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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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April 13, 1994

Mr. Laurence E. Gadbois
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, WA 99352

9413291.0519

Dear Mr. Gadbois:

Enclosed are the Washington State Department of Ecology's comments on DOE/RL-93-78, Draft A, "Limited Field Investigation Report for the 100-KR-1 Operable Unit" and WHC-SD-EN-RA-009, Revision 0, "Qualitative Risk Assessment for the 100-KR-1 Operable Unit." Please consider these comments when forwarding your assessment to the U. S. Department of Energy.

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If you have any questions concerning these comments, please feel free to contact me at (509) 736-3027.

Sincerely,

David Holland
Unit Manager
Nuclear Waste Program

DH:mf
Enclosure

cc: John Hall, Department of Wildlife
Administrative Record (100-KR-1 Operable Unit)

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Ecology's Comments on DOE/RL-93-78, Draft A
"Limited Field Investigation Report for the 100-KR-1 Operable Unit"

General Comments:

1. The criteria that determine an IRM candidacy are not well defined. I recommend that the regulators and USDOE reach an agreement, similar to what was accomplished for the groundwater operable units, that clearly defines what determines an IRM candidacy (see specific comments below).

Comments to Specific Sections:

2. Page ES-2, 3rd complete paragraph on the page, 1st bullet:

The manner in which the bullet is written implies that ecological risk estimates are tied to a human low-frequency use scenario. A separate bullet should be added that addresses the ecological criteria that determine IRM candidacy. The criteria should be clear in regard to which scenario(s) (0–6 feet or 0–15 feet scenarios, or both) and which ecological benchmarks are applicable for determining an IRM candidacy (see general comment No. 1 above).

3. Page ES-2, 3rd complete paragraph on the page, 5th bullet:

Natural attenuation of radionuclide contaminants should not be viewed as a criteria for determining IRM candidacy. It is a mitigating condition that allows a waste site's candidate status, once it is identified as a candidate based on radionuclide contaminant levels, to be reevaluated.

4. Page ES-2, last paragraph:

The statement that "the process effluent pipelines should be deferred to final remedy selection" is inconsistent with what is planned. The text should reflect that there is an expedited response action planned for the 100 Area Reactor Effluent Pipelines.

5. Page 1-4, last paragraph:

The statement that "any field investigations will be deferred until the cumulative risk assessment for the entire 100 Area" is not clear. Are field investigations performed in a quantitative risk assessment?

6. Page 2-2, Section 2.2.2, last paragraph on page, last sentence:

The scientific name for the eastern kingbird is incomplete.

7. Page 2-3, Section 2.2.2, 2nd complete paragraph and start of last paragraph on the page:

The information about ant mound and small mammal burrow soil sampling is misleading. These types of samples were collected adjacent to but not atop the waste sites. Therefore, although the information potentially is useful as monitoring data, it does not provide contaminant uptake information. Additionally, the coyote scat and raptor pellet information is problematic. For more information on these issues see Hall (1993). WHC and USDOE have previously agreed with the regulators on the resolution to the above comments as a part of resolving comments to Landeen, et al. (1993).

8. Page 2-4, Section 2.3, first sentence:

The phrase "sampling for geology" is used incorrectly. Perhaps "sampling for geological and physical properties" may be more accurate.

9. Page 2F-1, Figure 2-1:

The text in the notes states that "the boundary of the 100-KR-1 and 100-KR-4 operable units includes that portion of the Columbia River to the midstream lying north of the 100-K Area." The statement is inconsistent with Page 2T-1, Task 4, which states that "no surface water or sediments are included within the boundaries of the 100-KR-1 operable unit." Which is correct?

10 Page 2T-2, Table 2-2:

The "LFI Investigative Approach" for the Process Effluent Pipelines should also include the review of analogous data (A). This review is described on page 3-14 in section 3.2.6.4.

11. Page 2T-4b, Table 2-4:

The "Chromium" concentration of 400 milligrams per kilogram for MTCA Method B as shown in the chart should be clarified to read "Chromium VI."

