



9513383.2378

0042281

122

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10 HANFORD PROJECT OFFICE

712 SWIFT BOULEVARD, SUITE 5

RICHLAND, WASHINGTON 99352

October 17, 1995

Donna Wanek
U.S. Department of Energy
P.O. Box 550, H4-83
Richland, Washington 99352

Re: 200-BP-5 Operable Unit Treatability Test Report Review

Dear ~~Ms.~~ ^{Donna} Wanek:

41983

Enclosed are the Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) comments on the 200-BP-5 Operable Unit (OU) Treatability Test Report. Overall the report is well written and generally meets EPA's and Ecology's expectations. However, EPA and Ecology have several comments and concerns.

One outstanding issue remains with regards to the Risk Based Decision Analysis for the 200-BP-5 OU. The EPA has provided the DOE with a letter indicating errors in the modeling performed for the risk analysis dated September 19, 1995. Because the risk analysis is a critical part of the Treatability Test Report, the EPA recommends DOE revise the Treatability Test Report based on regulator comments, but not produce another revision until all issues regarding the risk analysis are resolved and incorporated into the Treatability Test Report. ✓

A complete copy of Ecology's original comments which were submitted to EPA are enclosed for your information. If you have any questions or concerns regarding this letter, please contact me at (509) 376-8665.

Sincerely

Paul R. Beaver
Operable Unit Manager

Enclosure

cc: Gerry Chiaramonte, ERC
Suzanne Dahl, Ecology
Dave Erb, ERC
Dibaker, Goswami, Ecology
Ken Porter, ERC
Doug Sherwood, USEPA
Administrative Record 200-BP-5



REGULATOR COMMENTS
200-BP-5 TREATABILITY TEST REPORT

GENERAL COMMENTS

The report should provide a more detailed discussion and mapping of the well network for each of the plumes (i.e.; distance between wells, depth of well to aquifer and basalt ... etc.)

The text should provide a measurement of the plume size (i.e.; areal extent, mass of contaminants in the aquifer and sorbed onto the sediments ... etc.)

The text should provide the size of the radius of influence for each extraction well for the pumping rates during treatability test operations.

The report needs to provide the costs of full scale remedial efforts based on agreed upon assumptions by the three parties.

From 1988 to 1995 contaminant levels in well 699-50-53A indicate much higher levels of contaminants than were used in the Risk Based Decisional Analysis calculations and modeling scenarios. The high ⁹⁹Tc levels must be accounted for in the Risk Based Decisional Analysis for all scenarios.

SPECIFIC COMMENTS

1. Section 1.2, Page 1-2:

The text states that the two plumes resulted from operations at the B-Plant facility. The text should provide a brief discussion of U-Plant operations sending waste to the BY Tank Farm which was then sent to the BY Cribs.

2. Section 1.1, Page 1-2, 2nd Paragraph:

The text should reference the risk assessment document.

3. Section 1.2.1, Page 1-2:

The text should explain further why well 299-E28-1 was not used. For example: the effluent from the treatment system indicated Strontium-90 to be above EPA's drinking water standards.

4. Section 1.3, Page 1-3, 4th Paragraph:

The text should indicate the final deposition of the spent resins.

5. Page 1-8, 4th Paragraph:

Change "... provides conclusions and recommendations for the future work in expectation of work stoppage" to "... provides conclusions and recommendations for future work for 200-BP-5 Operable Unit."

6. Figure 1-5, Page 1F-5:

The map shown is an old map. The map should be updated to show the most recent data to include all wells with elevated levels of contaminants.

7. Section 2.1.1.2, Page 2-2, Second Paragraph:

The text should explain why contaminant extraction testing was not performed for the BY Plume.

8. Section 2.1.1.2, Page 2-3:

It is apparent that the Treatability Test did not adequately fulfill these objectives. The text should state this and provide a reasonable course of action to fulfill any data gaps that still exist.

9. Section 2.1.2.2, Page 2-4, Second Paragraph:

What is 699-50-AM?

10. Section 2.2.1.1, Page 2-6, Third Paragraph; and Page 2-7, Fourth Paragraph:

Change "processing" to "producing" (i.e. a well capable of producing).

11. Section 2.2.2.1, Page 2-9, Last Paragraph:

The text should state here whether the Cobalt and Cyanide are complexed or not.

