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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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July 25, 1995

Mr. David Olson
Operable Unit Manager
U.S. Department of Energy
P.O. Box 550, H4-83
Richland, WA 99352

Dear Mr. Olson:

Re: Comments on the Proposed Plan for Remedial Measure at the 100-HR-3 Operable Unit, DOE/RL-94-102, Draft B; and 100-HR-3 Operable Unit Focused Feasibility Study Report, DOE/RL-94-67, Draft B

The Washington State Department of Ecology and the Environmental Protection Agency, as the support agency, have completed our expedited review of the 100-HR-3 Proposed Plan for Interim Remedial Measure Report, Draft B and the 100-HR-3 Focused Feasibility Study Report, Draft B. The enclosed comments pertain to our review of these documents.

If you have any questions or concerns, please contact me at (509) 736-3049.

Sincerely,

Wayne W. Soper, P.G.
Operable Unit Manager
Nuclear Waste Program

WS:skr
Enclosures

cc: Laurence Gadbois, EPA
Dick Biggerstaff, BHI
Charles Hedel, BHI
Administrative Records: 100-HR-3 Operable Unit



Ecology Comments on the 100-HR-3 Proposed Plan, Draft B**Specific Comments**

1. Page 1, first column, third paragraph. The preferred alternative will not reduce potential threats to human health.

Re: Reword or remove this sentence

2. Page 2, second column, third paragraph. In many cases the plumes have not been reduced by natural processes. Evidence does not support this claim.

Re: Remove this section, it does not add anything.

3. Pages 4 -6, Summary of Risk Section. It is disappointing to see that language in this section still includes only the occasional-use scenario. Ecology has taken the liberty of rewriting most this section.

Re: See Ecology/EPA rewrite.

4. Pages 6 & 7. Discussion on the salmon redd sampling study.

Too much emphasis is being placed on the salmon redd sampling study. The need to conduct this IRM for the remediation of chromium (VI) is based on the conceptual site model and sampling of seeps, and wells; not on random sampling of the salmon redds.

Re: Rewrite these sections.

5. Page 7, second column, fourth paragraph. I do not believe the regulators have approved several spawning cycles.

Re: Remove the section.

6. Page 9, first column, second paragraph. It was agreed to on June 26, 1995 that costs would be calculated on a five year basis.

Re: Change all cost numbers to the 5 year period.

7. Page 11, first column, second paragraph. These costs still appear too high.

Re: Recalculate and include the 5 year basis and use the current D area costs of \$ 30,000 per month. Even though this system is smaller, costs should be proportional.

8. Page 11, second column, first paragraph. commitment of the land area?

Re: Remove this sentence.

Comment 3, Rewrite**DRAFT 100-HR-3 PROPOSED PLAN RISK SECTION TEXT****SUMMARY OF SITE RISK**

“Potential risk to human health and ecological receptors was evaluated in the Qualitative Risk Assessment for the 100-HR-3 operable unit. The results are summarized in Table 1 and described in the following sections.”

(Add risks associated with **FREQUENT-USE** to Table 1 [as was done in Table 2 in the 100-DR-2 Proposed Plan])

(Expand Table 1 to show which contaminants were the key contributors to the risk. If within the block of the table it is too busy, include in the footnotes.)

(Insert a section on COPC's and what they mean under both scenarios.)

(Explain that we are doing this IRM to protect ecological receptors. I would suggest adding: 1) that land-use decisions have not been completed for the 100 Area, leave out any reference in the text to land-use; 2) COPC's that exceed human health risks will be addressed in the ROD; and 3) that decisions made now will not set precedence for future land-use decisions.)

“Based on monitoring data that consistently shows toxic chromium (VI) above Ambient Water Quality Criteria of 11 ug/L in near-river wells, shoreline springs and seeps; the qualitative risk assessment identified 100-HR-3 as exceeding the Environmental Hazard Quotient of one for chromium (VI). Potential ecological receptors of contaminants along the Hanford Reach of the Columbia River, where groundwater from the 100-HR-3 operable unit discharges, include fish and other organisms that spawn and live in the river, the river bottom, and the shoreline; birds and other animals and plants that use the river and adjacent marshlands; and predators, such as herons, that consume aquatic organisms. Receptors may come into contact with groundwater contaminated with chromium as the groundwater discharges into and mixes with the surface water in the river, or as groundwater emanates from springs and seeps along the river shoreline and flows into the river. Based on the QRA and the comparison with ARARs, the LFI recommended the IRM path for the 100-HR-3 operable unit.”

“In addition to determining potential ecological risk from chemical contaminants in groundwater, the effects from radioactive contaminants were also examined. It was calculated that no associated aquatic or riparian organisms will receive a dose from radionuclides in excess of the DOE Order 5400.5 limit of one rad per day. This dose is assumed to be protective of the ecosystem.”