12. Page 2T-6, Table 2-6:

The Endangered Species Act (ESA) of 1973 is identified as a potential federal location-specific ARAR. In association with the ESA, USDOE's Implementing Procedures for NEPA (10 CFR Part 1021) also should be identified as an ARAR. Within 10 CFR 1021, USDOE identifies that its concern for avoiding adverse impacts to individual species and their habitat is not restricted to federally endangered or threatened species, but rather is more inconclusive, i.e., "Federally-listed threatened or endangered species or their habitat (including critical habitat), federally-proposed or candidate species or their

habitat, or state-listed endangered or threatened species or their habitat." [10 CFR 1021, Appendix B to Subpart D, Section B(1)(ii)]. See Wagoner (1994) for an additional indication of USDOE's guidance on this issue.

13. Page 4-1, Section 4.1, 2nd to last sentence:

In the second to last sentence, change pocket mouse habitat to pocket mouse occupancy.

14. Page 4-2, Section 4.1.2, third paragraph:

The last sentence states that "the effect of radiation shielding by the upper six feet of soil on the external exposure risk at each waste site is evaluated." Ecology would agree with EPA that the use of six feet of fill in the calculation of exposure is not appropriate.

15. Page 4-2, Section 4.1.2, last paragraph, last sentence:

Add ". . . for nonradionuclide contaminants." to the end of the sentence. Radionuclides are not associated with NOELs.

16. Page 4-6, Section 4.3, last paragraph on page, last sentence:

Delete "(weighted by energy of radiation)". Weighting of radiation dose by energy does not apply to non-human receptors.

17. Page 4-7, Section 4.3, 1st complete paragraph on the page, 3rd sentence:

The sentence states that external radionuclide dose accounts for less than 1% of the total dose and is therefore negligible. This finding needs to be demonstrated for the scenario in which a pocket mouse hibernates and/or estivates within the first six feet of soil covering the "worst-case" waste site, and the resultant external dose compared to the internal dose the mouse receives by ingestion had it continued to feed, before the external pathway can be rejected generically. This approach was agreed to by unit managers during comment resolution on earlier source operable unit documents.

18. Page 4-7, Section 4.3, 2nd complete paragraph on the page, 1st sentence:

Delete ". . . assessment and . . ." from the sentence. There are no assessment endpoints for the ecological QRA scenarios.

19. Page 4-7, Section 4.3, 2nd complete paragraph on the page, 4th sentence:

Besides USDOE Order (these two "words" are reversed in the sentence) 5400.5, IAEA (1992) also is included as a reference for the 1 rad/day ecological benchmark. This is inaccurate. Instead, IAEA (1992) identifies a chronic dose rate of 0.1 rad/day (or less)

as a dose rate that provides adequate protection for populations of radiosensitive species (animal) in terrestrial ecosystems. Admittedly, however, IAEA (1992) does not recommend a specific radiation protection standard for non-human biota. Their position assumes, however, that human radiation protection standards will provide protection. This may not be strictly true in all scenarios (IAEA 1992).

20. Page 4-7, Section 4.3, 3rd complete paragraph on the page, last sentence:

Change ". . . some fraction of its . . ." to ". . . its entire . . . ." If the effect of the external exposure pathway for radionuclides is to be accurately evaluated and then compared to the ingestion pathway (see specific comment No. 10 above), then the change reflects a necessary assumption. Also delete ". . . when present . . ." for the same reason.

21. Page 4-7, Section 4.3.1, last paragraph on the page:

Table 4-5 also identifies the 116-KW-3 Basin (outside only) as having exceeded the concentration corresponding to the NOEL for cobalt.

22. Page 4-8, Section 4.3.2, 4th paragraph, last sentence:

In the previously provided sample calculations that USDOE included as a part of its response to regulator comments for the 100-DR-1 and 100-HR-1 QRAs, a gut assimilation factor of 0.3 was used. This conflicts with the statement in this LFI that 100% absorption efficiency was assumed.

23. Page 4-8, Section 4.3.2, 5th paragraph, last sentence:

Hibernation also can result in an increase in the amount of external exposure. Whether or not in all situations the ingestion pathway will dominant the external pathway (i.e., assume the mouse continues to eat contaminated foodstuffs rather than hibernates) remains to be demonstrated (see specific comment No. 10 above).

