their soil RmA efforts to facilitate successful reindustrialization of WWSY.

Review of this document meets the review cycle protocol of 90 days. Questions or comments concerning the contents of this letter should be directed to Eileen Marcillo at the above address or by phone at (865) 985-2397.

Sincerely

**Randy Young** Digitally signed by Randy Young  
Date: 2024.05.16 09:14:50 -04'00'

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

Enclosure

ec: Samantha Urquhart-Foster – EPA  
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xc: Wade Creswell – ORRCA  
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## Enclosure - Comments

### General Comments

1. The RIWP does not include collection of soil gas data to support a vapor intrusion evaluation. Because soil actions will be completed under a RmA to facilitate an early property transfer, the vapor intrusion pathway must be evaluated to support the inclusion of protective deed restrictions per CERCLA Section 120(h)(3)(C)(ii)(I). Soil gas samples should be collected as part of the proposed RmA and included in the baseline human health risk assessment.
2. As previously suggested to DOE during recent project team meetings, a survey and accounting of threatened, endangered, or rare species should be completed prior to clearing of vegetation to ensure any investigation or RmA activities are completed in accordance with threatened and endangered (T&E) species applicable or relevant and appropriate requirements (ARARs). The timing of this survey and the potential timing of vegetation removal (for example, bat habitat) is critical for moving forward with the proposed RmA and early property transfer of WWSY.
3. There are numerous inconsistencies with respect to the preliminary remediation goals (PRGs) and regional screening levels (RSLs) listed in the tables within the text. A non-exhaustive review of these tables was conducted, and specific comments are included below. Due to the numerous discrepancies, these tables need to be reviewed in their entirety.
4. The WWSY boundary is not consistent between figures within this document. An example of the differing boundaries can be observed on Figure 1.2 and Figure 1.3. Revise the figures to show a consistent boundary.
5. Revise the text and tables to include analyzing environmental samples for 1,4-dioxane and per- and polyfluorinated substances (PFAS).

### Specific Comments

1. **Page 1-1, Section 1, 3<sup>rd</sup> bullet** – Add the associated DOE document number for the *Surface Debris IROD*.
2. **Page 1-4, Section 1.4, 2<sup>nd</sup> bullet** – The purpose of the RIWP is not to determine compliance with ARARs but rather to preliminarily identify federal/state chemical- and location-specific ARARs per U.S. Environmental Protection Agency (EPA) OSWER Directive 9355.3-01 *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Please revise this bullet to state “preliminary identification of ARARs”.
3. **Page 1.7, Section 1.5.1, 1<sup>st</sup> bullet** – This bullet references CERCLA Section 120(h)(3)(I)(ii). Confirm this CERCLA citation is correct.



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4. **Page 1-8, Section 1.5.3, 1<sup>st</sup> paragraph** – This section states that enhanced geophysical investigations will be conducted to better understand the anomalies identified in the 1995 Geophysical Survey Report for the WWSY. The Field Sampling Plan (FSP) included as Appendix A does not describe the details of the proposed geophysical investigations. The FSP should be updated to include details on how the geophysical investigation will be conducted (i.e., spacing of transect lines).
5. **Page 1-8, Section 1.5.5 –**
  - a. This section states that the removal of trees and brush will need to be completed prior to field investigation activities. Ecological surveys to identify any T&E species in the WWSY footprint must be conducted prior to the vegetation removal to ensure these activities will not be removing T&E plants or habitat required for other T&E biota.
  - b. Federally listed bat species are known to be present in Bear Creek Valley and in the vicinity of WWSY. DOE must initiate a consultation with the United States Fish and Wildlife Service (USFWS) early in the planning process and prior to any tree and brush clearing to schedule these activities at a time that avoids impacts to any threatened and endangered bats that may be roosting in trees on the site. Per guidance from the U.S. Geological Survey (USGS), TDEC urges DOE to complete any necessary tree removals during the winter (i.e., by mid-March) when bats are less likely to roost in the area and maternity roosts of T&E bat species are significantly less likely to be impacted. See comment #11 for additional information.
6. **Page 2-2, Section 2.2, last paragraph** – Reference the document which established the land use controls (LUCs) for the WWSY.
7. **Page 3-1, Section 3.1, last paragraph** – It is stated the tributaries ET-3 and ET-4 are located adjacent to the WWSY, but Figure 1.3 illustrates ET-3 flowing through the southern boundary of the WWSY. Confirm the boundary of WWSY and the location of ET-3 and revise this section or figure as needed.
8. **Page 3-8, Section 3.5.2.4** – This section states fill material was used in low areas where contaminated soils had been removed. Provide a map showing the location of these fill areas and include further details including the depth of fill placed. Additionally, due to the placement of fill in areas where impacted surface soil has been removed, biased deeper soil borings should be advanced in these areas to ensure clean fill is not being sampled. The current soil sampling plan has a high number of surface soil samples (0 to 2 feet).
9. **Page 3-9, Section 3.7** – The groundwater description of the site seems inadequate and may need to be re-evaluated during the investigation period. Please describe the hydrogeology of this area. There are several geologic units that strike through the WWSY area. Please describe the hydrogeologic units and their depths (i.e., zones of similar hydraulic properties). What types of aquifers (unconfined, confined, etc.) exist in the area? What hydrogeologic units are the wells and piezometers screened in? What date range was used

