UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8960

October 6, 2021

VIA ELECTRONIC MAIL

Mr. Roger B. Petrie
Federal Facility Agreement Manager
Oak Ridge Office for Environmental Management
Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Petrie:

The U.S. Environmental Protection Agency has completed review of the *Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee* (DOE/OR/01-2794&D1) received on July 12, 2021.

This is a first draft decision document for a remedy to address additional disposal capacity for radioactive, hazardous and mixed waste under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The EPA comments are attached and must be resolved before a revised document is submitted.

If you have any questions or concerns regarding this matter or require additional information, please contact me at (404) 562-8550, or electronically at froede.carl@epa.gov.

Sincerely,

Froede, Carl Digitally signed by Froede, Carl Date: 2021.10.06 13:55:52 -04'00'

Carl R. Froede Jr.
Senior Remedial Project Manager
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EPA Comments on the Record of Decision for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal at the Environmental Management Disposal Facility, Oak Ridge, Tennessee (DOE/OR/01-2794&D1)

General Comments

1. The D1 ROD lacks limits for radionuclides in surface water, and does not provide sufficient information on the volume and activity of radionuclides and mercury that will be disposed in the EMDF. While EPA is aware that DOE is developing this information, not having them for review in the D1 ROD delays EPA's ability to evaluate whether the ROD is protective and complies with ARARs.

2. The D1 ROD does not clearly state that the Clean Water Act (CWA) is an ARAR for radiological discharges, per the wastewater dispute decision (Wheeler, 12/31/20). Please address this oversight and state that the CWA is an ARAR for radiological discharge as appropriate throughout the document.

3. This Record of Decision (ROD) is specifically selecting Central Bear Creek Valley (CBCV) **Site 7c** as the location for the EMDF. Many references throughout the ROD cite CBCV but nothing is mentioned specific to Site 7c. The 2017 RI/FS also identifies Site 7a (in a dual site plan) overlapping Site 7c and this is shown in the ROD as Figure 2.2. Which landfill configuration is being selected? Please specify Site 7c in association with reference to CBCV and identify it on a map so the reader can understand its specific location and configuration in Bear Creek Valley (Note: Site 7c is shown in Figures 2.4. and 2.5. on pages 56 and 58 of the D1 ROD but not identified as such. Site 7c should be clearly identified as the location of the EMDF throughout this ROD).

4. Sections 1.1 and 2.1, and repeated throughout document. The name of the NPL site is Oak Ridge Reservation (USDOE), per the original rule, published in 48184 - 48189 Federal Register / Vol. 54, No. 223 / Tuesday, November 21, 1989. The D1 ROD consistently identifies the site as Oak Ridge NPL site, rather than using the correct term Oak Ridge Reservation (USDOE) NPL site. Abbreviating the site name is acceptable, but the correct text should be used in Sections 1.1 and 2.1, and the abbreviation defined (see https://semspub.epa.gov/work/HQ/189634.pdf).

5. The ROD includes an evaluation of greenhouse gas emissions for the offsite disposal alternative. EPA expects the ROD to include a discussion of the potential impacts of climate change on the proposed remedy, including potential changes in rainfall, storm events and hydrologic conditions, and climate resiliency measures to be addressed in the design and construction of the remedy. Please include and address this information in the appropriate sections of the revised ROD.

6. The draft ROD refers to LLW and higher-level waste. Add definitions of these terms to the ROD, including maximum radioactivity levels and volumes.

7. The 2021 FFS should be revised, per EPA and TDEC comments on the D3, and approved prior to issuance of the D2 EMDF ROD. The water quality criteria for radionuclides discharged to Bear Creek will be developed in the FFS and must be incorporated in the revised EMDF ROD.

8. The draft ROD makes changes land use designations and creates new land use designations. CERCLA RODs or remedies can make land use assumptions based on land use designations that are typically set at the local level. In this case, land use designation would be set in a DOE Facility Land Use Plan. The draft ROD should be clear on that issue and provide a basis for changing the land use

assumptions.

9. Disposal of Rn-222 may result in radon emissions relevant to worker protection. Has this been evaluated for EMDF?

10. EPA and TDEC have determined, and DOE has agreed, that the EMDF ROD merits additional public involvement activities before finalization. Public involvement should include new information developed since the September 2018 Proposed Plan specifically the WAC, limits for radionuclides and mercury in surface water, and groundwater elevation at the proposed site location. Resulting public comments and responsiveness should be included in the final ROD.

11. The regulatory agencies must have the opportunity to review and approve the proposed WAC, limits for radionuclides and mercury in surface water, and the Site 7c location information before this information is presented to the public for comment.

12. Cleanup Levels Not Provided/Incorrect Compliance Measurement – Pursuant to the National Contingency Plan (NCP) at 40 CFR § 300.430(f)(5)(iii), "The ROD also shall indicate, as appropriate, the remediation goals discussed in paragraph (e)(2)(i) of this section, that the remedy is expected to achieve. Performance shall be measured at appropriate locations in the groundwater, surface water, soils, air, and other affected media." In the case of the EMDF landfill generated wastewater that will be discharged into Bear Creek (or its tributaries) the remediation goals (i.e., cleanup levels) shall include effluent limits based on instream ambient water quality criteria (AWQC) equivalent for radionuclides that have been properly derived in accordance with identified 'applicable or relevant and appropriate requirements' (ARARs). Consistent with the NCP and as required by the Clean Water Act (CWA) regulations identified as ARARs (Ref. Assistant Administrator Peter Wright ARARs table from Jan 19, 2021 letter issued pursuant to Administrator Wheeler decision on Dec. 31, 2020 on the Wastewater FFS dispute), the effluent limits must be met at the point of discharge into the surface water (i.e., end of the pipe[1]) and AWQC equivalents (as well as other AWQC and narrative criteria under TDEC Water Quality Criteria regulations) must be met throughout stream[2] (not some point downstream of the discharge where DOE believes exposure from fishing might occur).

Neither these effluent limits nor instream criteria (i.e., remediation goals or cleanup levels) were included in the draft ROD, and thus the ROD is not consistent with the aforementioned NCP requirements at 40 CFR 300.430(f)(5)(iii). Further, the Oak Ridge Reservation (ORR) Federal Facility Agreement (FFA) Section III. PURPOSE. 2. also requires that DOE develop, implement, and monitor appropriate response actions at the Site in accordance with CERCLA, the NCP, RCRA, NEPA, appropriate guidance and policy, and in accordance with Tennessee State law. Accordingly, DOE must include instream AWQC equivalent concentrations for radionuclides in a draft ROD before EPA can fully determine its sufficiency and consistency with the NCP. These PRGs should be consistent with 40

[1] Ref. TDEC 0400-40-05-.07(2)(h), TDEC 0400-40-05-.08(1)(k) "All permit effluent limitations, standards, and prohibitions shall be established for each outfall or discharge point…" and 40 CFR § 122.44(i) *Monitoring requirements. See also* NCP Preamble at 53 Fed Reg 51440 (Dec. 21, 1988) "…discharges of toxic pollutants to receiving waters is measured for compliance at the discharge point (i.e., "end of the pipe")." For purposes of these comments the terms 'discharge point', 'end of pipe', 'outfall', 'point of discharge' all have the same meaning for purposes of measurement (i.e., monitoring) of hazardous substances in wastewater effluent that is discharged into surface water.

[2] 40 CFR 122.44(d) *Water quality standards and state requirements*; 40 CFR 122.44(d)(vi)(A) "Establish effluent limits using a calculated numeric water quality criterion …which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use."

CFR § 300.430(e)(2)(i) and based on ARARs where available and discussed in the appropriate section of the draft ROD consistent with EPA guidance (e.g., *A Guide To Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, EPA 540-R-98-031, OSWER 9200.1-23P, July 1999).

In addition, consistent with CERCLA (e.g., section 113 and 117) and the NCP, the PRGs need to be developed and explained in the Revised *Focused Feasibility Study for Water Management for Disposal of CERCLA Waste on the Oak Ridge Reservation* [hereinafter "Revised Wastewater FFS" or "Revised FFS"] that is approved by EPA pursuant to the ORR FFA requirements for review and approval of Primary Documents in order to have an adequate Administrative Record supporting the final decision in the ROD. EPA is aware that the DOE is revising the FFS, per EPA and TDEC comments on the D3 FFS, and expects the next version of the ROD to include instream water quality levels ("AWQC equivalents") discussed in this comment.

13. Compliance with ARARs – CERCLA Section 121(d)(2)(A) establishes compliance with ARARs as a threshold criterion for remedy selection. As mentioned above and described more fully below in the Specific Comments, DOE did not include all of the ARARs required to be met by the landfill remedial action, including those in the December 31, 2020 Administrator Wheeler Decision (Wheeler Decision) (See: Ref. Table submitted by EPA Assistant Administrator Peter C. Wright in letter dated January 19, 2021) that should have been in the Revised Wastewater FFS and ultimately included in the ROD for the preferred alternative of construction, operation, closure and post-closure of the onsite EMDF which includes wastewater management. For example, DOE has not included certain CWA and RCRA requirements related to effluent limits from a RCRA landfill (40 CFR part 445) and RCRA tank system requirements in 40 CFR 264.192 et. seq. that EPA maintains are ARARs for this remedial action which could include management of wastewater and/or leachate that is considered RCRA hazardous waste. Pursuant to ORR FFA Section XXI.F. Identification and Determination of Potential ARARs - "D1 ARARs determinations shall be prepared by the DOE in accordance with Section 121(d)(2) of CERCLA, 42 U.S.C. § 9621(d)(2), the NCP, and pertinent guidance issued by EPA."

Additionally, DOE has proposed in the June 2021 Revised FFS point(s) of measuring compliance with water quality-based effluent limits and instream AWQC equivalent that are inconsistent with CWA NPDES regulations that were identified as ARARs (including those in EPA's Jan. 19, 2021 submittal pursuant to the Wheeler Decision) and carried that flawed approach into the ROD as part of the selected remedy. The DOE effluent limits for radionuclides in the Revised FFS are based on a dilution factor of 64x and use approximately 4 kilometers of Bear Creek to mix and dilute the concentrations of radionuclides in the landfill wastewater which is not allowed under EPA and TDEC CWA regulations for bioaccumulative carcinogens. As described more fully below in Specific Comments, DOE has apparently mis-interpreted certain CWA regulations and TDEC water quality criteria regulations identified as ARARs which effectively resulted in creating a new/modified Recreation Use Classification for Bear Creek specifically for radionuclides which is not allowed except by TDEC pursuant to its rulemaking process and approved by EPA. Instead, it appears that DOE is using a point of exposure for measuring radiation dose identified in the TDEC regulations for near surface radioactive waste land disposal that are based upon Nuclear Regulatory Commission (NRC) regulations at 10 CFR part 61.41.

> [*See* language in ROD Section 2.13.2 Compliance with ARARs - "The following NRC-based TDEC regulations are relevant and appropriate: TDEC 0400-20-11-.16(2) [equivalent to 10 CFR 61.41] and TDEC 0400-20-11-.16(4) [equivalent to 10 CFR 61.43]. These ARARs are used

along with site-specific parameters to develop limits on radiological discharges during operations that ensure protection of human health and the environment;" *see also* language in ROD Section 2.12.2.4 "These ARARs developed by the NRC provide dose limits for protecting the public. Compliance with the ARARs is required at the nearest point of public exposure which is downstream of the facility." "Discharge limits will be implemented where waters are discharged from the landfill operation, prior to mixing with proximate surface water."]

The NRC annual dose-based limits apply to protection of the public from landfill releases of radionuclides from all pathways including surface water [3]; however, there is no prescribed methodology or guidance on establishing protective effluent limits for radionuclides under this rule that considers the legally applicable TDEC *Use Classifications for Surface Water*. In addition, the NRC approach for measuring dose from a land disposal unit allows use of a 'buffer zone' which is defined as "a portion of the disposal site that is controlled by the licensee and that lies under the disposal units and between the disposal units and the boundary of the site[4]." This approach is inconsistent with CWA and TDEC water quality standard regulations (identified as ARARs including those submitted by EPA pursuant to the Wheeler Decision) that require effluent limits to be met at the discharge point into surface water to achieve instream AWQC as well as narrative criteria throughout the surface water in order to fully protect the designated uses (See Footnote 2 above).

As a result, the TDEC radioactive waste landfill regulation 0400-20-11-.16(2) is a less stringent ARAR than the CWA and TDEC water quality standards regulations that are also identified as ARARs for establishing and measuring compliance with effluent limits for radionuclides. Pursuant to the NCP at 55 Fed Reg 8741 (March 8, 1990), compliance with the more stringent ARAR is required for remedial actions in order to ensure all ARARs are met. These ARARs issues must be addressed by DOE in the Revised D3 Wastewater FFS and in the ROD in order to be compliant with CERCLA and consistent with the NCP and EPA guidance for a selected remedy as required by the ORR FFA. EPA is aware the FFS is currently being revised, and once approved, the resulting information should be in the revised ROD.

14. Protection of Human Health the Environment – Statements by DOE asserting that the Draft ROD meets CERCLA and the NCP's threshold requirements, namely overall protection of human health and the environment and compliance with ARARs, are premature and cannot be evaluated by EPA because the draft ROD does not specify remediation goals (including limits for radionuclides in surface water) and does not accurately apply ARARs (as described above) related to compliance with certain CWA and TDEC water quality standards identified as ARARs. Overall protection of human health and the environment and compliance with ARARs (unless a specific ARAR is waived) are threshold requirements that each alternative must meet in order to be eligible for selection [40 CFR § 300.430(f) *Selection of remedy*]. Similar to the ARARs issues described above, the identification of protective PRGs/cleanup levels must be addressed by DOE in the Revised D3 Wastewater FFS and in the ROD in order to be compliant with CERCLA and consistent with the NCP and EPA guidance for a selected remedy as required by the ORR FFA. EPA expects information developed in the revised and approved FFS will be incorporated into the revised ROD.

[3] 10 CFR 61.41 ("Concentrations of radioactive material which may be released to the general environment in groundwater, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public." (Underline added))

[4] 10 CFR 61.2 Definitions.

15. Please revise the ROD to discuss any long-term impacts of altered surface water hydrology and wetlands filling on potential for flooding and include wetlands ARARs. Please revise Table 2.1 comparing alternatives to consider potential long-term impacts on hydrology and flood retention.

16. EPA is aware the instream water quality values for radionuclides are being developed and expects these values to be included in the revised FFS (appendix K). Once the FFS is approved, EPA expects the instream water quality values to be included in the EMDF ROD prior to finalization of the ROD. As outlined in the EPA's July 22, 2021 comments on the D3 version *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation*, and as noted in other comments of this letter, the EPA expects:

a. the instream water quality values for radionuclides in Bear Creek to be set at 1x10E-5 risk level for the designated recreational use;
b. EPA-approved instream water quality values for radionuclides in Bear Creek will be the basis of effluent discharge limits. [EPA understands that specific effluent discharge limits are to be developed once design parameters such as the assimilative capacity of the receiving surface water body at the point of discharge are available.] These water quality-based effluent discharge limits will be developed and monitored consistent with regulations and guidance established under CWA NPDES program and TN NPDES regulations, and included in a post ROD FFA primary document subject to EPA and TDEC approval;
c. consistent with CERCLA, the NCP, and the Wheeler Decision, instream water quality values for radionuclides are risk-based cleanup goals and are not based on AEA/DOE Order-driven parameters, nor based on rationale that is tied to Institutional Controls (e.g., fences and guards) or DOE land use designations;
d. to the extent that development of instream water quality values for radionuclides in Bear Creek from landfill wastewater discharges deviate from the relevant EPA Office of Water guidance, CWA guidance default or TDEC guidance defaults, such as the use of site-specific consumption rates, any deviation must be supported by a well-reasoned and documented rationale for using specific parameters in place of CWA guidance or defaults;
e. the remedy in the ROD will include a monitoring component that includes compliance monitoring of the instream water quality values for radionuclides and surface water conditions (such as assimilative capacity) to ensure that effluent discharge limits remain protective under CERCLA over time.

<u>Specific Comments</u>

1. Declaration, Section 1.2, page 1-3, second paragraph. Please explain the process by which the FFA parties decided to use a stand-alone RI/FS and remedy selection process for the on-site EMDF. Revise the text to explain that in order to evaluate and select a comprehensive remedy for disposal of CERCLA waste from future cleanup actions at the Oak Ridge Reservation, a waste disposal decision separate from the decisions generating waste was determined necessary by the Federal Facility Agreement (FFA) parties.

2. Declaration, Section 1.2, page 1-3, third paragraph. The ROD language states, "The selection of the CBCV site requires updating the basis of remediation goals for the area in Bear Creek Valley (BCV) referred to as Zones 1 and 2 in the *Record of Decision for the Phase I Activities in Bear Creek Valley at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee* (DOE 2000, Table 2)." Please clarify whether DOE is suggesting that this will change the Bear Creek Valley remedial decision, or whether it merely needs to

update DOE's view on the reasonably anticipated land use for Bear Creek Valley. Also, consider including language on how that land use designation will be revised and documented by DOE.

3. Declaration, Section 1.2, page 1-3, fourth paragraph and Decision Summary, Section 2.12, page 2-33. DOE has established a new term, "restricted recreational" due to the fish advisory established by TDEC for the entirety of Bear Creek (from its headwaters to its mouth) as a result of mercury contaminated fish resulting from ORR releases. Reclassification of the state recreational use designation cannot be accomplished through a CERCLA ROD. While DOE may develop nomenclature as it wishes for its internal land use designation purposes, please note that the fish advisory does not change the use of Bear Creek as designated by the state's stream classifications in TDEC 0400-40-04-.09 *Use Classifications for Surface Water*. Notably, recreational use is intended to support "recreation in and on the waters including the safe consumption of fish and shellfish" (TDEC 0400-40-03-.02(2)), even where there is a fish advisory to protect the public while the surface waters are restored from damage due to legacy contamination. No discharges to surface water that are part of a CERCLA remedial action are allowed if the ROD does not provide for compliance with the applicable requirements of CWA or regulations promulgated under CWA (40 CFR 122.4(a)) or if the action will cause or contribute to a violation of a water quality standard (40 CFR 122.4(i)). Please revise the language to clarify that Tennessee's designated use classifications for Bear Creek includes Recreation. Attainment of AWQC, narrative criteria and AWQC equivalents for radionuclides is required throughout the stream pursuant to CWA and TDEC water quality standards regulations identified as ARARs. DOE's access restrictions (suppression of recreational use) should not be factored into derivation of AWQC equivalents for radionuclides.[5]

4. Section 1.2, STATEMENT OF BASIS AND PURPOSE, p. 1-3, 3rd and 4th paragraph: Land use controls (i.e., the land use Zones) are not considered part of the basis for selecting a remedy, rather land use controls may be a component of a remedy to maintain the long-term protectiveness of a selected remedy. Further, DOE land use zone and institutional controls do not change the state's designated use of the creek (recreational).

