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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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August 26, 1993

Mr. Steven H. Wisness  
Hanford Project Manager  
U.S. Department of Energy  
P.O. Box 550  
Richland, WA 99352



Dear Mr. Wisness:

Re: 100-HR-2 Operable Unit Resource Conservation and Recovery Act Facility  
Investigation/Corrective Measures Study (RFI/CMS) Work Plan <sup>29403</sup>

The Washington State Department of Ecology (Ecology), as the lead agency, and the U.S. Environmental Protection Agency (EPA,) as support agency, have completed the review of the *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-HR-2 Operable Unit*. Addressing radioactive burial grounds using the Interim Remedial Measure pathway, as described by the Hanford Site Past Practice Strategy (DOE/RL-9104, EDMC #020575), is an attempt to accelerate cleanup and is a major recommendation by the Schedule Optimization Study (SOS). The 100-HR-2 Work Plan is unclear in describing that this pathway *will* be utilized for the burial grounds. Additionally, other areas require clarification and/or more information.

Many sections of the 100-HR-2 Work Plan reference the 100-HR-1 and 100-BC-2 Work Plans to facilitate duplication of generic sections. The SOS recommended using this approach, and the three parties must ensure this process is functional for work plan review by the public.

As discussed in the 100-HR-2 Work Plan transmittal letter, dated June 28, 1993, the U.S. Department of Energy (DOE) committed to prepare, present, and discuss proposed treatability study objectives. At a minimum, DOE should be prepared to discuss possible treatability studies and select a treatability study that is agreed upon by the three agencies during the comment disposition period. This will include determining the scope, schedules, and milestones of the study.

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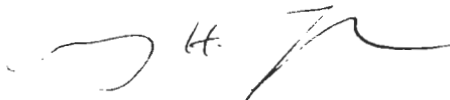
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To facilitate the comment resolution process, Ecology has divided the comments into three sections: 1) General; 2) Specific and; 3) Administrative. General and Specific comments require formal response, while the Administrative section contains comments that are not technical in nature and will not require formal response. However, it is expected that administrative comments will be incorporated in the work plan. This comment format was suggested in the SOS, and is an attempt to reduce the time required responding to non-technical and/or unsubstantial comments.

If you have any questions, please do not hesitate to call me at (509)736-3026.

Sincerely,



Gary Freedman, Unit Manager  
Nuclear and Mixed Waste Management Program

GF:mf  
Enclosure

cc: Eric Goller, DOE  
Jeff Ayres, WHC  
Paul Beaver, EPA  
Administrative Record (100-HR-2)  
Administrative Record (100-HR-1)

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## General Comments (continued):

8. Sect 4 does not make it clear that existing data is already sufficient for a Qualitative Risk Assessment (QRA), and to perform IRM's, as discussed in scoping meetings. This chapter will need to clarify this fact.
9. Sect 4 rationale does not clearly differentiate between those data needs and uses required for conducting the IRM's, and those for the final remedy selection. These items need to be dealt with separately in order to bely any confusion in the definition of their respective needs and uses for data.

## Specific Comments:

10. **Comment:** Sect II, pg ES-1/2, para 2

States that the available data, "was determined to be sufficient to formulate conceptual models and perform a Qualitative Risk Assessment(QRA) following the IRM pathway," yet the LFI path on figure ES-2 seems to be followed concurrently with the IRM path.

**Recommendation:** The reason for these concurrent pathways needs to be clearly stated.

11. **Comment:** Table ES-1

There are major discrepancies in the actual volume and the amount of waste received for the 128-H-1 and 118-H-1 waste units. This may be accounted for in the 128-H-1 Burning Pit if the reference is to the pre-burn volume, but this difference cannot be accounted for in the 118-H-1 Burial Ground.

**Recommendation:** These entries should either be corrected, or an explanation for the discrepancy should be noted in this table.

12. **Comment:** Sect 1.1, pg 1-1, para 1

The reference for the *Hanford Site Past-Practice Strategy* (DOE-RL 1991a) in chapter 8 is document number DOE/RL-91-40. This is inconsistent with documents in the possession of Ecology, which are numbered DOE/RL-91-04.