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in creating the potentiometric surface drawn on Figure 3.5? Discussion should be added to consider geologic features in the area as shown on Figure 3.4. Geologic features such as the White Oak Mountain fault will likely require groundwater interpretation beyond interpolation between points for groundwater levels.

10. **Page 3-9, Section 3.8** – Please provide a discussion in text identifying whether the surface water at the site is perennial or ephemeral. Do the tributaries ever run dry? Though dependent on precipitation and groundwater, is surface water always flowing to some degree? Is there ever a time where stream bed sediments are exposed for extended periods?
11. **Page 3-12, Section 3.9** – Expected ecological receptors include those described for the ORR in general and for Bear Creek Valley more specifically. This section currently represents an incomplete account of potentially impacted ecological receptors. However, there are several State and federally listed species documented in and near Bear Creek Valley that are not represented in Table 3.2. The species not included in Table 3.2 but known to exist in/near Bear Creek Valley or in Roane County (in general) are the Tennessee dace, four-toed salamander, Indiana bat, gray bat, tri-colored bat, Northern long-eared bat, and little brown bat. TDEC has reported acoustic records of all 5 bat species, which are also federally listed, in the annual TDEC Environmental Monitoring Reports from 2014-2017, and Oak Ridge National Laboratory (ORNL) Natural Resources staff should have similar records of these species present in the area. This list of species may still not be complete and only represents examples of the species that TDEC is aware of and which are not currently included in this section. For a complete accounting of listed, sensitive, or uncommon species that may be in the vicinity of WWSY, ORNL and Tennessee Wildlife Resources Agency (TWRA) biologists should be consulted and relevant sections of the RIWP should be updated to reflect a complete list of species that may be present and impacted.
12. **Page 3-13, Section 3.9** – There is a discussion of aquatic species documented in Bear Creek as a basis for what might be expected in the tributaries at the WWSY sites, but there is no information provided for any data collected from the WWSY tributaries specifically. Has any biological monitoring data been collected from the WWSY tributaries in the past? If so, please present that information here. If not, aquatic biological monitoring should be conducted for fish (if present) and benthic macroinvertebrates in these tributaries as part of a complete site characterization effort.
13. **Page 4-1, Section 4.1** – Preliminary screening values are listed for each media. For surface water, in addition to existing ambient water quality criteria (AWQC) for a contaminant of potential concern (COPC), EPA RSLs or maximum contaminant levels (MCLs) should be used for preliminary screening for human health risk, as well. For sediment and soils, EPA RSLs for soil to groundwater need to be considered during preliminary screening as part of a complete assessment of site risks to groundwater. Revise the tables within this section accordingly.