5. Section 1.2, STATEMENT OF BASIS AND PURPOSE, p. 1-3, fourth paragraph. The text states:

> Additionally, BCV from Highway 95 east to the Y-12 National Security Complex (areas including Zones 1, 2, and 3) is within DOE-posted No Trespassing property limits; therefore, although portions of this property are open for recreational hunting (turkey and deer) at limited times, fishing is never allowed, and is prohibited within the whole Bear Creek Watershed.

The entire watershed is not restricted, and this needs to be clarified in the revised ROD. Further, remediation goals must protect Bear Creek for its designated use (recreational) per state regulations.

6. Section 1.2, STATEMENT OF BASIS AND PURPOSE, p. 1-4. The language in the ROD states, "To further discourage the possibility of fishing in Bear Creek, beavers and their habitat, which cause pooling that could enhance fishing, are removed (as necessary) as a best management practice." Please confirm the statement that the beavers and their habitat are removed to discourage fishing (as opposed to removing possible sites of mercury methylation). In addition, if this is, in fact, the purpose, please indicate whether such habitat alteration is a "best management" practice under TDEC water quality standards regulations and/or the Clean Water Act. Alterations to surface water that would discourage

[5] Guidance for Conducting Fish Consumption Surveys, December 2016. Suppression is defined to include the reduction in consumption due to environmental or other factors (e.g., fears of chemical contamination in fish, fish populations of inadequate size to support consumption, loss of access to fisheries . . .), at p. vi.

and inhibit the development of healthy fish populations seems counter to the purposes of the Clean Water Act and TDEC water quality standards.

7. Section 1.2, page 1-4, fourth paragraph. Please add language to reflect that EPA has not approved the RI/FS for the EMDF landfill due to multiple issues that were not resolved by the December 7, 2017, dispute resolution agreement (DRA) signed by the FFA Senior Executive Committee. The only part of the RI/FS that EPA agreed to was Appendix G, ARARs, which was attached to the DRA. Appendix G provided the legal framework for the siting, design, construction, operation, and closure of the landfill, as well as a discussion of those legal requirements that the landfill would not meet. It also provided the information (including design elements of the proposed EMDF) that DOE was proposing to support a waiver of those legal requirements.

8. Declaration, Section 1.2, page 1-4, sixth paragraph. This paragraph discusses the public comment period. It should be noted that at least two elements of the Administrative Record were not complete at the time that the public comment period was held. In addition to the RI/FS (discussed in comment above), Tech Memo 2,[6] which provided additional "wet weather" groundwater elevation information, was not complete until after the Proposed Plan was published for public comment and therefore represented a gap in the Administrative Record at the time that the Proposed Plan was published. An additional and significant gap in the Administrative Record is the lack of an approved Wastewater FFS, which should have included preliminary remedial goals (PRGs) for the discharge of wastewater. This gap in the Administrative Record should be addressed consistent with the *community relations to support the selection of remedy* requirements at 40 CFR § 300.430(f)(3).[7] Because the only public comment period was before the finalization of Tech Memo 2 and the Revised FFS, it can be argued that the public has not had a "reasonable opportunity" to submit comments on the proposed plan, "including the RI/FS."[8] So, while remedy decision making should "factor[] in any new information or points of view expressed by the state (or support agency) and community during the public comment period,"[9] the public has not had an opportunity to comment on a landfill based on a higher-than-projected water table or PRGs for the discharge of landfill wastewater into surface water, including but not limited to Bear Creek. EPA expects DOE to accept public comment on the aforementioned information, and incorporate comments and responses in the final ROD.

9. Section 1.2, STATEMENT OF BASIS AND PURPOSE, p. 1-4. Twice the text references "30 CFR" when it should reference parts of 40 CFR. Wrong citation also occurs in top paragraph on page 2-50.

10. Declaration, Section 1.2, page 1-4, seventh paragraph. This paragraph states that the selected alternative meets the threshold criteria that the action "1) be protective of human health and the environment, (2) attain those applicable or relevant and appropriate requirements (ARARs) . . ." The ROD makes this assertion without a factual record to support it, that is, because the ROD does not identify cleanup levels such as ambient water quality criteria equivalents for radionuclides or the

[6] Tech Memo 1 provided "dry weather" information about groundwater elevations in the location of the proposed site (Site 7c).

[7] ("Provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments on the proposed plan and the supporting analysis and information located in the information repository, including the RI/FS.") Under either 40 CFR 300.430(f)(3)(i)(C) or 40 CFR 300.430(f)(3)(ii)(B).

[8] In this case, DOE proposed to remove the wastewater component of the action from the RI/FS and to place it into an FFS, so there is an FFS as well as an RI/FS that the public should be able to review in commenting on the proposed remedial action.

[9] 40 CFR § 300.430(f)(4)(1).

discharge limits that will be protective of those criteria, it is not clear that this action does, in fact, meet those threshold requirements.[10] Without having those criteria or limits, especially given DOE's calculations provided in the D3 (not final) FFS, a determination cannot be made that the remedy is protective or meets the state relevant and appropriate requirement that *Recreation Use* AWQCs for carcinogenic pollutants protective for fish consumption are to be developed at a 10E-5 level of risk (TDEC 0400-40-03-.03(4)(j) FN(c)). EPA is aware that AWQC-equivalents for radionuclides are being developed and the FFS is being revised. Once approved in the FFS, water quality values for radionuclides must be incorporated in the final ROD.

11. Declaration, Section 1.2, page 1-4, seventh paragraph. This paragraph states that the statutory preference for treatment will be addressed in the waste generation RODs. There is no exception for the application of this CERCLA preference to a selected remedy. While much of the preference may not be relevant to the operation of the landfill, certainly the wastewater, as a waste stream generated in this remedial action, should satisfy this preference. Please explain whether at least this component of the remedy satisfies the CERCLA statutory preference for treatment "which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants," since these actions are to be preferred over remedial actions not involving such treatment. Revise the ROD language accordingly to specify how this statutory preference is satisfied by this remedy (not other CERCLA response actions).

12. Declaration, Section 1.3, page 1-5, first paragraph. The first sentence states that the remedial action "protects the public health and the environment from actual or threatened releases of hazardous substances . . ." Without having approved radionuclide AWQCs from the Revised Wastewater FFS to incorporated into the ROD and no ROD cleanup levels (i.e., effluent limits) for the discharge of radiological hazardous substances into Bear Creek (or another location, which has apparently not been located), it is premature to assert that the remedy is protective of human health and the environment. Based on effluent limits in the as-yet-unapproved D3 FFS, however, the calculated limits are based on exposures other than recreational use of Bear Creek (including fish consumption) as understood under the Clean Water Act and TDEC water quality standards and were outside EPA's generally accepted risk-range for carcinogens. EPA is aware that AWQC-equivalents for radionuclides are being developed and the FFS is being revised. Once approved in the FFS, water quality values for radionuclides must be incorporated in the final ROD.

13. Section 1.3, ASSESSMENT OF THE SITE, p. 1-5: The text should state that the selected remedy will meet the remedial action objectives (RAOs) both during the operational period of the landfill and after the landfill is closed.

14. Section 1.3, ASSESSMENT OF THE SITE, p. 1-5 and Section 2.8, Remedial Action Objectives, p. 2-17. The RAO definition states: "Maintain a 15-ft separation between the bottom of emplaced waste and the seasonal high-water table of the uppermost unconfined aquifer, which includes 5 ft of liner system and 10 ft of geologic buffer consistent with TDEC 0400-11-01-.04(4)(a)(2)". Please add to the start of the sentence, "To protect groundwater, DOE shall…"

15. Declaration, Section 1.3, page 1-5, first paragraph, RAO bullets. There is an insufficient factual record to support the assertions in the first three bullets, which claim that people, the water resources,

[10] ROD p. 2-45 merely states, "All discharge water from EMDF will be treated as necessary to meet the most stringent applicable instream water quality criteria, including recreational, with consideration of the stream mixing zone at the point of discharge."

and ecological receptors would be protected by meeting identified ARARs, especially considering that DOE has not included all of the ARARs identified by EPA and that DOE appears to be following the NRC dose-based approach for protection of the public from surface water pathway and therefore is not complying with the most stringent ARAR for developing and measuring effluent limits for discharges of radionuclides. Please address these deficiencies in the revised ROA.

16. Section 1.4, DESCRIPTION OF THE SELECTED REMEDY, p. 1-5. These sections discuss land use changes. DOE's land use changes do not affect Tennessee's recreation use classification, and the entire water body must still meet CERCLA excess lifetime risk of cancer of 10E-5 based on fish consumption in a recreational use scenario. This needs to be clarified in the text.

17. Section 1.4, DESCRIPTION OF THE SELECTED REMEDY, p. 1-6. The text states:

- "Construction of groundwater and surface water drainage features, as needed, to ensure long-term protection of human health and the environment and to be consistent with ARARs.
- Construction of support facilities adjacent to the footprint of the landfill. Support facilities and infrastructure may include operations/support trailers; staging/laydown areas; borrow areas; stockpile areas; parking areas; wastewater storage tanks or basins; truck loading stations; electrical, water, and communication utilities; truck weigh scale; guard stations; wastewater and stormwater management systems; storage/staging areas; material stockpile areas; and spoil areas.
- Construction and operation of a landfill wastewater treatment system (LWTS) consistent with ARARs."

Clarify whether the potential for significant damage to the structural integrity/design of landfill due to potential increase in flood events were incorporated to the described conceptual design of the landfill and supporting facilities/features. For example, can the LWTS/other drainage features take on additional capacity if such an event were to occur? The level of climate resiliency of the selected remedy should be discussed.18. Section 1.4, DESCRIPTION OF THE SELECTED REMEDY, p. 1-6. The text states:

> "Use of fill material during operation of EMDF, including, but not limited to, crushed concrete, block and brick masonry, waste soil, clean soil, and other soil-like material consistent with ARARs"

Clarify whether fill material used during operation of EMDF will meet landfill WAC and how that will be determined.

18. Section 1.4, DESCRIPTION OF THE SELECTED REMEDY, p. 1-6. "Closure of EMDF after operations are complete, consistent with ARARs." Please clarify text to explain that closure, consistent with ARARS, will occur when EMDF operation is complete.

19. Section 1.5, STATUTORY DETERMINATIONS, p. 1-7. Add text that states the selected remedy was determined in the ROD to provide the best balance of tradeoffs among the alternatives with respect to the balancing criteria.

20. Declaration, Section 1.5, page 1-7. The second sentence states that there is no principal threat waste to be addressed as part of this action. DOE's calculation of effluent limits and screening level effluent limits in the D3 Revised FFS would result in concentrations of radionuclides in the effluent that are at a level of risk exceeding (10-3) that EPA would generally find to reflect principal threat waste for direct exposure. Once DOE has revised the Wastewater FFS and ROD to include AWQC equivalent and

effluent limits that meet all the ARARs (including the most stringent CWA and TDEC water quality standard regulations), this should be an accurate statement.

21. Declaration, Section 1.5, page 1-7. The third sentence states that the action meets all ARARs. This statement is not currently supported by a factual record (in the FFS currently under revision or in this ROD). Once the FFS and ROD have been revised and approved per these comments, that should be an accurate statement.

22. Declaration, Section 1.6, page 1-8. The last sentence states that the Administrative Record contains information approved by the three FFA parties. Note that EPA has not approved the RI/FS or a Revised Wastewater FFS for the EMDF landfill. This statement should be revised to accurately reflect the facts related to EPA approval (or not) of Primary Documents that are part of the EMDF Administrative Record file and support remedy selection.

23. Figure 2. Land use (from Phase I Bear Creek Valley ROD) and disposal sites evaluated in Bear Creek Valley, p. 2-5. The outlines for Site 7A and Site 7C overlap. Please make changes to the outlines that allow the reader to clearly differentiate between the two proposed locations for the EMDF.

24. Section 2.2.1, Previous Investigations and Data Sources, p. 2-7. "Results of the Phase 1 site characterization confirmed the acceptability of the CBCV site for a new, low level (radioactive) waste (LLW) landfill and support final site selection." When was this completed and where are the results of this study? Are they in the Administrative Record? Provide document names and approval dates in the ROD.

25. Section 2.2.1, Previous Investigations and Data Sources, p. 2-8. Based on the topography shown on Figure 2.3 (Phase I characterization and site characteristics of the EMDF site), it is unclear if the outside perimeter of the Environmental Management Disposal Facility (EMDF) landfill is sufficiently set back to allow for the engineered perimeter structures, such as mechanically stabilized earth walls or similar structures, needed to grade the site to the top of the geologic buffer. This is of particular note given the locations of streams NT-10 and NT-11, as shown on Figure 2.5 (EMDF conceptual site layout). Revise the ROD text to clarify if the outside perimeter of the EMDF landfill is sufficiently set back to allow for the engineered perimeter structures needed to grade the site to the top of the geologic buffer.

26. Section 2.2.1, Previous Investigations and Data Sources, p. 2-9. "Per the first formal Dispute Resolution Agreement between DOE, EPA, and TDEC in December 2017, the results and analysis of the field investigation, including the first 2 months of monitoring, were placed in the Administrative Record and were available during the Proposed Plan public comment period (DOE 2018c). The entire year long monitoring results are documented in a second Technical Memorandum (DOE 2019), also included in the Administrative Record." Was any new information found through the 2019 effort that had an impact on the remedy selected or its implementability? Include in the ROD, a summary of the findings in Technical Memorandum 1 and 2. These documents provide information that enhances the characterization for Site 7c. Add information about the anticipated post-ROD groundwater field study. EPA expects this information to be shared with the public in the upcoming public engagement activities, and included in the final ROD.

27. Decision Summary, Section 2.3, page 2-9. In the first paragraph, DOE states that it has surpassed CERCLA requirements for public engagement. This does not appear to be accurate, since it is not clear that the NCP requirements at 40 CFR § 300.430(f)(3), have been met. See comment on Decision

Summary Section 2.10.9 below. EPA is aware that additional public engagement is being planned, and once completed, it may be accurate to state that CERCLA requirements for public engagement have been met. EPA advises against the term "surpassed" in favor of the term "met."

28. Section 2.3, Highlights of Community Participation, Page 2-10, Paragraph 2: Please modify the text to explain why DOE did not conduct specific outreach efforts with residents of the Country Club Estates, a community close to the Proposed Site. Also, please include the venue(s) where the Scarboro meetings were held on the dates referenced.

29. Section 2.3, Highlights of Community Participation, Page 2-10, Paragraph 3: The approved DOE 2016 Public Involvement Plan (PIP) states that DOE will utilize all media outlets, e.g., radio and television, to communicate the availability of CERCLA decision documents, public comment periods and public meetings. Was this done for the EMDF and will it be followed for future public information for the EMDF? Please clarify text to address these issues.

30. Decision Summary, Section 2.3, page 2-10. In the third full paragraph, DOE states that "[t]his remedy was chosen in accordance with CERCLA, as amended by SARA and the NCP. This decision was based on the Administrative Record prepared for this project." This statement is premature since the RI/FS Report and Wastewater FFS have not been approved by EPA or TDEC and new information provided in the FFS should be analyzed by the EPA and TDEC.

31. Section 2.3, HIGHLIGHTS OF COMMUNITY PARTICIPATION, p. 2-10. The text states:

> This remedy was chosen in accordance with CERCLA, as amended by SARA and the NCP….
>
> • **Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee (DOE 2016)**
> (Bold added)

The bullet shown in bold above should be revised to clarify that this document will be updated, per EPA and TDEC comments, and approved before the ROD is approved (cite new FFS approval date) and is not the original 2016 D3 version of the document.

32. Section 2.3 Highlights of Community Participation, Page 2-10, Paragraph 5: Add a new bullet that references, in a summary manner, the use of information obtained in Technical Memoranda 1 and 2. These activities resulted from the Field Sampling Plan for Site 7c in Central Bear Creek Valley (CBCV) and provide information that enhances the characterization of the selected site, but was not presented in the Proposed Plan.

33. Section 2.4 SCOPE AND ROLE OF THE ACTION, p. 2-10. The ROD needs to be clear in the scope and role section (2.10) that each individual ROD for which a remedy will send waste to this landfill will meet the specific (yet to be specified) WAC for the landfill.

34. Section 2.4 SCOPE AND ROLE OF THE ACTION, p. 2-11. Fifth paragraph: "The scope of the action is to provide for disposal of CERCLA waste generated from the cleanup…If at some future time. DOE CERCLA waste…" What criteria will be used regarding CERCLA waste generated within the state that can be disposed at the on-site waste treatment unit? Need to consider how CERCLA offsite rule may impede the ability to retrieve ORR waste from offsite locations. More details are needed.

35. Decision Summary, Section 2.4, page 2-11. The fifth paragraph states, "If at some future time DOE

CERCLA waste from original Oak Ridge NPL Site activities is generated within the state that requires disposal, and it is determined by the FFA parties that EMDF is the appropriate place for disposal, then the FFA parties will agree that those waste streams may be disposed of within EMDF consistent with the project-specific Waste Handling Plan." Please revise this statement to reflect that disposal decisions for CERCLA waste located off the ORR will be made in a remedy selection document reviewed and approved by the FFA parties consistent with the FFA requirements and may include issuance of a Proposed Plan as part of the remedy selection consistent with NCP requirements. Please create a table listing **all** known areas offsite from the DOE-ORR that might be subject to a CERCLA removal action in the future consistent with the text above.