24. Page 4T-1, Table 4-1:

The table should be modified to show that there is a higher confidence in the LFI data than the historical data (currently they are evaluated together). See discussion in the text, Section 4.1.2, page 4-2, second paragraph.

25. Page 4T-4, Table 4-4:

Text should be added to clarify that the waste sites shown were where LFI sampling was performed (that EHQs were not generated from historical data).

26. Page 4T-4, Table 4–4:

This table should be consistent with Table 4–4 of the QRA. Information for the 116-K-2 Trench should be separated into inside and outside the trench. Also, information should be provided separately for both the 0–6 feet and 0–15 feet soil depth scenarios. Finally, the information in the QRA indicates that the radionuclide contamination inside the 116-KE-4 Retention Basins results in an EHQ greater than 1 (see QRA specific comment No. 59).

27. Page 4T-5, Table 4-5:

Text should be added to clarify that the waste sites shown were where LFI sampling was performed (that EHQs were not generated from historical data).

28. Page 4T-5, Table 4–5:

The title of the table is inaccurate. Background values are associated only with inorganic analytes. Footnote "c" is inaccurate. All contaminants are not below background inside the 116-KE-4 Retention Basins. Di-n-butylphthalate is present (organics do not have an associated background level); however, it need not be listed in the Table because it does not have a published NOEL value. Information should be provided separately for both the 0–6 feet and 0–15 feet depth scenarios.

29. Page 5-1, Section 5.1.1, first paragraph:

Text should be added to describe why the low-frequency use risk values (rather than high) were used to evaluate IRM candidacy. Additional text should also explain how noncarcinogenic effects (Hazard Quotients) were used to evaluate continued candidacy for high-priority waste sites for IRMs.

30. Page 5–1, Section 5.1.1, 2nd paragraph, 2nd sentence:

Clarify which ecological scenario (0–6 feet or 0–15 feet scenarios, or both) and which ecological benchmarks are applicable for determining an IRM candidacy (see general comment No. 1 above).

31. Page 5–3, Section 5.2.2, 1st sentence:

The sentence should indicate which EHQ (radionuclide or nonradionuclide contaminant) is greater than 1 and which exposure scenario (0–6 feet or 0–15 feet scenarios, or both) is the basis. This comment also applies to Sections 5.2.3 and 5.2.4.

32. Page 5-3, Section 5.2.2, 4th and 5th sentences:

These sentences conclude that the source of organic contaminants in the LFI samples may have been laboratory contamination, yet no information is provided that indicates the data validation methods of Section 2.5 of the LFI were followed (i.e., comparison with laboratory and field blanks) to justify a conclusion of laboratory contamination.

33. Page 5-4, Section 5.2.6:

Text should describe the current activities/plans surrounding the cleanup of the 100 Area effluent pipelines. EPA and Ecology do not agree with deferral to the final remedy selection process.

34. Page 5T-1, Table 5-1:

The Table should be expanded to include the high-frequency use scenario.

35. Page 5T-1, Table 5-1:

The ARARs column is misleading (they have not been met). In MTCA, cleanup levels for individual carcinogens (including radionuclides) are based upon the upper bound of the estimated excess lifetime cancer risk of one in one million. Where a hazardous waste site involves multiple hazardous substances and/or multiple pathways of exposure, method B cleanup levels for individual substances must be modified in accordance with the procedures in WAC 173-340- 708. Under this method, the total excess lifetime cancer risk for a site shall not exceed one in one hundred thousand and the hazard index for substances with similar noncarcinogenic toxic effects shall not exceed one (1).

Ecology's comments on WHC-SD-EN-RA-009, Revision 0
"Qualitative Risk Assessment for the 100-KR-1 Operable Unit"

General Comments:

1. No where in the entire QRA document is it indicated that there are two ecological exposure scenarios (i.e., 0–6 feet and 0–15 feet soil depths). Exposure results are presented as if based on two different soil profiles (0–6 feet and 6–15 feet) with no indication that these relate to an exposure scenario. Moreover, 6–15 feet is not an appropriate scenario. As agreed to in several comment resolution meetings for earlier source operable units, the QRA was to provide a brief description of the two exposure scenarios (0–6 and 0–15), their basis (i.e., what justifies their use), and some of the important modeling assumptions. Detailed descriptions of the exposure scenarios and example calculations were to be incorporated as part of the next revision of the HSBRAM (DOE-RL 1993). Note that it was also agreed to that before future source unit QRAs are submitted by USDOE for regulatory review, that the 0–6 feet scenario would be reevaluated to determine whether six feet was the appropriate cut-off depth to use in the ecological evaluation.