**Recommendation:** If the work plan is incorrect, it should be corrected. If all of Ecology's documents are incorrect, we should be furnished with corrected, up-to-date copies.

## Comments on the 100-HR-2 Operable Unit Work Plan

### General Comments:

1. The first draft of the 100-HR-2 Operable Unit (OU) work plan was delivered as Rev. 0. This classification is normally reserved for the final, approved document. It is expected that subsequent drafts, less the final, approved document, will be listed on the order of Drafts B, C, etc., and this first draft should be considered as Draft A.
2. As discussed in the 100-HR-2 OU work plan transmittal letter, dated June 28, 1993, DOE should be prepared to present and discuss proposed treatability studies for inclusion in this work plan. Topics should include a discussion of the types of studies available, scoping, schedules, and the setting of Milestones.
3. As set forth in the scoping of the 100-HR-2 OU work plan (100-HR-2 scoping notes dated Feb. 11 and Apr. 1, 1993), it was determined that the IRM path would be followed for the remediation of burial grounds. However, the work plan makes it unclear as to which path, LFI or IRM, is to be pursued. It needs to be clarified that the IRM path is indeed the path that will be followed for the burial grounds.
4. There are several treatability studies either in progress, or planned for the future. The scope of this work plan should discuss the inclusion of data from any recent or future Tri-Party agreements made on treatability studies, and the possible impact they may have on the 100-HR-2 OU.
5. A brief description of some of the applicable reactor components is given in the work plan. In order to more fully understand the relationships between these different reactor components, a simplified cross-section or schematic diagram of basic reactor construction including all referenced components should be incorporated.
6. There are many eco- and geological technical terms used in this work plan that require clarification. It is suggested that adding a glossary of technical terms would greatly aid the reader in reviewing these types of documents.
7. Throughout this and other work plans, different waste site numbering systems are used. Numbering of waste units should be consistent throughout this work plan, and with other work plans, for compatibility when cross-referencing.

**Specific Comments (continued):**

13. **Comment:** Sect 1.1, pg 1-2, para 4

Due to the non-intrusive nature of the LFI, identifying the extent and types of contaminants contained within the burial grounds may be possible through analogous sites and historical data, but is by no means certain.

**Recommendation:** This paragraph should reflect the fact that identification of these factors may not be fully accurate due to no direct intrusive work at the burial grounds

14. **Comment:** Sect 1.3, pg 1-3, para 1

This paragraph implies that there will be no field work associated with the 100-HR-2 OU Work Plan, when in fact, data from intrusive work at analogous facilities will be included.

**Recommendation:** This paragraph should make it clear that there will be no field or laboratory analyses performed *at* the 100-HR-2 OU as part of the LFI.

15. **Comment:** Sect 2.1.4, pg 2-4, para 3

As stated in this paragraph, there has been no attempt made to calculate the decayed radionuclide inventories through to the present.

**Recommendation:** This is not a difficult calculation, and included in this work plan, there should be a table with estimated radionuclide inventories decayed to the present.

16. **Comment:** Sect 2.1.4.1, pg 2-4, para 2

The text states, "...types of solid wastes generated by various facilities at Hanford are different..." Although there are some specialized waste sites at Hanford, this is not entirely true, as there are several analogous sites throughout the 100 areas, as shown in table 2-2.

**Recommendation:** This paragraph needs to be clarified, or revised to express what is trying to be said about these waste sites.

**Specific Comments (continued):**

17. **Comment:** Sect 2.1.4.1, pg 2-4, para 3

It seems that there were considerable amounts of Co, Cs, Eu, Sr, Tritium, and other constituents disposed of in these burial grounds that have relatively long half lives. The basis for considering these half lives as *long*, is unclear.

**Recommendation:** It needs to be clarified in this paragraph what is considered a short or long half life, which nuclides are considered short lived, along with the basis for these classifications.