12. Section 2.2.2.2, Page 2-10, Third Paragraph:

The text should state here whether The addition of SrCl_2 enhanced ⁹⁰Sr removal. This should also be stated once again in section 2.2.2.3 on page 2-11.

13. Section 2.2.2.2, Page 2-10, Fourth Paragraph:

The text should state why Clinoptilolite was the only absorbent evaluated in the second group.

14. Section 2.2.2.3, Page 2-12, First paragraph:

The first sentence in this paragraph does not make sense.

The text should state the "respective sites" mentioned in the last sentence.

15. Section 2.2.3, Page 2-12:

This section should provide aquifer thicknesses and cone of depression dimensions for the wells that were pumped.

16. Section 2.6.1, Pages 2-18 and 2-19:

The text needs to explain why several activities were not performed as stated on page 2-19.

17. Section 2.6.1.1, Page 2-19, First Paragraph:

The text should indicate the elevated ⁹⁹Tc levels encountered during the treatability test operations.

18. Section 2.6.1.2, Page 2-19:

The text should list the data from the sampling of this well in this paragraph or where it can be found within the report.

19. Section 2.6.2, Page 2-21, First Paragraph:

Three of the six holes did not intercept the water table. Therefore, the data quality objectives were not met. Hence, only three of the six holes were successful. Please add this information to the text.

20. Section 2.6.2, Page 2-21, Last Paragraph:

The text indicates "this proposal was not supported by the regulators". This is not true, the regulators had concerns which ERC could not appropriately respond to or answer. The text needs to be changed. Also, the text should explain why the proposed monitoring well at B-5 Reverse Well Plume was not drilled.

21. Section 2.6.5, Page 2-22:

The text indicates the RBDA process was approved, but does not indicate who approved it. The text should state who approved this process.

The text should also explain in detail what problems the Risk Based Decision Analysis (RBDA) avoids over the approved Qualitative Risk Analysis (QRA) method.

22. Section 4.3.3, Page 4-7, Second Paragraph:

The text states that the treatability tests indicate that the contaminants may have a different distribution coefficient (Kd) than the assumed published Kd. Specifically, the tests indicate that ¹³⁷Cs and ^{239/240}Pu in the groundwater may have lower Kd values and are less strongly sorbed to the formation and therefore more mobile than previously believed. The text also indicates that the tracer tests support the higher contaminant mobility.

The impacts of these new Kd values should be discussed. These new Kd values should be reflected in the risk analysis and modeling.

23. Page 4-9, First Line:

The treatability tests indicate that ⁶⁰Co is very mobile. However, the text references a published Kd number of 2000 mL/g

which is highly immobile. Which Kd is used in the modeling and risk analysis? Has the lower Kd been accounted for in the risk analysis and modeling? The risk analysis may need to be reevaluated to include the new field accurate Kd values.

24. Sections 4.3.5.2 and 4.3.5.3.2, Pages 4-8 and 4-9:

The text indicates a maximum range for ^{99}Tc to be 4,310 pCi/L. HEIS data show the following levels: 32,700 pCi/L during 1988 and 21,000 pCi/L during 1991 in well 699-50-53A. This data should be evaluated and discussed here.

25. Section 4.4.2.1, Page 4-11, First paragraph:

The text discusses ^{137}Cs . Is this correct?

26. Section 4.4.4.4, Page 4-14, Second Paragraph and Section 4.4.4.5, Page 4-15 Second Paragraph:

This text indicates that site specific field investigations estimate a dispersivity of 12 to 22 feet. However, the modeling in the RBDA uses dispersivity numbers ranging from 200 to 1000 feet. The modeling should take into account actual field data when available especially since the RBDA indicated that dispersivity used was the modelers' best guess.

27. Table 4-6, Page 4T-6:

Table 4-6 should include contaminant concentrations measured if any are available.

28. Section 5.2.1, Page 5-11, Second Paragraph:

The text indicates a divide axis. Is the northwest-to-southwest axis as indicated correct? The dividing line between 200-PO-1 and 200-BP-5 is oriented southwest-to-northeast. Also, see figure E-4 in the text.

29. Section 5.2.2.1, Page 5-13, Second Paragraph, First Sentence:

Figure 5-14 should be changed to Figure 5-13.

