UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 1, 2016

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
4SD

Mr. John Michael Japp
Federal Facility Agreement Manager
Department of Energy
Oak Ridge Office of Environmental Management
P.O. Box 2001
Oak Ridge, Tennessee 37831

SUBJ: D2 Focused Feasibility for
CERCLA Landfill Combined Waste Water Management
(DOE/OR/01-2664&D2; February 2016)
DOE Oak Ridge Reservation
Oak Ridge, Tennessee

Dear Mr. Japp:

The U.S. Environmental Protection Agency completed its review of the subject document received on March 1, 2016. EPA finds the response to several General and Specific Comments and the revisions to the D1 document to be insufficient. Accordingly, pursuant to FFA Section XXI.H, the EPA cannot approve the subject document. Specifically, the document revisions related to EPA's General Comments 1, 7, 8, 9, 11, 12, 23-31, 37, 38 and 49, and Specific Comments 5, 21 and 22 require resolution, as summarized in the enclosed summary. The EPA hereby invokes dispute resolution over these matters. Additional Comments are provided that should be considered in finalizing the document.

The EPA looks forward to working with the Department of Energy Oak Ridge Reservation (DOE ORR) and the Tennessee Department of Environment and Conservation through the informal dispute process pursuant to FFA Section XXVI.B for a timely resolution of these matters in support of final document revisions and approval. The EPA recommends that the Project Managers (i.e., both Project Team and FFA Project Managers), their immediate supervisors and all necessary support staff (e.g., attorneys and key contractors) participate in an informal dispute resolution meeting on these matters.

If you have any questions regarding this matter, please call me at (404) 562-8546.

Sincerely,

Jeffrey L. Crane
FFA Project Manager
Restoration & DOE Coordination Section
Superfund Division

Enclosure

cc: Randy Young, TDEC
ORSSAB
Amy Fitzgerald, City of OR

EPA Informal Dispute Summary

Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee (DOE/OR/01-2664&D2, February 2016)

General Comment 1

DOE ORR's overall conclusions in Appendix K to the FFS states that DOE Order 458.1 will be used for establishing discharge limits for radionuclides. EPA appreciates the analysis provided in Appendix K. However, the conclusions and recommendations are not consistent with the comment and EPA Policy (See attached EPA OSWER Guides 9200.4-18, August 22 1997 and 9285.6-20, June 13, 2014). Where AWQCs are not available, risk-based discharge limits shall be used to protect human health and the environment. DOE Order 458.1 is not cited as an ARAR and is not consistent with EPA Policy. As requested in the comment, DOE ORR should have used the Table K.12 risk-based values in the FFS to evaluate alternatives that would achieve varying levels of these risk-based standards in alternatives to compare against the NCPs five balancing criteria. Absent an evaluation of alternatives for varying levels of Preliminary Remediation Goals, EPA expects the 10^{-6} Excess Lifetime Cancer Risk values developed in Appendix K to be used for establishing the radionuclide COC discharge standards for all alternatives (including existing permitted facilities). Also, consistent with Table D.2, Footnote b, 10^{-6} risk levels are appropriate for setting recreational criteria discharge standards. All current and future discharges to surface water must meet these risk-based discharge criteria.

General Comment 7

Alternatives 2, 3 and 4 all appear to include some currently indefinite period of managed discharge (i.e., protective/ARAR compliant discharge via direct discharge or the PWTC) while waiting on construction of the waste water conveyance systems and treatment systems (e.g., LWTS, pretreatment, PWTC upgrades, OF 200). This should be clarified in the document (e.g., Section 3.3.1, p. 30). The Appendix D and Appendix K discharge standards, consistent with the discussion related to General Comment 1 above and the following discussion related to AWQCs, must apply to managed discharge, including new discharges of EMWMF leachate.

Managed discharge standards must include the lowest of the appropriate AWQC discharge standards for Bear Creek stream classification. This includes recreational standards for the group of four pesticide Key COCs.