**EPA Comments on: "Proposed Plan for Interim Remedial Measure
at the 100-HR-3 Operable Unit", DOE/RL-94-102, Draft B.**

General Comments

1. When appropriate, the comments provided here should be applied to 100-KR-4 as well.
2. There is a lot of jargon that we should try to remove, keeping the public reader audience in mind. For example: "source operable unit", "one rad", "screened from", "source to receptor pathway". Recommend that this document be handed to several non-Hanford people and have them mark the document every time they encounter an idea or term that is not clearly explained.
3. Regarding discharge of co-contaminants or residual chromium, state ARARs are an issue. If the resin used at Boomsnub is used in a proper design, compliance with the State of Washington's 50 ppb MCL for chromium should be easy. Interim Actions must attempt to meet ARARs, but if needed an interim action waiver of ARARs may be sought. Note, however that RCRA 3020 and related guidance is not applicable but may be relevant and appropriate for this issue. The co-contaminants such as nitrate and radioisotopes are not RCRA hazardous wastes. Also, the Proposed Plan states the effluent will be reinjected upgradient, but a concept of how far upgradient is not provided. The reader may think that 50 ppb hexavalent chromium is being reinjected only slightly upgradient and may escape the recapture well network and adversely affect the river.
4. The description of the nine criteria provided on page 11 is not very reader friendly. A revised description is provided in the specific comments. We are currently proposing its use for 200-UP-1 as well.
5. In the discussion of the nine criteria to this plan, the state and community acceptance criteria are not included. They should be. The state approves this plan. The community acceptance will be determined during public comment (although to date there has been overwhelming support expressed for this action).
6. A new section needs to be added to the end of the Proposed Plan. It should contain a more through description of the proposed plan. Pieces for that are scattered through the document, but no through description is provided. This should be able to be lifted and edited from the FFS.
7. A last new section, after the above, is a small section of text that is mandatory material for CERCLA proposed plans. This is provided in the specific comments below.
8. As a ecological-risk driven IRM proposed plan, any detailed discussion of human health confuses the issue. EPA's preference would be a statement that human health has been evaluated and since there is no current human use of the groundwater within 100-HR-3, human health risks are not addressed in this Proposed Plan. With a message such as that, all other human health reference can be removed, including most of table 1. If Ecology and DOE decide to include the more

lengthy discussion of human health, then both recreational and residential analyses should be included and presented in the specific comments below. Again, note EPA's preference is to remove essentially all the human health risk and land use discussion, and this preference supersedes the specific comments below.

Specific Comments

9. Page 1, caption near top of page, and 1st line of shaded text box. Throughout most of the document, the three agencies are identified in the order Ecology, EPA, and DOE. This should be consistent throughout the document.
10. Page 1, left column, last paragraph.
- a) The IRM is to remove groundwater from 'within' 100-HR-3, not 'beneath' 100-HR-3.
 - b) The IRM is for pump-and-treat. The studies alluded to in this paragraph and detailed on page 7 are DOE's proposals to spend money, are not encouraged by EPA, and we recommend that they not be identified as part of the IRM. Initiation of the pump-and-treat system and the compliance monitoring will provide useful actual aquifer response information rather than data modeled from uncertainty.
 - c) The IRM is for pump-and-treat to protect ecological receptors and does not target potential threats to human health.
11. We suggest the following revision to this paragraph:
 "The preferred alternative presented in this Proposed Plan is removal of contaminated groundwater from ~~beneath~~ the 100-HR-3 Operable Unit, treatment by ion exchange, and disposal of treated groundwater by returning it to the aquifer using injection wells. ~~In-situ treatment options will also be evaluated through treatability studies.~~ The preferred alternative will ~~reduce potential threats to human health and the environment; be protective of the Columbia River; protect the Columbia River environment from toxic hexavalent chromium;~~ provide information that will lead to final remedy selection; and will be consistent with possible final remedies at this and the source operable units.
12. Page 1, gray box
- a) A public meeting should be planned, and the date/time/location included either here or another prominent location.
 - b) The shading of this box is too dark. It should be either much lighter, or not shaded at all (see for example the 100-DR-1 Proposed Plan).
13. Page 1, right column, 1st full paragraph:
 The sentence that begins with "Comments may be made in person at the public meeting..." should read "Comments may be made in person at the public meeting **to be held at _____**, or comments may be made in writing and sent to the addressees listed below."

Later in that same paragraph, the last sentence should read "Responses to comments will be presented in a responsiveness summary that will be part of the **interim** record of decision, which is the ~~legal~~ decision document that selects the **interim** cleanup remedy for **this OU.**"