18. **Comment:** Sect 2.1.4.1, pg 2-5, line 2

This line references section 2.1.3 for definitions of reactor components mentioned in this section. There are none of these definitions in the referenced section.

**Recommendation:** These definitions should be added, or referenced somewhere else in the work plan.

19. **Comment:** Sect 2.1.4.1, pg 2-6, para 5 and bullet 2

The statement, "The sampling was not directed at establishing the radionuclide inventory," is confusing and inconsistent with the bullet which states that one of the parameters for the sampling was intended to "identify the concentration of radionuclides present." If the concentration of radionuclides present was identified, shouldn't there have been some kind of inventory established for the burial ground?

**Recommendation:** Provide an explanation for this inconsistency.

20. **Comment:** Sect 2.1.4.1, pg 2-7, para 1, bullet 3

The text identifies the primary radionuclide as "<sup>60</sup>Co through <sup>152</sup>Eu." The term "through" makes this statement confusing.

**Recommendation:** It should be revised to make it clear as to which is the primary radionuclide, <sup>60</sup>Co, <sup>152</sup>Eu, or both.

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**Specific Comments (continued):**

21. **Comment:** Sect 2.1.4.3.2, pg 2-11

The text refers to the 1607-H1 Sanitary Septic System as still being active.

**Recommendation:** This section should clarify the following questions/concerns: Why is this system still active, and can it's purpose be served by portable units rather than continuing to add waste to it?

22. **Comment:** Table 2-1

It has been brought to the attention of Ecology that the locations of some of these waste sites are not yet known.

**Recommendation:** If the location of a waste site is not known, it should be reflected in the facility description section of this table.

23. **Comment:** Sect 3.1, pg 3-1, para 1

It is Ecology's belief that this background study may not be completed in a time frame that will be useful to this work plan.

**Recommendation:** Alternatives must be presented here to cover the situation in the case that this background study will not be available as a reference.

24. **Comment:** Sect 3.1.2.1, pg 3-3, para 2

This section references a preliminary soil background study. See comment number 23.

**Recommendation:** It should be clarified as to whether this preliminary document be useful for the execution of this work plan.

25. **Comment:** Sect 3.1.2.1, pg 3-3, para 2, Figure 3-3, and Table 3-3

This figure and table are directly referenced from the most recent revision of *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, which has no mention of *Hoover and LeGore 1991*.

**Recommendation:** Please explain this discrepancy. Are these two documents one and the same, or is this just an incorrect reference?

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## **Specific Comments (continued):**

26. **Comment:** Sect 3.1.2.2, pg 3-3, para 2

This section refers to sampling results done near waste sites in the 100-HR-1 OU for analogy to similar waste sites in the 100-HR-2 OU.

**Recommendation:** It should be clarified as to what similar facilities there are to the 116-H-1 disposal trench and the 116-H-7 retention basin in the 100-HR-2 OU that justify the use of these results for this analogy.

27. **Comment:** Sect 3.3.1.2, pg 3-6, para 2, and 3.3.1.3, pg 3-7, para 1

The text makes reference to the infiltration potential being negligible for contaminant migration from burial grounds. This may be true in some years, but there is a substantial amount of precipitation occurring in other years. For example, during the winter of 1991-92, a record six feet of snow fell in the Tri-City area. Since the cribs surface consists mainly of cobble, infiltration rates are usually higher than native soils.

**Recommendation:** This release mechanism needs to be re-evaluated, and presented in a more feasible manner.

28. **Comment:** Sect 3.3.1.3, pg 3-7, para 2

The text states that there is no evidence indicating small mammals and ants bring contaminants to the surface where wind transport can occur. There is no mention of where this observation took place.

**Recommendation:** If this information was taken from an existing document, it should be referenced here.

29. **Comment:** Table 3-5

This table shows values for  $^{90}\text{Sr}$  at the 100 areas of Hanford as ten times that of the distant community samples. This is this a significant difference.