Comments to Specific Sections:

2. Page ES-1, Background, 2nd paragraph, last two sentences:

These sentences are inaccurate. A comparison to risk-based benchmark concentrations is only true for the human health evaluation; it is not true for the ecological evaluation (i.e., there is no risk-based screening for ecological contaminants of concern).

3. Page ES-2, Results, last paragraph of the section, 2nd to last sentence:

Lead is identified as having exceeded a NOEL at the 116-KW-3 Retention Basin; however, the LFI data indicate that lead concentrations do not exceed background. Note that this comment is dependent on whether there is agreement on the lead background level concentration and how it was determined.

4. Page ES-3, Uncertainties (ecological):

Some of the listed uncertainties seem to be better described as conservatisms used in the ecological evaluation. For example, although most of the waste sites are covered by cobble or gravel (bullet two), as a conservative assumption the exposure scenario assumes the presence of a vegetative cover at each site that can be a source of contaminant uptake and food for the pocket mouse. The use of conservative assumptions can be used to account for uncertainties in the exposure scenario. The QRA should be clearer in distinguishing uncertainties from conservative assumptions.

5. Page ES-3, Uncertainties (ecological), 1st bullet:

Revise this sentence so that it is understandable. "Data" are not available for uptake. This particular sentence, or a form of it, occurs throughout the QRA document. The sentence should be revised wherever it occurs.

6. Page ES-3, Uncertainties (ecological), 4th bullet:

The time the receptor (pocket mouse) spends feeding is not estimated. The exposure scenario assumes a fractional use equal to one.

7. Page ES-3, Uncertainties (ecological), 5th bullet:

This statement is too strong as it stands. Uncertainties that are non-conservative, such as our lack of knowledge of wildlife toxicology, have not even been addressed in this section.

8. Page 1-2, Section 1.1.1, last paragraph and last sentence of the section:

Add ". . . for nonradionuclide contaminants." to the end of the sentence. Radionuclides are not associated with NOELs.

9. Page 1-15, Section 1.3.3, last paragraph of the section, last two sentences:

Delete in the second to last sentence ". . . and will receive most of its dose from within a waste site," and replace with "The QRA assumes that the mouse spends its entire life on the waste site and receives its total exposure dose from that waste site." Also, delete the last sentence. The ecological QRA is not intended to enable a risk comparison between waste sites.

10. Page 1-15, Section 1.3.3.1, Stressor Characteristics, 2nd paragraph, last sentence:

The statement is not completely accurate. Although the specific biological uptake data cannot be used in the QRA calculations, WHC did conduct some ecological sampling at the 100-K Area (Landeen et al. 1993; see Section 2.2.2 of the LFI).

11. Page 1-16, Section 1.3.3.1, Endpoint Selection, 3rd sentence:

Delete ". . . assessment and . . ." from the sentence. There are no assessment endpoints for the ecological QRA scenarios.

12. Page 1-16, Section 1.3.3.1, Endpoint Selection, 2nd to last sentence:

Instead of USDOE Order 5400.5, IAEA (1992) is identified as the reference for the 1 rad/day ecological benchmark. This is inaccurate. Instead, IAEA (1992) identifies a chronic dose rate of 0.1 rad/day (or less) as a dose rate that provides adequate protection for populations of radiosensitive species (animal) in terrestrial ecosystems. Admittedly, however, IAEA (1992) does not recommend a specific radiation protection standard for non-human biota. Their position assumes, however, that human radiation protection standards will provide protection. This may not be strictly true in all scenarios (IAEA 1992).

13. Page 1-16, Section 1.3.3.1, Endpoint Selection, last sentence:

Indicate that the toxicity values are NOELs.