36. Section 2.4, SCOPE AND ROLE OF THE ACTION, p. 2-11. The text states: "The selection of the remedial action involving onsite disposal at EMDF in BCV is consistent with the recommendations made by EUWG; however, the EUWG recommendation favored those areas already contaminated…" This statement does not reflect the EUWG recommendation, which specifically identifies CBCV within Zone 2. Suggested text: "Notwithstanding the EUWG recommendation favoring placement of long-term waste disposal facilities in areas already contaminated or near areas of contamination." The text also states that "for a variety of technical reasons discussed under Sect. 2.12.1, the FFA parties believe that CBCV is the preferred location for the landfill." However, review of Section 2.12.1 does not find technical reasons that explain the preference for CBCV over other sites considered. In general, the ROD doesn't explain the reasons that CBCV site is preferred over other options for onsite disposal. Please add text to justify why there is a preference for the CBCV location.

37. Decision Summary, Section 2.4, page 2-11. The last paragraph states that DOE has completed the required public review and comment. EPA is aware that additional public review and comment is being planned, and that the D3 Wastewater FFS is being revised for approval. Upon completion of those activities, this statement may be accurate. The next draft of the ROD will be reviewed accordingly.

38. Section 2.5.3, Surface Water, p. 2-13. Section 2.5.3 and Figure 2.3. Though the text refers to drainage feature D-11 East, the figure does not include drainage feature D-11 East. (None of the figures include D-11 East.) Please update the appropriate figures to include D-11 East.

39. Section 2.5.2, Groundwater. p. 2-13. The text refers to the absence of strike-parallel groundwater contamination in the Nolichucky Shale and Maryville Limestone around the Bear Creek Burial Grounds (BCBG). As noted in prior Remediation Effectiveness Reports and commented upon by EPA, there is an absence of groundwater monitoring in critical areas of the outcrop belts of these formations to the west of the BCBG. Thus, it is inappropriate to cite the groundwater conditions around the BCBG as supporting some conclusion or inference that groundwater contamination would not likely migrate along strike in these formations to the west of the EMDF area. Update the text to reflect this probable groundwater flowpath.

40. Section 2.5.3, Surface Water, p. 2-13. The second paragraph of Section 2.5.3 should add an explanation for the losing character of the streams. A losing stream implies a karst condition which is inconsistent with the characterization of the EMDF setting presented in Section 2.5.1.

41. Section 2.5.4, Ecological Resources, p. 2-14. Please describe the area of the wetland delineation study and indicate it in a figure. It is variously referred to as "a broader area" and "expanded study area" but details regarding the area is not presented in a figure.

42. Section 2.5.4, Ecological Resources, p. 2-14. There is no discussion of the anticipated or potential impacts to the Bear Creek riparian system. Will tree clearing for the landfill impact the creek (loss of shade, erosion, siltation, etc)? How will additional stormwater due to land clearing impact Bear Creek? How will construction activities, rerouting the roads, etc., impact Bear Creek?

43. Section 2.5.4, Ecological Resources, Page 2-14, Paragraph 2: Irrespective of observing no Tennessee dace in the tributary streams at the CBCV, the impact on the Tennessee dace population from the EMDF construction through operation should be addressed in this section.

44. Decision Summary, Section 2.5.4, page 2-14. The third paragraph states that there are three federally listed endangered bat species living in or near the CBCV site. Please confirm that the consultation with U.S. Fish & Wildlife Service required under Section 7 of the Endangered Species Act has been completed. The consultation requirement is cited as part of a Location-specific ARAR, so it is presumed that it has or will be completed, but it should be completed in a time frame that allows for the Secretary of FWS to render an opinion, which may suggest an action other than the one proposed by the federal agency (DOE). Clarify this in the revised ROD.

45. Section 2.5.5, Cultural Resources, p. 2-15. Section 2.5.5 indicates that DOE intends to avoid the Douglas Chapel Cemetery and preserve it in-situ as well as maintain access to the cemetery for visitors; however, this is not conveyed on Figure 2.5 (EMDF conceptual site layout). Specifically, no rerouted roads to the cemetery are shown. Revise the ROD to clarify how access to the Douglas Chapel Cemetery will be maintained for visitors given the proximity of the cemetery to the EMDF, borrow area, and support facility, shown on Figure 2.5.

46. Section 2.5.5, Cultural Resources, p. 2-15. "Because of their limited research potential, no further work was recommended at these five sites. The sites were recommended not eligible for inclusion in the National Register of Historic Places." Although the archeological/historic artifacts were deemed not eligible for inclusion of the National Register of Historic Places, please clarify how the archeological/historic artifacts will be handled during construction activity in the event that additional artifacts are discovered. Who will be involved as part of process? Is there a contingency plan in the event that additional artifacts are encountered during construction phase? Revise text to answer these questions.

47. Section 2.6, CURRENT AND ANTICIPATED LAND USES, p. 2-16. "While the EUWG Stakeholder Report on Stewardship (DOE 1998b) included recommendations on the end use of BCV and for siting an onsite CERCLA waste disposal facility, there are no formal land use plans for ORR." How are the designations established without a formal land use plan? Please explain.

48. Section 2.6, CURRENT AND ANTICIPATED LAND USES, p. 2-16. Per the LUC Checklist #2, in Section 2.6 please include current and anticipated land uses for Zone 1, 2, and 3. Revise the text to define the different zones and identify any prohibited uses.

49. Section 2.6.1, Current Land Use, p. 2-16. Description of land use. This section says that DOE is modifying the land use but does not clearly specify the new land use. Please clarify in the ROD.

50. Section 2.6.1, Anticipated Land Use, p. 2-16. Description of ownership of land. The anticipated land use should be specified in this section. Revise text.

51. Section 2.7, SUMMARY OF SITE RISKS. p. 2-16. TDEC has classified Bear Creek as having a fishable/swimmable goal. Bear Creek is CWA 303(d) listed for not currently achieving its designated uses on account of PCBs, cadmium and mercury. The creek lacks additional capacity to take on increased discharges of pollutants. The ROD should discuss how CWA and TDEC 0400.40.03 were considered in the selection of the remedy.

52. Section 2.7, SUMMARY OF SITE RISKS. p. 2-16. Please discuss the risks to human health and ecological risk from potential landfill discharges to surface water, groundwater, and air.

53. Decision Summary, Section 2.8, page 2-17. This text repeats text in the Declaration, Section 1.3, page 1-5, first paragraph, bullets. There is an insufficient factual record to support the assertions in the first three bullets, which claim that the remedial action objectives, that is, protection of people, the water resources, and ecological receptors, would be met by meeting ARARs. There is an insufficient record to support an assertion that all ARARs will be met. For instance, the requirement at TDEC 0400-40-04(4)(j) FN(c) requires that AWQCs be developed at a 10E-5 level of risk. Neither the ROD nor the FFS contain calculated AWQCs for radionuclides that may be contained in the landfill wastewater and discharged from the landfill. The "effluent limits" or "screening level effluent limits" in the old D3 Wastewater FFS clearly do not meet that level of risk for the designated use of recreation because DOE's calculations are based on exposure inputs which results in an ingestion rate (e.g., one day a year for fishing) that does not appear to have a scientific basis and is not consistent with exposure assumptions used by TDEC for establishing AWQCs for pollutants that are protective for fish consumption. While the ROD does not contain limits based on those inputs, the record established in the old D3 FFS does not support DOE's statements that the remedy will "meet ARARs." In addition, later parts of the ROD (see Sections 2.12.2.4 and 2.13.2.3) suggest that the federal and state NRC rules are "the" ARARs that the radiological discharge component of the remedial action must meet. This is inconsistent with the December 31, 2020, Administrator Wheeler Decision and the January 19, 2021 supplemental ARARs, which identified additional Clean Water Act (CWA) regulations as ARARs for the discharge of wastewater and also directed that the existing CWA ARARs already identified as "applicable" to pollutant be designated as "relevant and appropriate" to radionuclides. Also inconsistent with the Decision's direction, DOE did not identify certain state water quality standards as "relevant and appropriate" to radionuclides (e.g., TDEC 0400-40-04-.03(4)). This must be corrected in the ROD. EPA is aware that AWCQ-equivalents for radionuclides are being developed and the D3 FFS is being revised. Information from the approved FFS should be included in the final EMDF ROD.

54. Section 2.8, REMEDIAL ACTION OBJECTIVES, p. 2-17. Remediation Goal (2.8) – Under CERCLA we need to set remediation goals for all parts of the response. Will there be an unacceptable risk to a person standing on the landfill due to gamma radiation? What level of radioactivity will be allowed to be disposed in this unit? A Low-Level Waste designation does not provide information as to the level of radiation. Please address these issues in the revised ROD.

55. Section 2.8, REMEDIAL ACTION OBJECTIVES, First bullet. p. 2-17. "Prevent exposure of people to waste in EMDF (or contaminants released from the EMDF into the environment) through meeting chemical-, location-, and action-specific ARARs, and by preventing exposure that exceeds a human health risk of 10-4 to 10-6 ELCR or HI of 1." Please explain "prevent exposure"; does this involve direct contact, inhalation, fish consumption, etc.? Also, please modify this RAO as follows:

> Prevent exposure of people to CERCLA waste (or contaminants released from the waste into the environment <u>including soil, air, surface water and groundwater</u>) through meeting chemical-, location-, and action-specific ARARs, and by preventing exposure that exceeds a human health

risk of 10-4 to 10-6 ELCR or HI of 1.

56. Section 2.8, REMEDIAL ACTION OBJECTIVES, Second bullet. p. 2-17. Please correct the acronym in the following text:

> Prevent adverse impacts to water resources (surface water and groundwater) from CERCLA waste or contaminants released from the waste through meeting chemical-, location-, and action-specific ARARs, and by preventing exposure that exceeds a human health risk of 10-4 to 10-6 **ECLR** or HI of 1. (Bold and underline added)

The acronym should be ELCR - excess lifetime cancer risk.

Also, please modify this RAO as follows:

> Prevent adverse impacts to water resources (surface water and groundwater) from CERCLA waste or contaminants released from the waste through meeting chemical-, location-, and action-specific ARARs, and by preventing ~~exposure~~ releases to groundwater or surface water that exceed a human health risk of 10-4 to 10-6 ECLR or HI of 1 for recreation use of surface water and use of groundwater for drinking water.

57. Decision Summary, Section 2.9, page 2-17**.** The first paragraph states that the alternatives are presented in the ROD as they were presented in the RI/FS and that any later changes are discussed in a separate part of the ROD. While it is not clear from this text, if the alternatives are not as they were presented in the Proposed Plan, please correct this section to reflect the alternatives as presented in the Proposed Plan.

58. Section 2.9.2, Alternative 2 – Onsite Disposal Alternative, p. 2-18. The description of the four sites evaluated for potential location of EMDF use different terminology than figure 2.2 (p. 2-5). Help the reader match the four locations described in the text to the figure. For example (shown in bold and underlined text):

- East Bear Creek Valley (EBCV) site, just east of the existing EMWMF **(labeled Site 5 on figure 2.2)**
- West Bear Creek Valley (WBCV) site, located approximately 2.5 miles west of the existing EMWMF **(Site 14)**
- Dual site, which includes a site beside and to the west of the existing EMWMF, and a second site in CBCV, located 1.5 miles west of the existing EMWMF **(Sites 6b and 7a)**
- CBCV, expansion of one of the dual sites **(Site 7c)**

59. Decision Summary, Section 2.9.2, page 2-18. The fourth full paragraph, last sentence, states that an ARAR-compliant wastewater treatment system was part of the onsite disposal alternative. That statement is not supported by the record in this case (i.e., no approved FFS for wastewater management, but the D3 FFS provided by DOE does not currently appear to comply with the most stringent ARARs for discharge of landfill wastewater and does not clearly acknowledge Clean Water Act requirements – both federal and state – as RAR for the discharge of radionuclides). EPA expects the revised FFS to include state and federal CWA requirements, and ARARs from the revised and approved FFS to be incorporated into the revised EMDF ROD.

60. Decision Summary, Section 2.10.1, page 2-20. The second paragraph, first sentence, states, “The No Action Alternative is the least protective as it is anticipated that the lack of a coordinated disposal program results in an increased reliance on management of waste in place at CERCLA remediation sites

and a potential slowing of the pace of cleanup." Use of off-site disposal options (although likely more costly) would not necessarily result in containment remedies for the other CERCLA response actions under the FFA. It is premature to make this declaration in the ROD. Accordingly, the language in the ROD should be consistent with the Appendix G of the RI/FS or clarified considering this remedy selection process for an on-site landfill is not directly addressing existing releases of hazardous substances.

61. Section 2.10, Overall Protection of Human Health and the Environment, Table 2.1, p. 2-21. "Offsite Alternative: More protective than the Onsite or Hybrid Disposal Alternatives in preventing releases on the ORR because waste would be permanently removed and disposed in unpopulated regions with greater depths to groundwater." It is either protective or not, so please delete the term "more protective. "Please explain the long-term effectiveness and permanence versus short term risks of the offsite alternative.

62. Table 2.1 Summary of CERCLA evaluation criteria for disposal alternatives (cont.), p. 2-22. Short-term effectiveness: The table includes the collection of leachate in a leachate collection system, but does discuss treatment of leachate, and does not discuss collection and treatment of contaminated stormwater (also known as "contact water"). Please add a brief description of how that wastewater will be managed.

63. Decision Summary, Section 2.10.2, page 2-25. The third paragraph states that all onsite alternatives meet ARARs. As noted in other paragraphs, there is an insufficient record to support this statement. Notably, this paragraph does not discuss the wastewater discharge ARARs. While it would be more complete to include in this section a discussion of those ARARs, it would be inappropriate to assert, at this time, that those ARARs will be met since the ROD has no AWQC equivalents for radionuclides or effluent limits that will be protective of those instream AWQCs and meet TDEC Water Quality Standards regulations. EPA is aware that AWCQ-equivalents for radionuclides are being developed and the FFS is being revised, and must be approved prior to finalization of the ROD. EPA expects this information to be in the revised ROD.

64. Section 2.10.3, Long-term Effectiveness and Permanence, p. 2-25. "The No Action Alternative may or may not have been effective, as it would depend on multiple future individual waste disposal decisions. Because the decisions would be under CERCLA, they would be required to be protective." Effective and protective are different criteria. Each criteria (protectiveness, effectiveness and permanence) should be discussed individually and clarified in the revised ROD.

65. Decision Summary, Section 2.10.3, page 2-25. The third paragraph, last sentence, states that landfill wastewater generation would cease upon landfill closure. Please confirm the accuracy of this statement and revise the text accordingly. Typically, leachate can be generated after final closure as the waste continues to dewater.

66. Decision Summary, Section 2.10.4, page 2-26. The third paragraph, first sentence states that "Onsite Disposal Alternatives would provide landfill wastewater treatment needed to meet ARARs, including portions of the Clean Water Act of 1972 (CWA) that address hazardous chemicals and ARARs addressing radiological discharges." This appears to be incorrect or at least confusing, as it suggests that the CWA requirements are different from the ARARs addressing "radiological discharges." Please revise this sentence to read, "Onsite Disposal Alternatives would provide landfill wastewater treatment needed to meet ARARs, including portions of the Clean Water Act of 1972 (CWA) regulations that

address hazardous chemicals and radiological discharges as well as Nuclear Regulatory Commission requirements that addresses radiological discharges alone."

67. Section 2.10.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Page 2-26, Paragraph 4: Although the text states that treatment is not part of the remedy, the statement is misleading. Please revise the text to clarify that aspects of treatment could include waste volume reduction. Additionally, a general description of administrative and physical WAC should be presented. Consider explaining the waste disposal hierarchy to conserve EMDF capacity (similar to the hierarchy decision tree used for the EMWMF). This will present to the community the commitment to ensure disposal of waste material will be implemented responsibly.

68. Section 2.10.5, Short-term Effectiveness, p. 2-27. There is a discussion regarding short-term environmental effects of onsite disposal, such as land disturbance and loss of habitat, however, it does not address impacts of increased stormwater or discharges of landfill wastewater to Bear Creek or tributaries to Bear Creek. Please add that information to this discussion.

69. Section 2.10.5, Short-term Effectiveness, p. 2-27. The proposed EMDF will impact forested lands. The text states:

> "Disturbance to terrestrial resources would be expected, with land use resulting in losses/changes of habitat and displacement of wildlife from the construction areas. The greatest impact would be installation of EMDF in CBCV or WBCV, where up to 94 acres of forested land would be expected to be impacted. The other onsite alternatives had less, but still notable, impact on environmental habitat."

Some of the public comments ask why DOE is building the EMDF in a greenspace. Please address this issue in this section and the responsiveness summary.

70. Section 2.10.7, Cost, p. 2-28. Costs are in FY 2016 dollars (page 2-28) and in FY 2012 dollars (page 2-49). Costs should be consistent and should be updated.

71. Section 2.10.8, State acceptance, p. 2-28. State acceptance is mentioned (page 2-28) but no information is provided to support that statement.

72. Section 2.10.9, Community Acceptance, Page 2-29. "DOE held a public review and comment period from September 10, 2018 to January 9, 2019, and hosted two information sessions and a public meeting on November 7, 2018…" Was a transcript of the meeting added to the Administrative Record? It is a requirement under the NCP to keep a transcript of the public meeting held during the public comment period pursuant to CERCLA section 117(a) and make such transcript available to the public. [CERCLA 117(a)(2); NCP 40 C.F.R. §300.430(f)(3) (i)(E)]. Please answer these questions in the revised ROD.

73. Section 2.10.9, Community Acceptance, Page 2-29. First paragraph in this section. Include the language from the responsiveness summary which states: The meeting was publicized in all of the local newspapers, on social media, and by mailing reminders to all 15,000 households in Oak Ridge.

74. Section 2.10.9, Community Acceptance, Page 2-29. "The Responsiveness Summary in Part 3 of this ROD presents DOE's responses to comments received from the public review and comment period." Please note that an optional fact sheet to explain the ROD in a concise format can be used to communicate the decision more effectively with the public. A video going over the fact sheet or an

information session about the ROD can also be considered.

75. Section 2.10.9, Community Acceptance, p. 2-29. The text states "Although the SSAB did not submit comments during the public comment period, they had provided earlier endorsement of the EMDF." Please provide clarification. In what form did the SSASB provide endorsement? Is this endorsement available to the public? Please provide a reference to that location (and number if referenced).

