



**STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Remediation - Oak Ridge
761 Emory Valley Road
Oak Ridge, Tennessee 37830

November 29, 2018

Mr. John Michael Japp
DOE FFA Project Manager
P.O. Box 2001
Oak Ridge, TN 37831-8540

Re: TDEC Comments

Natural Resource Assessment for the Proposed Environmental Management Disposal Facility (EMDF), Oak Ridge, Tennessee (ORNL/TM-2018/515)

Dear Mr. Japp

The Tennessee Department of Environment and Conservation (TDEC) – Division of Remediation (DoR) received three sensitive resource study reports on August 23, 2018: Natural Resources Assessment, Phase I Archeological Survey, and Historic Architectural Resource Survey. TDEC reviewed the three reports pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR) and provides comments on the Natural Resource Assessment report in Attachment A.

TDEC can provide additional information supporting these comments. Please direct any questions or comments regarding this letter or the attached comments to Brad Stephenson. You may reach him at the above address or by phone at (865) 220-6587.

Sincerely

A handwritten signature in black ink, appearing to read "Randy Young".

Randy Young
FFA Manager

Enclosures: Attachment A, TDEC Comments – Natural Resources Assessment

xc Dave Adler, DOE
Patricia Halsey, DOE
Carl Froede, EPA
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ATTACHMENT A: TDEC Comments

Document Name: *Natural Resource Assessment for the Proposed Environmental Management Disposal Facility (EMDF), Oak Ridge, Tennessee ORNL/TM-2018/515, June 2018*

This attachment presents Tennessee Department of Environment & Conservation (TDEC) – Division of Remediation (DoR) comments on the Natural Resource Assessment for the Proposed EMDF, referred to herein as *the report, the document, or the assessment*. TDEC reviewed this report pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR).

The report presents information on anticipated environmental impacts from construction of the proposed EMDF at the Central Bear Creek Valley (CBCV) site to inform facility planning and decision-making. The natural resource assessment was conducted between April 2018 and early June 2018 and included surveys of potential impacts to wetlands, streams, timber resources, rare species, including state- and federally-protected species, and species of conservation concern on the ORR, including plants, birds, mammals, and amphibians. The report provides information of value in addressing or mitigating natural resource-related Applicable or Relevant and Appropriate Requirement (ARARs).

General Comments

1. The assessment described in this report is inadequate to comprehensively inventory flora and fauna species in the proposed EMDF area. Examples of key deficiencies include the following.
 - Collectively, DOE, TDEC, and Domain 07 National Ecological Observatory Network (NEON) assessments documented 11 state- and federally-listed flora and fauna species in the CBCV area since 2015. However, the DOE assessment does not document four of these species.
 - The report provides insufficient information for several surveys associated with DOE's assessment. For example, the report provides minimal justification to explain the rationale for sampling site choices, and DOE did not sample some parts of the survey area.
 - The report does not present species accumulation curves or rarefaction analyses to demonstrate whether the assessment sufficiently represented species living in ecological community at the CBCV site.
 - The assessment did not include a benthic macroinvertebrate survey or address the structure or condition of this community. TDEC recommends that DOE survey the benthic macroinvertebrate community at the CBCV site, including spring and fall samples, before construction activities affect these communities.

Upper headwater streams often provide habitat for taxa not typically found further downstream in the watershed. The diversity of fish species is likely limited in headwater streams, so macroinvertebrates are often critical members of healthy stream ecosystems. DOE should identify macroinvertebrates at the lowest taxonomic levels possible. A cursory

examination will not provide the necessary information to determine impacts to the aquatic communities during and after landfill construction.