14. Page 1, last line
Change to read: "This proposed plan and other documents can be read at the Public Information Repositories listed at the end of this Proposed Plan".
15. Page 2, Figure 1. This is a very clear figure, however it does not show the springs/seeps that are discussed in the text.
16. Page 3, 1st column, last sentence
The statement: "aquatic organisms may have been impacted by contaminants that migrated along with groundwater from waste[s] sites at the surface" is confusing. It needs to be simplified. This one sentence refers an concept that has not been introduced -- waste sites at the surface. This sentence identifies groundwater as having its origin in waste sites (i.e. no waste sites, no groundwater?). This one sentence introduces the concept of contaminant migration. This one sentence introduces the concept of aquatic organisms being impacted by contaminants in the groundwater (how did the animals that live in the river get into the groundwater in the waste sites?). This comment exaggerates the problem, the point being that there are a number of concepts, each worthy of explanation, packed into one sentence.
17. Page 3, 2nd column, 1st paragraph
The document states that "The most prevalent waste constituents remaining the groundwater are the chemical constituents chromium and nitrate, and the radionuclides tritium, technetium-99, and strontium-90. However the next paragraph states that "Today, chromium, a metal that is toxic to aquatic organisms, is the contaminant of concern remaining in the groundwater". This needs to be fixed to not confuse the reader. Perhaps, "the groundwater contaminant that is at toxic concentrations for aquatic organisms is hexavalent chromium", or "Today, chromium, a metal that is toxic to aquatic organisms, continues to pose a risk to aquatic organisms in the Columbia River is the ~~contaminant of concern remaining the groundwater~~ in the 100-D/DR and 100-H Areas (Figure 2).
18. Page 3, 2nd column, 1st paragraph
Change to: "has been addressed in previous interim action Proposed Plans".
19. Page 3, 2nd column, 2nd paragraph, 3rd line.
The text calls out "100-IU-4" and references figure 1. This operable unit is not identified in the figure.
20. Page 3, 2nd column, 2nd paragraph
A statement should be added that the source cleanup actions will remove chromium that poses a risk to future 100-HR-3 groundwater. (Hence there is some relevance to be discussing the surface cleanups in this groundwater Proposed Plan.)
21. Page 3, last line
The document discusses hexavalent and trivalent, but should conclude with a statement of what is found at 100-HR-3. Need some statement indicating that hexavalent, because it is soluble, is the

form collected in groundwater monitoring. Hence, figure 2, although actually measured as total chromium is essentially all hexavalent chromium.

22. Page 4, 1st column, 2nd paragraph
This whole paragraph should be removed:
- The first sentence of this paragraph is redundant with the last paragraph on page 3.
 - The second two sentences address current human use of the river and potential future human use of land, both irrelevant to this IRM.
23. Page 4, 1st column, 4th paragraph
This whole paragraph should be removed:
The Hanford Reach EIS and its implications to future land use is irrelevant to this IRM.
24. Page 4, 2nd column, top two paragraphs.
This is a substantial block of text devoted to explanation of how human health risks are calculated and how risk thresholds compare to background risk...all for a facet of risk that is not addressed by this IRM. This IRM is for ecological risk. It may be preferable to remove these two paragraphs.
25. Page 4, 2nd column, last two paragraphs on "Human Health Risk";
Page 6, 1st column, first two paragraphs
These four paragraphs should be removed and replaced with the text Wayne and Larry developed during July 17-18.
Specifically, it strives to decouple this ecological-risk driven IRM from future land use implications of the human health evaluation.
26. Page 4, right column, second paragraph:
If Ecology and DOE decide to include human health language in the proposed plan, below are several additional ideas:

The sentence that begins "Under a 1×10^{-4} risk, 2,501 cancer diagnoses..." is a little confusing. Maybe something like "Under a 1×10^{-4} risk scenario, only one additional cancer diagnosis would be expected to be added to the 2,500 cancer diagnoses that are already expected under current national cancer rates."

I would suggest combining the first sentence of the second to last paragraph of page 4 with some of the information in the first paragraph on page 6 as follows:

"HUMAN HEALTH RISK - Human health risks were evaluated for the 100-HR-3 Operable Unit in order to determine whether interim remedial measures were required. The *Focused Feasibility Study for the 100-HR-3 Operable Unit* concluded that there were no unacceptable human health risks at this time from contaminants in the groundwater at the

100-HR-3 OU (Table 1). Due to the limited scope of interim actions under CERCLA, only ecological risks will be addressed in this interim remedial action. However, this interim remedial action will not pose any unacceptable risks to human health. The final remedy that will be selected for the 100-HR-3 OU will address both human health risks and ecological risks."

27. Page 5, figure 2.

- a) A symbol for a well is identified in the legend, but none are included in the actual figure (that I could see). Remove this from the legend.
- b) The technique of depicting surface features as a faint dotted line is very effective. Nice work. There is one bold rectangle in the figure for the H Area that needs to be changed to this same faint depiction.

28. Page 6, Table 1

- a) The column headers should be modeled after table 2 in the 100-DR-1 Proposed Plan (i.e. residential and recreational risks).
- b) Identify the key contaminants in each category.
- c) Remove all the existing footnotes. Replace with something like:
 - * Maximum defensible contaminant concentrations were used to calculate risks. Data from all wells were used to calculate human exposure risks. Data from near-river wells were used to calculate ecological risks.
 - * Recreational land use corresponds to an occasional-use scenario.
 - * Residential land use corresponds to a frequent-use scenario.

Note for the last two bullets above: This is all that should be said for inter-conversions of these human exposure scenarios / land uses. Anywhere else in the document, use the terms "recreational" or "residential". Again, EPA's preference is that during revision of this document to emphasize the ecologically-driven IRM nature of this action, human exposure won't need to be discussed in such a manner that exposure parameters / land use are broached.

29. Page 6, "Ecological Risk", first three paragraphs

These paragraphs should be replaced with the text Wayne and Larry developed during July 17-18.