14. Page 1-16, Section 1.3.3.1, The Conceptual Model, 1st paragraph, last sentence:

The sentence concludes that the external ionizing radiation contribution to dose is minimal. This finding needs to be demonstrated for the scenario in which a pocket mouse hibernates and/or estivates within the first six feet of soil covering the "worst-case" waste site, and the resultant external dose compared to the internal dose the mouse receives by ingestion had it continued to feed, before the external pathway can be rejected generically. This approach was agreed to by unit managers during comment resolution on earlier source operable unit documents.

15. Page 1-16, Section 1.3.3.1, The Conceptual Model, last paragraph:

The whole paragraph is not applicable to the assumptions of the QRA. The QRA is intended to consider only one receptor, the pocket mouse, whose home range is assumed to be equivalent to the area of an individual waste site. The paragraph foreshadows a consideration important to a baseline risk assessment not the QRA.

16. Page 1-17, Section 1.3.3.2, Ecosystem Characterization:

Between the second to last and last sentences, add "For each waste site evaluated in this QRA the waste site area is considered to approximate the receptor home range, and the receptor obtains all of its food from the waste site area."

17. Page 1-17, Section 1.3.3.2, Exposure Analysis, 1st paragraph, 3rd sentence:

Change ". . . some fraction of its . . ." to ". . . its entire . . . ." If the effect of the external exposure pathway for radionuclides is to be accurately evaluated and then compared to

the ingestion pathway (see specific comment No. 35 above), then the change reflects a necessary assumption. Also delete ". . . when present . . ." for the same reason.

18. Page 1-17, Section 1.3.3.2, Exposure Analysis, 2nd paragraph:

Identify the type of ecological benchmarks that will be used in the QRA for both radionuclide contaminants (regulatory limit of 1 rad/day) and nonradionuclide contaminants (wildlife NOELs).

19. Page 1-17, Section 1.3.3.2, Exposure Profile, 3rd paragraph:

As agreed to in the comment resolution for earlier source operable units, the usage factor for the pocket mouse for all waste sites will be one. The paragraph should be revised accordingly. The update to the HSBRAM (DOE-RL 1993), identified as DOE-RL (1994) in the paragraph, should perhaps not be referenced until all relevant parties have signed-off on the third revision.

20. Page 1-17, Section 1.3.3.2, Characterization of Ecological Effects, 2nd and last sentence:

USDOE Order 5400.1 should be 5400.5. Change the last sentence to read "Toxicity data (NOELs) for inorganic and organic contaminants also are evaluated."

21. Page 1-18, Section 1.3.3.2, Evaluation of Relevant Effects Data, 2nd paragraph, 2nd and 3rd sentences:

It is doubtful if any NOEL is based on an actual human dose-response model. Most human dose-response information is based on laboratory animals. Reword the third sentence to make it say what is intended.

22. Page 1-18, Section 1.3.3.2, Stressor-Response Profile, 2nd sentence:

See comment No. 33 for cautions about the use of IAEA (1992) as a reference supporting the use of 1 rad/day.

23. Page 1-19, Section 1.3.3.3, Interpretation of Ecological Significance, last sentence:

Delete the last sentence as it inaccurately describes the purpose of the QRA. Consider adding information that describes both the ecological role of the pocket mouse and why the QRA does not use assessment endpoints.

24. Page 1-19, Section 1.3.3.4:

This section is essentially a rehash of the bulleted items in the uncertainty section (ecological) of the Executive Summary. Refer to comment Nos. 4-7 above and revise this section accordingly. In the last sentence of this section, what does "boundaries" refer to?

25. Page 1T-7a, Table 1-7:

For some elements the table provides a transfer coefficient for both the element and a specific isotope(s), yet the text does not describe how one or the other coefficient (or both) was used in the QRA. The QRA should either explain why two (or more) different coefficients are used, or only list the coefficient that is relevant to the QRA calculation.

26. Page 1T-8, Table 1-8:

Toxicity information should be provided, and their effects included in the QRA, for those radionuclides that also have a chemical toxicity (e.g., uranium). Also include information on phenanthrene which is present in the soils outside the 116-KW-3 Retention Basins (see Table 2-5).