- DOE conducted plant surveys only along streams and tributaries. Rare plant species likely exist throughout the survey area, not just along streams and tributaries.
- The assessment did not document at least two common vertebrate species and more than five threatened and endangered (T&E) vertebrate species (among all vertebrate taxa) that exist in the CBCV area.
- The assessment may have not have adequately sampled cavity-roosting bat species which are often underrepresented by acoustic surveys. Four state- and federally-listed T&E bat species in the area are cavity-roosting species. DOE should conduct mist-netting and/or direct roost searches to represent T&E bat species at the CBCV site more completely.
- The assessment did not document five species of shrews, four T&E species and one common species, known or likely to live in the CBCV site area. Sherman live traps are not well suited for evaluating fossorial and semi-fossorial species (e.g., moles and shrews). DOE's assessment should use additional methods to produce a more complete inventory of the small mammal community.
- The report says that Sherman live traps were set in "*strategic locations at each point,*" but it does not describe how DOE selected the strategic locations. While this approach is common practice, it may inadvertently bias the species captured. For example, setting Sherman traps along fallen logs is a great way to target certain species of rodents that utilize fallen debris as thoroughfares to travel above leaf litter, but setting traps in this manner is likely to miss species that prefer to navigate under the cover of the leaf litter itself.
- The report should provide more detailed information about the duration of the small mammal survey. It appears the survey was not sufficient to characterize the small mammal community. If so, DOE should complete a more thorough inventory of the small mammal community to document other species that may be present, particularly rare species.

The report indicates that 48 Sherman traps (three traps per site at 16 sites across the survey area) were set for a single night. Typical return on small mammal trapping effort is approximately 10% trap success. For 48 traps, DOE was likely to capture only 4 to 5 animals per night of trapping. This is not sufficient to describe the small mammal community of any area, especially the CBCV community, which is dominated by a single species (>90% deer mouse, *sensu lato*).

- TDEC recommends that DOE survey the small mammal community over several seasons because the composition of the community can change drastically from one year to the next. The assessment included a single survey within a narrow timeframe during a single year. The data from this survey may not accurately represent the small mammal species present in the larger CBCV community.

- The report should include more detailed information about cover board sampling for reptiles and amphibians.
 - The report provides no information about cover board placement or location selection. If field crews placed cover boards at strategic locations, as described for the Sherman live traps, the survey may have biased the reptile and amphibian inventory to species that favor microhabitats represented by the selected locations.
 - It is unclear whether field crews placed cover boards on the same night as the Sherman traps. If so, the sampling activities may have interfered with each other if locations for cover boards were near the small mammal trap locations.
- 2. The report should explain why DOE only surveyed vertebrate fauna.
- 3. The assessment should address the potential for migrating contaminants to affect the Tennessee dace, a species designated by TDEC as “in need of management,” and other sensitive species. The report indicates that the Tennessee dace occurs in Bear Creek and tributaries upstream and downstream of the CBCV site, although field crews did not observe this species in the survey area.

Tributaries in the CBCV area may be important for recruitment and seasonal migration of aquatic species, including fish. Semi-tolerant fish species (those not entirely tolerant of habitat disturbances and pollution, including heavy metals) were found near Bear Creek headwater tributaries and lower reaches closer to the CBCV site.

Specific Comments

1. Introduction, page 1

“This location has the advantages of not requiring aggressive groundwater controls, being near to the Y-12 and ORNL facilities where the waste will be generated, being sufficiently separated from other facilities in Bear Creek Valley to avoid conflicts during construction and operations, and being over some of the most favorable geologic formations on the ORR from a landfill siting perspective.”

The State requests that DOE replace this statement with the following:

“The location has the advantages of being near the Y-12 and ORNL facilities where the waste will be generated and being sufficiently separated from other facilities in Bear Creek Valley to avoid conflicts during construction and operations.”