Treatment system discharge standards (e.g., LWTS, PWTC, OF 200 and pre-treatment) must include the same list of discharge standards used for managed discharge, consistent with the appropriate stream classification (e.g., White Oak Creek, East Fork Poplar Creek). In short, a single set of discharge standards for the protective management of waste waters should be accumulated and presented in a single table in Section 2.2.

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General Comment 8.b and Specific Comments 11, 25, 27 - 31, 37, 38 and 49

The PWTC is proposed to be a portion of Alternative 2 and the primary component of Alternative 3 as an onsite response action under the scope of this operable unit remedial action. Please clarify why DOE removed the WETF but retained the PWTC, when the EPA comments are essentially the same.

Whereas the PWTC permitted facility may have a WAC that must be met, the scope of this operable unit is not limited to compliance with the WAC and unspecified pretreatment actions. Both the PWTC and specific pretreatment (i.e., not limited to a statement of pretreatment) response actions must be included in the scope of the remedy, including assurance that pretreatment and PWTC treatment meet the threshold criteria.

DOE notes that the Process Water Treatment Complex (PTWC) is the designated "onsite" facility for treatment and disposal of leachate and contact water (where treatment is necessary to meet surface water quality criteria). Generally, designating part of the remedial action as "onsite" results in a requirement to identify the substantive legal requirements that are applicable or relevant and appropriate (ARAR) to the chemical, location or action. Whether a new or an existing facility, if it is onsite, the RI/FS (or, in this case, the FFS) and Record of Decision must identify the ARARs. If a permitted facility is not considered onsite, then the CERCLA documents need not identify the ARARs, but it must be verified that the permitted facility will meet all legal requirements and that the permit is set up to characterize and treat the COCs to protective levels. This is generally accomplished via an "off-site acceptability" determination. The PTWC does not have "off-site acceptability" at this time. Please submit this facility for an offsite acceptability determination or identify the ARARs (and treatment levels/discharge limits) for all alternatives in this RI/FS. EPA agrees with the summary discussed in Section 2.3, p. 22, about onsite versus off-site. Please ensure that all ARARs are identified for all alternatives in this RI/FS. That is, if one alternative sends waste waters to PWTC, then please include all substantive requirements for that onsite facility.

General Comments 9 and 30 and Specific Comment 52

As discussed above, a single set of discharge standards must apply for the various treatment response actions and managed discharge. Because of the frequency of the batch discharges, including significant increases for leachate direct discharge, the lowest of Recreational and Fish and Aquatic Life (CCC) should be used, the same as for the treatment plant continuous discharges. This FFS was undertaken, in part to remedy the "situation" at EMWMF where generated waste waters needed to be disposed of in protective and legally compliant manner. To the degree that there is currently-generated waste water that exceeds the AWQC for the correct classification of Bear Creek, the PWTC should be considered the "managed" (prior to the construction of new waste water treatment facilities) component of both Alternatives 2 and 4.

The current practice of discharging to Bear Creek at the "fish and aquatic" classification is inconsistent with its classification as both fish and aquatic AND recreational. All current and future discharges to surface water must meet these criteria.

General Comments 11, 12, 23

It is not clear whether Alternative 3 PWTC includes the cost of the facility life extension for redesign and construction to ensure this alternative remains viable for the duration of the required response action. If that is necessary for this operable unit to meet RAOs, then its cost should be included or justified as to why it is assured via other funding mechanisms that are assured. Confirm all costs of each alternative are included.

General Comment 24

The comment response has not apparently been acted upon as suggested. Describe specific efforts DOE has taken to provide the comment to the FFA Project Managers. There has been no discussion by DOE on this matter to milestone an NT-8 response action despite numerous attempts to seek a milestone for the project by EPA and TDEC, subsequently milestoning the project only latter to be deferred by DOE and no longer milestoned.

General Comment 25

The specific rationale for precluding listed waste remains unclear. Additionally, a specific response to the specific issues were not provided.

General Comments 26

The comment response does not address monitoring of the benthic community composition and fish, rather simply states details will be addressed in the SAP/QAPP. General monitoring requirements, including fish tissue monitoring for assessing bioaccumulation in fish, should be included in the alternatives to ensure sufficient cost estimations and the general development of alternatives are complete.