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14. **Page 4-2, Section 4.1.1** – It is stated four soil samples were previously collected, but Table 4.1 only summarizes results for one soil sample. Revise Table 4.1 (page 4-3) to summarize the results for all the soil samples.
15. **Page 4-2, Section 4.1.3** – Would surface water be considered an exposure medium of concern for human health risk, as well, in a residential scenario? Please revise as necessary.
16. **Page 4-3, Table 4.1** – Confirm the units listed in the table. For example, the metals units are listed as milligrams per gram (mg/g), but the numerical criteria for metals listed in the table correspond to units of milligrams per kilogram (mg/kg).
17. **Page 4-4, Table 4.3** – Are all measured contaminants from historical surface water records represented in this table or are only the COPCs with associated AWQC shown? If the latter, a footnote should be added to the table to clearly state this, and a full list of contaminants sampled for and detected should be included somewhere in the main text. Similar footnotes should be added to all tables for this purpose, if applicable.
18. **Page 4-5, Table 4.4** – The table should be revised as follows:
  - a. Add a footnote referencing the nickel and lead MCLs are per TDEC 0400-40-03-.03 General Water Quality Criteria.
  - b. Add a footnote referencing the radionuclides MCLs are per beta particle and photon activity 4 mrem/year.
  - c. The MCL for cesium-137 should be listed as 200 picocuries per liter (pCi/L).
  - d. Confirm mercury EPA RSL should be 0.063 micrograms per liter (µg/L) and not 0.63 µg/L, revise frequency as needed.
19. **Page 4-10, Figure 4.3** – It is unclear in the conceptual site model (CSM) and in the text what exactly the difference is between an external exposure and direct contact. Please provide more information to help interpret the Ecological CSM.
20. **Page 4-10, Section 4.3.3** – Subsurface debris, vessels, and containers in direct contact with soils could leave contamination in place. Please clarify why soils are not considered an exposure medium for subsurface debris, vessels, and containers?
21. **Page 5-3, Section 5.1.1** – Table 5.1 lists potential chemical-specific ARARs for surface water. Please clearly state that these constituents listed may not be comprehensive and that other constituents may be added upon further site characterization. As the remedial investigation (RI) has not yet been completed, other constituents listed in TDEC 0400-40-03.03 may apply.
22. **Page 5-3, Section 5.1.1.2** – The last sentence references Table 5.1 as containing the numeric criteria for groundwater, but Table 5.1 summarizes surface water AWQCs. This section should be updated to reference the correct table.
23. **Page 5-5, Section 5.1.3.2** – This section summarizes that historical sediment samples show that sediment is not a medium of concern for human health risk; however, it does not

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mention that sediment values exceeded ecological screening values (ESVs). It should be noted that sediment remains a concern for ecological receptors. Additionally, as referenced in Section 4.1.2, only two (2) sediment samples were collected from ET-4 in 1995. No sediment samples were collected from ET-3. Section 4.1.2 also states that there is a level of uncertainty associated with the preliminary screening of historical sample results. Additional samples should be collected from ET-4 and ET-3 to properly assess whether sediment is a medium of concern for human health.

### **24. Page 5-10, Section 5.1.3.4 and Table 5.5 –**

- a. The text states that Table 5.5 presents the human health and ecological PRGs. Table 5.5 does not present ecological PRGs. Remove the reference to ecological.
- b. The table needs to be revised to include the MCL for cesium-137, and the MCL for tritium should be revised to 20,000 pCi/L.
- c. Explain why a hazard quotient (HQ) of 3 is deemed acceptable for use as a preliminary remediation goal. The EPA *Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals* states that the initial PRGs should be developed using a target risk of  $1 \times 10^{-6}$  and a  $HQ=1$  until a baseline human health risk assessment (BHHRA) is completed. Once the BHHRA is completed, the PRGs can be modified as appropriate.
- d. Revise table to include the RSL for nitrate, phosphorus, and lead. RSLs are included in Table 4.4 and should be included here as well.
- e. Provide an explanation why the RSL for mercury is based on methyl mercury in this table but based on mercury (elemental) in Table 4.4.
- f. Trichloroethene has a noncarcinogenic screening level. Revise the table to include these values.

**25. Page 5-11, Section 5.2 –** This section needs to address soil gas and include discussion of technologies that can be applied to mitigate vapor intrusion.

**26. Page 6-4, Section 6.1.4 –** The WWSY CERCLA investigation must also include evaluating soil gas within the WWSY footprint. Revise the first sentence to include soil gas and include soil gas discussions within the subsequent sections.

**27. Page 6-4, Section 6.1.5 –** For a residential scenario, should a human health risk value be compared to  $1 \times 10^{-5}$  or lower? When is a decision made to adjust the risk limits within the  $10^{-4}$  to  $10^{-6}$  range?

### **28. Page 6-5, Figure 6.1 –**

- a. The 1994 *Interim Remedial Action Postconstruction Report for Waste Area Grouping 11* (DOE/OR/01-1263&D2) documented surface debris was removed from 138 grids (100 originally documented plus an additional 38 – Figure 2). The WWSY CERCLA investigation area footprint depicted in Figure 6.1 does not appear to cover all 138 grids, confirm this boundary does include the 138 grids where surface debris was removed.



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- b. Consider shading the ET-3 and ET-4 areas green as these two tributaries are included in the investigation area.

