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

October 6, 2023

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

TDEC Comment Letter for Engineering Evaluation/Cost Analysis for North Tributary-8 at the Y-12 National Security Complex Bear Creek Burial Ground, Oak Ridge, Tennessee (DOE/OR/01-2957&D1)

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation-Oak Ridge Office (DOR-ORO), received the above referenced submittal on September 6, 2023. The document has been reviewed pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation. The following paragraph and comments are relevant to the review of this document.

TDEC notes the conceptual site model and groundwater discussions in this document solely focus on shallow groundwater that expresses as surface water and are not representative of contaminant concentrations, including dense non-aqueous-phase liquid (DNAPL), or migration pathways within bedrock. While the purpose of this engineering evaluation/cost analysis (EE/CA) is to reduce the uranium discharge to North Tributary-8 (NT-8) East by capturing contaminants, specifically uranium, that migrate as shallow groundwater and express as surface water during the wet season, TDEC fully expects the U.S. Department of Energy (DOE) to address groundwater under a future decision document.

General Comments

1. The extent of NT-8 East is not consistently illustrated on the figures. For example, Figure 1.3 (page 1-4) depicts NT-8 headwater located much farther south than what is shown on Figure 1.5 (page 1-8). TDEC recommends revising the figures to be consistent throughout the document to ensure the record is clear.

2. Additional details regarding the influent concentration profile to the Y-12 Groundwater Treatment Facility (GWTF) and the treatment capabilities of this facility should be included in this document, especially given the much higher concentrations noted in surface water

samples (order of magnitude difference) collected near the source area compared with the concentrations noted in the sample collected from the Leachate Collection System (Table 1.10). While uncertainty exists with respect to the influent concentrations related to this proposed removal action, these details should be included to ensure that discharges from this GWTF are protective of the receiving streams.

3. Please provide a geologic map showing the locations of the direct-push technology (DPT) piezometers.

4. TDEC recommends discussing the geometries, depths, and construction of the waste trenches relative to water levels to tie into the conceptual "bathtubbing" model.

5. Please discuss why DPT 1 shows elevated uranium soil activity with lower groundwater concentrations while DPT 2 has lower soil activity that yields much higher activities in groundwater.

Specific Comments

1. **Page ES-2, last paragraph, *and* page 1-1 first paragraph.** The scope is defined as a reduction of uranium migration. Please also include a statement indicating that this removal action is not sufficient to meet completion requirements as a final remedy for the site and that future remediation activities are expected.

2. **Page ES-2, second paragraph, last sentence**. The last sentence states that future contaminants associated with the Bear Creek Burial Grounds (BCBG) and ecological risks will be addressed in the BCBG Record of Decision (ROD) or Bear Creek Valley ROD. Please include a sentence that states what Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) decision document will address groundwater contamination at the BCBG.

3. **Page ES-2, Executive summary, third bullet**. One of the removal action objectives listed this removal action is "Develop a cost-effective solution to minimize uranium discharge to NT-8 East." TDEC recommends revising to state the removal action objectives is to reduce uranium discharges to NT-8 East.

4. **Page 1-3, Figure 1.2.** The map in the EE/CA labels the DNAPL area north of the Burial Grounds, but the map in the 2023 Remediation Effectiveness Report (pg. 4-9) shows the DNAPL area as west of the Burial Grounds. Why are these shown in different locations between the two maps? What data indicates (or suggests) the presence of DNAPL? Consistent with general comment 1, the figures should be evaluated for consistency throughout the document.

5. **Page 1-15, Soils Tables.** TDEC recommends for DOE to provide context or some screening comparison to better understand the soil data. Please provide comparison criterion to elaborate on any significance, if any, of the soil detections.

6. **Page 1-49, Section 1.4.5, fourth paragraph**. When describing the bathtubbing trench concept, the document states that "The leachate may gradually seep through groundwater where attenuation processes act upon the contaminants." Waste that is in contact with groundwater will be a continuous source unless excavated. As written, this paragraph suggests no migration of contaminants is occurring but rather attenuation processes dominant. Please revise this paragraph to include a discussion that when waste is in contact with groundwater, migration of contaminants is also occurring resulting in groundwater contaminant plumes.

7. **Page 1-52, Figure 1.26.** Please include the sampling locations on the inset map and label A and A' on the cross section.

8. **Page 2-3, Location-Specific ARARs.** Please confirm a wet-weather conveyance determination was conducted by a qualified hydrologic professional and when the determination was made.

9. **Page 2-3, Action-Specific ARARs, second paragraph**. Generally, it is not best practice to reuse potentially contaminated soil in areas that are otherwise not contaminated. Samples of the excavated soil should be collected for laboratory analysis to confirm the soil is not contaminated prior to reusing onsite.

10. **Page 2-3, Action-Specific ARARs, last paragraph AND Page 3-12, section 3.3.3, last bullet.** The document states the water treatment associated with this removal action will meet the existing facilities permit requirements including discharge criteria. Please elaborate on the treatment for all contaminants of concern (COCs) encountered (e.g., Tetrachloroethene, Trichloroethene, Vinyl Chloride, Uranium metal and isotopes, polychlorinated biphenyls (PCBs), etc.). Despite this removal action focusing solely on the reduction of uranium, it is important that the treatment facility is capable of treating these other constituents that will accompany any uranium bearing water. Please provide more information on the percent effectiveness of the treatment system for each individual contaminant.

11. **Page 3-12, last bullet.**

    a. Discuss the uranium removal efficiency of the GWTF and uranium concentrations in the effluent. Could the additional flow impact removal efficiency?
    b. The GWTF discharges through internal OutFall (OF)512 and eventually discharges through OF200 to Upper East Fork Poplar Creek (UEFPC) and is covered by National Pollutant Discharge Elimination System (NPDES) Permit TN0002968. Per the permit, there is no limit for uranium. How will protection of UEFPC for additional uranium discharges be ensured? Have potential impacts to UEFPC for all additional and increased constituents been assessed? It is imperative to demonstrate this action does not simply move uranium, PCBs and other constituents from one watershed to another without properly removing them. Consistent with approaches at the Liquid

and Gaseous Waste Operations NPDES permitted facility, a uranium concentration limit can be imposed under CERCLA in the Action Memorandum.

c. Has DOE Environmental Management coordinated with DOE National Nuclear Security Administration under Part III A. (Toxic Pollutants) of the NPDES permit?

d. OF200 MTF will become operational during this removal action, per Appendix J of the FFA. Have any potential impacts of this additional flow to OF200 Mercury Treatment Facility been assessed?

12. **Page 3-15, Second paragraph**. What percentage of the total uranium loading from BCBG to Bear Creek is eliminated through this removal action?

13. **Page 5-2, Long-term effectiveness**. Does DOE plan for this removal action to remain active until a final remedy is implemented?

Review of this document meets the review cycle protocol of 30 days. Questions or comments concerning the contents of this letter should be directed to Cody Juneau at the above address or by phone at (865) 314-2328.

Sincerely

Randy C Young Digitally signed by Randy C Young
Date: 2023.10.06 12:17:00 -04'00'

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

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