27. Page 2-2, Section 2.1.1.3, last bullet:

This bullet refers only to human health considerations. It should be clearly indicated that this bullet does not refer to the ecological QRA. This comment also applies to the last bullet of Sections 2.1.2.3, 2.1.3.3, and 2.1.4.3.

28. Page 2-10, Section 2.3.2, 2nd paragraph, 2nd sentence:

The organic compounds and radionuclides do not have an associated Hanford Site background level; only the inorganic analytes have this. This whole section should clarify for what contaminants a background level does and does not apply.

29. Page 2T-13, Table 2-13:

According to the LFI data, barium and lead are not present above background at any of the waste sites. Add phenanthrene to the list of organic compounds (see specific comment No. 47).

30. Section 3.1 Waste Sites With Data:

As described in general comment No. 22, ecological evaluation results are presented as if based on two different soil profiles (0-6 feet and 6-15 feet) with no indication that these

relate to an exposure scenario. Moreover, 6–15 feet is not an appropriate scenario (should be 0–15). Whatever depth the scenario extends to, the total depth of soil above it is included in the scenario. The appropriate tables associated with this section also should reflect the above changes.

31. Page 3–2, Section 3.1.1.3, 2nd paragraph:

The first sentence inaccurately implies that organic compounds have associated background data. In the second sentence replace "DOE-RL (1994)" with "Table 1–8."

32. Page 3–2, Section 3.1.1.4, 1st paragraph, 2nd to last sentence:

This sentence leaves the reader hanging as to whether the uncertainty about the contaminant distribution is conservative or nonconservative. If contaminants are concentrated at a "shallow" depth, a reader could infer that they are readily available to shallow-rooted plants. Thus, they may have a significantly increased bioavailability as compared to the situation in which contaminants are available for uptake by only deep-rooted plants. This comment also applies to similar sentences in Sections 3.1.3.4 and 3.1.4.4.

33. Page 3–3, Section 3.1.1.4, 2nd paragraph on the page:

The paragraph as written is hard to follow. It should start by first identifying the basic conservative assumption of the exposure scenario: though most of the waste sites are covered by cobble or gravel, there is present at each site a vegetative cover that can be a source of contaminant uptake and food for the pocket mouse. The scenario does not specify which plant species are present, and are available to be eaten by the pocket mouse, because most of the transfer coefficients are based on non site-specific information anyway. It is assumed, however (at least for the 0–6 feet scenario), that the expected rooting depths are characteristic of some of the plants on Hanford. The major uncertainties associated with the vegetation are not knowing for sure what plant species may eventually colonize the waste site in the absence of herbicide control, what each plant's specific transfer coefficient is for different contaminants, how the contaminants are actually compartmentalized, and what the mouse actually eats. This comment also applies to similar paragraphs in Sections 3.1.2.4, 3.1.3.4, and 3.1.4.4.

34. Page 3–5, Section 3.1.2.3, 1st complete sentence at the top of the page:

Insert "radionuclide" before EHQ.

35. Page 3–7, Section 3.1.3.3, 1st paragraph:

There should be a discussion of, and an appropriate table for, the 0–15 feet soil depth scenario. In the fourth sentence replace "DOE-RL (1994)" with "Table 1–8" and indicate

which organics were present that have published NOEL values. Delete the last sentence (LFI data indicates lead was below background).

36. Page 3-7, Section 3.1.3.3, 2nd paragraph:

In the first sentence, Table 3-5c should be Table 3-5d. In the third sentence, indicate which organics having published NOEL values were present (see specific comment No. 61).

37. Page 3-7, Section 3.1.3.4, 1st paragraph:

Revise the third sentence. As written it implies that "burrows" receive exposure to contaminants (also revise a similar sentence in Section 3.1.4.4). Revise the last sentence. It is doubtful that the overflow area "contains most of the contaminant inventory for the KW reactor."

38. Page 3-10, Section 3.1.4.3, 1st paragraph:

In the first sentence include Table 3-6d. The second and third sentences are incorrect. Table 3-6c indicates that the radionuclide dose rate is 1.1 rad/day, which results in a radionuclide EHQ greater than 1 for soils inside the 116-KE-4 Retention Basins. This result also applies to the 0-15 feet soil depth scenario.