**29. Page 6-6, Section 6.2** – Include characterization of soil gas in this section.

**30. Page 6-6, Section 6.2.1** –

- a. Consider if physical property samples should be collected for soil and/or if hydraulic property testing is necessary to inform the feasibility study.
- b. Several contingency sample locations to be determined should be included so that additional sample locations can easily be added after the completion of the geophysical investigation.
- c. In historic reports there are several locations identified as areas of significant findings (i.e., areas where buried material was removed) where it does not appear biased samples are being proposed. For example, the 1991 *Surface Radiological Investigations at White Wing Scrap Yard* (ORNL/ER-52) identified an area of surface subsidence (5 ft in depth) with several buried drums. The proposed sample location map (Figure 6.2) does not appear to have any proposed samples in this area. Illustrate all areas of significant findings identified during previous work on a figure and confirm all areas of significant findings have deeper biased soil samples proposed.

**31. Page 6-6, Section 6.2.2, 6.2.3, 6.2.4** – Revise the text to reference Table 6.2 instead of Table 6.1 in each paragraph.

**32. Page 6-12, Figure 6.4** – Insufficient deep biased soil samples are proposed for the Y-12 area. Several areas of interest have no soil samples associated with them. These areas must be evaluated to inform future soil actions. Add additional deep biased soil samples in these locations.

**33. Page 6-16, Section 6.2.4** – Synoptic water level events must be conducted as part of groundwater monitoring to evaluate groundwater flow within the WWSY. Please add text describing the plans for synoptic water level monitoring.

**34. Page 6-18, Section 6.3** – It is not appropriate to assume an approved soil characterization strategy that was developed for a different project is applicable to the WWSY. The details of the dynamic characterization strategy proposed to be applied to the WWSY must be included in this RIWP for regulator input and approval. Revise this document to include the necessary details of the proposed dynamic characterization strategy.

**35. Page 6-18, Section 6.5** – Please provide text discussing how reasonable maximum exposure areas will be determined to calculate exposure point concentrations (EPCs) that are representative of potential risk. For example, will hot spots (if identified during sampling) be used to adjust exposure unit sizes? Will other site-specific characteristics or conditions be used to determine exposure units? Are exposure units defined by the investigation areas?



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36. **Page 6-19, Section 6.5.1.1, 3<sup>rd</sup> paragraph** – This section does not discuss soil gas or groundwater data. Identify what criteria the soil gas and groundwater data will be compared against to determine soil gas and groundwater COPCs.
37. **Page 6-21, Table 6.3** – The title of Table 6.3 references East Tennessee Technology Park (ETTP). Revise the title to reference WWSY and update table accordingly.
38. **Page 6-21, Section 6.5.1.2.1** – Provide text briefly discussing why EPCs will default to the maximum detected concentration (MDC) if the UCL95 exceeds the MDC.
39. **Page 6-22, Section 6.5.1.2, last paragraph** – Vapor intrusion is a potential exposure pathway and must be evaluated for an adult industrial worker. Remove the “as necessary” from the last sentence.
40. **Page 6-22, Section 6.5.1.2.1, 2<sup>nd</sup> paragraph** –
  - a. Contaminant levels in groundwater will also be directly measured. Revise the first sentence of this paragraph to include groundwater.
  - b. It is not appropriate to model concentrations in air when soil gas samples can directly measure the concentrations. Update this section to include direct measurements of soil gas.
41. **Page 6-23, Table 6.4** – The title of Table 6.4 references ETTP, revise the title to reference WWSY and update table accordingly.
42. **Page 6-25, Section 6.5.1.3** – The references to Sections 3.5.2 and 3.5.4 do not seem to be correct. Please revise the text to reference the appropriate sections.
43. **Page 6-30, Section 6.5.2.3.4** – Please explain why background soils data from ETTP are best to determine background at WWSY, which is within Bear Creek Valley. Soils data from past Bear Creek Valley investigations may be a more representative data set for comparison. If such background data are not available for Bear Creek Valley, DOE may need to consider including background sampling within Bear Creek Valley as part of the sampling plan.
44. **Page 6-37, Table 6.8** – How recently was existing dragonfly data collected? Is it representative of current site conditions? How large is the dragonfly dataset? Will it need to be supplemented as part of the RI sampling plan?
45. **Page 6-38, Table 6.8** – Will dragonfly data be used as a measurement endpoint to model potential risk to the gray bat, using the little brown bat as a representative species? If so, please state that information here. Similarly, please state the decision point associated with other T&E species that may be present (see comment #11) and that the river otter represents.