30. Page 7

The sections "Need for Interim Remedial Measure" and "Scope and Role of Action" would benefit from a major rewrite. As written, they have a lot of overlap and could be combined. Secondly, there is discussion of activities that should not be identified as part of the IRM. A separate section entitled "Related Activities" could be created, and put at the end after the detailed description of the IRM and before the standard CERCLA proposed plan language. (Actions such as the CRCIA, Development of Performance Monitoring Methodology, and Ongoing Groundwater Sampling could be in this section.) Within the new section should be a statement that these actions will be useful for whatever final remedy is selected.

31. Page 7, 1st column, 4th line.

Remove the statement "This dose is assumed to be protective of the ecosystem." It has no value.

32. Page 7, 1st column, 1st full paragraph, 4th line
Remove the word "considered" from the phrase "may locally exceed levels that are considered toxic to salmon eggs". Note: contaminant levels are either toxic or not toxic to salmon eggs. It is irrelevant whether we "consider" it toxic.
33. Page 7, 2nd full paragraph.
The document states that: "Groundwater will be extracted...the effluent from the treatment process will be returned...this pump and treat system will result" etc. This document is a proposal. As written, it is a statement that the remedy as been finalized. This is a Proposed Plan. This section needs to reflect that this is a proposal for public comment.
34. Page 7, the seven studies.
Of the seven studies planned by the DOE, the "Development of Performance Monitoring Methodology", and part of "Ongoing Groundwater and River Sampling" are relevant components of this IRM. These two projects can support compliance monitoring for the pump-and-treat. EPA does not support spending money planning and conducting the other components of these studies with money that could be doing actual remediation.
35. Page 7, 2nd column, last full paragraph
I would rewrite the first sentence to read "The proposed interim remedial measure is protective of ecological receptors in the short term and is intended to provide adequate protection until Ecology, EPA and DOE select the final remedy for this OU ~~determine the final remedy selection.~~"
36. Page 8, 1st column, 1st full paragraph
This is essentially an attempt to state part of the standard CERCLA proposed plan text. This should be replaced or modified as per the later comment on this topic, and moved to the end of the document (just before the administrative record section).
37. Page 8, 1st column, 1st full paragraph, last line.
Change to read: "posed by groundwater at ~~beneath~~ this site".
38. Page 8, 1st column, 2nd full paragraph, last sentence.
Change to read: "Operable Unit that have or may contribute ~~previously contributed~~ to groundwater contamination". Better yet, this whole paragraph could be removed as it is redundant to an earlier paragraph (3rd paragraph in "Site Background").
39. Page 8, 1st column, "Interim Remedial Action Goal"
Interim Remedial "Action" should be changed to Interim Remedial "Measure" throughout the document. The use of two different terms for the same concept is confusing.
40. Page 8, 2nd column, 1st full paragraph

- a) Treated water is identified for reinjection upgradient. No conceptual model is provided for where that upgradient location is has been provided. That much of this water will be recaptured and re-treated is valuable information.
- b) The document states that "The goal of this action is to remove hexavalent chromium from the effluent stream through treatment to meet the state of Washington Model Toxics Control Act". 1st, the goal of this action is to protect the Columbia River ecology (and this will be done in compliance with MTCA). Also, need to clarify the reference to MTCA, namely, will meet the 50 ppb drinking water MCL.
- c) The RCRA reference to section 3020 is not appropriate. See the general comment on this subject.

41. Page 8, 1st column, 2nd last paragraph, 4th line

Change to read: "levels that are considered protective of the aquatic environment including salmon eggs, alevin...

42. Page 8, 1st column

"The relevant standard is the EPA's chronic Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life for hexavalent chromium of 11 parts per billion. The point of compliance for this standard is in the pore water 18 inches into of the river bottom substrate.

Because sampling sediment pore water in salmon spawning habitat is logistically difficult, costly, and poses safety hazards to workers, an alternative performance monitoring methodology is being considered. It is based on groundwater samples collected from ~~new drive-point well locations on~~ temporary sampling tubes driven to various depths into the shoreline and from existing near-river monitoring wells. ~~Plans call for a correlation that relates chromium concentrations in wells to Ambient Water Quality Criteria for chromium at the point of compliance to be developed during remedial design.~~ (For additional information, see WAC 173-340-730(6)(b) and the "Final Cleanup Action Plan, D Street Petroleum Site, Tacoma, WA" dated July 1991 that addressed the use of a dilution factor within the groundwater between the point of monitoring and the receptor point of exposure.)

43. Page 8, 2nd column, 1st full paragraph, last sentence

Change to read: "An operating ~~The~~ pump-and-treat system...".