Site characterization data reported in DOE’s Technical Memorandum #1 (TM-1) do not support the statement that the proposed EMDF location “...has the advantages of not requiring aggressive groundwater controls...” Sections 3.1.1 through 3.1.6 of the Natural Resource Assessment say the location’s wet hydrology “...comes from a seasonally high groundwater table...” The report also states (Sections 3.1.1, 3.1.2, 3.1.5, and 3.1.6) that multiple drainages contribute to the wet hydrology. Based on the conceptual design provided in the D5 remedial investigation and feasibility study (RI/FS) and site characterization data reported in TM-1, groundwater levels would be within the waste over a large portion of the proposed landfill.

As noted in the State Acceptance section of the Proposed Plan, the State of Tennessee would not support a disposal facility that has a drainage feature (underdrain) to suppress the water table. Such drainage features could make the landfill less stable and allow water to enter the waste if the underdrain failed. Additionally, underdrains provide direct routes for transporting any contamination released from the landfill directly into nearby streams. Selecting a disposal alternative that requires an underdrain would require (1) exemptions or waivers from Tennessee Division of Radiological Health and TSCA requirements and (2) a convincing demonstration that use of underdrain(s) would protect human health and the environment.

2. Introduction, page 1

"Development of EMDF may impact approximately 140 acres in central Bear Creek Valley."

The report should clarify whether this includes areas within the proposed EMDF footprint or nearby areas.

3. Introduction, page 1

"Specific ARARs that cover the EMDF project are provided in the project record for the RI/FS (UCOR staff, personal communication)."

Please correct this statement to say something similar to the following:

"The EMDF RI/FS provides a preliminary list of ARARs."

The Dispute Resolution Agreement for the D5 RI/FS says:

"The attached RI/FS Appendix G preliminarily reflects the ARARs and TBCs. The ROD will determine the final version of Appendix G (and waivers with justification, if necessary) considering new information gathered after the Proposed Plan and all public comment received. Appendix G does not currently reflect agreement regarding DOE Order and Manual TBCs as citations, however the parties will resolve this issue prior to signature of the ROD" [sic]

4. Section2, Survey Approach, page 2

"The approach taken to natural resource assessment of the area...is similar to the approach taken at other sites across the Oak Ridge Reservation..."

The report should cite any guidance or standard operating procedure (SOP) that DOE followed in completing the assessment.

5. Section 2.2, Stream Surveys, page 3

"In addition, sampling was conducted in each suitable stream reach to determine presence/absence of fish species."

The report should describe the sampling methodology and extent of the sampling effort, including any bias toward dominant or rare species that may be inherent in the method.

6. Section 2.4, Rare Species Survey, page 4

The report should describe the rare plant survey methodology, including why DOE did not complete plant surveys within the proposed EMDF footprint.

7. Section 2.4, Rare Species Survey, page 4, paragraph 2

"Sixteen survey points were established approximately 200 meters apart across the site... Three Sherman live-traps were set in strategic locations at each point to gather information on small mammal populations frequenting the area."

The report should document the number of nights included in the Sherman-trap survey and the total trapping effort (trap nights = total # traps set x total nights trapped).

8. Section 3.1, Wetland Delineations, page 6

"A total of 11.81 acres of wetland were surveyed."

The report should describe the wetland acreage that construction of the proposed EMDF would remove. Based on the conceptual model presented in the D5 RI/FS and Proposed Plan, the footprint of the proposed EMDF includes 4.6 acres of wetlands.

TDEC suggests the following, or similar:

"A total of 11.81 acres of wetlands were surveyed, and 4.6 acres of the total wetlands are located within the actual proposed site for EMDF."

9. Section 3.2, Stream Surveys, pages 11-12

TDEC recommends a thorough analysis of the benthic communities in streams at the CBCV site, including seasonal sampling (at least early spring and fall). Such tributaries often support species not found in larger waterbodies downstream. The health of the benthic community is a significant factor in determining the health of an aquatic system. The report presents fish survey information collected from small streams on site. If fish are present, there should be macroinvertebrates.