The comment response states that the document was revised to indicate monitoring will comply with ARARs and risk based levels. Confirm where this was added to the document.

General Comment 27

The derived U metal discharge limit does not appear to be protective of ecological receptors. Furthermore, Bear Creek continues to fail to meet the Phase I IROD uranium flux goal issued

sixteen years ago. Additional loading of U metal should be carefully considered for protection of both human and ecological receptors. See the attached discussion on this matter.

Specific Comment 5

RRLs are not appropriate in lieu of AWQCs due to source of the Key COC.

Specific Comment 21

It could not be found where the bullets were updated as stated in the comment response.

Specific Comment 22

The response states that the sampling frequencies have been included in the FFS as assumptions for the purpose of preparing a cost estimate, and actual sampling frequencies will be determined in the SAP/QAPP. The response also states that additional text has been added to explain the basis for the basis of the sampling frequencies. While the text added to Appendix L of the D2 FFS does describe the sampling frequencies, the text does not state why the selected sampling frequencies (for costing purposes) were deemed appropriate. Therefore the response and text revisions are insufficient, as follows:

- The text in the bulleted items on page L-5 states, "Total Organic Carbon (TOC) will be used as an indicator of the potential presence of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs)". However the text does not specify the frequency of sampling for TOC.

- The text in Appendix L indicates mobile constituents will be collected from the landfill wastewater discharge every other year. [Note that the header for this segment on page L-5 refers to 'Annual Samples', however the proposed sampling frequency is bi-annual, therefore the header requires revision as such.] The basis for proposing a bi-annual sampling frequency for mobile constituents is not provided.

- The text on page L-6 states that bi-annual samples will be collected for the full suite of COCs [contaminants of concern]; however the basis for the bi-annual sampling frequency has not been provided.

- Table L.3 (Annual mobile constituent analyte list) does not include all of the key COCs in contact water and leachate that may be considered mobile, such as Technetium-99 which is listed in Table L.1.

It is important that the FFS contain reasonably accurate assumptions so that the proposed remedial alternatives can be evaluated based on the best information possible. Further discussion and agreement between the FFA parties is required to resolve this concern.

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New Specific Comments Related to Issues Described Above

1. Section 3.3.3, page 31. Please revise the first sentence to state that the waste water is initially discharged to Bear Creek only in the instance that it meets the applicable stream classification water quality criteria. The No Action alternative, which is not protective, should be the only alternative in which discharge at the current levels in Table 6 are included. Please revise the last sentence in the Summary paragraph by replacing "current" with "legally applicable" to clarify that this alternative re-establishes the appropriate discharge limits shown in the right-most column of Table 6.

2. Section 3.3.3, page 33. Consistent with the preceding comment, please remove the text that states that discharge of waste water to Bear Creek will be at "current discharge limits (Table b). . ." The discharge limits in "Discharge Limits – Managed Discharge" are neither protective nor consistent with legally applicable requirements. This action must, upon implementation, be compliant with the two threshold criteria of CERCLA: be (1) protective and (2) satisfy ARARs. This current approach to "managed" discharge levels in the second to right most column of Table 6 is neither when it anticipates discharging to Bear Creek at levels above the current stream classification.

3. Section 3.3.3, page 36. The legal requirements for discharge to Bear Creek will be identified in the ARARs table, but this section should remove any text that suggests that this remedial decision will support (or evaluate) anything other than meeting the legal requirements for the more stringent of the two applicable stream classifications, fish and aquatic and recreational. Further, please clarify whether this system envisions continuous or non-continuous discharge, since the legal requirements are not the same. This section states that the water will be sampled once per week, so this might indicate a non-continuous system, but please clarify using the terminology of the regulation. TDEC 0400-40-05-.08.

4. Section 3.3.3, page 36. In the last paragraph, please clarify whether it is an accurate statement that treatment is not currently necessary to achieve legally-required discharge limits. As earlier comments have pointed out, EPA does not support using the limits in the "Managed Discharge" column of Table 6 post-ROD.