**Recommendation:** Please give an evaluation of this difference as a possible cause for concern.



## Specific Comments (continued):

30. **Comment:** Table 3-5

The table reads an error for distant community sampling of  $^{90}\text{Sr}$  as  $\pm 9.000008$  pCi/m<sup>3</sup>. This is inconsistent with all other error values in this table.

**Recommendation:** If this is a typographical error, it should be corrected. If it is not, the cause for this discrepancy with all of the other error values on this chart should be explained in the notes for this table.

31. **Comment:** Table 3-5

Note <sup>a</sup> suggests that negative values are common in radiological testing because of the need to subtract instrument background. It is not logical to assume that an instrument's sample reading is less than its background reading.

**Recommendation:** If an instrument reading is below background, then the background value for the instrument should be re-evaluated.

32. **Comment:** Sect 4.1.2.3, pg 4-5/6

It is implied here that the IRM pathway still needs to be evaluated using this data. As stated in the general comments, the determination to follow the IRM pathway has already been made.

**Recommendation:** The fact that the IRM pathway *will* be followed needs to be clarified in this section.

33. **Comment:** Sect 4.2.1.2.2

There are two contaminated tank trucks and a tractor parked inside the exclusion area fence near the 105-H Rod Cave. Apparently, they fall under the cognizance of Decontamination and Decommissioning.

**Recommendation:** The disposition of these vehicles should be included here in the investigation of other decommissioned facilities.

## Administrative Remarks:

34. Sect 1.1, pg 1-2, para 2

States that, "The waste sites in the 100-HR-2 OU consisted primarily of liquid waste disposal sites." This is incorrect. This line should be changed to read "...solid waste disposal sites."

35. Sect 1.1, pg 1-2, para 3

Reads, "...to refine the conceptual , conduct the QRA,..." This is confusing, and should be changed to read, "...to refine the conceptual *model*, conduct the QRA,..."

36. Sect 1.1, pg 1-2, para 3

Reads, "...no intrusive field activities are required during the conduct of the LFI..." To clarify the fact that data from treatability studies and analogous facilities will be used, the wording should be changed to reflect that there will be no intrusive work performed *at* the 100-HR-2 OU during the conduct of it's LFI.

37. Sect 1.1, pg 1-2, para 4

This paragraph describes what data will be included in the LFI. It should also be reflected here that data from any applicable current or future treatability tests will be included it the LFI.

38. Sect 1.1, pg 1-3, fifth bullet

There is no reference for this document in section 8.0. This reference should be added.

39. Sect 1.2, pg 1-3

The second paragraph says essentially the same thing as the last sentence of the first paragraph. The two paragraphs can be combined with essentially no loss of meaning to avoid causing any confusion.

40. Sect 1.3, pg 1-3, para 1

References section 6.6 of EII 1.9 as "Work Plan Review." This title is incorrect. It should be changed to the proper title, "Changes to Approved Documents."

**Administrative Remarks (continued):**

41. Sect 2.1.1, pg 2-2, para 1

The coordinates listed do not match those used on figures 2-1 and 2-5. For consistency, the same coordinate system should be used throughout the work plan.

42. Sect 2.1.4

The majority of the radionuclide half lives listed in this section are inaccurate, or erroneously rounded. They should be changed to reflect the proper half lives of their respective radionuclides.

43. Sect 2.1.4, pg 2-4, para 4

This conversion of units to metric does not serve any purpose. Units should be consistent throughout the work plan (example: feet (meters)).

44. Sect 2.1.4.1, pg 2-6, para 2

<sup>137</sup>Ea is listed as a fission product. This is not an element. It should either be replaced with the correct element, if one exists for this item, or be deleted.

45. Sects 2.1.4.1.1 through 2.1.4.1.5, pgs 2-7 through 2-9

These sections give depths for their respective burial grounds. The text should state whether or not this depth includes the clean fill on top of the burial ground.

46. Sects 2.1.4.1.2 through 2.1.4.1.5, pgs 2-8 through 2-10

All of these burial grounds seem to have the same estimated curie content. The basis of the 1.00 Curie of <sup>60</sup>Co for each of these burial grounds should be stated.