76. Decision Summary, Section 2.10.9, page 2-29 to 2-30**.** DOE's statement that it "obtained public input on the proposed action for onsite disposal of Oak Ridge NPL Site CERCLA waste at EMDF" should be qualified since information collected after the proposed plan was not made available to the public for consideration. The original Proposed Plan for on-site CERCLA waste disposal was issued to the public (September 10, 2018) and comments were sought through early 2019. New information has been obtained (i.e., DOE obtained groundwater elevation data which it documented in *Technical Memorandum 2*, which indicated groundwater elevations higher than projected in the RI/FS) and is being developed (i.e., water quality values for radionuclides) since the original Proposed Plan was published. Under the NCP, new information should be made available for public review and comment consistent with 40 CFR § 300.430(f)(3) before it can issue a ROD with a selected remedy which includes discharges of wastewater from the EMDF landfill along with effluent limits identified as cleanup levels. Thus, the ROD will need to be revised, at a minimum, to include additional responses to any received public comments in the Responsiveness Summary and the remedy may need to be revised in response to public comments as part of the NCP's Modifying Criteria for community acceptance. EPA is aware that AWCQ-equivalents for radionuclides are being developed and the D3 FFS is being revised. Please revise the ROD to reflect this information.

77. Section 2.10.9, Community Acceptance, Page 2-30, Paragraph 1: Please clarify that the Environmental Quality Advisory Board (EQAB) is part of the City of Oak Ridge.

78. Section 2.10.10, NEPA Values, p. 2-30. Please define the term "NEPA values." This section does not include discussion of habitat loss, especially with regards to threatened or endangered species, and does not discuss the potential impact to water quality or habitat associated with Site 7c in Bear Creek Valley.

79. Section 2.10.10, NEPA Values, p. 2-32. Environmental Justice. There is one paragraph in the D1 ROD addressing Environmental Justice (located in the "NEPA Values" section). As written, the D1 ROD insufficiently addresses environmental justice. Environmental Justice is about the disproportionate environmental burdens on a community from cumulative environmental impacts, not limited to the particular decision at hand (EMDF). An evaluation is needed to identify communities with potential environmental justice concerns. If communities with environmental justice concerns are present, further evaluation of the concerns and appropriate responses may be needed. EPA has provided some resources on this matter, and is available for further consultation.

80. Environmental Justice (in Section 2.10.10. NEPA Values, Page 2-32). A new section should be added that conveys the results of an EJ analysis. The 2015 EPA "Guidance on Considering Environmental Justice During the Development of Regulatory Actions" provides more information on how to consider EJ. The guidance states "current EPA guidance does not prescribe or recommend a specific approach or methodology for conducting screening-level analysis. A screening-level analysis should provide information related to whether there may be potential EJ concerns associated with regulatory actions, and may include elements such as the following:

1. A description of the potential impacts on, and existing risks to, minority populations, low-income populations, and/or indigenous peoples. This may involve a description of:

- The proximity of sources being regulated to these populations
- The number of sources that may be impacting these populations
- The nature and amount of pollutants that may be impacting these populations
- Whether there are any unique exposure pathways involved
- Combinations of the various EJ factors occurring in conjunction with one another
- Expressed stakeholder concerns about the action, if any.

2. A description of potential impediments to meaningful involvement. This may involve understanding whether the action presents opportunities to improve public involvement requirements or limits opportunities in some way." After initial screening, qualitative factors addressing site-specific factors should be identified and considered.

Revise this section of the ROD and address the guidance on EJ and these specific issues.

81. Section 2.10.10. NEPA Values, Page 2-32, Paragraph 2: Please reference Executive Order 12898-Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and add more information regarding the DOE's environmental justice assessment regarding air deposition from EMDF landfill operations and the impact to nearby communities.

82. Decision Summary, Section 2.11, page 2-32. This section discusses principal threat waste and concludes that there is no principal threat waste concern in this ROD. To the degree that the discharge of landfill radiological wastewater is as DOE represented in the D3 FFS, which is at or greater than a 10-3 level of risk when using Clean Water Act recreational use exposures, this would likely constitute the discharge of principal threat waste into Bear Creek, in that this effluent at these concentrations (e.g., for Tc-99 a concentration of 1,818,240 pCi/L at the end of pipe) meets all three elements of PTW: it is liquid, mobile and highly toxic. As noted above, however, once DOE has revised the Wastewater FFS and ROD to include AWQC equivalent and effluent limits that meet all the ARARs (including the most stringent CWA and TDEC water quality standard regulations), this should be an accurate statement.

83. Section 2.12, SUMMARY OF PREFERRED REMEDY, p. 2-33. The following text should be added to this section:

Because land use restrictions are part of the remedy, a land use control (LUC) plan should be part of a remedial design or remedial action work plan for EPA and TDEC review and approval, and should contain implementation and maintenance actions, including periodic inspections.

84. Section 2.12, SUMMARY OF PREFERRED REMEDY, p. 2-33. Third paragraph. Specify that a land use change to restricted recreational use is selected for Zone 1 for short and long term, and state the rationale for that change. Land use is not being changed from unrestricted to restricted recreational because there are no trespassing signs; rather, the land use change is being made to provide a buffer between the landfill and potential human access (or other reason that should be stated). The text states that fish consumption advisories and prohibitions on fishing are in place, but please include the reasons for the advisories and prohibitions, and whether these advisories and access (no trespassing) prohibitions will be needed in the long term.

85. Decision Summary, Section 2.12.1, page 2-35. The second paragraph states that the remedy described in the ROD is protective and attains ARARs. As noted in earlier comments, because the ROD fails to establish AWQCs for radionuclides and corresponding discharge limits that are protective of those AWQCs, there is no basis for concluding that the remedy is protective or attains ARARs. The only indication of the kind of discharge limits that DOE is proposing is in the D3 FFS, which EPA has not approved because it fails to establish discharge limit PRGs that are protective and meet ARARs. EPA expects this issue to be resolved in a revised and approved D3 FFS and in the final ROD.

86. Decision Summary, Section 2.12.2, page 2-35. The second paragraph incorrectly dismisses the CERCLA statutory preference for treatment as "not germane to a disposal decision." Please note that this preference is not excluded for any remedial action. Please include an analysis of whether the remedy meets that statutory preference, paying attention to the waste, including the wastewater generation component of this remedy.

87. Section 2.12.1, Summary of the Rationale for the Selected Remedy, p. 2-35. The text states:

> • The site is **adjacent** to an existing area designated as a CERCLA waste management area (i.e., EMWMF) *along with several other CERCLA disposal areas in BCV*.

This sentence is not clear and should be revised. The Site 7c EMDF location will be approximately 1.5 miles (2.4 kilometers) west of the existing EMWMF. While land use designation Zone 2 (the area containing the EMDF) is adjacent to Zone 3 (the area containing the EMWMF) the location of the EMDF is not "adjacent" to the existing EMWMF. Additionally, the italicized text is not accurate and should be changed to reflect TDEC-permitted Resource Conservation and Recovery Act managed landfills and not multiple CERCLA-managed landfills. The is only one CERCLA-managed landfill, the EMWMF.

88. Figure 2.5. EMDF conceptual site layout, p. 2-36. Please label D-11 East. Stream D-11 East is discussed in the text, but not shown on the figure. Will there be a settling basin for uncontaminated stormwater (non-contact water)? Please identify this feature (if present) in this figure.

89. Section 2.12.2, Description of the Selected Remedy, p. 2-37. Waste Acceptance Criteria (WAC) – The draft does not include numerical waste acceptance criteria and therefore this package is deficient. Furthermore, the public has not been given the opportunity to review the Waste Acceptance Criteria. DOE should address this in the planned public form and include information on the WAC in the final ROD.

90. Section 2.12.2, Description of the Selected Remedy, p. 2-37. Construction and operation of a landfill wastewater treatment system (LWTS) consistent with ARARs. Details of the LWTS should be included as part of the remedial design which will undergo EPA review/approval. This should be explained in the selected remedy section along with a schedule for remedy implementation.

91. Section 2.12.2, Description of the Selected Remedy, p. 2-38. Last bullet. The text states that the remedy includes "Change of the initial land use designation used to set remediation goals in BCV Zone 2 to future DOE-controlled industrial land use of the area." Additional text should be added to indicate that the land use designation for BCV Zone 1 is also being changed, in this case, from unrestricted to restricted recreational.

92. Section 2.12.2.2, Construction activities, p. 2-38. "The EMDF construction will be conducted in phases over the cleanup time frame." Please include the anticipated time frame for cell construction and anticipated schedule for those activities.

93. Section 2.12.2.1, (Conceptual design of EMDF and infrastructure). p. 2-38. "The landfill will not be constructed over NT-10 or NT-11, but the berm may be placed over D-10W," yet Figure 2.5 (EMDF conceptual site layout) indicates that the support facilities [i.e., landfill wastewater treatment system (LWTS), storage area, leachate/contact water storage] and Site 7b Borrow Area will be constructed over an unnamed creek. The ROD includes no discussion regarding the short- and long-term impact on this creek or how Applicable and Relevant and Appropriate Requirements (ARARs) will be met. It should be noted that diversion ditches are discussed in the ROD for rerouting D-10W but not for this creek. Revise the ROD to discuss the short- and long-term impact of constructing support facilities and Site 7b Borrow Area over this unnamed creek and how it will comply with ARARs.

94. Section 2.12.2.2, Construction activities, p. 2-38 and 2-39. Section 2.12.2.2 states, "Borrow material for EMDF will be obtained from the knoll just east of the facility and other locations at ORR, which will be developed during this early phase;" however, it is unclear why borrowing materials from an adjacent knoll is proposed when borrow material will be available from the EMDF site. As noted in the Phase 1 Construction subsection of Section 2.12.2.2, "The site will be graded to the top of the geologic buffer and the perimeter berm will be constructed to support the first cell(s)." If the materials excavated from the EMDF site are suitable, they should be reused. Revise Section 2.12.2.2 to clarify why borrowing materials from an adjacent knoll is proposed when borrow material will be available from the EMDF site.

95. Section 2.12.2.2, Construction activities, p. 2-39. "As the overall design of the landfill progresses, the scope of activities in the site preparation phase may be modified." Add timelines for each phase of construction.

96. Section 2.12.2.3, Waste acceptance criteria, p. 2-39. The text states:

> These criteria are derived from various constraints placed upon EMDF, such as specific risk **or dose limits** and design elements in regulatory-based laws and guidance, as well as constraints on waste acceptance that are established through discussion and agreement among the FFA parties (DOE, EPA, and TDEC). (Bold and underlining added)

Remove the words "or dose limits" since CERCLA is based on risk. The DOE-based dose limits will not be considered or used to make decisions in this CERCLA ROD.

97. Table 2.4. EMDF administrative WAC, p. 2-41. It is EPA's understanding that mercury waste that is also RCRA hazardous waste by characteristic (i.e., toxicity) will be prohibited; please add to the table.

98. Section 2.12.2.3, Waste acceptance criteria, p. 2-40. The text states:

> These two elements of the WAC (**along with additional procedures for implementing those WAC**) must be met before waste may be placed in the EMDF for disposal. (Bold added)

What are the "additional procedures" highlighted in bold text? Please add text to clarify and explain what this entails.

99. Section Analytic WAC, p. 2-42. The text states:

> The inventory (WAC) limits are the maximum values allowed per the ARAR dose for protection of the public, which has been deemed protective under CERCLA by EPA.[5]

Footnote 5 states:

> [5] **EPA Administrator, Dispute Resolution Decision on radiological discharge limits for the Oak Ridge Reservation, December 31, 2020.** (Bold added)

Footnote 5 citing the 12/31/20, EPA Administrator decision addresses radiological wastewater discharge and not the WAC. It is unclear if this statement is citing the old ARAR of NRC 10 CFR61, the 25/75/25 NRC dose and state rules 10 CFR 61.41/TDEC 0400-20-11-.16(2), or something different. Note that EPA considers only regulatory effective dose limits of 12 mrem or less as sufficiently protective ARARs and nothing higher. Rewrite this sentence and modify the footnote to clarify the issue being discussed consistent with CERCLA risk.

100. Section 2.12.2.3, Waste acceptance criteria, p. 2-43, citation to Table 2.6. Typo: "Table 2.6 also met the CERLCA threshold…" please change to CERCLA.

101. Section 2.12.2.3, Waste acceptance criteria, p. 2-45. "All discharge water from EMDF will be treated as necessary to meet the most stringent applicable instream water quality criteria, including recreational, with consideration of the stream mixing zone at the point of discharge". This statement should apply to all COCs (including chemicals and radionuclides); please clarify the text.

102. Section 2.12.2.3, Waste acceptance criteria, Page 2-45.

A. Although there is no chemical specific Tennessee WQS for radionuclides, the discharge must not violate TDEC narrative WQS. This means that radioactivity or other releases to the environment from the EMDF cannot cause damage to the diversity or productivity of benthic macroinvertebrate communities or fish communities. Radionuclides have long-half lives, and bioaccumulate in the environment. Monitoring for remedy effectiveness should include benthic macroinvertebrate and fish community surveys and the measument of mercury, PCBs, uranium, and radionuclides in forage fish and benthic macroinvertebrates to assess exposure. To the degree that baseline data are unavailable, data will be necessary to characterize the health of aquatic communities and their contaminant body burdens prior to the landfill construction to provide a point of comparison.

B. Text on Page 2-45 does not discuss control of mercury methylation although methylmercury is more mobile in the environment and is 90% of the total mercury in fish tissue. A study by Mathews et al. (2013) indicated that surface water concentration would likely need to be less than 51 ppt to achieve the tissue-residue based NRWQC for mercury in fish tissue of 0.5 ppm. Revise the text to discuss the effects of the proposed remedy on mercury methylation and how the proposed remedy will meet ARARs.

103. Decision Summary, Section 2.12.2.3, Mercury Management Approach, page 2-45. In the second bullet, there are inaccuracies in both sub-bullets. In the first sub-bullet, please note that the limits must be established consistent with TDEC's "Antidegradation Statement" at TDEC 0400-40-03-.06 as well a technology-based effluent limit (if it is more stringent than the recreational water quality criterion-based

limit 0.51 ng/L). If DOE pursues remediation of Bear Creek addressing sources of methylation such that the non-attainment status of mercury in fish tissue is corrected and reduced below the 0.3 mg/kg level, then the antidegradation-based limits would not be based on an "unavailable parameter," and the discharge limits could be revised depending on the assimilative capacity via a post-ROD modification. The language in this section should be revised to be consistent with any Mercury Management approach agreed upon by all the FFA parties. EPA is aware that the mercury management approach is under development and expects it to be revised in the next version of the ROD.

104. Decision Summary, Section 2.12.2.3, page 2-45**.** This section states that mercury wastewater will be discharged at 0.51 ppt (WQBEL). Please note that there are three ARARs that apply to the discharge of mercury (as well as PCBs) since Bear Creek is designated by TDEC as non-attainment for these pollutants. In order to meet the CWA requirements and be consistent with the NCP, the discharge must meet the most stringent of either the TBEL (which has yet to be determined), a WQBEL, or an antidegradation-based limit. Please revise the text accordingly to reflect that establishment of effluent limit for mercury will meet the most stringent of a technology-based, water quality-based, or antidegradation-based effluent limit consistent with the Mercury management approach being discussed between the FFA parties. Please note, the FFA parties are developing a proposed Mercury Management Approach for Discharges to Bear Creek. This document includes a process for establishing and modifying effluent limits for mercury that hinges on whether non-attainment can be removed as result of addressing sources of methylation, if approved by the FFA parties, that information would be contained in this section of the ROD.

105. Section 2.12.2.4, p. 2-45. The term "wastewater" should be defined in the ROD as "leachate and contaminated stormwater (also known as contact water)." For example: **Landfill wastewater from EMDF, defined as landfill leachate and contaminated stormwater (also referred to as contact water), will be stored and sampled.** This section may be the appropriate place for this clarification.

106. Decision Summary, Section 2.12.2.4, page 2-46. In the second paragraph, the lack of water quality values for radionuclides in the ROD illustrates a problem for not only this statement, but with the ROD itself. While DOE states that it will create water quality-based discharge limits, not having them for EPA to review in the D1 ROD delays EPA's ability to evaluate whether the ROD is protective and complies with ARARs. Currently, without the water quality values for radiological discharge and a scientifically-valid basis for those standards, it is neither.

In addition, the discharge criteria would, at least for non-radiological pollutants, include technology-based effluent limits; references in the ROD are to only AWQCs as discharge criteria (see Section 2.12.2.3, ***Mercury Management Approach***). In contrast, non-radiological pollutants must have discharge criteria or limits that are applied at the point of discharge and are based on the most stringent among limits based on technology, water quality, and for the unavailable parameters (mercury and PCBs), the antidegradation statement consistent with the CWA and TDEC Water Quality Standards regulations.[11] Please note that for the TBELs, non-treatment techniques such as in-stream aerators and flow augmentation are generally is not an acceptable "treatment" to achieve TBELs for non-radiological pollutants unless a non-treatment technique is approved by EPA and TDEC. Landfill wastewater will

[11] Ref. TDEC 0400-40-03.02(4), TDEC 0400-40-03.05(6), TDEC 0400-40-03.06(2) and CWA §§ 301(b)(1)(C), 401(a)(1); see also 40 CFR § 122.44(d), "No permit may be issued…[w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States."

need to be measured for compliance with effluent limits prior to any commingling of wastewater with storm water.[12]

107. Decision Summary, Section 2.12.2.4, page 2-46. The fourth paragraph gives inaccurate information about the discharge ARARs for radionuclides. First, it omits Clean Water Act requirements as relevant and appropriate requirements for the discharge to surface water of radionuclides as identified in the Wheeler Decision. It errs further in suggesting that complying with ARARs (namely water quality-based effluent limits for radionuclides) is at any point other than at the end of pipe where it discharges into surface water.[13] In addition, it is premature to state that the discharge will meet the ARAR of AWQCs for radionuclides being developed at a 10E-5 risk level because there are neither AWQCs or discharge limits to meet those AWQCs (or antidegradation-based limits, as appropriate) in the ROD.[14] EPA is aware that water quality values for radionuclides and associated effluent limits are being developed and the FFS is being revised. EPA expects this information to be in the revised ROD.