30. Section 5.3.2.1, Page 5-19, Second Paragraph:

The text indicates no surface source of groundwater in this location. The Fuel Storage Facilities located in the vicinity discharged more than 750,000,000 gallons of contaminated water to the soil in ponds and trenches. The text should discuss these discharges.

31. Section 5.3.2.4, Page 5-21:

What plans are proposed to investigate the potential for continuing sources of ^{99}Tc in basalt fractures? The chance of monitoring wells screened across the water table detecting the contaminant sources is non-existent. How are these potential continuing sources accounted for in the modeling of the RBDA?

32. Section 5.3.3.2, Page 5-23, Last Paragraph:

The text is not clear whether the storage coefficients are 0.21 at both wells 699-55-50C and 699-55-50D or if the author forgot a number. Please clarify.

33. Section 5.4, Page 5-25, Last Paragraph:

The text does not discuss the modeling conducted for the ⁹⁰Sr plume associated with the Gable Mountain Pond. The text should provide the results of the Risk Based Decision Analysis.

34. Section 5.4.1.2, Page 5-26:

The table on top of page should include the time required for the contaminants to reach the Columbia River.

35. Section 5.4.1.3, Page 5-26:

List the present MCL and references; list the proposed MCL and reference, and list the contaminant concentration for comparison. Has the proposed MCL₅ been reviewed and approved? If not, do not list here. Above 10⁻⁵ is not 'an acceptable risk' based on MTCA standards.

36. Section 5.4.2.2, Page 5-27 and page 5-28 and Section 5.4.2.3:

The Treatability Test Report indicates that the published mobility of these contaminants may underestimate the actual mobility of the contaminants. How does this new information influence these calculations and conclusions?

37. Section 5.5, Page 5-29:

These data gaps should be discussed with tentative field actions recommended to fill in these and other data gaps.

38. Figures 5-15, 5-16, 5-17, 5-20, 5-21, 5-22, and 5-24:

These figures are not legible. If these figures are to be used, they need to be legible.

39. Section 6.0, Page 6-1, First Paragraph:

The text states that the Gable Mountain Pond Plume contaminants will decay away to negligible levels long before the plumes migrate off the Central Plateau. Since this plume is already off the Plateau, the text needs to be changed.

Does the plume exceed MCL? Is the ILCR greater than 10⁻⁵? If yes, then there is a risk. There is a risk in a specific area for a specific amount of time. Specify these details in this conclusion.

The recommendations from the Uncertainty and Data Needs (Section 5.5) should be added in this section.

40. Page 6-1, 1st Paragraph last line:

40. Page 6-1, 1st Paragraph last line:

The last sentence in this paragraph needs more explanation. The text should provide justification. The sentence should be changed to "... it is recommended that the treatability test/ pilot scale pump and treat study be discontinued at the B-5 Reverse well plume."

Did the treatment system satisfactorily remove the ⁹⁰Sr? The text should expand on this issue.

41. Section 6.1, Page 6-2, Fourth Paragraph:

Change last sentence to read "... recommendation that the treatability test/ pilot scale pump and treat study be discontinued at this time for the 200-BP-5 Operable Unit."

This Treatability Test Report gives multiple evidence for the remediation potential of the BY-Crib plume. The treatment system works well in removing contaminants. Please change the incorrect information in the second sentence of this paragraph.

42. Page 6-3, 2nd Paragraph:

More information and explanation is necessary in the conclusion paragraph concerning the Gable Mountain Pond.

COMMENTS IN THE 200-BP-5 OPERABLE UNIT TREATABILITY REPORT
(DOE/RL-95-59, Draft A)

GENERAL COMMENTS:

The Treatability Test Report does not incorporate information gained from the actual treatability tests into the subsequent sections of the Risk Analysis or Conclusion Sections. Missing from the report is a cost estimate to bring the pump and treat systems up to full scale and operational. This information is necessary to discuss cost effectiveness. The general methodology used to create a Risk Based Decision Analysis report (RBDA) has not been reviewed or approved by Ecology. Also, the conclusions of the RBDA are not supported by the data within the RBDA. Many technical questions still exist over the groundwater modeling which was conducted in support of the RBDA.