5. Section 3.3.3, page 37. The first full paragraph states that additional management controls may be needed but will not require either treatment or transportation. Please clarify whether it is expected that these parameters will exceed legal requirements and specify which ones.

6. Section 3.3.4.1, page 38, last paragraph. Since all onsite components of a remedy must meet ARARs, this FFS should include all legal requirements (ARARs) for the discharge from both EMWMF and EMDF. In order to be able to consider the PWTC to be part of a viable alternative, please review the PWTC permit to ensure that all COCs for this onsite CERCLA action are identified in the PWTC and that the limits for such COCs are established in the permit consistent with the values set in this FFS. As a point of clarification, however, the EMWMF ROD established the definition of "onsite" for

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purposes of building EMWMF, not for designating all facilities on Oak Ridge Reservation as "onsite". Other facilities might be considered "onsite", in which case the ARARs will be identified in the operable unit's administrative record and decision document(s). (Same comment applies to Alternative 4, page 48-49.)

7. Section 3.3.4.1, page 39. The second full paragraph states that pre-treatment will be required in order to extend the design life of the PWTC. Table 7 identifies "waste acceptance criteria" for a set of contaminants for the PWTC; ensure that this list includes all COCs. In addition, if this is part of an onsite response action, the report establishing a WAC should be reviewed and approved by EPA. Further, see the immediately preceding comment and note that the FFS will need to specify the discharge limits for the COCs arising from EMWMF and EMDF and to ensure that the permit limits are consistent.

8. Section 3.3.4.1, page 43. It is not clear that the PWTC is a viable alternative since a permit variance will have to be granted in order to allow for treatment of mercury and a permit modification for 'longer-term' treatment of mercury. If mercury is the only COC that cannot be handled by PWTC, then perhaps it can retained as an interim management of EMWMF and EMDF, prior to placement of mercury in EMDF.

9. Section 3.3.5.1, page 49. It is not clear why a treatability study will follow this FFS to determine whether an alternative will require pre-treatment or not. In the future, any studies that impinge on the definition of an alternative should precede the FFS or RI/FS.

10. Section 3.3.5.1, page 52. The first paragraph under "Support Activities" states that pretreatment will increase the operating costs for this facility. Please ensure that these costs are included in the comparison of alternatives in this FFS, rather than being lost or diverted to another remedial action.

11. Section 3.3.5.1, page 52. In the last paragraph, the inclusion of treatment prior to construction of OF200 as an "if" is misleading. Treatment is anticipated to be needed for EMWMF immediately, so this alternative is not viable for addressing the water problem at EMWMF. The addition of immediate treatment is necessary for this alternative to be viable to address both waste cells.

12. Section 4.3.2, page 62. As noted above, discharge to Bear Creek at current levels is not tied to the current stream classification (or more stringent of two stream classifications) and, therefore, inconsistent with the law. Prior to the construction LWTS, the waste water must be sampled and treated prior to discharge if it exceeds levels protective of the receiving water at the correct classification.

13. Section 4.3.2, page 63, Protection of Human Health and the Environment. The first paragraph states that the alternative will meet discharge limits prior to discharge. As the FFS is written and prior comments have noted, this is not a true statement. The current discharge limits were a temporary place-holder until a final solution could be developed. Continuing discharge at levels that do not comply with the law is not a final solution. Once changes to the FFS consistent with these comments have been made, this statement

will be true. There is more than the anti-degradation requirements to be met when discharging to surface water.

14. Section 4.3.2, page 63, Effectiveness. Same comment as comment 13.

15. Section 4.3.2, page 63, Compliance with ARARs. Same comment as comment 13.

16. Section 4.3.2, page 64, Effectiveness. Same comment as comment 13.

17. Section 4.3.2, page 65, Capital Cost. The capital cost of $13 million does not take into account the transportation (either by trucking or pipeline) to PWTC as part of the "Managed Discharge" that will be necessary for the discharge to comply with the action-specific ARARs for this project.

18. Section 4.3.3, p. 66. Protection of Human Health and the Environment should include influent/effluent monitoring similar to the LWTS.