108. Section 2.12.2.4 Description of EMDF operations, p. 2-46. The text states:

> Regarding discharge of radionuclides contained in landfill wastewater, the ROD includes TDEC 0400-20-11-.16(2) [equivalent to 10 *CFR* 61.41] and TDEC 0400-20-11-.16(4) [equivalent to 10 *CFR* 61.43]. These ARARs, developed by the NRC, provide and refer to dose limits for protecting the public. Compliance with the ARARs is required at the nearest point of public exposure, which is downstream from the facility. Radiological discharge limits (RDLs) are in compliance with the 10-5 risk specified in the Dispute Resolution Decision[6] and consistent with TDEC 0400-40-03-.03(4)(j) Footnote C, as determined based on site-specific exposure assumptions. Compliance with these discharge limits will assure human health and the environment are fully protected to the requirements of CERCLA.

The water quality-based discharge limits for radionuclides are required to use the 10-5 target risk specified in TDEC 0400-40-03-.03(4)(j) Footnote C as stated in the Dispute Resolution Decision (footnote 6). As stated in another comment, the derivation of water quality-based effluent limits for radionuclides should be in compliance with the most stringent ARAR which includes identified EPA CWA and TDEC regulations, as opposed to NRC dose-based limits which the ROD language above implies. Until effluent limits for all hazardous substances (including radionuclides) have been derived in compliance with identified ARARs and approved by EPA it is presumptuous to make this statement in the ROD. Further, CERCLA Section 121(b) requires that remedial action simply be "protective of human health and the environment." Accordingly, either delete the sentence or revise to better reflect

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[12] See 40 CFR § 125.3(f) Technology-based treatment requirements cannot be satisfied through the use of ''non-treatment'' techniques such as flow augmentation and instream mechanical aerators. However, these techniques may be considered as a method of achieving water quality standards on a case-by-case basis when: (1) The technology-based treatment requirements applicable to the discharge are not sufficient to achieve the standards;
(2) The discharger agrees to waive any opportunity to request a variance under section 301 (c), (g) or (h) of the Act; and (3) The discharger demonstrates that such a technique is the preferred environmental and economic method to achieve the standards after consideration of alternatives such as advanced waste treatment, recycle and reuse, land disposal, changes in operating methods, and other available methods.

[13] The ROD states that the nearest point of public exposure is downstream from the discharge point. While this may be how DOE measures compliance under its Orders for dose-based limits, in a CERCLA action, where there are multiple ARARs, it is a fundamental principle of CERCLA that the most stringent ARAR must be met. 55 Fed Reg 8741.

[14] The D3 FFS does not contain AWQCs, and the discharge limits in the D3 FFS are based on exposure assumptions (1 meal per year of fish of approximately 170 grams) that do not have a factual or scientifically-defensible basis (consistent with Clean Water Act guidance on how to conduct a fish consumption survey).

that compliance with effluent limits derived in accordance with CWA ARARs to protect water quality and attain TDEC's use classifications is part of the remedy that will be protective of human health and the environment.

109. Section 2.12.2.4, Description of EMDF operations, p. 2-46, 4th paragraph discussing radionuclide discharge. The paragraph discussing radionuclide discharge is ambiguous and not fully consistent with the EPA Administrator dispute decision. For example, the text refers to ARARs with dose-based limits and doesn't mention CWA ARARs for radionuclide discharge. The paragraph says that the standard applies at the point of public exposure, then later says that discharge limits (in compliance with 10E-5) will be implemented at the point of discharge. This creates some ambiguity about whether 10E-5 will be met throughout the water body. Please revise text to be consistent with the Administrator decision.

110. Section 2.12.2.4, Description of EMDF operations, p. 2-46. Dilution and distance are being used (see EPA's 7/22/21 comments on the June, 2021 revised FFS Appendix K). This approach is not consistent with relevant and appropriate CWA regulations, is not consistent with CERCLA and the NCP (for example, compliance with substantive requirements in ARARs), and does not ensure protectiveness of human health and the environment as required by CERCLA. Revise this section consistent with the final agreement documented in the revised and approved FFS.

111. Section 2.12.2.4, Description of EMDF operations, p. 2-46. The text implies that NRC regulations (not CWA regulations) are the ARARs being used for purposes of wastewater discharge effluent limits (see p. 2-46 and 2-50). To the extent the NRC regulations are not as stringent as the relevant and appropriate CWA regulations, this approach is not consistent with the NCP and as discussed in the preamble to the final NCP, this approach does not ensure protectiveness of human health and the environment as required by CERCLA. The text should be revised to add CWA regulations as ARARs.

112. Section 2.12.2.4, Description of EMDF operations, p. 2-46. The text refers to a "…wastewater treatment system…sized to accommodate the estimated wastewater volume to be treated and designed to remove contaminants projected to exceed discharge criteria". Text should be added that explains the plans to minimize leachate or contact water generation during later phases of landfill operation.

113. Section 2.12.2.6, Maintenance activities and environmental monitoring, p. 2-47. "Surveillance and maintenance (S&M) and performance monitoring will be implemented during operation and after facility closure." If performance monitoring shows that the landfill is not functioning properly, not meeting ARARs and/or posing an unacceptable risk to human health and the environment, what are the specific criteria to trigger the need to revisit the remedy? Have contingency plans been considered in the event the landfill impacts groundwater? It may be helpful to identify these triggers in the ROD so that the FFA parties have a clearer understanding of potential future actions.

114. Decision Summary, Section 2.12.2.7, page 2-47. These comments are provided in order to ensure that the land use controls selected in the EMDF are consistent with EPA's guidance, ***Sample Federal Facility Land Use Control ROD Checklist with Suggested Language,*** *OSWER* Directive 9355.6-12, January 4, 2013.

a. Please include a (labeled) map or figure showing boundaries and/or location of the land use controls. (Checklist Item 1)

b. In the list of LUC objectives, please substitute the phrase “DOE-controlled industrial use (waste management)” for “alternate” to ensure that the concise list of objectives effectively communicates the objectives. (Checklist Item 4)
c. Please include a LUC objective to “Maintain the integrity of any current or future remedial monitoring system such as monitoring wells, permeable reaction barriers.” (Checklist Item 4)
d. Please add a LUC objective to “maintain the soil cover once it is put in place at each waste cell to limit ecological impact.” (Checklist Item 4)
e. Please add a LUC objective to “maintain a cover at landfill closure that prevents inadvertent intrusion into the waste.” (Checklist Item 4)
f. Please clarify whether ORR will put a notice in a facility plan that includes a description of the allowed and prohibited uses at the site. (Checklist Item 5)
g. Please include the following statement, “Land Use Controls will be maintained until the concentration of hazardous substances in the soil and groundwater are at such levels to allow for unrestricted use and exposure.” (Checklist Item 6)
h. Please include a statement that “DOE is responsible for implementing, maintaining, reporting on, and enforcing the land use controls.” (Checklist Item 7)
i. Please include the following language, “A LUC Remedial Design will be prepared as the land use component of the Remedial Design. Within 90 days of ROD signature, or as part of the Remedial Design for the EMDF, DOE shall prepare and submit to EPA for review and approval a LUC remedial design that shall contain implementation and maintenance actions, including periodic inspections.” (Checklist Item 9)

115. Section 2.12.2.7, Land use controls, p. 2-47. Please apply the LUC Checklist, and clearly differentiate Zones 1-3. This section is missing items from the LUC Checklist: specifically, items 6-9; list of prohibited activities relating to industrial use. (Additional details are provided in the previous comment.) Please address and include in the revised ROD.

116. Section 2.12.2.7, Land use controls, p. 2-47. It is not clear what the Performance Action Objectives are for Zone 1, 2, and 3. Please differentiate the LUC for each area. Note that EPA's 1999 ROD Guidance states “Present a clear statement of the specific RAOs for the operable unit or site and reference a list or table of the individual performance standards.” Address these issues in the revised ROD.

117. Section 2.12.2.7, Land use controls, p. 2-47. Please identify the LUC instrument that will be used.

118. Section 2.12.2.7, Land use controls, p. 2-47. Please include the following language: “Although DOE may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, DOE shall retain ultimate responsibility for remedy performance and integrity.”

119. Section 2.12.3, Cost Estimate for the Selected Remedy, p. 2-48 and Table 2.8, Total estimated project costs, p. 2-49. Based on Section 2.12.3 and Table 2.8, present worth costs for the alternatives were calculated using a real discount rate of 1.5 percent according to the Office of Management and Budget (OMB) Circular No. A-94, dated November 2016; however, it is appropriate to use the OMB Circular No. A-94, dated December 2020 to ensure the ROD meets the costing requirements outlined in the ROD Guidance. Revise the ROD to utilize the current real discount rate.

120. Section 2.12.3, Cost Estimate for the Selected Remedy, p. 2-49. Table 2-8 (Total estimated project costs) includes the costs associated with the construction of Cell 5; however, the ROD, including Section 2.12.3 (Cost Estimate for the Selected Remedy), does not propose construction of five cells. Based on Figure 2.5 (EMDF conceptual site layout) and the text, only four cells are proposed. If Cell 5 will not be constructed, revise Table 2-8 to only include the costs associated with the construction of Cells 1-4. If Cell 5 will be constructed, revise the ROD to consistently present construction of five cells across Site 7c

121. Decision Summary, Section 2.12.4, page 2-49**.** The first paragraph states that the remedy will meet RAOs, will be protective of human health and the environment, will protect human and ecological receptors, and will prevent adverse impacts to surface water. As noted in other comments, there currently is no factual basis in the D1 ROD or the Administrative Record for this ROD to support any of these statements. Until there is a factual record to support them, the ROD is inconsistent with CERCLA, the NCP and the FFA. EPA expects this issue to be addressed in the revised FFS and incorporated in the next version of the ROD.

122. Section 2.12.4, Expected Outcomes of the Selected Remedy, p. 2-49. Text in Section 2.12.4 indicated wetlands mitigation would be implemented as required by ARARs. However, the text did not describe controls to prevent disruption of, impact to, or alteration of wetlands and how effectiveness of such controls would be measured using EPA's wetlands guidance with the goal of "no net loss": https://www.epa.gov/cwa-404/background-about-compensatory-mitigation-requirements-under-cwa-section-404. If loss is anticipated, outline the process by which on-site or off-site compensatory mitigation will be proposed.

123. Section 2.13.1, Overall Protection of Human Health and the Environment, p. 2-50. Please add reference to the groundwater RAO in this paragraph.

124. Section 2.13.2, Compliance with ARARs, p. 2-50. The text suggests NRC regulations (not CWA regulations) are the ARARs being used for purposes of wastewater discharge effluent limits (see p. 2-46 and 2-50). To the extent the NRC regulations are not as stringent as the relevant and appropriate CWA regulations, this approach is not consistent with the NCP and as discussed in the preamble to the final NCP, this approach does not ensure protectiveness of human health and the environment as required by CERCLA. Hopefully, this issue is resolved in the revised Wastewater FFS and in the revised ROD.

125. Decision Summary, Section 2.13.2, page 2-50**.** The fourth paragraph states that waste may be accepted for disposal even if it is not located at the NPL site. The term *on-site* means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action" 40 CFR 300.400(e)(1). Any decision to dispose of DOE legacy waste must be made through the CERCLA remedy selection process under the ORR FFA including a CERCLA decision document that is approved by EPA and TDEC. Please add text to clarify this issue under the FFA.

126. Decision Summary, Section 2.13.2, page 2-50. The fifth paragraph states, "The following NRC-based TDEC regulations are relevant and appropriate: TDEC 0400-20-11-.16(2) [equivalent to 10 CFR 61.41] and TDEC 0400-20-11-.16(4) [equivalent to 10 CFR 61.43]. These ARARs are used along with site-specific parameters to develop limits on radiological discharges during operations that ensure protection of human health and the environment." While this statement is consistent with the Wheeler Decision, it also omits a key principle of that Decision that Clean Water Act requirements are **also**

relevant and appropriate requirements for the development of AWQC equivalents and discharge limits for radionuclides. The sentence should be revised to acknowledge that identified CWA NPDES regulations and TDEC Water Quality Standards are also ARARs used to derive water quality-based effluent limits. As noted above, where there are multiple ARARs, the most stringent requirement must be met. Please revise text accordingly.

127. Decision Summary, Section 2.13.2.1, page 2-51**.** This section describes the basis of the waivers from the TSCA requirements, including the requirement that "[t]*he bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high-water table."* The document states waivers are being conducted under CERCLA Section 121(d)(4) [equivalent standard of protectiveness ARAR wavier]. This is not correct and was one of the issues raised by EPA and dealt with under the resolution of the RI/FS dispute (in the DRA attachment Appendix G). Please correct the text by removing discussion of waivers under CERCLA 121(d)(4) and clarify that the waivers are being evaluated under TSCA (40 CFR 761.75(c)) and the Department of Radiation Health (TDEC 0400-20-04-.08)).

In addition, this section states that certain TSCA requirements in 40 CFR § 761.75(b)(3) *Hydrologic conditions* have been met because DOE concludes that this is a post-construction requirement. EPA did not agree with DOE's assertion during the RI/FS dispute and as a result negotiated an Appendix G with an explanation of the TSCA requirements being waived (included as an attachment to the December 7, 2017 Dispute Resolution Agreement). This TSCA regulation includes certain requirements that are tied to design and others that are more like siting requirements (which could be identified as a location-specific ARAR) and specifies the condition of the site in order for a TSCA landfill location selection; it is not a post-construction requirement whose compliance is determined after site preparation or landfill construction. Please revise the ROD to clarify that DOE is seeking a waiver under 40 CFR 761.75(c)(4) as part of the selected remedy described in this ROD to both requirements in 40 CFR 761.75(b)(3) including: "There shall be no hydraulic connection between the site and standing or flowing surface water"; and "The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high-water table." The waiver of both of these requirements is based on the same justification that relate mostly to compliance with more stringent landfill design and construction requirements that establish a buffer from connection with surface and groundwater.

Further, the ARAR waiver discussion in the RI/FS Appendix G had significantly more information than is presented in the ROD. Please explain why that information from Appendix G which EPA considered necessary or helpful in demonstrating the basis for the waiver (as well as the additional requirement that, despite the waiver, the remedy is protective under CERCLA) has been omitted.

Please note that a post ROD waiver of any identified ARAR would require another EPA approved decision document AROD or ESD providing justification for invoking a waiver as required by the NCP at 40 CFR § 300.430(f)(5)(ii).

128. Section 2.13.2.1, Waiver to TSCA 40 CFR 761.75(c)(4), p. 2-51. The text states:

> DOE justifies a waiver of the TSCA hydrologic conditions requirement on the basis that the EMDF will be at least as protective due to the following design elements, which provide protectiveness exceeding that provided through the siting requirements (please note that floodplains and shorelands are being avoided and that the site will have monitoring wells and leachate collection):

• More stringent liner and leachate detection and collection requirements under RCRA
• Low permeability vadose zone geologic buffer material as committed to in this ROD.

A third bullet must be added which states:

• A groundwater monitoring network surrounding the EMDF compliant with RCRA groundwater monitoring requirements.

129. Section 2.13.2.3, Radiological Discharge Limits, p. 2-54. All of the data to be collected under the EPA Administrator's decision is to be documented in the revised *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D3). This FFS is to remain open and run parallel to the completion of the D2 EMDF ROD. The FFS will be revised to include the radionuclide-specific fish data that have been collected, and the derived water quality values for radionuclides. Following approval, the FFS will then be placed in the Administrative Record for public availability. The public will be informed of the contents of the FFS through specific public outreach activities before the D2 EMDF ROD is approved and signed by the EPA Administrator. All of the information stated above must be included in this section of the EMDF ROD to inform the public.

130. Decision Summary, Section 2.13.2.3, page 2-54 and 2-55. This section notes that radiological discharge limits will be included in the ROD prior to its approval. Without these discharge limits, there is no current basis for evaluation of the ROD's assertions that it is protective and attains ARARs, or, therefore, that it is consistent with CERCLA and the NCP. EPA expects that water quality values for radionuclides will be developed in the revised FFS and included in the next version of the ROD.

131. Decision Summary, Section 2.13.5, page 2-55**.** This section states that treatment of CERCLA waste is not a component of the remedy. This is inaccurate. This action will generate CERCLA waste as wastewater and possibly other wastes, and as noted in the last sentence, at least this CERCLA wastewater will be treated. Please delete the first sentence.

132. Section 2.13.3, Cost Effectiveness, p. 2-55. The total present worth cost is based on a 2016 estimate; please update for 2021.

133. Section 2.13.6, 5-Year Reviews, p. 2-56. Revise text to clarify that the five-year reviews will start during operation of the landfill.

134. Section 2.14, p. 2-56. Documentation of Significant Changes. The Proposed Plan was released in September 2018; the date provides context for the rest of the discussion in this section. Please add the Proposed Plan public review release date and approval dates to this section.

135. Section 2.14.1, Impacts to Reindustrialization, Page, 2-56, Paragraph 1: Include general text that presents the economic relationship between DOE, CROET and the City of Oak Ridge regarding reindustrialization and how the city participates in the reindustrialization decision-making at the DOE site.

136. Section 2.14, Documentation of Significant Changes, p. 2-56. According to Section 2.14, a slight modification to the eastern boundary of the landfill was made as part of the conceptual design process "but it does not change any of the evaluation of alternatives including demonstration of protectiveness or

compliance with ARARs;" however, the reason for this modification is not discussed. This modification is of particular note given the location of the Douglas Chapel Cemetery, as shown on Figure 2.3 (Phase I characterization and site characteristics of the EMDF site), to the eastern boundary. Revise the ROD to clarify the reason for the modification to the eastern boundary of the landfill and to explain how it remains protective and compliant with ARARs.

137. Figure 2.6. Proposed Rail Waste Route at ETTP, p. 2-58. The figure identifies three separate areas across ETTP as "Retained By DOE." All three sites are former landfills and collectively they comprise approximately 63 acres. These sacrifice areas will require perpetual DOE controls on both the land surface and any groundwater contamination originating from these areas. This is inconsistent with the ROD text which states:

> DOE's current goal is to transfer all of ETTP out of DOE ownership and for it to be beneficially reused. The creation of a waste handling facility is inconsistent with this goal and a deterrent to future beneficial reuse of the site.

Please rewrite the text (above) to more accurately reflect DOE's own anticipated Final Heritage Center End State Vision (shown in Figure 2.6) with perpetual sacrifice zones and include the proposed airport location.

