



2/1/2019

Mr. William F. Hamel, Assistant Manager for the River and Plateau
Richland Operations Office
U.S. Department of Energy
PO Box 550, MSIN: H5-20
Richland, Washington 99352

Re: 200-BP-5 and 200-PO-1 Groundwater Operable Units Feasibility Study for Interim Action,
DOE/RL-2018-30, Draft A

Dear Mr. William F. Hamel,

The Yakama Nation Environmental Restoration Waste Management Program (YN ERWM) has reviewed the *200-BP-5 and 200-PO-1 Groundwater Operable Units Feasibility Study for Interim Action* (DOE/RL-2018-30, Draft A) prepared by the U.S. Department of Energy (USDOE) Richland Operations Office, submitted with DOE-RL Letter 19-AMRP-0041, dated December 18, 2018. YN ERWM has the following comments.

General Comments

1. The selection of remedial alternatives in this Feasibility Study (FS) is based on simulations without considering the continuing sources. These simulations based on false inputs to the model are not representative of the Hanford Site condition and would lead to misleading results. Do not select a preferred alternative based on these simulation results. The recommended approach is to evaluate the alternatives based on the scenarios considering the sources, such as those presented in Section 4.2.1 of ECF-HANFORD-18-0023 Rev. 0, 2018, and perform an uncertainty analysis.
2. The attached calculation file Appendix A (ECF-HANFORD-18-0023 Rev. 0, 2018) presents simulation scenarios that are different from the main report of the FS. Suggest that you modify Appendix A to contain the details of the scenarios described in the main report and be consistent with the main report, otherwise remove the appendix from the report and list it as a reference.
3. The projected cleanup time should be based on simulated maximum contaminant concentration (C_{\max}), not the 95 UCL (of the mean). The model grid cells are 200 m by 200 m, or 40,000 m² (about 10 acres). Even the concentration of one cell is above the cleanup level, the area of the plume is still large. Please estimate the projected cleanup time based on C_{\max} .
4. Page 3-17 acknowledges the NHPA as an ARAR and that there are cultural resources identified in the 200 area. Please reference the documents that address compliance with NHPA, specifically cultural resources and the investigations completed to assess the effects

to cultural resources. Include information, references, and documents that show that DOE has followed the EPA guidance in the EPA CERCLA Compliance with Other Laws Handbook, specifically section 4.1 Compliance with NHPA.

Specific Comments

1. Throughout the document: Please edit “95th percentile upper confidence limit” to “95 percent upper confidence limit”.
2. Page 1-4, Figure 1-2: The monitoring wells (MWs) defining the plumes are not evenly distributed within and around the plumes. There seem lack of MW control at places around the plumes, e.g., only two MWs for the long Gable Gap Plume, with one of them located at the area that is marked as “Basalt Above Water Table”, and no MW at the south side of the B Plant uranium plume. The center and the extent of each plume should be further investigated to achieve an accurate data set for extent of plume to support appropriate cleanup decisions.
3. Page 1-5, Lines 24–25, “This plume is in an area that is characterized by few wells and where groundwater flow is currently stagnant or nearly stagnant”: This means that the plume is not well characterized yet and more wells are needed to characterize the plume.
4. Page 1-6, Lines 7–8, “The plume is approximately 6 ha (15 ac) in area, and is defined by two wells with concentrations ranging from approximately 40 to 55 µg/L”: Additional wells are needed to better define the extent of the plume. Are there other monitoring wells in this area?
5. Page 1-6, Lines 10–15: The sentence “This plume is defined by a single well screened at 6.1 to 9.1 m (20 to 30 ft) below the water table” contradicts the latter part of this paragraph, that information from a “number of other wells” are used to define the Tc-99 plume. Provide an explanation or correct this contradiction.
6. Page 2-6, Lines 8–10, “The Ringold Formation is overlain in some areas by the Cold Creek unit (CCU) (formerly known as the pre-Missoula gravel), which is overlain with coarse-grained, paleoflood deposits of the Hanford formation”: The “Pre-Missoula Gravels” (CCUg) is generally a sub-unit of CCU and overlain by “Caliche” (CCUc), as shown in Figure 2-5 on Page 2-7. Please correct this sentence to be consistent with the figure.
7. Pages 2-7 and 2-8, Figures 2-5 and 2-6: In Figure 2-5, Ringold units B/D are grouped into HSU 8; but in Figure 2-6, units B/D are grouped into HSU 5. Please correct them and make them consistent, otherwise please discuss the reasons.
8. Page 2-8, Line 6: HSU 9 is listed in the text but not shown in the cited Figure 2-6. Please edit to make them consistent.
9. Page 2-8, Lines 7–10: (1) HSU 8 is the Rlm as shown in Figure 2-6 and not Ringold upper mud. (2) The description of “with Ringold units B/D stratigraphically included within the Rlm interval” is not consistent with Figure 2-6. Please correct the descriptions and make them consistent with the figure.
10. Page 2-11, Lines 1–2: These two lines are duplicates of Lines 42–43 on Page 2-10, and should be deleted.
11. Page 2-19, Line 31, “Cancer risks $>1 \times 10^{-4}$ or non-cancer hazards >1 were used to identify areas and contaminants warranting remedial action”: Based on WAC 173-200-040 and WAC 173-200-050, human cancer risks shall not exceed 1×10^{-6} . Please revise.
12. Page 3-21, Lines 2 and 5: Edit “federal *Clean Air Act of 1990* and amendments” to “federal *Clean Air Act Amendments of 1990*”.

