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

May 20, 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 Remedial Investigation/Feasibility Study for
 CERCLA Program Waste Disposal
 (DOE/OR/01-2535&D4; March 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 22, 2016. EPA finds the response to several General and Specific Comments and the revisions to the subject 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 8, 10, 13, 16, and Specific Comments 11, 12, 22, 24, 27, 36, 37, 38, 42, 44, 56 and 57 require resolution, as described in the enclosed summary. The EPA hereby invokes dispute resolution over these matters. Due to the significant revisions to the subject document, additional comments are provided that must be addressed in finalizing the document.

The EPA looks forward to working with the Department of Energy Oak Ridge Reservation 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(s) on these matters in a timely manner.

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BY: DOEIC

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

Sincerely,

A handwritten signature in black ink, appearing to read "J. Crane", written in a cursive style.

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

Remedial Investigation Feasibility Study for CERCLA Waste Disposal at the Oak Ridge Reservation, Oak Ridge, Tennessee (DOE/OR/01-2664&D2, February 2016)

General Comments 8, 10, 16, and Specific Comments 22, 36, 38, 42, 44

The purpose of Appendix C to discuss the potential for in cell macro-encapsulation mercury (ICME) Land Disposal Restriction treatment should be removed from the FFA. Inclusion of an entire Appendix to discuss treatment that is not part of the alternatives is at best unnecessary and potentially misleading as to appear to present a complete evaluation of treatment alternatives, acknowledged in the document to be the obligation of the operable units generating mercury waste and not the disposal operable unit. Section 5.1.4 is a sufficient discussion of this matter. Separate from this operable unit, the FFA Parties need to address mercury principal threat source treatment from the Y-12 West End Mercury Use Area Building demolition and surrounding soils. EPA and TDEC issued a letter proposing a path to addressing this issue and are awaiting DOE's response.

General Comment 13

The response does not fully address the original EPA comment with respect to specifying how ecological risk will be evaluated in the absence of ambient water quality criteria (AWQC) standards for surface water. Additionally, the response does not discuss the use of Preliminary Remediation Goals (PRGs) for radionuclides in determining the PreWAC.

Specific Comment 11

The response to the Specific Comment regarding the modeled water table conditions predicting post landfill construction water table levels has not been sufficiently presented or documented to support the evaluation of alternatives, including appropriate siting standard waiver/exemptions, and meaningful considerations regarding differentiators among the various onsite options in the detailed analysis of Section 7.2.2 and Table 7-6.

Specific Comment 12

The response to comments to addresses the issue of exceeding the minimum clay liner permeability design standard due to the concern over shallow water table conditions diverts the issue to ensuring the cover system has a lower permeability than the bottom liner to prevent "bathtubbing" from cover system infiltration. The comment response should consider cover system design or contingencies in addition to the bottom liner that may:

- Decrease the permeability of both the cover and bottom liner proportionally; and,
- Revise the alternatives to include measures to ensure what the comment response alludes to as a more likely condition that the cover system performance is compromised. This may include specification that the Trust Fund, secured by TDEC, can be used by DOE, per agreement of the FFA Parties, to deploy corrective measures to address cover system performance issues that would eliminate the need to seek federal funding for this purpose and potentially delay corrective action of this critical component of assuring the remedy's protectiveness.

Specific Comments 24 and 27

The response to EPA comment S.024 addresses the comment as if it applies only to existing wells at Site 5. The comment did focus on the existing wells and made an incorrect assumption they could be included in a long-term groundwater monitoring program at Site 5. However, the comment was intended to more generally state EPA's position that any new wells should be developed, whether they are screened or open-hole completions. The first bulleted note at the bottom of Table 2 in the March 2015 and March 2016 versions of Appendix E could be interpreted to indicate that because a well has an open-hole completion, well development would not be needed.

The response to EPA comment S.029 indicates that the existing wells at Site 5 will be plugged and abandoned prior to any construction activities at Site 5. The intent of the comment was not to necessarily imply that the existing wells (open hole or otherwise) should be used in any Site 5 long-term monitoring program, but rather was to also suggest that additional testing of existing wells at Site 5 could be beneficial for the design of monitoring wells that would be a part of a long-term monitoring program, should Site 5 be selected as the EMDF location.