138. Section 2.14.1, Impacts to Reindustrialization, p. 2-57. One statement in this section reads "…daily hauling of radioactive waste is inconsistent with the development of the National Historic Park." This statement is unquestionably factual but would it not likewise in some sense apply to the removal and hauling of waste material and soils by truck from at least some of the same source areas to the EMDF? If so, then citing the movement of radioactive or other waste materials by rail as a negative aspect of the off-site disposal option would seem to be a misplaced argument for favoring onsite over offsite disposal unless it is presented in a comparative analysis to the waste handling and hauling elements of the onsite disposal option. Please clarify.

139. Section 2.14.3, Groundwater Field Demonstration, p. 2-60. This section should be moved to the selected remedy section.

140. Responsiveness Summary**.** There are several instances in the responsiveness summary and elsewhere in the document that state waivers are being conducted under CERCLA Section 121(d)(4), the "equivalent standard of protectiveness" ARAR wavier. This is not correct and was one of the issues raised by EPA and addressed by the resolution of the RI/FS dispute (in the DRA attachment Appendix G). Please correct any responses by removing discussion of waivers under CERCLA 121(d)(4) and clarify that the waivers are being evaluated under TSCA (40 CFR 761.75(c)) and the Department of Radiation Health (TDEC 0400-20-04-.08)).

141. Responsiveness Summary. The ROD text of Section 2.10.5 notes: "The greatest impact would be installation of EMDF in CBCV or WBCV, where up to 94 acres of forested land would be expected to be impacted. The other onsite alternatives had less, but still notable, impact on environmental habitat." The remedy decision impacts forested lands. Some of the responses asked why DOE is building this landfill in a green area, and a complete response was not provided. Please address this issue in the revised responsiveness summary.

142. Responsiveness Summary. Many comments noted the need for a reopened public comment period since key information on WAC, ARARs, and other issues was not made available to the public. Also, numerous questions were repeated relating to why DOE did not consider an already contaminated area for the disposal area. The DOE revision to the responses to comment should address these issues.

143. Responsiveness Summary. Based on the D1 ROD it seems that the majority of the public engagement activities regarding this decision were mainly conducted in 2015 and 2016 and then engagement in 2018 during the public comment period. Due to the significant length of time since the issuance of the Proposed Plan for public comment, FFA parties have agreed to additional public engagement regarding new information and a public comment period. Public comments received during the upcoming public comment period will be addressed in the D2 ROD responsiveness summary.

144. Responsiveness Summary, Page 3-3. First paragraph in this section. Suggest starting the paragraph with a new sentence which states: "This responsiveness summary was prepared in accordance with the requirements of Section 117(b) of CERCLA, as amended. The purpose of this responsiveness summary is to summarize and respond to significant public comments on the Proposed Plan (2018a)."

145. Responsiveness Summary, Page 3-3. "The U.S. Department of Energy's (DOE's) Oak Ridge Office of Environmental Management (OREM) is committed to conducting all of the robust communication efforts listed in its Environmental Management Disposal Facility (EMDF) Community Outreach Plan, which was approved by the U.S. Environmental Protection Agency (EPA) and State of Tennessee." What is the year this document was issued/updated? Is it accessible by the public? Add the document to the references section if not already there and incorporate a hyperlink to the document.

146. Responsiveness Summary, Page 3-3. The text states, "The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) public comment periods are only required to span 30 days. OREM's public comment period for the Proposed Plan was 120 days (September 10, 2018 – January 9, 2019) to ensure all interested parties had time to review and provide comments on the document. Two extensions were granted while the original comment period was set at 45 days." This comment is misleading. Please update this response with the language from the NCP - specifically, NCP 40 C.F.R. §300.430(f)(3)(i)(C). According to the NCP, DOE is to provide a reasonable opportunity, not less than 30 calendar days, for submission of written and oral comments on the Proposed Plan and the supporting analysis and information that already resides in the information repository (e.g., RI/FS). The NCP further requires, that upon timely request, the lead agency will extend the public comment period by a minimum of 30 additional days. Rather than stating "only required to span 30 days" the text should clarify that the NCP requires a period no less than 30 days with opportunities for extensions based on public interest.

147. Responsiveness Summary, Page 3-3, Bullet 6: Please add the date(s) of the tours provided for the EQAB and the Tennessee Citizens for Wilderness Planning.

148. Summary of Comments and Responses, Geology and Rainfall, Page 3-6, Paragraph 4: Clarify the text regarding rainfall as the historical average rainfall of 54 inches/year but in recent years that has increased to 77 inches/year. Provide information on any potential climate change forecasting associated with the selected remedy and impacts on the community.

149. Socioeconomic impact, pp. 3-6 and 3-7. The text states:

> To the contrary, jobs associated with construction and operation of the facility, and the acceleration of cleanup enabled by onsite disposal and subsequent opportunities that [it] would present to the Y-12 and Oak Ridge National Laboratory, are expected to benefit both the economy and perception issues associated with environmental conditions in Oak Ridge. (Bold added)

Please insert the word "it" where indicated by brackets above or rewrite for clarity.

150. Responsiveness Summary, Page 3-55. DOE states several times throughout the responsiveness summary: *"The developed WAC are anticipated to require nearly 90 percent of the radiological content in the low volume/highly contaminated waste streams to be sent offsite for disposal while the lower contaminated/high volume waste streams remain onsite.*" Update this response to clarify the criteria for offsite waste disposal including the type and estimated volume of waste. Provide definitions for "lower contaminated" and "highly contaminated" in the ROD.

151. Responsiveness Summary: The comments from 194 individuals along with DOE's response is included in this section. In summary, the DOE identified the four general areas of supportive comments and responded with a standard response. Many of the unsupportive or opposing comments requested additional information such as:

- Opportunity to review and comment on the waste acceptance criteria (WAC) prior to issuing with the ROD
- Concerns with mercury-contaminated waste
- Need for waivers for regulatory compliance
- Use of partially forested greenfield area rather than brownfield site
- Underlying geology and rainfall
- Overestimation of offsite disposal cost and risk
- Impact of on-site hazardous waste disposal site on home values and attracting people/businesses to Oak Ridge.

The DOE developed a standard response addressing each of the concerns listed above. For several comments, the DOE provided the standard responses and included additional language specific to the public comment. However, not every response fully addressed the issues raised by the commenter. The following responses lack specificity:

- The standard responses provided did not address the subject or concern(s) of the public comment: Comments 114, 144, 149, 155, and 180.
- Comment 107: Bullet 3: Add text that provides summary information from the Technical Memo 1 and 2, since this information was not formally presented in detail during the public comment period or at the Proposed Plan meeting.
- Comment 115: The response does not address the citizen's concern. For example, the DOE chose not to respond to the statement that, "Choosing a solution before all ground water impact testing is complete (per David Adler) just screams that a decision has already been made regardless of environmental impact." The response should explain why shipping wastes to an area with an extremely low water table would not be preferable.
- Comment 117: The response does not address the request for a required environmental impact

statement (similar to Comment 128) and provides an insufficient response to questions regarding hydrogeology. Also, a better response to the reference to inappropriate disposal of waste at the EMWMF is to acknowledge these instances occurred and identify corrective measures implemented to preclude future occurrences.

- Comment 118: The response does not address concerns that engineering design components (diversion structures, the gravel drains, the pipes, the liners, the caps) can be expected to fail. Also, a better response to the reference to inappropriate disposal of waste at the EMWMF is to acknowledge these instances occurred and identify corrective measures implemented to preclude future occurrences (similar to EPA review of response to Comment 117). DOE should provide an explanation of why the Country Club Estates, did not experience direct DOE outreach efforts prior to issuance of the Propose Plan as other residents or organizations, since this community is nearest to the selected site. The DOE should revisit the response regarding the BCV ROD future use designation compared to setting remediation levels for cleanup for uncontaminated areas. Modify the DOE response to acknowledge site-specific characterization for Site 7c to fully support the selected remedy was not conducted at the time of the RI/FS, although generalized characterization information existed for Bear Creek Valley; however, information obtained from the Field Sampling Plan and reported in Technical Memorandum 1 and Technical Memorandum 2 provides more site information, but may not have been clearly presented in the Proposed Plan. Discuss the approach to mercury disposal being discussed between the FFA parties.
- Comment 120: The DOE response did not address the concern regarding that the EMDF is outside areas where already dedicated to waste management and is not consistent with the community's plan for future use of the area. Please revise the DOE response.
- Comment 122: The response does not address socioeconomic concerns or address the request for a cost-benefit analysis.
- Comment 124: The response does not address socioeconomic concerns.
- Comment 128: The response does not address concerns regarding siting, harm to an undisturbed area, or proximity of residences.
- Comment 129: The response does not address the preference for disposal in a dry area (such as Utah).
- Comment 130: The response does not address the preference for disposal in a dry area (such as Utah).
- Comment 132: The response does not address concerns regarding siting or mercury contamination.
- Comment 134: The response does not address concerns regarding unstable geology, groundwater, or proximity to population.
- Comment 135: The response does not address concerns regarding the preference for disposal elsewhere.
- Comment 136: The response does not address concerns regarding the preference for disposal elsewhere (Yucca Mountain).
- Comment 138: The response does not address concern regarding the performance of the liners and impact of landfill close to residence.
- Comment 146: The response does not address concern of impact to downstream communities and comparison with municipal landfills. The DOE response should acknowledge some inappropriate disposal occurred and identify corrective measures implemented to preclude these occurrences in the future (similar to EPA review of response to Comment 117).
- Comment 147: The response does not address the concerns regarding mercury contamination.
- Comment 154: The response does not address the concerns regarding mercury contamination.

- Comment 155: The response does not address the concerns of well water contamination and shipment to a western facility (Utah).
- Comment 156: The response does not address the concerns of well water contamination and shipment to a western facility (Utah).
- Comment 160.2: The response does not address the concerns of site selection and the lack of characterization not presented at the time of site selection. Modify the DOE response to acknowledge site-specific characterization for Site 7c to fully support the selected remedy was not conducted at the time of the RI/FS, although generalized characterization information existed for Bear Creek Valley; however, information obtained from the Field Sampling Plan and reported in Technical Memorandum 1 and Technical Memorandum 2 provides more site information, but may not have been clearly presented in the Proposed Plan.
- Comment 160.11: The response does not address the concerns including, but not limited to underdrains, mercury contamination, or separation of waste from groundwater.
- Comment 160.17: The response does not address the comment. For example, the citizen requests an update on when the Environmental Management Waste Management Facility will be 100 percent full and the current contingency plan if this Proposed Plan is not approved by that time. None of the numerous and detailed technical concerns are addressed.
- Comment 162: The response does not fully address the concerns regarding future rainfall amounts and how this may impact the design.
- Comment 165: The response does not fully address the comment. Additional response is warranted.
- Comment 167: The response does not address concerns regarding hydrogeology or the use of underdrains.
- Comment 168.24: The comment warrants a response to clarify the status of the administrative record supporting the proposed plan.
- Comment 174: The response does not fully address the comment.
- Comment 175, Part 2: The DOE does not provide a response to Part 2 of the comment.
- Comment 179: The response does not adequately address the comment, including the proximity of residences with private wells. Additional response is warranted.
- Comment 184: The response does not address several items including: 2.d (PDF page 292), 2.e (PDF page 292), 2.b (PDF 294), and 2.c (PDF 294).

The DOE should reevaluate the responses to the comments listed above and revise the responses to address the specific issues raised in the comments.

152. **Appendix A, ARARs**. The RI/FS Appendix G attached to the 2017 Dispute Resolution Agreement included the following table of AWQCs as the first table in the tables of ARARs. Please include and add rows for any radionuclides that are likely to be in the waste stream, along with associated AWQC-equivalents for recreational use. (EPA is aware that these criteria are currently under development and expects the criteria to be in the next draft of the ROD.)

Table G-1. Numeric Ambient Water Quality Criteria (AWQC) that are Potential Chemical-Specific ARARs/TBCs for Key COCs in EMWMF/EMDF Landfill Wastewater[a]

Chemical	Fish and Aquatic Life [TDEC 0400-40-03-.03(3)]		Recreation[b] [TDEC 0400-40-03-.03(4)]	Required reporting level[c] [TDEC 0400-40-03-.05(8)]
	Criterion maximum concentration (CMC) (µg/L or ppb)	Criterion continuous concentration (CCC) (µg/L or ppb)	Organisms only (µg/L or ppb)	(RRL) (µg/L or ppb)
Aldrin (c)	3.0		0.00050	0.5
Arsenic (c)			10.0	1.0
Arsenic (III)	340[d]	150[d]		1.0
b-BHC (c)			0.17	
Cadmium	2.0[e]	0.25[e]		1.0
Chromium (III)	570[e]	74[e]		1.0
Chromium (VI)	16[d]	11[d]		10.0
Copper	13[e]	9.0[e]		1.0
Cyanide	22	5.2	140	5.0
4,4'-DDT (b)(c)	1.1	0.001	0.0022	0.1
4,4'-DDE (b)(c)			0.0022	0.1
4,4'-DDD (b)(c)			0.0031	0.1
Dieldrin (b)(c)	0.24	0.056	0.00054	0.05
Lead	65[e]	2.5[e]		1.0
Mercury (b)	1.4[d]	0.77[d]	0.051	0.2
Nickel	470[e]	52[e]	4600	10.0

(b) = bioaccumulative parameter
(c) = carcinogenic parameter

[a] http://www.tn.gov/sos/rules/0400/0400-40/0400-40-03.
[b] A 10^{-5} risk level is used for setting TDEC recreational criteria for all carcinogenic pollutants. Recreational criteria for noncarcinogenic chemicals are set using a 10^{-6} risk level. [*Note*: All federal recreational criteria are set at a 10^{-6} risk level].
[c] In cases in which the in-stream AWQC or effluent limits established for an outfall are less than current chemical technological capabilities for analytical detection, compliance with the AWQC or limits will be determined using the higher RRLs, as allowed pursuant to TDEC 0400-40-03-.05(8).
[d] Criteria are expressed as dissolved.
[e] Criteria are expressed as dissolved and are a function of total hardness (mg/L). Criteria displayed correspond to a total hardness of 100 mg/L.

ARARs = applicable or relevant and appropriate requirements
AWQC = ambient water quality criteria
CCC = criterion continuous concentration
CMC = criterion maximum concentration
COCs = contaminants of concern
EMDF = Environmental Management Disposal Facility
EMWMF = Environmental Management Waste Management Facility
RRL = required reporting level
TBC = to-be-considered [guidance]
TDEC = Tennessee Department of Environment and Conservation

153. **Appendix A, Table A.1, p. A-3, 2nd row**: Radionuclide releases to the environment. This row only lists NRC regs (and TDEC equivalents) as RAR - CWA should be included here.

154. **Appendix A, ARARs, Table A-1, pages A-3 through A-5**. The table does not identify the state water quality criteria as relevant and appropriate to radionuclides. Please add the following notation to the "Prerequisite" column, for all the water quality criteria: "Point source discharge of radionuclides into surface water **– relevant and appropriate.**" As with pollutants, this notation can be added in the first row only (but applies to all the similar citations below). In addition, please add the following note to the "Prerequisite" column for these citations, "NOTE: under TDEC 0400-40-03-.05 INTERPRETATION OF CRITERIA, mixing zones shall not apply to the discharge of bioaccumulative pollutants to waters of the state where the risk-based factors in Rule 0400-40-03-.03(4)(l) are exceeded for the pollutant group."

155. **Appendix A, ARARs, Table A-2 Location-specific ARARs, page A-6.** Please include the following citations prior to 10 CFR 1022.13(a)(3).

	Project Description. This section shall describe the proposed action and shall include a map showing its location with respect to the floodplain and/or wetland. For actions located in a floodplain, the nature and extent of the flood hazard shall be described, including the nature and extent of hazards associated with any high-hazard areas.		10 CFR 1022.13(a)(1)
	Floodplain or Wetland Impacts. This section shall discuss the positive and negative, direct and indirect, and long- and short-term effects of the proposed action on the floodplain and/or wetland. This section shall include impacts on the natural and beneficial floodplain and wetland values (§ 1022.4) appropriate to the location under evaluation. In addition, the effects of a proposed floodplain action on lives and property shall be evaluated. For an action proposed in a wetland, the effects on the survival, quality, and function of the wetland shall be evaluated.		10 CFR 1022.13(a)(2)

156. **Appendix A, ARARs, Table A-2, Wetlands Requirements page A-6.** As mentioned by EPA R4 attorneys during ARARs meetings with DOE and TDEC, the EPA *Compensatory Mitigation for Losses of Aquatic Resources* rule at 40 CFR part 230 et. seq. may be considered ARARs for this remedy considering the anticipated removal of wetlands prior to construction of the EMDF. These regulations establish performance standards and criteria for the use of permittee-responsible compensatory mitigation, mitigation banks, and in-lieu programs to improve the quality and success of compensatory mitigation projects that should be evaluated along with the DOE and TDEC wetlands requirements that are currently included in the Location-specific ARARs table. Examples of these regulations are provided in the table labeled **Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]** included in these comments.

157. **Appendix A, ARARs, Table A-2, page A-7.** DOE has added a citation to TDEC 0400-40-07-.04(7)(a) in the first row. Please remove it at this location, as this row discusses mitigation required for wetlands. This citation to subparagraph (a) is included on page A-13. In addition, please change the second "Citation" to TDEC 0400-40-07-.04(7)(b) (not (c)).

158. **Appendix A, ARARs, Table A-2, page A-9.** The following citation was included in RI/FS Appendix G ARARs. Please include or explain why it is being removed.

Within an area potentially impacting "waters of the State" as defined in TCA 69-3-103(42)	• Must comply with the [substantive] requirements of the ARAP for erosion and sediment control to prevent pollution of waters of the state. Pollution control requirements are detailed in each particular General Permit.	Action potentially altering the properties of any "waters of the State"—**applicable**	TCA 69-3-108(1) TDEC 0400-40-07-.01

159. **Appendix A, ARARs, Table A-2, page A-9 to A-10.** The requirements for Bank Stabilization have been changed/reworded since the RI/FS Appendix G ARARs. Please explain the basis for the change. Please note in the last bullet that it should be revised to read: "Hard armoring bank stabilization treatment shall not exceed 300 linear feet for the treatment of one bank, or 200 linear feet per bank if the treatment includes both banks."