39. Page 3-12, Section 3.2.1.3:

The title of this section should be similar to that of Section 3.2.2.3. This section does not represent an uncertainty analysis. Similar to Section 3.2.2.3, include a statement that an ecological evaluation is not provided.

40. Pages 3T-5d and 3T-5e, Tables 3-5d and 3-5e:

Include information on toluene, pyrene, and fluoranthene. These are organics that are present in the soils that are outside the 116-KW-3 Retention Basins (see Table 2-5) and that have published NOEL values (Table 1-8).

41. Page 4-4, Section 4.2.1, 2nd paragraph, last sentence:

Delete this sentence if the LFI information is accurate about the lead background and its relationship to the waste site lead data.

42. Page 4-5, Section 4.2.2, 1st complete sentence at the top of the page:

This sentence is inaccurate. The maximum reported waste concentration <u>from the top 15 feet of the soil profile</u> is used as the source term.

43. Page 4–5, Section 4.2.2, 2nd complete paragraph on the page, last sentence:

In the previously provided sample calculations that USDOE included as a part of its response to regulator comments for the 100-DR-1 and 100-HR-1 QRAs, a gut assimilation factor of 0.3 was used. This conflicts with the statement in this QRA that 100% absorption efficiency was assumed.

44. Page 4–5, Section 4.2.2, 3rd complete paragraph on the page:

In the middle of the third sentence, it is stated that the QRA "approach does not consider whether roots of a plant actually grow deep enough to contact a contaminant." For the 0–6 feet soil depth scenario, and the possible modifications of this scenario that USDOE-RL and its contractors are evaluating, the basis of the scenario is plant rooting-depths. The last sentence does not address the complete consequences of hibernation. Hibernation also can result in an increase in the amount of external exposure. Whether or not in all situations the ingestion pathway will dominant the external pathway (i.e., assume the mouse continues to eat contaminated foodstuffs rather than hibernates) remains to be demonstrated (see specific comment No. 10 above).

45. Page 4T-4, Table 4–4:

The "116-KE-3 Retention Basin (outside)" should be the "116-KW-3 (outside)." The two result columns should be separately identified as the 0–6 feet and the 0–15 feet soil depth scenarios, respectively. For the 116-KW-3 Retention Basin (inside) and (outside) and the 116-KE-4 Retention Basin (inside) both result columns should say "Yes."

46. Page 4T-5, Table 4–5:

The title of the table is inaccurate. Background values are associated only with inorganic analytes. Replace footnote "a" with footnote "a" from Table 4–5 of the LFI. Footnote "c" is inaccurate. All contaminants are not below background inside the 116-KE-4 Retention Basins. Di-n-butylphthalate is present (organics do not have an associated background level); however, it need not be listed in the Table because it does not have a published NOEL value. Lead should be deleted where it occurs in the Table as the LFI data indicate this contaminant occurs at below background levels. Information should be provided separately for both the 0–6 feet and 0–15 feet soil depth scenarios.

References

DOE-RL. 1993. Hanford Site Baseline Risk Assessment Methodology. DOE/RL-91-45, Rev. 2. U. S. Department of Energy, Richland, Washington.

Hall, J. A. 1993. Letter to E. D. Goller, Review of 100 Areas CERCLA Ecological Investigations, WHC-EP-0620, dated December 7, 1993.

IAEA. 1992. Effects of Ionizing Radiation on Plants and Animals at Levels Implied by Current Radiation Protection Standards. Technical Report Series No. 332. International Atomic Energy Agency, Vienna, Austria.

Landeen, D. S., M. R. Sackschewsky, and S. Weiss. 1993. 100 Areas CERCLA Ecological Investigations. WHC-EP-0620. Westinghouse Hanford Company, Richland, Washington.

Wagoner, J. D. 1994. Letter to Barbara Ritchie, Response to Comments on August 1993 Draft Environmental Assessment: Access Road from State Route 240 to the 200 West Area, dated January 20, 1994.

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