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- 46. Page A-18, Section A.4.2.2, 3<sup>rd</sup> paragraph** – This paragraph states an evaluation will be conducted to determine which piezometers are adequate for groundwater sampling. What metrics would qualify a piezometer to be adequate for groundwater monitoring? Because these piezometers have never been used for groundwater sampling, will they be redeveloped prior to groundwater sample collection?
- 47. Page A-18, Sections A.4.2.2.1, A.4.2.2.2, and A.4.2.2.1** –
- a. These sections specify the depth intervals, every 5 feet (ft), to be sampled for the soil borings advanced to the water table. The depth intervals assume that the top of water is located at 22 ft below ground surface (bgs). The depth to water presented in Table 3.1 ranges from 5.1 ft bgs to 82.1 ft bgs, with more than half the wells having depths to water much deeper than 22 ft bgs. Will additional samples be collected if water is encountered deeper than 22 ft bgs? If not, state the number of samples planned for each deeper soil boring and provide additional details pertaining to the logic for selecting soil samples for laboratory analysis.
  - b. As previously stated, describe the dynamic characterization strategy proposed for the WWSY allowing regulator input and approval.
- 48. Page A-25, Section A.4.2.2.6** – Synoptic water level events are not mentioned in this RIWP. Are synoptic water level events planned to facilitate evaluating groundwater flow direction? Revise this section to include a discussion on how groundwater flow direction will be assessed.
- 49. Page A-29, Section A.4.3, 5<sup>th</sup> paragraph** – Do not reference the reader to a separate document to review volatile organic compound (VOC) field screening procedures. Attach the *Class 1 and Class 2 Sample Screening Protocol for VOCs* to this RIWP. Field screening of VOCs should not be conducted as outlined in this protocol, rather a headspace method should be deployed.
- 50. Page A-30, Section A.4.3, 8<sup>th</sup> paragraph** – Groundwater samples also need to be collected and analyzed for 1,4-dioxane using EPA Method 8270 isotope dilution with selective ion monitoring (SIM) and PFAS.
- 51. Page A-34, Section A.4.4.2, 2<sup>nd</sup> paragraph** – This section describes the decontamination of equipment and mentions decontamination of tubing for reuse. Please clarify if sampling tubing is planned on being reused at different wells. It is not recommended by the State of Tennessee to reuse tubing used for sampling at multiple wells.
- 52. Pages A-1-3 through A-1-7, Table A-1.1.** –
- a. Field screening for radionuclides is not included for the soil samples collected in the K-25 area. Provide an explanation for not field screening for radionuclides or revise the table to state that this will occur in the K-25 area.
  - b. The footnote for radionuclides states samples will be submitted for analysis of gross alpha, gross beta, and others to be determined. On page A-37, it states



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that all samples will be analyzed for alpha activity, beta activity, uranium isotopes, technetium-99, and gamma spectroscopy. Revise the table to reflect the radiological parameters listed on page A-37.

- c. This table lists the specific six piezometers identified for groundwater sampling. Previously on page A-18 it states that an evaluation will be conducted to determine which six (6) of the 11 piezometers are adequate for groundwater sample collection. Has this evaluation been completed and are these the six piezometers that were selected for groundwater sampling? The text and/or table should be revised to reflect the plan.

### **53. Pages B-3-7 through B-3-12, Table B-3.1 –**

- a. Confirm the RSL (tap water) for benzo(a)pyrene.
- b. Several RSL screening values listed in Table B-3.1 and Table 4.4 are different (e.g., trichloroethene, cobalt, cadmium). Please provide an explanation for these differences and add a footnote to Table B-3.1 stating what target risk and hazard quotient were used to generate these screening levels.
- c. Confirm mercury and methyl mercury screening levels and confirm units.
- d. For the water analyses, add columns and list the federal/state MCLs and AWQCs so the analytical methods can be evaluated to determine if they are sensitive enough for comparison to the corresponding numeric criteria.
- e. The row titled "Water" appears to be placed in the incorrect location. Please adjust as necessary.

### **54. Pages F-3 through F-8, Table F.1 – Revise the table to include the following ARARs.**

- a. State of Tennessee law and regulations pertaining to waters of the state (i.e., streams, wetlands, wet weather conveyances) including both use classification and impacts/mitigation;
- b. Regulations related to activities causing accumulation of stormwater or stormwater run-off; and
- c. Federal T&E species and migratory birds.