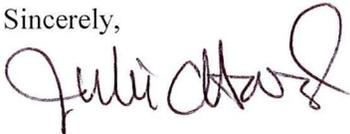
13. Page 5-3, Lines 15–30: Suggest change the numbers to bullets for the list of approaches, because the numbers are used for Sections.
14. Page 5-4, Figure 5-1: Do the Subregions end on the figure boundaries shown or extend to the model boundaries?
15. Page 5-5, Lines 19–23: The sources of the recharge to the model and the properties of the boundaries are described but the rate, hydraulic head, and discharge are not. Please describe how much recharge is applied to the model and list the boundary conditions.
16. Page 5-6, Lines 16–17: The Alternative 1 (No Action) assumes that no active remedy is operating. Please note that there are active pump and treat systems already in this area, e.g., Wells 299-E33-360 and 299-E33-361 listed on Table 5-1. Would the ongoing pump and treat system be stopped under this alternative?
17. Page 5-8, Figure 5-2:
 - a. Legend “Model Extent” is listed in many figures of this report and the appendices, but only the northern boundary is shown. It would be better to show the whole model extent at least once.
 - b. The location of the hypothetical extraction well “WC_E_2” is not the same as in Appendix A, Figure 3.2. Are all the simulation results in the main report of the FS based on the updated well location too? Please remove Appendix A from the FS report if the Appendix is not for the simulations described in the FS.
18. Page 5-10, Lines 1–7: Thank you for the effort of simulating the scenarios considering the continuing sources. The selected preferred alternative should be based on these simulation results and not those that ignore the continuing sources. Provide justification for a simulation that does not include continuing sources.
19. Page 5-10, Section 5.1.1.3: The evaluation areas are defined here but mentioned before in the text on Page 5-3, in Figure 5-1, and in Table 5-1. Suggest move the evaluation area (sub-region) definition to Section 5.1.1.
20. Page 5-15, Lines 15–27: The reasoning is confusing.
 - a. Please compare the results of Alternative 2 and no source with the results of Alternative 1 and no source. The effectiveness of Alternative 2 and no source cannot be claimed based on the existence of the source that is not simulated in this scenario.
 - b. If the scenario of Alternative 2 (P&T) does not result in a faster cleanup than Alternative 1 (No Action) for Tc-99, it is likely because of the location and pumping rate of the extraction wells. Please optimize the locations and pumping rates of the extraction wells, re-run the scenarios, and re-write this paragraph.
 - c. Define “Scenario 1”. Is it the No Action scenario (Alternative 1)?
21. Page 5-15, Lines 28–30: Would the P&T at B Complex, C Farm and A-AX Farms (Alternative 2) have any effect on the groundwater flow and plume migration near the Gable Gap, comparing with Alternative 1? Provide details on this conclusion.
22. Page 5-21, Lines 7–8, “It should be noted that these vadose zone sources are not part of the 200-BP-5 or 200-PO-1 OUs”: The contaminants from the vadose zone and the periodically rewetted zone (PRZ) sources are migrating into the aquifer of the 200-BP-5 and 200-PO-1 OUs with time, thus these sources cannot be ignored. Consideration of the source terms for the simulations and selection of remedial alternatives are necessary and need to be included in the evaluation of alternatives.