The unsubstantiated conclusions drawn by this Treatability Test Report are to conduct no further work at this time, except for monitoring. Ecology does not agree. Ecology would like to see a short Feasibility Section added to the Treatability Test Report. The Feasibility Section would outline a Description of Work that would address the next phase of field work, and a Limited Field Investigation, which would focus on the identification of areas of increased saturated thickness. Including the Feasibility Section into this document is a time efficient, cost saving measure which would not produce additional future documents such as a Feasibility Study report.

SPECIFIC COMMENTS:

1. Page 1-2, 2nd Paragraph: Please reference the risk assessment document.
2. Page 1-3, 4th Paragraph: What is the final deposition of the spent resins?
3. Page 1-4, 4th Paragraph: Change alkali to alkaline.
4. Page 1-7, 5th Paragraph: Aquifer testing does not indicate gradients as stated in text, please rewrite.
5. Page 1-8, 4th Paragraph: Change "... provides conclusions and recommendations for the future work in expectation of work stoppage" to "... provides conclusions and recommendations for future work for 200-BP-5 Operable Unit."
6. Page 2-4, first two lines: The first two lines are repeated in the first lines of section 2.1.2.2
7. Page 1-4, 3rd Paragraph: Well ID 699-50-AM is wrong; should it be 699-50-53A?
8. Page 2-6, 10 Paragraph and Page 2-7, 4th Paragraph: Change word "processing" to "producing" (i.e., a well capable of producing).

9. Page 2-21, 1st and 2nd Paragraphs: Three of the six holes did not intercept the water table, therefore not completing the data quality objectives for each hole. Hence, only three of the six holes were successful. Please add to text.
10. Page 2-21, 2nd Paragraph: Explain why the regulators did not want to proceed. I believe it had to do with questions with the resolution potential of the geophysical method as it relates to the site specific geology.

Also explain why the proposed monitoring well at B-5 Reverse Well Plume was not drilled.

11. Page 2-22, 4th Paragraph: Explain in detail what problems the Risk Based Decision Analysis (RBDA) avoids over the approved Qualitative Risk Analysis (QRA) method.

Who approved the RBDA methodology? Please clarify. As stated above, Ecology has not reviewed and approved the methodology employed in the RBDA for this operable unit or any other.

12. Page 4-7, 4th Paragraph: The text states the treatability tests indicate the contaminants may have a different distribution coefficient (Kd) than the assumed published Kd. Specifically, the tests indicate that ¹³⁷Cs and ^{239/240}Pu in the groundwater may have smaller Kd and be less strongly sorbed to the formation and, therefore, more mobile than previously believed. The text also indicates the tracer tests support the higher contaminant mobility.

The impacts of these new Kd values should be discussed. These new Kd values should be reflected in the risk analysis and modeling.

13. Page 4-9, 1st Line: The treatability tests indicate that ⁶⁰Co is very mobile; however, the text references published a Kd number of 2000 mL/g which is highly immobile. Which Kd is used in the modeling and risk analysis? Has the lower Kd been accounted for in the risk analysis and modeling? The risk analysis should be reevaluated to include the new field accurate Kd values.
14. Page 4-14, 3rd Paragraph; and Page 4-15 2nd Paragraph: This text indicates that site specific field investigations estimate a dispersivity of 12 to 22 feet. However, the modeling in the RBDA uses dispersivity numbers ranging from 200 to 1000 feet. The modeling should take into account actual field data when available especially since the RBDA indicated that dispersivity used was the modeler's best guess.
15. Page 5-21: What plans are proposed to investigate the potential for continuing sources of ⁹⁹Tc in basalt fractures? The chance of monitoring wells screened across the water table detecting the contaminant sources is non-existent. How are these potential continuing sources accounted for in the modeling of the RBDA?

16. Page 5-22, 2nd Paragraph: This text indicates more field investigations are necessary to validate the conceptual model. This should be highlighted as a conclusion in this section and Section 6.
17. Page 5-25, Risk Analysis: Comments on the RBDA are outlined in a separate letter. These comments to RBDA should be addressed in the stand alone RBDA document and in the RBDA included in the Treatability Test Report. The groundwater modeling should be reevaluated to include the higher contaminants concentrations discussed in the September 28, 1995, meeting and to include changes in input values (dispersivity and Kd), as discussed below.