19. Section 4.3.3, p. 69 Confirm Alternative 3 includes "lifecycle extension" costs.

20. Section 4.3.4, page 70. The pre-construction treatment of waste water is not addressed in the alternatives analysis. As noted above, prior to the construction of the OF200 treatment system, the waste water will have to meet the ARARs for the designated stream classification, whether discharged to Bear Creek or White Oak Creek. Please make corrections to all parts of this analysis, including cost, to account for this missing component of this alternative.

21. Table D.2, page D-31. It is not clear what is intended by the right-most column. Note that the requirement is that the more stringent of REC or FAL standards must be met in the waste water as it is discharged to surface water.

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Attachment 1

General Comment 27 Follow Up

General Comment #27 referred to the lack of a TDEC AWQC for uranium as a metal (U). The response referred to the response to General Comment #1, which indicated that radionuclides or other constituents that lacked AWQC would use the EPA Radionuclide Preliminary Remediation Goal (PRG) calculator under a recreational scenario. The revised discharge limits for landfill wastewater in Appendix K included a resulting risk-based discharge limit for uranium (soluble salts) of 24 mg U/L for protection of human health (Table K.12). The discharge limit was based on human recreational consumption of fish and incidental water contact. The revised discharge limit for U did not consider protection of aquatic life. The 24 mg U/L in Table K.12 is less conservative than published benchmarks for protection of aquatic life, such as Suter and Tsao (1996) and the Canadian Council of Ministers of the Environment (CCME) science-based goals for freshwater aquatic ecosystems (Table 1).

Table 1. Freshwater Screening Benchmarks for Uranium (CAS 7440-61-1) for Protection of Aquatic Life.

Source	Criterion Continuous Concentration (CCC), mg/L	Criterion Maximum Concentration (CMC), mg/L
Suter and Tsao (1996)	0.0026	0.046
CCME (2011)	0.015	0.033

The benchmarks reported by Suter and Tsao (1996) and CCME (2011) are supported by the body of literature. Recent studies, such as Goulet *et al.* (2015), Horemans *et al.* (2015), and Sheppard *et al.* (2005), have reported the toxicity of uranium in surface water to be pH and hardness dependent. At a water hardness of 120 mg/L as $CaCO_3$ (closest to the hardness of NT-8 water reported on average as 112 mg/L as $CaCO_3$) all aquatic species tested were sensitive to uranium in surface water at concentrations below the revised discharge limit proposed by DOE for protection of human health. No Observable Effects Concentrations (NOECs) ranged from 0.02 mg U/L for *Ceriodaphnia dubia* reproduction to 2.5 mg U/L for *Oncorhynchus mykiss* survival (Goulet *et al.*, 2015). Lowest Observable Effects Concentrations (LOECs) ranged from 0.06 mg U/L to 6.3 mg U/L for the same species and endpoints (Goulet *et al.*, 2015). DOE's response has not addressed EPA's comment regarding protection of ecosystems from U discharges to surface water. A discharge limit lower than 24 mg/L will be necessary to be protective. Moreover, Table 6 should include a discharge limit for U for managed discharges to prevent acute toxicity to aquatic life from short-term exposures associated with batch releases. The units in Table 6 are in micrograms whereas the units in Table K-12 are in milligrams. Please revise the document to correct the units and to add risk-based discharge limits for U from Suter and Tsao (1996).

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Attachment 2

New Comments for Document Finalization

1. Section 2.1, page 17. This short section mentions the EPA guidance, Land Use in the CERCLA Remedy Selection Process, EPA OSWER 9355.7-04. It might be worth adding the following statement prior to the last two sentences: "This guidance was written to assist in the evaluation of how to remediate existing contamination. That is not the nature of this decision. This decision, in contrast, is to evaluate whether and where to locate and construct a landfill to contain CERCLA remediation waste, and so, the reference to this guidance should not be used to suggest that it is directly applicable."