44. Page 8, 2nd column:

Paragraph should be changed as follows: "Treated groundwater will be re-introduced into the aquifer using injection wells located upgradient within plume boundaries. The goal of this action is to remove hexavalent chromium from the effluent stream **by treating the effluent** to meet the drinking water standard for chromium under the state of Washington's *Model Toxics Control Act*. **This standard is 50 ppb.** It should be noted that **since this interim action is designed only to reduce the levels of hexavalent chromium in the groundwater and the river substrate,** there is a potential for other groundwater co-contaminants **to be present in the effluent to be re-injected at concentrations above the drinking water standards set for those contaminants.** Potential co-contaminants include nitrate, strontium-90, tritium, uranium, and technetium. The

final remedial action for the 100-HR-3 OU will address these co-contaminants and therefore they will not be addressed as part of this interim action. The provisions of RCRA Section 3020 allow reinjection of hazardous waste into groundwater provided that the reinjection is: 1) a part of a CERCLA response action; 2) the contaminated groundwater is treated to substantially reduce hazardous constituents prior to reinjection; and 3) the CERCLA response action will, upon completion, be protective of human health and the environment. RCRA Section 3020 is [applicable? relevant and appropriate?] to this interim remedial action because _____. An operating pump-and-treat system will achieve substantial treatment of the primary contaminant of concern for this interim action, chromium. The final record of decision for the 100-HR-3 OU will consider human health risks and ecological risks posed by the other co-contaminants in the reinjected effluent and, if necessary, appropriate response actions will be taken."

45. Page 8, 2nd full paragraph.
Change to read: "The interim remedial measure is not intended to achieve a final predetermined cleanup level limits in the groundwater". ~~A detailed quantitative baseline risk assessment~~ A final cleanup level will be developed during the final remedy selection process...". Remove the last sentence of the paragraph.
46. Page 9, 1st sentence.
This document gets confusing because it states that "The treatment of groundwater contaminants in situ was screened from...", but in the list of activities DOE wants/is doing it includes in situ groundwater treatment. See the earlier comment regarding DOE's activities.
47. Page 9, left column, first paragraph:
This paragraph should read as follows: "The treatment of groundwater contaminants in situ was **evaluated and dropped out of the 100 Area Feasibility Study, Phase 1 and 2** as an appropriate alternative for the 100-HR-3 OU....."
- As a general comment, for the ease of the reader, I would label each of the alternatives as "Alternative 1: No action", "Alternative 2: Institutional Control/Continued Current Actions", and so on. It makes it easier to organize.
48. Page 9, cost common elements.
As discussed by the Tri-Parties on June 28, 1995, costs for pump-and-treat remedial actions should be identified on a 5-year basis. This needs to be reflected in the Proposed Plan and Focused Feasibility Study.
49. Page 9-10, costs
- a) Parallel language and format should be used to describe each of these alternatives. The purpose of this section is to facilitate comparison of alternatives, and a consistent format will help. For example, the ion exchange description has a list of objectives.
 - b) An intuitive cost breakdown would be:
Capital cost: D/DR and H Area

Annual O&M cost:

Present Worth: (5-year IRM period)

- c) The pump-and-treat options are identified as not including sampling and analysis costs. These are a necessary component of this alternative and should be included. These costs appear to be included in the detailed cost descriptions in the FFS. Is this statement in the Proposed Plan correct?
50. Page 9, Institutional Controls
O&M costs are identified as "annual", however it appears that it should be "lifetime".
51. Page 9, 2nd column, 1st line
"First Year PW" should be "PW".
52. Page 9, Containment, last line of text.
Remove the statement "The potential risks to ecological receptors would remain the same". That statement is not true.
53. Page 10, 1st column, last paragraph.
Suggest to read "Modifications to the preferred alternative remedial actions may be made based upon new information state and local comments and concerns". (Note: this already has state acceptance.)
54. Page 10, Reduction of Toxicity, Mobility, or Volume.
The 2nd and 3rd sentences should be removed and replaced with the simple statement that "The remaining alternatives contain no treatment".
55. Page 10, State Acceptance
Identify this category and indicate that the state has accepted this preferred alternative.
56. Page 10, Community Acceptance
Identify this category and indicate that this Proposed Plan is provided to solicit comment, and a public meeting will be held to solicit comment. These and the Administrative Record will be used to evaluation community acceptance.
57. Page 10, left column, last paragraph:
In general, you must add a heading entitled "Applicable and Relevant and Appropriate Requirements" and briefly list the title and citation to the ARARs that come into play for this action, and why they are either applicable or relevant and appropriate. Then, the reader will be able to understand the ARARs discussion under the "Evaluation of Considered Alternatives" subheading.

I would rewrite the last paragraph in the left column as follows:

"The preferred alternative, Alternative 4: Removal/Ion Exchange Treatment/Disposal, is preferred as it provides the best balance of tradeoffs among the alternatives with respect to the

nine evaluation criteria contained in the *National Contingency Plan ("NCP")* that are used to evaluate remedies under CERCLA. A description of those criteria are listed below (see shaded box). **The five alternatives are evaluated against these criteria to identify a preferred alternative. The community acceptance criteria will be evaluated following the public comment period of this proposed plan. The following presents a brief analysis of each of the alternatives for the 100-HR-3 OU against the NCP evaluation criteria. Only criteria pertinent to the selection of an interim action have been addressed in detail."**