23. Page 5-21, Lines 11–13, “The continuing source modeling results indicate that, without source remediation, contamination in groundwater beneath the B Complex and the C Farm and A-AX Farms area will remain at concentrations above the PRGs for >50 years”: The selection of the preferred alternative should be based on these results, with analysis of uncertainties.
24. Page 5-21, Lines 16–17: The Alternative 2 described here about the extraction and injection contradicts the descriptions in Sections 5.1.1.2 and 5.1.1.3. Please verify.
25. Page 5-22, Figures 5-11 and 5-12: The legends of the figures indicate “Alternative 3”, but the titles of the figures indicate “Alternative 2”. Please verify.
26. Page 5-29, Table 5-4, and Page 5-32, Table 5-5, Row of “New injection wells”: the Pumping Rate of 284 L/min is equivalent to 75 gpm and not 50 gpm. Please correct the numbers and check the balance of the flow rates.
27. Page A-13, Section 3.2.1 “Model Regions”: The text says “Figure 3.1 shows the 6 sub regions developed for evaluating the model results”, but only 5 sub-regions are shown in Figure 3-1, and their names are not consistent with the text. Please verify.
28. Page A-17, Lines 4–5, “PEST utilities were used to provide the summary statistic estimates presented in 3.2.2”: PEST is usually used as a model calibration tool, and R for statistics. Was PEST used to calibrate the groundwater model for this FS? Please verify.
29. Page A-18, Table 3.1:
 - a. There are four scenarios listed, with total extraction of 0, 250, 350, and 425 gpm, respectively. This is not the same as in the main report of this FS. In the main report, three extraction rate scenarios are simulated (Table 5-1), with total extraction of 0, 300, and 400 gpm, respectively. Please verify.
 - b. The well location of WC_E_2 is different from Table 5-1 of the main FS report. Please verify.
30. Page A-18, Section 4, Line 2: There is no “Appendix F” in the main report of this FS, the Appendix A (ECF-HANFORD-18-0023, Rev. 0, 2018), or CP-57037. Please verify.
31. Page A-23: Footnote 9 is a duplicate of Footnote 3, and Footnote 8 is a duplicate of Footnote 6.
32. Page A-26, Section 6.1.1, Line 2: Edit “upper right-hand corner” to “upper left-hand corner”, to be consistent with the figure.
33. Page A-27, Figure 6.1: The figure title (indicating for nitrate) does not match the Scenario title and the Legend (indicating for Tc-99). Please verify what plume contours are plotted in the figure and edit the figure title and the Legend accordingly.
34. Page A-28, Figure 6.2: The figure title (indicating cyanide) does not match the primary Y-Axis title (indicating Tc-99). Please double-check what plume statistics are plotted in the figure and edit the titles accordingly.
35. Page A-29, Table 7.1: The cleanup time for Tc-99 under Alternative 3 (extraction of 350 gpm, and injection of 100 gpm) is 22 years, based on the simulated 90th percentile. But from Table 5-2 of the FS (Page 5-1), the estimated cleanup time under Alternative 2 (extraction of 300 gpm) is 7 years, based on the simulated C_{max} . The continuing sources are not considered in either case. Why is the cleanup faster with a smaller extraction rate, no injection, and a harder concentration criterion? Please provide an explanation.

36. Page A-30, Table 7.2: Why is the Uranium cleanup time for the WMA C, in all alternatives, much longer than those listed in Table 5-2 of the FS (Page 5-1), even longer than the No Action Alternative of the FS? Please provide an explanation and verify your results.
37. Pages A-261–A-327: Scenario 5 is presented in these figures, but the text (Page A-28, Section 7, Lines 1–4) citing these figures indicates that there are 4 sets of simulations. Please list all the corresponding scenarios in the text, or remove the irrelevant figures or simulations.
38. Page B-45, Table C-1, and Page B-51, Table C-2: Items on these pages are needed every 2–15 years, how are the costs of these items reflected in the “COST PER YEAR”? Provide an explanation of how the cost per year process is accomplished and verified.
39. Page B-46, Table C-2: There are several items noted “Not needed for GAP”, but the “COST PER YEAR” are still calculated and not zero. Provide a description of what is included in the COST PER YEAR for GAP when the item is noted “Not needed for GAP”.
40. Page B-57, Table D-1: Please update the Notes/References “XXXXX need info”.

YN ERWM appreciates the opportunity to review and provide comments on these documents. We look forward to meeting with you and discuss our comments on this report and our vision and concerns on the cleanup of the Hanford Site. If you have any questions, please contact me at (509) 452-2502 or jatwood@ynerwm.com.

Sincerely,



Julie Atwood
Technical Lead
Yakama Nation ERWM

cc:

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