160. **Appendix A, ARARs, Table A-2, page A-12.** The citation to TCA 69-3-108(q) seems to be unnecessary unless waters within the scope of this project have been designated by the state as wet weather conveyances. To EPA's knowledge, this has not been done.

161. **Appendix A, ARARs, Table A-2, page A-13.** In the row with the citation to TDEC 0400-40-07-.04(7)(a), the "Requirements" column should be revised to reflect the language in the regulation: "If an applicant proposes an activity that would result in an appreciable permanent loss of resource value of a state water, the applicant must provide mitigation which results in no overall net loss of resource values. For any mitigation involving the relocation or re-creation of a stream segment, to the extent practicable,

the applicant shall complete the mitigation before any impact occurs to the existing state waters. Mitigation measures include but are not limited to: 1. Restoration of degraded stream reaches and/or riparian zones; 2. New (relocated) stream channels; 3. Removal of pollutants from and hydrologic buffering of stormwater runoff; and 4. Any other measures which have a reasonable likelihood of increasing the resource value of a state water." In addition, the existing language may be helpful, but its source/citation is not clear. Please clarify. Lastly, please remove the citation to TDEC 0400-40-07-.04(7)(b), as this requirement is addressed on page A-7.

162. **Appendix A, ARARs, Table A-2, page A-13 Discharge of Dredge and Fill.** Please revise existing entries and add the following CWA Section 404(b) requirements to the Location-specific ARARs.

Location encompassing aquatic ecosystem as defined in 40 CFR 230.3(c)	No discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact on the aquatic ecosystem or if will cause or contribute significant degradation of the waters of the US.	Action that involves the discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands – **Applicable**	40 CFR § 230.10(a) and (c) Clean Water Act Regulations – Section 404(b) Guidelines
	Except as provided under [CWA] section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps [in accordance with 40 C.F.R. 230.70 *et seq. Actions To Minimize Adverse Effects*] have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.		40 CFR § 230.10(d) Clean Water Act Regulations – Section 404(b) Guidelines
	No discharge of dredged or fill material shall be permitted if it: Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable State water quality standard; Violates any applicable toxic effluent standard or prohibition under section 307 of the CWA; Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or results in likelihood of the destruction or adverse modification of a habitat which is determined by the Secretary of Interior or Commerce, as appropriate, to be a critical habitat under the Endangered Species Act of 1973, as amended. If an exemption has been granted by the Endangered Species Committee, the terms of such exemption shall apply in lieu of this subparagraph; (4) Violates any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under title III of the Marine Protection, Research, and Sanctuaries Act of 1972.		40 CFR Part 230.10(b)

163. **Appendix A, ARARs, Table A-2, page A-17.** The citation notes that a waiver will be requested for a requirement or requirements in 40 CFR 761.75(b)(3). In the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G, it noted that a waiver would be requested for some part of the following requirement: "The landfill must be located above the historical high groundwater table. Floodplains, shorelands, and groundwater recharge areas shall be avoided. The site shall have monitoring wells and leachate collection. There shall be no hydraulic connection between the site and standing or flowing

surface water." Please clarify if it is DOE's position that a waiver is not being requested for requirements in this part, or if the one note applies to both paragraphs.

164. **Appendix A, ARARs, Table A-2, page A-17.** In the citation to 40 CFR 761.75(c), please add the following note, which was included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G, at the bottom of the description in the "Requirements" column:

Note: Waiver of any technical requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the TSCA standard.

165. **Appendix A, ARARs, Table A-2, page A-19.** In the citation to TDEC 0400-20-04-.08, part of the note that was included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G, has been removed. Please restore the second sentence in the note below, copied from that Appendix G:

Note: The exemption, variance or exception from the requirement shall be made as part of the CERCLA Record of Decision process. The CERCLA remedy protectiveness standard will apply in addition to the DRH standard.

166. **Appendix A, ARARs, Table A-2, page A-23 and where appropriate.** The following RCRA tank systems, surface impoundments, and container storage area requirements have been removed from the ROD, but were included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G. Please explain the basis for not including those previously identified ARARs and how DOE intends to manage both contact wastewater from within the landfill and collected leachate. DOE is building a RCRA Subtitle C landfill, and EPA maintains that for prudent and protective operation of this landfill, these requirements should be included in case management of hazardous wastes generated by the landfill requires use of these types of units. As stated during several of the ARARs meetings with DOE and TDEC, the leachate collection system should include a tank compliant with the RCRA requirements in order to hold leachate for characterization prior to disposal in an NPDES permitted CWA wastewater treatment facility or disposal elsewhere in accordance with RCRA requirements for hazardous waste. While some of these requirements have been identified as relevant and appropriate to the operation of the landfill, others are considered legally applicable and may not be removed unless agreed to by EPA as part of the remedy selection for the EMDF.

RCRA Tank System and Impoundment Designs			
Design of a RCRA Tank System	Must prepare an assessment attesting that the tank system design has sufficient structural integrity and is acceptable for the storing/treating of hazardous waste. The assessment must include the information specified in 40 CFR 264.192(a)(1)-(5) [TDEC 0400-12-01-.06(10)(c)(1)-(5)].	Storage of RCRA hazardous waste in a new tank system—**relevant and appropriate**	40 CFR 264.192(a) TDEC 0400-12-01-.06(10)(c)(1)
	Ancillary equipment (i.e., piping) must be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.		40 CFR 264.192(e) TDEC 0400-12-01-.06(10)(c)(5)
	Must provide the degree of corrosion protection based upon the information in 40 CFR 264.192(a)(3) (TDEC 0400-12-01-.06[10][c][1][iii]) to ensure the integrity of the tank system during use. Installation of field fabricated corrosion protection system must be supervised by an independent corrosion expert.		40 CFR 264.192(f) TDEC 0400-12-01-.06(10)(c)(6)
	Must provide secondary containment in order to prevent release of hazardous waste or constituents into the environment.		40 CFR 264.193(a)(1) TDEC 0400-12-01-.06(10)(d)(1)
	Secondary containment systems must be: • Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during the use of the tank system; and • Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.		40 CFR 264.193(b) TDEC 0400-12-01-.06(10)(d)(2)

	Secondary containment systems must be at a minimum: • Constructed of or lined with materials that are compatible with the wastes(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic). • Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift; • Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the owner or operator can demonstrate to the Regional Administrator that existing detection technologies or site conditions will not allow detection of a release within 24 hours; and • Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and environment, if the owner or operator can demonstrate to the Regional Administrator that removal of released waste or accumulated precipitation cannot be accomplished within 24 hours.		40 CFR 264.193(c) TDEC 0400-12-01-.06(10)(d)(3)
	Secondary containment for tanks must include one or more of the following devices: • a liner (external to the tank); • a vault; • a double-walled tank; or • an equivalent device as approved by the EPA.		40 CFR 264.193(d) TDEC 0400-12-01-.06(10)(d)(4)
	External liner systems must be: • designed and operated to contain 100 percent of the capacity of the largest tank within its boundary; • designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. (Such additional capacity must be sufficient to contain precipitation from a 25 year, 24-hour rainfall event); • free of cracks or gaps; and • designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the waste if the waste is released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the waste).		40 CFR 264.193(e)(1) TDEC 0400-12-01-.06(10)(d)(5)(i)
	Vault system must be: • designed or operated to contain 100 percent of the capacity of the largest tank within its boundary; • designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. (Such additional capacity must be sufficient to contain precipitation from a 25 year, 24-hour rainfall event); • constructed of chemical-resistant water stops in all joints (if any); • provided with an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of the waste into the concrete; • provided with a means to protect against formation of and ignition of vapors within the vault if the waste being stored or treated meets the definition of ignitable or reactive waste under 40 CFR 261.21 or 261.23; and • provided with an exterior moisture barrier or otherwise designed or operated to prevent migration of moisture into the vault if the vault is subject to hydraulic pressure.		40 CFR 264.193(e)(2) TDEC 0400-12-01-.06(10)(d)(5)(ii)

	Double-walled tanks must be: • designed as an integral structure (i.e., an inner tank completely enveloped within and outer shell) so that any release from the inner tank is contained by the outer shell; • protected, if constructed of metal, from both corrosion of the primary tank interior and of the external surface of the outer shell; and • provided with a built-in continuous leak detection system capable of detecting a release within 24 hours, or at the earliest practicable time.		40 CFR 264.193(e)(3) TDEC 0400-12-01-.06(10)(d)(5)(iii)
	Ancillary equipment must be provided with secondary containment (e.g., trench, jacketing, double-walled piping) that meets the requirements of 40 CFR 264.193(b) and (c) (TDEC 0400-12-01-.06[10][d][2] and [3]) except for: • aboveground piping (exclusive of flanges, joints, valves, and other connections) that are visually inspected for leaks on a daily basis; • welded flanges, welded joints and welded connections, that are visually inspected for leaks on a daily basis; • seamless or magnetic coupling pumps and seal-less valves, that are visually inspected for leaks on a daily basis; and • pressurized aboveground piping systems with automatic shut-off devices (e.g., excess flow check valves, flow metering shutdown devices, loss of pressure actuated shut-off devices) that are visually inspected for leaks on a daily basis.		40 CFR 264.193(f) TDEC 0400-12-01-.06(10)(d)(6)
Design and installation of a RCRA surface impoundment	Must install a liner system consisting of two or more liners and a leachate collection and removal system, constructed in accordance with 40 CFR 264.221(c)(1)-(4) (TDEC 0400-12-01-.06[11][b][3][i]-[iv]).	Storage of RCRA hazardous waste in a new surface impoundment—**relevant and appropriate**	40 CFR 264.221(c) TDEC 0400-12-01-.06(11)(b)(3)
	Must implement a leak detection system capable of detecting, collecting and removing leaks of hazardous constituents from all areas of the top liner during the active life and post-closure care period.		40 CFR 264.221(c)(2) TDEC 0400-12-01-.06(11)(b)(3)(ii)
	Must design, construct and maintain dikes with sufficient structural integrity to prevent massive failure.		40 CFR 264.221(h) TDEC 0400-12-01-.06(11)(b)(8)
	Alternative design practices to those in 40 CFR 264.221(c) (TDEC 0400-12-01-.06[11][b][3]) may be approved by the Regional Administrator.		40 CFR 264.221(d) TDEC 0400-12-01-.06(11)(b)(4)
Design and operation of a RCRA container storage area	Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by paragraph (b) of this section, except as provided by paragraph (d) of this section or provided that: (1) Area must be sloped or otherwise designed and operated to drain liquid from precipitation, or (2) The containers must be elevated or otherwise protected from contact with accumulated liquid.	Storage of RCRA hazardous waste in containers that do not contain free liquids—**applicable**	40 CFR 264.175(c) TDEC 0400-12-01-.06(9)(f)(3)
	Area must have a containment system designed and operated in accordance with 40 CFR 264.175(b) as follows: • a base must underlie the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed; • base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids; • must have sufficient capacity to contain 10 percent of the volume of containers or volume of largest container, whichever is greater; • run-on into the system must be prevented unless the collection system has sufficient capacity to contain any run-on which might enter the system along with volume required for containers immediately above; and • spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in a timely manner as or necessary to prevent overflow of the collection system.	Storage in Containers: Storage of RCRA hazardous waste with free liquids or F020, F021, F022, F023, F026 and F027 in containers—**applicable**	40 CFR 264.175(a), (b), and (d) TDEC 0400-12-01-.06(9)(f)
Pre-operation/operation of a RCRA tank system (tanks and piping)	Prior to use, must ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation.		40 CFR 264.192(b) TDEC 0400-12-01-.06(10)(c)(2)
	Prior to use, must inspect the system for the presence of weld breaks, punctures, scrapes of protective coatings, cracks, corrosion, other structural damage, or inadequate construction/installation. All discrepancies must be remedied before the system is covered, enclosed or placed in use.		40 CFR 264.192(b)(1)-(6) TDEC 0400-12-01-.06(10)(c)(2)(i)-(vi)
	Prior to use, tanks and ancillary equipment must be tested for tightness. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) must be performed prior to the system being placed into use.		40 CFR 264.192(d) TDEC 0400-12-01-.06(10)(c)(4)
Control of air emissions from an above-grade RCRA tank system	The requirements of 40 CFR 264 Subpart CC do not apply to a waste management unit that is used solely for on-site treatment or storage of hazardous waste that is generated as a result of implementing remedial activities required under CERCLA authorities.	Storage of RCRA hazardous waste in a new tank system—**relevant and appropriate**	40 CFR 264.1080(b)(5) TDEC 0400-12-01-.32(a)(2)(v)
	Must comply with the requirements of 40 CFR 264.196 (TDEC 0400-12-01-.06[10][g]) if a leak or a spill occurs in the tank system.		40 CFR 264.194(c) TDEC 0400-12-01-.06(10)(e)(3)
Operation of a RCRA surface impoundment	Design and operate facility to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error.	Storage of RCRA hazardous waste in a surface impoundment—**relevant and appropriate**	40 CFR 264.221(g) TDEC 0400-12-01-.06(11)(b)(7)
	Remove surface impoundment from operation if the dike leaks or if there is a sudden drop in liquid level.		40 CFR 264.227 TDEC 0400-12-01-.06(11)(h)

Closure of a RCRA tank system	Must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.) contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless 40 CFR 261.3(d) (TDEC 0400-12-01-.02[1][c][4]) applies. If all contents cannot be practicably removed or decontaminated, consider the tank system a landfill and close in accordance with the landfill closure requirements of 40 CFR 264.310 (TDEC 0400-12-01-.06[14][k]).	Closure of a RCRA hazardous tank system—**relevant and appropriate** if wastewater is determined to be hazardous	40 CFR 264.197(a) and (b)TDEC 0400-12-01-.06(10)(h)(1) and (2)
Closure and post-closure care of a surface impoundment	Must remove or decontaminate all waste residues and contaminated materials; otherwise free liquids must be removed, the remaining wastes stabilized to a bearing capacity sufficient to support final cover, and the facility closed and covered with a final cover designed in accordance with 40 CFR 264.228(a)(2)(iii)(A)-(E) (TDEC 0400-12-01-.06[11][i][1][ii][III]). If some waste residues or contaminated materials are left in place at final closure, must comply with all postclosure requirements contained in §§264.117 through 264.120 (TDEC 0400-12-01-.06[7][h] through [k]), including maintenance and monitoring throughout the postclosure period. Must also: • maintain integrity and effectiveness of final cover, making repairs to the cap as necessary; • maintain and monitor leak detection system; • maintain and monitor groundwater monitoring system; • prevent run-on and runoff from eroding or otherwise damaging final cover.	Closure of a hazardous waste surface impoundment—**relevant and appropriate** if wastewater is determined to be hazardous	40 CFR 264.228(a) and (b) TDEC 0400-12-01-.06(11)(i)(1) and (2)

167. **Appendix A, ARARs, Table A-2, page A-23.** The following relevant and appropriate requirement has been removed from the ARAR table. Please restore or explain why it is not relevant and appropriate for this action.

Pre-construction activities	Prior to excavation, all bore holes drilled or dug during subsurface investigation of the site, piezometers, and abandoned wells which are either in or within 100 feet of the areas to be filled must be backfilled with a bentonite slurry or other sealant approved by the Commissioner to an elevation at least ten feet greater than the elevation of the lowest point of the landfill base (including any liner), or to the ground surface if the site will be excavated less than ten feet below grade.	Construction of a solid waste disposal facility—**relevant and appropriate**	TDEC 0400-11-01-.04(2)(l)

168. **Appendix A, ARARs, Table A-2, page A-27.** This applicable requirement has been removed from ARARs table. Please restore and include the following language in the "Prerequisite" column: "Generation of RCRA hazardous waste for storage, treatment or disposal – **applicable.**" It is possible that DOE thought that 40 CFR 262.11(d)(2) could be substituted. Please restore the citation below.

	Must obtain a detailed chemical and physical analysis of a representative sample of the waste(s) which at a minimum contains all the information which must be known to treat, store, or dispose of the waste in accordance with 40 CFR 264 and 268.		40 CFR 264.13(a)(1) TDEC 0400-12-01-.06(2)(d)(1)

169. **Appendix A, ARARs, Table A-2, page A-30.** The following solid waste landfill requirements were determined by the three FFA parties to be relevant and appropriate to the operation of EMDF, especially given DOE's assertion that it will not dispose of hazardous waste in the EMDF. Please restore or explain why DOE does not consider them relevant and appropriate.

Operation of a Subtitle D solid waste landfill	A facility must be operated and maintained in a manner to minimize litter. Fencing, diking and/or other practices shall be provided as necessary to confine solid wastes subject to dispersal. All litter must be collected for disposal in a timely manner.	Operation of a Subtitle D solid waste landfill—**relevant and appropriate**	TDEC 0400-11-01-.04(2)(d)
	There must be maintained on-site operating equipment capable of spreading and properly compacting the volume of solid wastes received, and capable of handling the earthwork required. Back-up equipment must be available within 24 hours of primary equipment breakdown.		TDEC 0400-11-01-.04(2)(g)

	Cover material sufficient to meet the initial and intermediate cover requirements of this rule must be available at the facility. If such material must be hauled in from off-site *[i.e., off of ORR]*, at least a 30-day supply must be maintained on site at all times. [*Note: Off-site, as referred to here, is assumed to mean off of the ORR.*]		TDEC 0400-11-01-.04(2)(h)
	Collection and holding facilities associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system. Run-on and run-off must be managed separately from leachate. Other control measures (e.g. temporary mulching or seeding, silt barriers) must be taken as necessary to control erosion of the site.		TDEC 0400-11-01.04(2)(i)
	The operator must take dust control measures as necessary to prevent dust from creating a nuisance or safety hazard to adjacent landowners or to persons engaged in supervising, operating, and using the site. The use of any dust suppressants (other than water) must be approved prior to use.		TDEC 0400-11-01.04(2)(j)
	There must be installed on-site a permanent benchmark (e.g., concrete marker) of known elevation.		TDEC 0400-11-01.04(2)(o)
Waste handling activities at a solid waste landfill	Solid waste disposal activities shall be confined to the smallest practicable area. Compaction will be performed as necessary to ensure a stable fill..	Land disposal of solid waste—**relevant and appropriate**	TDEC 0400-11-01-.04(6)(b)(1)
	Emplaced solid wastes shall be covered with soil or other material of such depths and at such intervals as is necessary to prevent fire hazards, promote a stable fill, minimize potential harmful releases of solid wastes or solid waste constituents.		TDEC 0400-11-01-.04(6)(b)(2)

170. **Appendix A, ARARs, Table A-2, page A-34 and where appropriate.** The following DOE Order Manual citations were included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G ARARs table. No agreement was reached among the three FFA parties, but EPA believes that these citations are useful in ensuring protective handling of low-level radioactive waste at the EMDF. Please restore. See Footnote 11 in these comments, which indicates that the FFA Parties agreed in the December 7, 2017, Dispute Resolution Agreement on the EMDF RI/FS that this issue would be resolved prior to signature of the ROD. Note that the reference to EMWMF should be changed to EMDF. This error is an artifact because it was extracted from the EMWMF ROD, where the requirement is noted as a TBC.