Specific Comment 37

DOE's response to EPA.S.037 indicates that DOE has added the NRC siting criteria as ARARs. DOE has, however, included all the siting criteria, but excluded TDEC 0400-20-11-.17(1)(h) on the basis that this particular requirement is not relevant and appropriate. DOE's justification for this conclusion relies upon an assertion that this waste disposal site is not sufficiently similar to sites that are regulated by NRC licensing. EPA has found no support for this conclusion and does not agree that this requirement should be excluded as not relevant and appropriate. Please add it to the table of relevant and appropriate siting requirements. Note, however, that the Tennessee rule allows for exceptions under TDEC 040-20-04-.08 **APPLICATIONS FOR EXEMPTIONS**: "The Department may, upon application by any person or upon its own initiative, grant exemptions, variances, or exceptions from the requirements of these regulations which are not prohibited by statute and which will not result in undue hazard to public health and safety or property." This "application" should be presented and will be considered in the context of this RI/FS. Because there appear to be significant differences among the alternative onsite locations in the amount of discharge of groundwater to the surface within the disposal site, this demonstration and application should evaluate each location individually. This will allow an evaluation of not only the application for an exception but also a basis on which to compare the various onsite alternatives. This evaluation and comparison should be added to Section 7 ("Comparison of Alternatives") of the RI/FS.

Specific Comment 38

Please remove the requested language. The RTC indicates that the language was removed; it was not.

Specific Comment 56

The response requires further discussion. The comment states that if the under drain system were to fail, groundwater infiltration from beneath the liner will infiltrate the landfill, which may significantly impact contaminant release and migration rates. The response indicates an evaluation of drain system failure is addressed in Appendix H Section 4.5. However, the discussion on the MODFLOW, MODPATH, and MT3D modeling indicates the contaminant migration was evaluated by replacing the underdrain with porous media cells, and did not consider the case where the underdrain is completely breached. Section 4.5, Evaluation of Model Sensitivity and PATHRAE Limitations in Appendix H goes on to state that additional refinements to this modeling are beyond the scope of the RI/FS. It is unclear why the case in which the underdrain is completely breached was not considered and it does not seem prudent to not evaluate such a scenario. This issue warrants further consideration to ensure all possible scenarios are sufficiently considered in the contaminant fate and transport evaluation.

Specific Comment 57

The response to EPA comment S.057, point a does not actually address the comment.

The response to EPA comment S.057, point h again states that measured head values for the Site 5, Phase I wells were in general agreement with model-predicted values without specifically identifying what the observed and model-predicted heads are. While the regional BCV model may be more definitive with regard to the overall groundwater flow modeling for this RI/FS, complete documentation of the modeling necessitates that the site-specific matchup of observed to model-predicted heads should be included as a part of the documentation of the modeling. This documentation can be done in either tabular or graphical (modeled versus observed water levels) format. This comment also has applicability to comment EPA S.057, point k.

The response to EPA comment S.057, point i is unacceptable. Regardless of whether or not conductance values are a significant factor in the modeling, Appendix H should identify what the values are (I am requesting full documentation of the modeling, not only documentation the author deems significant). The appendix can certainly state that the conductance values, whatever they are, are not a significant factor in the modeling results.

The response to EPA comment S.057, point j, is unacceptable. The comment is not identical to EPA comment S.056. Comment S.057 point j was in part contemplating potential design modifications to the underdrain system (not only underdrain failure, as per S.056). Figure 6-12 of the RI/FS Report shows an underdrain plan for a Site 5 EMDF. As an example of a potential design modification, what would be the effect on the modeling outcomes if the so-called blanket underdrains needed to be extended further upstream or upslope along one or more of the various pathways where the blanket underdrain features are shown? This point may have particular significance for the channel that crosses the central part of the potential landfill at Site 5, where there is an identified spring upslope of the depicted upslope extent of the blanket underdrain. Presumably, the blanket underdrain features are intended to address a need for increasing the downslope movement of water out of the subsurface beneath the base of the landfill containment interval, to avoid groundwater presence at the lower elevations of the landfill (or to maximize the buffer zone between the landfill and groundwater). This downslope drainage function may need

to be increased relative to the condition depicted on Figure 6-12 and modeled in Appendix H and should at least be conceptually discussed in the appendix. EPA comment S.056 was not my comment (although similar to the other aspects of EPA comment S.057 point j) and I concur with the EPA contractor's statement regarding how that comment has been addressed. Also, the S.057 point j comment specifically addressed the modeled potential Site 5 EMDF location but should be considered as having potential applicability to any of the potential locations of the EMDF. Thus, while not relevant to this modeling effort, if another potential site was selected for the EMDF facility, EPA comment S.057 point j may have some applicability to that location.