47. Sect 2.1.4.1.2, pg 2-9

The text states that the waste volume of this burial ground is 2 m<sup>3</sup>. It should be clarified as to whether this refers only to the west vault, or to the whole burial ground.

48. Table 2-3

There are several grammatical errors in this table. The *Function or Use* block for "dummies" and "Lead Wool" need to be proofread.

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## Administrative Remarks (continued):

49. Sect 3.1, pg 3-1, para 4

The text states, "Much of the available related to the..." This is confusing, and should read, "Much of the available *data* related to the..."

50. Sect 3.1.1, pg 3-2, para 2

The text states, "The inventories are based on documented disposal information rather than measurements at the waste units." This should be clarified as to whether the inventories are based on documented disposal information from the 100-HR-2 OU, or from the listed primary references.

51. Sect 3.1.3, pg 3-3, para 1

The last sentence beginning with, "Although there does not appear to be..." does not make sense. Rewording of the sentence for clarification is necessary.

52. Sect 3.3.1.3, pg 3-6, line 1

This line reads, "...conceptual model the follow were identified," and is grammatically incorrect. It should read, "...the *following* were identified as transport media."

53. Sect 4.1, pg 4-1, para 1

The second sentence is not complete, and does not make sense. It should read something to the effect of, "...contamination from these units, is determined to be sufficient to conduct..."

54. Sect 4.1, pg 4-2, para 2

Text states, "...will use the observational approach during the implementation of the *remedy*..." For clarification this should read *IRM vice remedy*.

55. Sect 4.1.2.2, pg 4-5

This section states, "A qualitative risk assessment (QRA) is performed as part of the process to determine the need for an IRM." While this statement is true, it is incomplete. It should be further clarified that the need for an IRM is determined by a QRA, or an ARAR trigger as per the *Hanford Site Past Practice Strategy* (DOE/RL-9104), pg 15, "IRM Decision."

**Administrative Remarks (continued):**

56. Sect 4.1.2.4, pg 4-6, para 3

Since there will be no intrusive sampling at the 100-HR-2 OU, it should be reflected in this paragraph that the basis for these models should include laboratory testing of selected samples from this *and related* RFI's.

57. Sect 4.2.1.2.1, pg 4-10, para 1

This paragraph describes the data gathering activities required for the IRM. It should also include the review of data obtained from applicable treatability studies.

58. Table 4-2

The requirements for Data Quantity sources listed in this table are confusing. This block should be revised to state these requirements more clearly.

59. Sect 5.1.1.1, pg 5-2, para 2

The text states that there is no notable difference between subtasks for the 100-HR-2 OU work plan and the referenced 100-HR-1 OU work plan, with the exception of subtasks 1e and 1h. It then gives a reason for the difference in subtask 1h between the two work plans, but not for subtask 1e. An explanation of the difference in subtask 1e should be presented here.

60. Sect 5.1.1.2.2, pg 5-3

This section is confusing. It implies that sampling will be done, but not when, or which action--an IRM or the final remedy-- it applies to. A clarification should be made in this paragraph as to whether the mentioned sampling will be done under the IRM or the final remedy.

61. Sect 5.1.1.2.3 activity 2c-2, pg 5-4

These bullets address facilities that will be deferred to the final remedy. They should also include soils from the ash pit and sludge from the active septic tank.

62. Sect 5.1.1.2.3 activity 2c-2, pg 5-4

The Septic Systems paragraph addresses the inactive septic tank, tile field, and the active tile field. It should also address the active septic tank.

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**Administrative Remarks (continued):**

63. Sect 5.1.2, pg 5-7, para 3

The text incorrectly states that the final RFI report is a secondary document. It is in fact a primary document as should be stated in this paragraph.

64. Sect 6.0, pg 6-1, para 1

The provided work schedule does not include all work described in Chapter 5 of this work plan, as the final remedy is not depicted. This paragraph should be revised to better define the scope of work as detailed on the schedule.

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