Characterization of LLW (e.g., wastewater, contaminated PPE)	Shall be characterized using direct or indirect methods and the characterization documented in sufficient detail to ensure safe management and compliance with the WAC of the receiving facility.	Generation of LLW for storage and disposal at a DOE facility—**TBC**	DOE M 435.1-1(IV)(I)
	Characterization data shall, at a minimum, include the following information relevant to the management of the waste: • physical and chemical characteristics; • volume, including the waste and any stabilization or absorbent media; • weight of the container and contents; • identities, activities, and concentrations of major radionuclides; • characterization date; • generating source.		DOE M 435.1-1(IV)(I)(2)
Temporary storage of LLW	Shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water.	Management of LLW at a DOE facility—**TBC**	DOE M 435.1-1(IV)(N)(1)
	Shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.		DOE M 435.1-1(IV)(N)(3)
	Shall be managed to identify and segregate LLW from mixed waste.		DOE M 435.1-1(IV)(N)(6)
	Shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	Storage of LLW in containers at a DOE facility—**TBC**	DOE M 435.1-1(IV)(L)(1)(a)
	Vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.		DOE M 435.1-1(IV)(L)(1)(b)
	Containers shall be marked such that their contents can be identified.		DOE M 435.1-1(IV)(L)(1)(c)
Treatment of LLW	Treatment to provide more stable waste forms and to improve the long-term performance of a LLW disposal facility shall be implemented as necessary.	Generation for disposal of LLW at a DOE facility—**TBC**	DOE M 435.1-1(IV)(O)
Disposal of LLW at an off-site disposal facility or in the EMWMF	LLW shall be certified as meeting waste acceptance requirements before it is transferred to the receiving facility.		DOE M 435.1-1(IV)(J)(2)
Transportation of LLW off-site	LLW waste shall be packaged and transported in accordance with DOE O 1460.1A and DOE O 460.2.	Preparation of off-site shipment of LLW—**TBC**	DOE M 435.1-1(I)(1)(E)(11)
	To the extent practicable, the volume of waste and number of shipments shall be minimized.		DOE M 435.1-1(IV)(L)(2)

171. **Appendix A, ARARs, Table A-2, page A-46.** The following requirement related to closure of a low-level waste landfill was included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G ARARs table but was removed from the ROD. Please restore.

Closure of a LLW landfill	Covers must be designed to minimize to the extent practicable water infiltration, to direct percolating or surface water away from the disposed waste and to resist degradation by surface geologic processes and biotic activity.	Closure of a LLW disposal landfill—**relevant and appropriate**	TDEC 0400-20-11-.17(2)(d)

172. **Appendix A, ARARs, Table A-2, page A-47.** The following requirement relating ot the abandonment of groundwater monitoring wells was included in the 12.7.17 Dispute Resolution Agreement attachment, RI/FS Appendix G ARARs table but was removed from the ROD. Please restore.

Closure of groundwater monitoring well(s)	Shall be accomplished by a licensed driller.	Permanent plugging and abandonment of a well—	TDEC 0400-45-09-.16(2)

173. **Appendix A, ARARs, Table A-2, page A-48 and where appropriate.** The following requirements were included in the January 19, 2021, letter to DOE from Peter Wright, as additional water discharge-related ARARs that should be included in the FFS. They should also be included in the ROD, per the discussion in the December 31, 2020, Wheeler Decision in the FFS dispute.

Use of Reporting Limits	In instances where permit limits established through implementation of these criteria are below analytical capabilities, compliance with those limits will be determined using the following reporting limits, unless in specific cases other reporting limits are demonstrated to be the best	Point source discharge of pollutants as defined in 40 CFR 122.2 into surface water – **Applicable**	TDEC 0400-40-03-.05(8)
Development of effluent limitations	For new sources, technology-based effluent limitations shall require the greatest degree of effluent reduction achievable through application of the best available demonstrated control technology, which shall be new source performance standards, if available.	Discharges of pollutants as defined in 40 CFR 122.2 from "*new sources*" – **Applicable**	TDEC 0400-40-05-.08(1)(b)
	Toxic effluent limitations shall be based on consideration of the toxicity of the pollutant, its persistence, its degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affective organisms and the nature and extent of the effect of the toxic pollutant on such organisms.	Discharge of toxic pollutants as defined in 40 CFR 122.2 into surface water – **Applicable** Point source discharge of radionuclides into surface water – **Relevant and Appropriate**	TDEC 0400-40-05-.08(1)(d)
	All effluent limitations or standards shall meet or exceed any minimum standards promulgated by the Administrator and currently effective under the Federal Water Pollution Control Act, P.L. 92-500 as amended or any subsequent applicable acts.		TDEC 0400-40-05-.08(1)(f)
	All pollutants shall receive treatment or corrective action to insure compliance with effluent limitations established by the US EPA pursuant to Section 301 and 302 and standards of performance for new sources pursuant to Section 306, effluent limitations and prohibitions and pretreatment standards pursuant to Section 307 of the Federal Water Pollution Control Act, P.L. 92-500 as amended; also to insure compliance with any approved water quality standard.		TDEC 0400-40-05-.08(1)(g)

174. **Appendix A, ARARs, Table A-2, page A-50.** See the citation to 40 CFR 122.44(i)(1). The table omitted a requirement from subpart iii, noted in the January 19, 2021, letter to DOE from Peter Wright. Please include in the "Requirements" column along with (i) and (ii).

(iii) Other measurements as appropriate including pollutants in internal waste streams under § 122.45(i); pollutants in intake water for net limitations under § 122.45(f); frequency, rate of discharge, etc., for non-continuous discharges under § 122.45(e); pollutants subject to notification requirements under§ 122.42(a); and pollutants in sewage sludge or other monitoring as specified in 40 CFR part 503; or as determined to be necessary on a case-by-case basis pursuant to section 405(d)(4) of the CWA.

175. **Appendix A, ARARs, Table A-2, page A-52.** In the "Prerequisite" cell for the citation to 40 CFR 122.45(e), it should contain the following text: "Point source discharge of radionuclides into surface water—**relevant and appropriate."** Please include. Also, please delete the phrase "if water is released on a non-continuous batch basis rather than continuously" after "**applicable.**" It is not necessary as the text already describes it as non-continuous discharge.

176. **Appendix A, ARARs, Table A-2, page A-52.** In the row of citations regarding bypass (TDEC 0400-40-05-.07(2)(l) and (m)), in the "Prerequisite" column please add the following text, since these requirements should be noted as relevant and appropriate to radionuclides in the waste stream: "Bypass, as defined in TDEC 0400-40-05-.02(15), of waste stream—**relevant and appropriate** to radionuclides)."

177. **Appendix A, ARARs, Table A-2, page A-52.** The following citation was included in the D2 FFS. When DOE prepared the D3 FFS, it omitted the citation to TDEC 0400-40-05-.09(1)(b). This should be restored to the FFS. It does not need to be included as shown below, grouped with the other TN CWA requirements. It must, however, be included because there are no effluent guidelines for discharge into surface water of pollutants contained in Superfund wastewater; and the applicable requirement below directs how to develop technology-based effluent limits in this situation. The last sentence in the text box below is the appropriate text to include in the "Requirement" column, and the "Action" and "Prerequisite" columns can use the text box language below.

Release of contact water and leachate into Bear Creek tributary	Shall receive the degree of treatment or effluent reduction necessary to comply with water quality standards and, where appropriate, will comply with the "Standard of Performance" as required by TN Water Quality Control Act at TCA §§69-3-101, et seq. For industrial discharges without applicable federal effluent guidelines, best professional judgment should be employed to determine appropriate effluent limitations and standards.	Point source discharge(s) of pollutants into waters of the U.S. —**applicable**	TCA §§69-3-101 *et seq.* TDEC 0400-40-03-.05(6) TDEC 0400-40-05-.09(1)(b)

178. **Appendix A, ARARs, Table A-2, page A-53.** The following requirements were included in the January 19, 2021, letter to DOE from Peter Wright, as additional RCRA landfill water discharge-related ARARs that should be included in the FFS. They should also be included in the ROD, per the December 31, 2020, Wheeler Decision in the FFS dispute.

Discharge of wastewater from RCRA hazardous waste landfills	Except as provided in 40 CFR § 125.30 through § 125.32, any existing point source subject to this subpart must achieve the Effluent Limitations listed in the regulation for each regulated parameter[2] which represent the application of *best practicable control technology* (BPT).	Discharge of wastewater[3] from landfills subject to 40 CFR Part 264, from an *"existing "*source – **Applicable**	40 CFR § 445.11 *Effluent limitations attainable by the application of BPT.*
	Except as provided in 40 CFR § 125.30 through § 125.32, any existing point source subject to this subpart must achieve the following effluent limitations which represent the application of *best available technology economically* (BAT): Limitations for ammonia (as N), a-terpineol, aniline, benzoic acid, naphthalene, p-cresol, phenol, pyridine, arsenic, chromium		40 CFR § 445.13 *Effluent limitations representing the degree of effluent reduction attainable by the application of BAT.*

	and zinc are the same as the corresponding limitations specified in §445.11.		
	Any new source subject to this subpart must achieve the following performance standards: Standards are the same as those specified in § 445.11.	Discharge of wastewater[1] from landfills subject to 40 CFR Part 264, from a *"new"* source – **Applicable**	40 CFR § 445.14 *New source performance standards*

[2] Radionuclides are not on the list of *regulated parameters*.

[3] "*Landfill wastewater* means all wastewater associated with, or produced by, landfilling activities except for sanitary wastewater, non-contaminated storm water, contaminated ground water, and wastewater from recovery pumping wells. Landfill wastewater includes, but is not limited to, leachate, gas collection condensate, drained free liquids, laboratory derived wastewater, contaminated storm water and contact wash water from washing truck, equipment, and railcar exteriors and surface areas which have come in direct contact with solid waste at the landfill facility." 40 CFR 445. 2(f). "*Contaminated storm water* means storm water which comes in direct contact with landfill wastes, the waste handling and treatment areas, or landfill wastewater as defined in paragraph (f) of this section. Some specific areas of a landfill that may produce contaminated storm water include (but are not limited to): the open face of an active landfill with exposed waste (no cover added); the areas around wastewater treatment operations; trucks, equipment or machinery that has been in direct contact with the waste; and waste dumping areas." 40 CFR 445.2(b).

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**
Wetlands			
Presence of wetlands	Shall take action to minimize the destruction, loss or degradation of wetlands and to preserve and enhance beneficial values of wetlands. *NOTE*: Federal agencies required to comply with E.O. 11990 requirements.	Federal actions that involve potential impacts to, or take place within, wetlands – **TBC**	Executive Order 11990 Section 1.(a) *Protection of Wetlands*
	Shall avoid undertaking construction located in wetlands unless: (1) there is no practicable alternative to such construction, and (2) the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.		Executive Order 11990, Section 2.(a) *Protection of Wetlands*
Presence of Wetlands (as defined in 44 C.F.R. § 9.4)	The Agency shall minimize[15] the destruction, loss or degradation of wetlands. The Agency shall preserve and enhance the natural and beneficial wetlands values.	Federal *actions affecting or affected by Wetlands* as defined in 44 C.F.R. § 9.4 – **Relevant and Appropriate**	44 C.F.R. § 9.11(b)(2) and (b)(4) *Mitigation*
	The Agency shall minimize: • Potential adverse impact the action may have on wetland values.		44 C.F.R. § 9.11(c)(3) *Minimization provisions*
General Compensatory Mitigation for Wetlands	Compensatory mitigation required to offset unavoidable impacts to waters of the United States authorized by DA permits. Compensatory mitigation requirements must be commensurate with the amount and type of impact that is associated with a particular DA permit. • Amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. • Compensatory mitigation may be provided through mitigation banks or in-lieu fee programs.	Alteration of wetlands requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.93(a)(1) *General compensatory mitigation requirements*

[15] *Minimize* means to reduce to smallest amount or degree possible. 44 C.F.R. § 9.4 Definitions.

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**
	• Implementation of the compensatory mitigation project shall be, to the maximum extent practicable, in advance of or concurrent with the impact-causing activity. *NOTE*: Although permits are not required per CERCLA Section 121(e)(1), consultation with the USACE recommended to determine mitigation of any adverse impacts. Such mitigation would be performed as part of the remedial action.		
General Compensatory Mitigation for Wetlands	Compensatory mitigation may be performed using the methods of restoration, enhancement, establishment, and in certain circumstances preservation. Restoration should generally be the first option considered because the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation.	Alteration of wetlands requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.93 (a)(2)
	All compensatory mitigation projects must comply with the standards in this part [40 CFR Part 230], if they are to be used to provide compensatory mitigation for activities authorized by DA permits, regardless of whether they are sited on public or private lands and whether the sponsor is a governmental or private entity. *NOTE:* Although permits are not required per CERCLA Section 121(e)(1), consultation with the USACE recommended to determine mitigation of any adverse impacts. Such mitigation would be performed as part of the remedial action.		40 C.F.R. § 230.93 (a)(3)
	Required compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services, taking into account such watershed scale features as aquatic habitat diversity, habitat connectivity, relationships to hydrologic sources (including the availability of water rights), trends in land use, ecological benefits, and compatibility with adjacent land uses.		40 C.F.R. § 230.93 (b) *Type and location of mitigation*

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**
	Project site must be ecologically suitable for providing the desired aquatic resource functions. In determining the ecological suitability of the compensatory mitigation project site, the district engineer must consider, to the extent practicable, the factors in subsections (i) thru (vi). Applicants should propose compensation sites adjacent to existing aquatic resources or where aquatic resources previously existed.		40 C.F.R. § 230.93 (d)(1) and (3) *Site selection*
	In general, in-kind mitigation is preferable to out-of-kind mitigation because it is most likely to compensate for the functions and services lost at the impact site. Except as provided in paragraph (e)(2) of this section, the required compensatory mitigation shall be of a similar type to the affected aquatic resource.		40 C.F.R. § 230.93 (e)(1) *Mitigation type*
	The amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. Where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used.		40 C.F.R. § 230.93 (f)(1) *Amount of compensatory mitigation*
	Implementation of the compensatory mitigation project shall be, to the maximum extent practicable, in advance of or concurrent with the activity causing the authorized impacts. The district engineer shall require, to the extent appropriate and practicable, additional compensatory mitigation to offset temporal losses of aquatic functions that will result from the permitted activity.		40 C.F.R. § 230.93 (m) *Timing*
Compensatory Mitigation Planning	Prepare a mitigation plan addressing objectives, site selection, site protection, baseline information, determination of credits, mitigation work plan, maintenance plan, performance standards, monitoring requirements, long-term management, and adaptive management.	Alteration of wetlands requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.94(c) *Mitigation Plan*

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**
	NOTE: Plan would be part of CERCLA document, such as a Remedial Action Work Plan. Plan to include items described in 40 C.F.R. § 230.94(c)(2) through (c)(14).[16]		
Compensatory Mitigation Performance Standards	The approved mitigation plan must contain performance standards that will be used to assess whether the project is achieving its objectives. Performance standards should relate to the objectives of the compensatory mitigation project, so that the project can be objectively evaluated to determine if it is developing into the desired resource type, providing the expected functions, and attaining any other applicable metrics (e.g., acres).	Alteration of wetlands requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.95 (a) *Ecological Performance Standards*
	Performance standards must be based on attributes that are objective and verifiable. Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner. Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, and/or comparisons to reference aquatic resources of similar type and landscape position. The use of reference aquatic resources to establish performance standards will help ensure that those performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology should take into consideration the hydrologic variability exhibited by reference aquatic resources, especially wetlands.		40 C.F.R. § 230.95 (b) *Ecological Performance Standards*

[16] If mitigation obligations will be met by securing credits from approved mitigation banks or in-lieu fee programs, mitigation plan need include only items described in Section 230.94(c)(5) and (c)(6), and name of mitigation bank or in-lieu fee program. 40 C.F.R. § 230.94(c)(1).

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**
Compensatory Mitigation Project Monitoring	Monitoring the compensatory mitigation project site is necessary to determine if the project is meeting its performance standards, and to determine if measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. Compensatory mitigation project monitoring period shall be sufficient to demonstrate that project has met performance standards, but not less than five (5) years.	Alteration of wetlands requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.96 (a) and (b) *Monitoring*
Compensatory Mitigation Project Management	The aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. For government property, long-term protection may be provided through federal facility management plans or integrated natural resources management plans. *NOTE:* Plan would be part of CERCLA document, such as a Remedial Action Work Plan and/or Operations & Maintenance Plan.	Alteration of wetlands on *government property* requiring compensatory mitigation to replace lost aquatic resource functions – **Relevant and Appropriate**	40 C.F.R. § 230.97 (a)(1) *Site Protection*
	Projects shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. This includes minimization of active engineering features (e.g., pumps) and appropriate siting to ensure that natural hydrology and landscape context will support long-term sustainability. Where active long-term management and maintenance are necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party must provide for such management and maintenance.		40 C.F.R. § 230.97 (b) *Sustainability*

ARAR = applicable *or* relevant and appropriate requirement
CFR = Code of Federal Regulations NWP = Nationwide Permit

Table. Location-Specific Federal ARARs and TBCs for Wetlands [excludes CWA 404(b) requirements]

LOCATION–SPECIFIC ARARs/TBC			
Location	**Requirement**	**Prerequisite**	**Citation**

CWA = Clean Water Act
DA = Department of the Army
FL = State of Florida
TBC = To Be Considered
USACE = U.S. Army Corps of Engineers
U.S.C. = United States Code