The response to EPA comment S.057 point l directs the reader to Appendix H, Section 4.2.1.4 where clarifications have been made in response to the comment. That section of Appendix H refers the reader to Appendix E, Section 2.4.3.1 for the average flow rate measured at the NT-3-Bear Creek junction location. A review of that appendix indicates there is no such section in Appendix E, nor does the 0.55 cfs discharge at the junction (the streamflow cited in Appendix H Section 4.2.1.4) appear to be referred to in any of the Appendix E sections that concern surface-water hydrology. Apparently, further changes or clarifications are needed.

Additional Comments for Document Finalization

1. Volume estimates for alternatives with smaller footprints that do not straddle Bear Creek North Tributaries (NTS) are lower and may require multiple locations. Assuring capacity during operations of the new landfill is critical to support an alternative with a waste footprint between NTs, including the dual site option. Sequencing of waste fill with waste debris is assumed to be enable 50% of waste soil to be used as debris fill. This assumption is acknowledged as uncertain due to project sequencing and funding. Section 6.6.2.1 discusses the importance of the lesson learned to sequence waste and that improved planning is necessary. However, due to DOE's preference toward "shovel ready D&D projects" over soil cleanup and other funding related pressures to accelerate D&D, past history has demonstrated significant challenges in effectively sequencing waste soils to match void space debris fill needs. This discussion states sequencing will be planned "as much as possible." This soft commitment is insufficient.

Include the following in the FS for purposes of more effectively balancing soil cleanup and D&D to preserve landfill capacity:

- An Administrative WAC requiring all waste soil is used as debris fill, unless a variance is approved by the FFA PMs
 - EMDF waste stockpiling as a technology retained for certain alternatives to assist in meeting the Administrative WAC above and minimizing variances, especially those alternatives that are footprint limited.
2. Appendix E Section 2.8.2 indicates that the EMDF conceptual model for Site 5 has conceptual applicability to each of the other proposed EMDF sites. There are numerous investigations of the surface and subsurface geology/hydrology both up and down Bear Creek Valley (BCV). Section 2.8.2 should include a summary statement that data from the numerous borings, wells, piezometers, et cetera in the BCV watershed are consistent (completely or mostly consistent, as appropriate) with the Site 5 conceptual model. If there are any observations from elsewhere in the watershed that are inconsistent with the
 3. In Section 4, include the following two bullets to the list of requirements supporting the RAOs:
 - For radionuclides, groundwater will be protected consistent with RCRA Subpart F at the waste management unit boundary utilizing the same system of detection (and other) monitoring wells as for the conventional constituents. The groundwater protection standards for radionuclides will be the MCLs under the SDWA (unless it is determined that the MCLs are not protective due to multiple contaminants or multiple pathways of exposure).
 - For radionuclides, surface water will be protected via development of risk-based (at the point of departure) or ambient water quality criteria-like levels for each radionuclide

(these are addressed in more depth in the *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation* (still under review/not yet approved).

4. Appendix E Section 2.8.2 conceptual model, these inconsistencies should be described in detail, the location of the inconsistent data/observation should be identified, and the significance of the inconsistencies should be explained.
5. Appendix E Figure E-15 shows the proposed locations of Site 5 and Site 6b relative to the crest of Pine Ridge and the contact between the Rome Formation and the Pumpkin Valley Formation. Site 5 extends upslope a considerable distance relative to Site 6a. Is there a potential for Site 6a to be extended further upslope than proposed without the landfill/landfill support features impinging on a surface-water feature or otherwise being a landfill design concern? If so, why isn't this Site 6b upslope extension option being considered to increase the total available volume of landfill available? The same comment is also applicable to additional potential EMDF landfill locations further to the southwest. There, it may be possible to reposition at least some of the proposed landfill cover areas to minimize their overtopping surface-water features, without any substantive change to the overall landfill size. Extending the landfill areas as far upslope as practicable also has the benefit of reducing movement of water from upslope areas into the surface/subsurface occupied by the landfill.

Section 2.9.2 of Appendix E implies that because the proposed landfill at Site 5 extends as far upslope as it does, there is the potential for upward hydraulic gradients and groundwater flow into the lower part of that upslope landfill area. It seems as if the real concern for that location is that one or more small tributaries head up in the upslope area of Site 5. Any such surface-water features can probably be avoided in the upslope areas of one or more of the other potential EMDF landfill locations.