Other issues identified while reviewing the Treatability Report that should be included or changed in both versions of the RBDA include:

- Tracer studies indicated a dispersivity of 12 to 22 feet, while the modeling in the RBDA used 200-1000 feet. The tracer test dispersivities should be considered in the modeling effort and the modeling dispersivity numbers adjusted accordingly. The rationale for choice of dispersivity numbers should be clearly justified and discussed.
 - The modeling in the RBDA needs to take into account the Kd(s) obtained from literature may not match field conditions. The Kd(s) used in the modeling should be adjusted according to the information obtained from the treatability testing.
 - The modeling effort should reflect the potential for continuing contaminants sources existing at depth within basalt fractures as outlined on pages 5-21 of the Treatability Test Report.
18. Page 5-26, Section 5.4.1.3: List the present MCL and references; list the proposed MCL and reference, and list the contaminant concentration for comparison. Has the proposed MCL been reviewed and approved? If not, do not list here. Above 10^{-5} is not "an acceptable risk" based on MTCA standards.

These conclusion comments need to be modified in regard to the impacts of previous comments.

19. Page 5-27, 4th Paragraph and One Table; page 5-28, One Table, and Section 5.4.2.3: The Treatability Test Report indicates the published mobility of these contaminants may underestimate the actual mobility of the contaminants. How does this new information influence these calculations and conclusions. Please recalculate and add detail.
20. Page 5-29, Section 5.5: These data gaps should be highlighted in the conclusion section (Section 6) of this report and tentative field actions (developed to fill in these and other data gaps) should be identified in the conclusion section (Section 6).

21. Figures 5-15 through 5-17 and 5-20 through 5-22: These figures are not readable and should be redrafted.
22. Page 6-1, 1st Paragraph: RBDA needs to be corrected and the conclusions should be changed accordingly. The statement concerning "... no significant future risk to human health ... at B-5 Reverse Well Plume" is false.

Does the plume exceed MCL? Is the ILCR greater than 10^{-5} ? If yes, then there is a risk. There is a risk in a specific area for a specific amount of time. Specify these details in this conclusion.

The recommendations from the Uncertainty and Data Needs (Section 5.5) should be added in this section.

23. Page 6-1, 1st Paragraph last line: The last sentence in this paragraph needs more explanation. What reasons? The sentence should be changed to "... it is recommended the treatability test/ pilot scale pump and treat study be discontinued at the B-5 Reverse well plume."

Did the treatment system satisfactorily remove the ^{90}Sr ? Expand on this issue.

24. Page 6-1, 2nd Paragraph: The future risks due to this plume are unacceptable, not "marginal" as stated in the text. These risks are unacceptable based on: MCL, risk calculations now and in the future, and concentration of contaminants (and associated risks) leaving the plateau.

The recommendations from the Uncertainty and Data Needs, Section 5.5, should be added in this section.

Strike the last sentence and add in it's place: "It is recommended that the treatability test/pilot scale pump and treat study be discontinued at the BY-Crib plume. The Feasibility Section of this document identified a description of work that will guide the future Limited Field Investigation (LFI). This LFI will be designed to fill the necessary data gaps, especially the location of a sufficient saturated section within the plume."

25. Page 6-2, 4th Paragraph: Change last sentence to read "... recommendation that the treatability test/pilot scale pump and treat study be discontinued at this time for the 200-BP-5 Operable Unit."
26. Page 6-2, 6th Paragraph: The future risks at the BY-Cribs plume are unacceptable not "marginal or acceptable." Modify the first sentence of this paragraph to represent the results of the Risk Analysis. As a summary, please add information that describes the size of the plume and location (greater 10^{-5}) at 2018, and when it intercepts the river.

This Treatability Test Report gives multiple evidence for the remediation potential of the BY-Crib plume. The treatment system works well in removing contaminants and future field investigation will identify preferred extraction locations. When appropriate extraction locations are identified, the pump and treat activity could be performed at an efficient level. Please change the incorrect information in the second sentence on this paragraph.

Change second sentence to "... suggest the treatability test/ pilot scale pump and treat study be discontinued at this time for BY-Crib plume. The Feasibility Section of this document identified a description of work that will guide the future limited field investigation. This LFI will be designed to identify a location of a sufficient saturated section within the plume."

27. Page 6-3, 2nd Paragraph: More information and explanation is needed in this conclusion paragraph concerning the Gable Mountain Pond.