2. Section 3.1, page 23. In the first bullet, please delete the letter "t" in "posted"; it should be "posed".

3. Section 3.3.4.1, page 48. "Documents" mentions Alternative 4, when it likely means 3.

4. Section 3.3.5.1, page 48, Background, first paragraph. The D2 added a statement that OF200 is being designed to remove mercury from UEFPC surface water. Please remove as this purpose is not part of the OF200 review of alternatives or selection of remedy (not yet final).

5. Section 3.3.5.1, page 52. The discussion of how the solid waste streams will be handled applies to the other onsite alternatives (2 and 3). Please include a similar discussion in section 3.3.3.1 and 3.3.4.1.

6. Section 4.2, page 58. Under Criterion 2, replace "may" with "will" in the first sentence of the revised text.

7. Appendix D, page D-4. The second paragraph states that there are five alternatives (there are now four), and includes an incorrect fourth alternative. Please replace with the correct fourth, which uses OF200 (not WETF) to treat and dispose of waste waters.

8. Appendix D, page D-4. The third paragraph states that the FFS set of ARARs "is included" in the EMWMF-EMDF RI/FS. First, there is no EMWMF-EMDF RI/FS. Second, the EMDF RI/FS is still at the D2 stage, and so isn't final. Please delete EMWMF from this sentence and change "is" to "will be."

9. Appendix D, Section D.3.2, page D-6. The second paragraph refers only to construction of a new outfall to Bear Creek as having "aquatic impacts" that would trigger location-specific ARARs. It might be clearer to add that the alternatives have varying impacts to these aquatic resources such that location-specific ARARs have been triggered in varying degrees.

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10. Appendix D, Section D.4, page D-8. In the first partial paragraph, please delete "EMWMF" from "EMWMF-EMDF RI/FS" since there is no EMWMF-EMDF RI/FS (or change to "are included in the EMWMF RI/FS and will be included in the EMDF RI/FS."

11. Appendix D, Section D.4, page D-8. The first full paragraph states that the requirements at 40 CFR 445 are not triggered for the landfill, based upon language in 40 CFR 445.1(e) ("landfills operated in conjunction with other industrial or commercial operations when the landfill only receives wastes generated by the industrial or commercial operation directly associated with the landfill"). EPA does not agree that either EMWMF or EMDF are entitled to an exemption under this regulation for several reasons. First, ORR is not an "industrial or commercial operation" as envisioned by this regulatory exemption. ORR is a massive industrial complex that is and has been over its history involved in many different industrial operations and has generated many different kinds of waste. This CERCLA response to collect and dispose of this multi-decade waste in a landfill, while dedicated to disposition ORR waste, is exactly the kind of landfill that should, in fact, meet the requirements in 40 CFR 445, whether they are considered applicable or relevant and appropriate. Second, DOE has used the term "trigger" when the question is not whether a regulation has been "triggered", but is whether the regulation is applicable or relevant and appropriate. Please deleted this text and restore the 40 CFR Part 445 requirements to the ARARs table. In addition, these regulations set the floor of how the waste waters from the landfill will be characterized and handled; additional characterization will be required from a protectiveness perspective.

12. Appendix D, Section D.4, page D-8. In the next-to-last paragraph, DOE notes that air regulations will be examined as facility design is further developed. Since water treatment is part of all three alternatives, it is not clear why these ARARs are not included in the FFS. Since EPA did not catch this on review of the D1 FFS, please ensure that they will be included in the update to the EMWMF ROD and the EMDF ROD.

13. The ARARs table has included a discharge requirement that is applicable to non-continuous discharge. It is not clear that non-continuous discharge is the appropriate characterization of the waste water effluent from either of the two landfills. Please include citations to TDEC 0400-40-.03-.05(6) and TDEC 0400-40-05-.08(g).

14. Table D.1, page D-28. Please remove the citation to the exemption in 40 CFR 445.1(e) and restore the requirements from 40 CFR Part 445 as applicable requirements. Specifically add citations to 40 CFR 445.14 for New Source Performance Standards.

15. Section 3.3. The discussion of the documentation for the various alternatives is not consistent. Review and ensure consistency with the FFA.

16. Section 4.4.3.5. p. 77. Correct the cost in the final sentence.