10. Section 3.4.1, Plant Surveys, page 18

The survey identified four plant species of potential concern in the survey area:

"Tuberclad rein orchid ... is listed as Threatened on the Tennessee Rare Plant List. ... In addition...three other plant species of interest were found. American ginseng ... listed as Special Concern-Commercially Exploited. ... Pink lady's slipper...listed as Commercially Exploited. ... Canada lily (Lilium canadense) is no longer listed on the Tennessee Rare Plant List; however, it is still monitored on the ORR."

Correct the report to reflect that the TDEC Division of Natural Areas rare plant list no longer includes the Pink lady's slipper orchid. It was delisted several years ago (personal communication, Division of Natural Areas, 9/18/18; TDEC Interactive Rare Species Database, refined by "County = Anderson" and "Category = Flowering Plant," accessed 10/31/2018).

The report should also discuss any DOE plans to protect, or mitigate impacts to, these orchid populations. Tuberclad rein orchid populations noted along tributaries are the largest

populations of orchids on the Reservation, and they are large populations for Tennessee. Protecting T&E species, and critical habitat of those species, is a preliminary ARAR for the proposed EMDF that is applicable as designated in 50 CFR 17.11 and 17.12 (16 U.S.C. 1531 et seq., Sect. 7(a)(2)).

11. Section 3.4.2, Bat Surveys, pages 19-22

TDEC recommends that DOE perform mist-net surveys to determine if acoustic survey data accurately represent the presence or absence of roosting bat species. Several roosting bat species occur on the ORR, some of which are endangered and/or threatened by White Nose Syndrome (WNS). U.S. Fish and Wildlife Service (USFWS) guidelines recommend the survey of two mist-net sites per square kilometer (one net site per 123 acres) of habitat impacted for determining the presence or absence of Indiana bats (Carter 2010).

DOE should complete bat surveys in the southeastern portion of the CBCV survey area which has not been assessed (Figure 10). In addition to mist-net surveys, TDEC recommends that DOE complete directed searches for maternity roosts in the CBCV area before construction begins to minimize impacts to endangered roosting bat species. For example, DOE should avoid construction activities from mid-May through mid-August, as well as removal of occupied trees.

12. Section 3.4.3, Other Mammal Surveys, page 22

The terrestrial small mammal trapping effort was not sufficient to determine whether federally- or state-listed species occur at the CBCV site. Although this survey did not document the presence of the southern short-tailed shrew (*Blarina brevicauda*), it is a common species known to live on the ORR. Jumping mice, moles, and shrews have state-listed species in the area, but the sampling methodology described in the report is not likely to observe these species.

The report identified a vole captured in the survey area as *Pitymys pinetorum*. *Pitymys* is a subgenus of *Microtus*, which contains the woodland vole, also known as the pine vole. How was the woodland vole genus determined to be *Pitymys* and not *Microtus*? TDEC suggests using the more common taxonomic designation, *Microtus pinetorum*, unless DOE can confirm the captured specimen was *Pitymys pinetorum*.

13. Section 3.4.4, Reptile and Amphibian Surveys, pages 22-23

"No state or federally listed reptile or amphibian species were recorded on the site during these surveys."

The survey effort and methodology described in this report were not adequate to produce a representative inventory of the terrestrial vertebrate species living at the CBCV site. Examples of T&E species observed in the general area include the following.

The snapping turtle (*Macrochelys temminckii*) is state listed as threatened. A TDEC Environmental Monitoring Report (2015) documents observations of snapping turtles in the eastern portion of the Black Oak Ridge Conservation Easement, which lies near the CBCV site.

TWRA lists the four-toed salamander (*Hemidactylium scutatum*) as "in need of management". The home range of this species suggests that it may be present at the CBCV site.

In 2016 and 2017, NEON's pitfall trapping yielded vertebrate bycatch not represented in DOE's reptile and amphibian survey. The vertebrate species found include (1) four *Plethodon serratus* individuals (Southern red-backed salamander) and (2) two *Eurycea wilderi* individuals (Blue Ridge two-lined salamander).