6. Since an underdrain is a consistent design feature regardless of the location selected for the EMDF, Appendix E Section 2.9.1 needs to conceptually discuss the potential layouts of underdrain features at sites other than Site 5.
7. Section 2.9.3 of Appendix E notes that the Site 5 seasonal high water table was observed on April 21, 2015. Data from this period was unavailable when the previous RI/FS was prepared. If water levels were also measured in monitoring wells around the existing EMWMF during this general April 2015 period, are those water levels the highest water levels that have been measured to date in such older monitoring wells around the EMWMF? If not, added conservatism to any projected future water levels beneath the Site 5 EMDF should be obtained by adjusting upward the April 15, 2015 water levels around Site 5 by some average difference between measured water levels at wells around the EMWMF in the April 2015 period and the highest previous water levels noted for wells around the EMWMF.
8. What is the explanation for the substantial difference in the RI/FS 2016 version model-projected water level declines around the Site 5 surface water feature identified as

EMDNT3-SP1 in comparison to the 2015 RI/FS-projected water level declines around that feature (consider Figure E-20 in the March 2016 RI/FS to the highest water level observed at EMDNT3 versus the “model-predicted post construction steady state groundwater flow conditions of the March 2015 RI/FS version, Appendix E, Attachment A, Figure 30)? Note that Figure E-22 in the 2016 RI/FS doesn’t appear to indicate the same degree of water-level declines as that suggested by Figure E-20 and Figure E-21 in the March 2016 RI/FS. This observation implies errors in some of the projected water-level declines shown on Figure E-20 and Figure E-21.

9. The following issues have been discussed and require further confirmation by all parties in finalizing this document and the included PreWAC, or an alternate path to closure via the final WAC
 - o Refinement of modeling parameters (porosity, etc.);
 - o Identification and Assessment of risk for Receptor location at 100 m (Groundwater); and determination of whether to include modeling points of exposure for groundwater at the underdrain and surface water at the underdrain or in Bear Creek;
 - o Determination of model exposure benchmarks based on human health risk and based on ARARs; and a determination of whether to evaluate radiological risk for groundwater and/or surface water;
 - o Assessment based on CERCLA risk and a determination of how to update e findings from Performance Assessment;
 - o Risk goal as a function of time of peak, with a determination if modeling will be included past 1,000 years;
 - o Further define fate and transport model parameters;
 - o Resolve WAC quality control issues that appear to be the basis for a low Uranium WAC;
 - o Human Health Toxicity at a HI of 3 is not protective for modeling to years beyond 1,000.
10. Section 6.2, p. 6-2 states “...the volume of waste assumed to be able to meet an on-site WAC is conservatively estimated to allow for a maximum on-site disposal footprint design.” This statement and the considerable uncertainty of total volume needs should be recognized in the Section 7 evaluation of alternatives where the lower cost/larger footprint single landfill design over less favorable hydrogeologic settings may not be warranted if volume uncertainty were not conservatively assumed and capacity assurance during remedy implementation is required (e.g., sequencing).
11. Section 6.2.1.1, p. 6-9 discusses the proximity to contaminated areas. Section 7.2.2.6 and Table 7-6 should compare/contrast the implementability of monitoring for the various onsite alternatives that may be in closer proximity to significant groundwater contamination (e.g., Sites 5 and 6b) as a differentiator among onsite alternatives.
12. Section 6.2.2.1, p. 6-26 discusses the need for extensive analysis for the dual site option. Include a discussion of planning a portion of this assessment as part of Pre-ROD activities so as to confirm assumptions in the FS to verify site location selection in the ROD.
13. Table 7-1 should include a new line under “Proximity to Water Resources” for “Minimum distances to bottom of waste to top of current/estimated post-construction lowered water table.
14. Section 6.2.2.7, .7.1, and .7.2 discusses process modifications that may include treatment of CERCLA derived waste placed in the landfill. Treatment to reduce mobility, toxicity or volume,

including LDR compliance is not a process modification but rather a fundamental component of the remedy. Remove this text along with Appendix C.