58. Page 10, right column, second paragraph (ARARs):
 In this paragraph (which will likely end up being two or three paragraphs by the time you have addressed the comments here), you need to list the ARARs that will be met or waived for each alternative. You also need to add the following paragraph (or something like it): **"Some of the major ARARs identified for the five alternatives include _____. An interim remedial action is an interim action designed to reduce immediate risks through mass reduction of contaminants of concern. Therefore, an interim remedial action by its nature is not intended to specifically meet ARARs. Thus, ARARs will be met to the extent practicable. However, ARARs must be met for: 1) any portion of the interim action that is final; 2) materials that are treated or managed off-site; and 3) any release of hazardous substances that may occur during implementation of the interim action. It should be noted that this action is not intended to meet, nor will it meet, the drinking water standards for all the co-contaminants at the 100-HR-3 OU before re-injecting the treated groundwater back into the ground. Section 121(d)(4)(A) of CERCLA allows the waiver of certain ARARs when the action taken is protective of human health and the environment and it would not be practical to meet those ARARs. At the 100-HR-3 OU, levels of hexavalent chromium in the treated groundwater will be below drinking water standards and below 1×10^{-4} risk levels. The levels of _____ in the treated groundwater will be below 1×10^{-4} risk levels; however, these levels will still be above the drinking water standards. The final remedy selected for the 100-HR-3 OU will address the risks posed by the contaminants that remain in the groundwater at this site and, if necessary, response actions will be taken to address those risks."**

In addition, the paragraph must be rewritten as follows: **"The No Action alternative would not invoke any ARARs that would need to be satisfied. The Institutional Controls/Continued Current Actions alternative would not meet the applicable water quality standards for the Columbia River, as this alternative would allow [hexavalent chromium??] to continue to exist in the river at levels above the water quality standards. [Any other ARARs that these two alternatives would or would not meet?? If so, add a sentence describing] Both the pump-and-treat alternative and the containment alternative can meet the applicable water quality standard in the river. Containment, however, would not meet ARARs for reinjection, because effluent treatment (which is required by the RCRA ARARs governing reinjection), is not a component of the containment alternative. [Any other ARARs that these two alternatives would or would not meet?? If so, add a sentence describing] For the treatment alternatives (ion exchange and reverse osmosis), ARARs must will be met or waived under Section 121 of CERCLA before treated effluent can be reinjected. In addition, ARARs for disposal of**

removed chromium will also be met. [Any other ARARs that these two alternatives would or would not meet?? If so, add a sentence describing] "

59. Page 11, right column, first paragraph:
Is there a document that can be cited as the source of the statement that potential direct and indirect impacts "have been evaluated", or is this contained in the interim ROD? If it will be in the interim ROD, then end the first sentence of this paragraph with "...alternatives have been evaluated as **part of this interim remedial action**, including potential direct and indirect impacts."
60. Page 11, 1st column, 1st paragraph.
Suggest changing to: "The reverse osmosis treatment alternative is somewhat more difficult to implement ~~an[d] will require treatability testing~~".
61. Page 11, Cost.
We request the following statement be added to the end of this paragraph. "The regulators have evaluated the design basis used by DOE to estimate project cost for ion exchange treatment. That evaluation indicates that substantial cost savings can be realized with a more optimal design."
62. Page 11, 2nd last paragraph, 2nd last line
Typo: "propose din" should be "proposed in".
63. The following description of the CERCLA 9 criteria should be used:

Evaluation Criteria

EPA uses nine criteria to identify its preferred alternative for a given site. To be selected, an alternative must meet the first two "threshold" criteria. EPA uses the next five criteria as "balancing" criteria for comparing alternatives and selecting a preferred alternative. After public comment, EPA may alter its preference on the basis of the last two "modifying" criteria, which are state and community acceptance.

Threshold Criteria:

1. **Overall protection of human health and the environment**— How well does the alternative protect human health and the environment, both during and after construction?
2. **Compliance with federal and state regulations (ARARs)**— Does the alternative meet all federal and state applicable or relevant and appropriate requirements (ARARs)?

Balancing Criteria:

3. **Long-term effectiveness and permanence**— How well does the alternative protect human health and the environment after completion of cleanup? What, if any, risks will remain at the site?
4. **Reduction of toxicity, mobility, or volume through treatment**— Does the alternative effectively treat the contamination to significantly reduce the toxicity, mobility, and volume of the hazardous substance?
5. **Short-term effectiveness**— Are there potential adverse effects to either human health or the environment during construction or implementation of the alternative? How quickly does the alternative reach the cleanup goals?
6. **Implementability**— Is the alternative both technically and administratively feasible? Has the technology been used successfully on other similar sites?
7. **Cost**— What are the estimated costs of the alternative?

Modifying Criteria:

8. **State acceptance**— What are the state's comments or concerns about the alternatives considered and about EPA's preferred alternative? Does the state support or oppose the preferred alternative?
 9. **Community acceptance**— What are the community's comments or concerns about the preferred alternative? Does the community generally support or oppose the preferred alternative?
64. The following standard language needs to be in the Proposed Plan. This would be an appropriate place to put it:
- The preferred alternative is believed to provide the best balance of trade-offs among the alternatives with respect to the evaluation criteria used to evaluate remedies. The preferred alternative will protect human health and the environment, complies with ARARs, is cost-effective, and will utilize permanent solutions to the maximum extent practicable. The preferred alternative satisfies the preference for treatment as a principle element.
65. **Page 13, Conceptual Site Model**
It would help and reader to have a figure of a conceptual site model. It could show a source waste site contaminating the groundwater that flows out springs/seeps on the river shore and flows up through the river bottom. We've seen good view-graph depictions of this sort of thing, so that are already available. Also, the seeps that are described in the text are not depicted in figures 1 or 2. Perhaps these could be identified in the conceptual model figure, or added to an existing figure.