15. Section 6.2.2.5.4, p. 6-40 discusses in the final paragraph underdrain impact on travel times for releases. This discussion should be placed in each of the alternative site options so significance of time of travel can be compared, here and further in the detailed analysis. Sites 14 and 7a are described as similar but that does not appear to be accurate in that the size of the underdrain at Site 14 is considerably larger (i.e., approximately twice as large per Table 7-1). Discuss this as a differentiator among onsite options in the detailed analysis Section 7.2.2.3 and Table 7-6.
16. Section 7.2.2.3 and Table 7-6 need to include discussion of the effect of underdrains at various sites with regards to time of travel implications and ability to monitor/respond as a differentiator among onsite options.
17. Appendix G, page G-9. The last paragraph, first sentence, states that all on-site alternatives meet all ARARs. EPA notes that, at this time, this statement is not accurate. See the discussion above on EPA Specific Comment 37, which notes that EPA does not agree that TDEC 0400-20-11-.17(1)(h) is relevant but not appropriate. To the degree that certain alternatives (or, in DOE's language certain locations of "the" onsite alternative) do not meet the two threshold CERCLA requirements, they should be removed from the RI/FS, and then this statement will be accurate.
18. Appendix G, page G-10 and -11. This section should be revised to eliminate statements (or suggestions) that NRC rules or the equivalent state regulations in "NRC Agreement" states should not be considered relevant and appropriate requirements for the siting, design, construction and operation of a LLW landfill. While it is accurate that those regulations are not "applicable" to the EMDF landfill project, the evaluation of whether a regulation is relevant and appropriate is a site-specific, rather than a programmatic, one. The National Contingency Plan outlines the factors that are considered when making a "relevant and appropriate" determination. "In evaluating relevance and appropriateness, the factors in paragraphs (g)(2)(i) through (viii) of this section shall be examined, where pertinent, to determine whether a requirement addresses problems or situations sufficiently similar to the circumstances of the release or remedial action contemplated, and whether the requirement is well-suited to the site, and therefore is both relevant and appropriate." 40 CFR 300.400(g)(2). While DOE may have incorporated certain NRC regulations into its DOE Orders, DOE has not outlined the factors that it considered for comparison to those in the NCP to facilitate a comparison. More importantly, however, is the recognition in FFA Section XXI.F that DOE shall prepare ARAR in accordance with Section 121(d) of CERCLA, the NCP and pertinent guidance issued by EPA. Please restore all citations to the state NRC rule that DOE eliminated between this D2(4) version and the D1(3).
19. Appendix G, Section 4.3, page G-17. EPA does not accept DOE's assertion that the waste disposal facility evaluated in the RI/FS is "vastly different" from the "disposal scenario" of the NRC rule. In contrast to DOE's assertion that the rule envisioned disposal only in shallow, unlined trenches, NUREG-0902 states that "[t]he proposed rule, 10 CFR Part 61, defines a near-surface disposal facility as a land disposal facility-in which radioactive

waste is disposed of in or within the upper 15-20 meters (or greater) of the earth's surface." While "shallow land burial" is one of the types of disposal methods utilized in NRC-licensed facilities, it is not the exclusive one.

20. Appendix G, Section 5.1, page G-18. In the first paragraph contains a statement that AWQC would be "negotiated". Please note that where a state regulation provides narrative or numeric criteria to be met, those will not be negotiated and will be met. To the degree that a regulation does not provide for such criteria or where there are multiple options for meeting the requirements, "negotiation" of a cleanup number might occur. However, the discharge limits to Bear Creek, with the exception of radiological constituents, already have objective limits. For the radiological constituents, discharge limits that will be protective of the Bear Creek will be developed consistent with the Clean Water Act and CERCLA. Discharge to Bear Creek will be protective of Bear Creek whether the selected remedy includes an onsite water treatment facility at the EMWMF/EMDF.
21. Appendix G, Section 5.2, page G-19. Please delete the first paragraph. EPA does not recognize DOE's dose limits as ARARs.
22. Appendix G, page G-31 through G-34. The first column refers to "leachate" and "contact water." For clarity, the nomenclature for "contact water" begun in the EMWMF ROD should not be brought forward into the EMDF ROD and that regulatory definitions should be used. As noted in 40 CFR Part 445, both "contact water" and "leachate" meet the regulatory definition of "landfill wastewater" and are, accordingly, treated under the same Part 445 rules. While it is not clear that instream water quality criteria should be considered ARARs for this action (i.e., we are not cleaning up a stream), they may be informational in the event of a release or discharge to surface water from the landfill.
23. Appendix G, page G-48. Please restore the citation to TDEC 0400-20-11-.17(h). See discussion in comment 12.
24. Please note that EPA has already initiated a dispute on the EMWMF-EMDF Combined Water Focused Feasibility Study. Where ARARs subject to dispute in that document impact disposition of water at EMDF, it may facilitate resolution to combine those with the dispute initiated with this set of comments.
25. The portion of this RI/FS addressing alternatives for the combined treatment of EMDF and EMWMF Waste Waters for managed discharge/treatment were addressed in a separate letter. The scope of the onsite alternatives under this operable unit for waste water treatment needs assure that ARARs and risk-based discharge standards are being met consistently for all onsite managed water discharges and waste water treatment plants (new or existing).