- 66. Page 13, Expedited Response Action
"A path"? "A rapid response is necessary?"
- 67. Page 14.
Need to add a reader friendly definition of "Pore Water". It is critical to the discussion in the Proposed Plan.

Ecology Comments on the 100-HR-3 Focused Feasibility Study, Draft B.

General Comments

1. At the previous HR-3 comment resolution meeting the regulatory agencies stated that the frequent-use scenario will be included in the FFS. Throughout the document this has not been done or has been ignored. In order to be consistent with land-use scenarios used for 100 area source cleanup decisions, the frequent-use scenario will be incorporated. The regulatory agencies require that references to the occasional-use scenario be changed to the frequent-use scenario or that the frequent-use scenario be included.
2. The cost information presented in the FFS which apparently provides the ground work for the cost data in the proposed plan is not clear. First, the regulators require that all cost information be calculated in 5 year increments. Second, the cost information is very incomplete. We recommend that the information be presented similar to that for 100-KR-4. Third, in a letter from DOE-RL to Ecology & EPA, Response to "The Hanford Cleanup Costs In Perspective: Pump-and-Treat For Hexavalent Chromium", received July 5, 1995, O & M costs to run the pump & treat in the D area at 60 gpm are 30,000/mo. Why in the FFS are the O & M costs for the D area Pump & Treat at 80 gpm (?) 126,000/mo.? Why do we have two full-time operators when we just installed automated equipment and why are we regenerating the resin?
3. Conservative or not, the Ambient Water Quality Criteria, with a dilution factor to be determined by the regulatory agencies, will be applied at near-river wells until such time that the regulatory agencies decide to change it.

It is unfortunate at this late stage that general themes put forth by the regulatory agencies many times in the past have not been incorporated. This document needs some major revisions before it is released.

Specific Comments

1. Page ES-1, bullets. Use 5 years for the cost data not 12 years.
2. Page ES-1, bullets. The frequent-use scenario is assumed for the operable unit.
3. Page EST-2, fifth row. There will be a reduction in Chromium to the river. Concentrations will fall below the AWQC at the near-river wells. Cost numbers are way too high.
4. Page 2-6, second paragraph. If you are going to mention the salmon redd sampling study, present all the results. Include the five hits and the seep results.
5. Pages 3-1 through 3-15. This section has gone from bad to worse. See general comments 1 and 3.

6. Page 6-19, last paragraph. The following tables referenced here do not address general comments 1 and 2.
7. Page 8-1, second paragraph. Change to frequent-use.
8. Page 8-2, first bullet. The standard will be the AWQC of 11 ug/L until the regulatory agencies decide otherwise. Strike the last sentence of this paragraph.
9. Page 8-6, last paragraph. Change to 5 years.
10. Page 8F-1. We decided to remove or change these confusing charts. Do it.
11. Page 8T-1. Same as comment 3.
12. Page 8T-2, first column. Change to 5 years.
13. Page B-16. Add the estimated number of wells, locations, pumping rates, etc.

**EPA Comments on : "100-HR-3 Operable Unit Focused
Feasibility Study", DOE/RL-94-67, Draft B.**

Due to the several day review period for this document, EPA conducted cursory reviews on several portions of the document. Specific statements or conclusions within this document that are contrary to previous direction provided by EPA on this or related projects are not endorsed by EPA, even though they may not have been highlighted in this review. Comments contained herein in regard to a specific portion of the document should be considered applicable to the entire document. Comments provided for the Proposed Plan, apply as appropriate to this Focused Feasibility Study document as well. These comments should be applied, as appropriate to the 100-KR-4 FFS.

68. Page EST-1, Alternative GW-2
Change to read: "Columbia River Comprehensive Impact Assessment Evaluation".
69. Page EST-2, Ion exchange alternative, Overall protection column
Change to read something like: "Good - immediate reduction in chromium mass in groundwater expected however mass removal rate relative to total inventory is unknown but will likely become apparent during compliance monitoring, with likely reduction in chromium concentrations entering the river."
70. Page EST-2, Ion exchange alternative, Compliance with ARARs
Change to read something like: "Fair Good - Chromium mass in groundwater will decrease and concentrations may will fall below AWCQ at the river".
71. Page 1-1, third paragraph.
The document states that all work conducted at the waste sites is accordance with the Tri-Party Agreement. This statement should be removed. A substantial amount of work at the waste sites is not addressed in the Tri-Party Agreement. Of the work conducted at the waste sites, some of it fails to meet TPA criteria.
72. Page 1-11, last paragraph.
Change to read: "operation using the following criteria, ~~operation using the following criteria~~"
73. Page 1-13, 2nd bullet.
The Dowex 21K™ resin is identified as the test resin for the pump-and-treat treatability test.
74. Page 1-13, last bullet.
It is not clear from reading the assumptions in Appendix D whether resins will be disposed or regenerated during the IRM period. At the Boomsnub site, it was determined to be slightly more cost effective to dispose of used resin at a commercial facility (paying commercial disposal costs) rather than regenerate the resins. At Hanford, with its own disposal facility and traditionally high labor costs, it should be dramatically more cost effective to dispose of the resins, and we recommend that be the basis for cost planning.

75. Page 2-4, Section 2.2
This document stumbles under the burden of carrying a dual set of terminologies: residential and recreational vs frequent-use and occasional use. The single set of terms, "residential and recreational" should be used. Once, perhaps in this section, the alternate terms "frequent" and "occasional" use can be defined to allow cross reference to the QRA/LFI.
76. Page 2-5
Several paragraphs on this page summarize the contaminants of concern under the different human and ecological scenarios. This is good information that could be captured in Table 1 of the Proposed Plan.
77. Page 3-7, remedial action objectives, 1st bullet
This object is wrong and should be replaced with the statement (as per the proposed plan) that the AWQC would be met at a depth 18 inches down in the river substrate.
78. Page 3-8 to 3-10, Sections 3.2 and 3.3
These sections contain discussions about future land uses and exposure scenarios that are inconsistent with the planning basis for the remedial actions established for the 100-DR-1 and 100-HR-1 source operable units. Those cleanup plans are geared to support residential future land use. IRMs with future implications should be consistent with that future land use. Of course IRMs can target current risks such as is proposed for hexavalent chromium that is not directly related to restoration for a future land use.
- Much of the text on page 3-9 and the top of page 3-10 is not appropriate and should be removed. The Focused Feasibility Study is not the forum to determine appropriate future land use.
79. Page 3-15, 1st paragraph, last sentence
Change to read: "The criterion applies to the riverbed sediments that are or could be used by Chinook salmon for spawning habitat".
80. Page 4-1, 3rd paragraph
This sounds like an advertisement flyer for DOE's EM-50 program. This should be eliminated, or give equal play to the Army Corps' programs for environmental restoration, and the U.S. Navy's environmental restoration applied technologies programs, or EPA's myriad of programs for environmental cleanup technologies.
81. Page 4-2, section 4.1.1
See EPA's comment #22 on the 100-KR-1 Proposed Plan, EPA letter dated May 19, 1995.
- This section states that the no action alternative "consists of continued existing access controls". However the next paragraph in section 4.1.2 regarding the no action alternative states "this alternative requires no restrictions, controls". The last sentence on the page states "Existing access controls...are continued".

82. Page 4-3, Section 4.2.1, first line

It appears that the following is the intent of this statement: "The access restrictions included in this alternative are not unique to groundwater media".

83. Appendix A, tables A-1 and A-2

In the discussion on the first few pages, several ARARs such as 40 CFR 141 for MCLs and 40 CFR 144 for reinjection are not included in the tables at the end of the appendix.

Ambient Water Quality Criteria are discussed extensively but do not appear to be included (40 CFR 131) in the Appendix A table. The Interim Final Rule (May 4, 1995 Federal Register) of revised aquatic life metals criteria in EPA's national Toxics rule does not appear to be in the list.

These are some premier ARARs and if they are not included in tables A-1 and A-2, it casts general doubt on the completeness of this table. DOE should do a through review of these tables.

84. Appendix D, Ion Exchange, Task # WHC:12.05.08

It appears that the system is not planned to be automated. The planning basis indicates 2 Ft.'s, one shift per day, seven days a week. Pump-and-treat is an established technology that off-Hanford is typically run in an automated mode. That should probably be planned and implemented for this site as well.

85. Appendix D, Ion Exchange, Task # WHC:12.05.08

We suggest DOE critically analyze the basis for planning to pH adjust the water. At Boomsnub this was beneficial because costs to adjust the pH were justified because the high chromium concentrations consumed resin at a high rate. The concentrations in 100-HR-3 are much lower and hence will consume resin at a much lower rate. Costs to adjust the pH, however are a function of water volume (and will be higher at 100-HR-3 than at Boomsnub).

86. Appendix D, Ion Exchange, Task # WHC:12.05.08

The cost basis is to regenerate resins rather than dispose. This is not cost effective based on comparison to the Boomsnub site. At Boomsnub, cost comparison determined that it is slightly more cost effective to dispose of rather than regenerate resins. That is based on commercial disposal rates. Hanford has the ERRED that should provide much more cost effective disposal. In addition regeneration of resin is primarily a labor-driven cost element. With the traditionally high labor charges at Hanford, this is not cost effective planning. Thus for multiple reasons disposal of resins appears to be the much more cost effective.

87. Appendix D, Section 1.3, Cost Summary Tables

The usefulness of this document to identify the cost basis for remedial alternatives would be greatly improved if a "Detailed Estimate" cost breakdown as provided in the FFS for 100-KR-4, draft A (pages C-132 to C-162) was provided. As requested and documented in the meeting minutes from June 28, 1995 for this project, EPA would like to see detailed cost breakouts.