

START

United States  
Environmental Protection  
Agency

Region 10  
Hanford Project Office  
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January 30, 1992



James D. Goodenough  
Operable Unit Manager  
U.S. Department of Energy  
P.O. Box 550, A6-95  
Richland, Washington 99352

Re: Review of the Draft Remedial Investigation/Feasibility Study  
Work Plan for the 100-FR-1 Operable Unit, Hanford Site,  
Richland, Washington, dated November, 1991.

Dear Mr. Goodenough:

Enclosed are the comments from the U.S. Environmental  
Protection Agency (EPA), the Washington State Department of  
Ecology (Ecology), and their contractors on the rescoped Draft  
Remedial Investigation/Feasibility Study Work Plan for the 100-  
FR-1 Operable Unit, Hanford Site, Richland, Washington.

The work plan is well written and has been revised  
significantly to reflect the rescoping. However, EPA has  
concerns with the 100-FR-1 schedule. In particular, we believe  
that drilling activities associated with task five "Vadose  
Investigation" should begin upon approval of this work plan. The  
anticipated approval date for this work plan is May 1992. Given  
this, the remaining schedule should be adjusted to reflect the  
accelerated schedule for the vadose zone investigation.

EPA requires three interim milestones be added to milestone  
M-15-00. The first interim milestone for the 100-FR-1 Remedial  
Investigation /Feasibility Study Work Plan will require submittal  
of all validated data of sampling activities associated with  
source and vadose zone investigations to us by July 1, 1993.

The second interim milestone will require the USDOE to  
submit a draft 100-FR-1 Remedial Investigation report to EPA and  
Ecology for review by February 1, 1994.

The third interim milestone will require USDOE to submit a  
draft 100-FR-1 Feasibility Study report and Interim Remedial  
Measures Plan to EPA and Ecology for review by September 1, 1994.

A review of the schedule shows that there is no commitment  
to any remedial activity beyond the Interim Record of Decision  
(ROD). The schedule must be changed to reflect that additional  
remediation may need to occur to reach a final ROD. In addition,  
EPA does not agree that the proposed plan produced as a result of  
the 100-FR-1 RI/FS Work Plan will necessarily result in an

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interim ROD. This plan may address clean up of the entire operable unit and therefore result in a final ROD.

The schedule for the Interim Record of Decision is incorrect. The EPA is responsible for writing the Record of Decision based on the proposed plan submitted by USDOE. The schedule must be changed to correct this error.

Another major area of concern focuses on the lack of detail in the Quality Assurance Project Plan (QAPjP) and field sampling activities listed in Section 5. These sections must be strengthened to support implementation of field sampling activities. Discussions held during comment resolution on the work plans for 100-BC-1 and 100-BC-5 resolved the issues concerning the QAPjP. It was agreed to at that time that the QAPjP for all future workplans would be revised based on those discussions.

The final concern pertains to the Data Management Plan. As you are aware, the EPA and Ecology are concerned with the current site-wide Data Management Plan and its ability to track and make available the large volumes of data that will be generated during the life of these projects. Since the Data Management Plan is applicable to all operable unit work plans it is suggested that the Site Wide Data Management Plan be addressed as part of appendix F to the Hanford Federal Facility Agreement and Consent Order. By doing this it will allow for more time to address the Data Management Plan issue while not impacting the approval of this work plan.

The comments for this work plan has been transmitted to you electronically via cc:mail. If you have any questions or concerns, feel free to contact me at (509) 376-8631.

Sincerely,

Dennis A. Faulk  
Unit Manager



Enclosure

- cc: D. Teel, Ecology
- G. Hofer, EPA
- D. Lacombe, PRC
- W. Staubitz, USGS
- T. Veneziano, WHC
- Administrative Record (100-FR-1 Operable Unit)

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Specific Comments for 100-FR-1 Work Plan

1. Deficiency: Section 1.1, p. WP 1-2

This section is entitled Purpose and Scope of the Remedial Investigation/Feasibility Study. But it does not discuss the purpose of a RI/FS study.

Recommendation:

Revise the text to state "The purpose of the RI/FS process is not the unobtainable goal of removing all uncertainty, but rather to gather information sufficient to support an informed risk management decision regarding which remedy appears to be the most appropriate for a given site." (See Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, October 1988.)

2. Deficiency: Section 1.1, pp. WP 1-2 Through WP 1-3

The purpose of the work plan is to gather data necessary to write RI/FS reports. This must include the compilation and collection of contaminant concentrations to make remedial decisions.

Recommendation:

Expand the section to discuss how the Description of Work for sampling and analysis will contain a detailed description of sampling locations, sampling methods, level of analysis, etc. Also, include a discussion that the Description of Work is not a primary document but that unresolved regulator comments could result in denying approval of the RI report, extensive resampling, or insufficient data to support the FS report.

3. Deficiency/Recommendation: Section 1.3, page WP1-5

Appendix D should be included because the appendix is a supporting plan necessary to conduct the remedial investigation and feasibility study.

4. Comment: Section 2.1.1, WP 2-1, first paragraph, last sentence.

This statement reads the 100-F area is the Hanford site production area closest upstream from Richland. This is not a true statement. The text should be changed to state that the 100-F area is the closest of the old production reactors to the city of Richland.

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5. Deficiency/Recommendation: Section 2.1.2.2.1, page WP2-2, first paragraph

The text refers to the 142-F laboratory as the first facility used for ichthyological (fish) studies. According to Becker (1990), the first aquatic biology building was the 146-F hut. The correct facility number should be verified.

6. Comment: Section 2.1.4.1.1, pg. WP 2-8, 3rd paragraph

The first word(s) of the last sentence has been deleted.

7. Comment: Section 2.2.3.2, pg. WP 2-19

It is stated that groundwater flow is generally from west to east. Recent work in the 100-H Area indicates that the flow direction changes with river stage, paralleling the river at high stage. The F Area probably experiences similar changes in flow directions. Add a statement that flow direction may change with varying river stage.

8. Comment: Section 2.2.6.2, pp. WP 2-22 to 23

The Bald Eagle Site Management Plan for the Hanford Site, South-Central Washington (Fitzner and Weiss, Oct 1991) gives further information regarding the habitat of the bald eagle on the Hanford Site. Of particular interest is the occurrence of two nesting areas in the F Area, one north and one south of 100-F. This information should be included in the work plan as it may effect investigation scheduling.

9. Comment: Section 2.2.7.2, pg. WP 2-25

Recent archaeological surveys of the 100-F area indicate the presence of potential sites. The work plan should be updated to reflect this.

10. Deficiency/Recommendation: Figure 2-30, page WP2F-30

The title for this figure includes the term "wildlife". However, statistical tables contain fish and bird species exclusively. The table should either present additional examples of wildlife, or replace the term with one more specific.

11. Comment: Figure 2-10, p. WP 2F-20 and Table 2-2, p. WP 2T-2a

Well 699-84-33 is shown on the figure, but is not included in the table.

12. **Comment:** Table 2-2, p. WP 2T-2A

This information would be more useful if the depth to water was correlated with the well construction at the time of water-level measurement. With each change in well construction, water-levels and water-quality can be expected to change. The well data should be presented to show the periods of each construction in each well so that water-level and water-quality data can be matched to the proper construction.

13. **Deficiency/Recommendation:** Table 2-3, page WP2T-3a

This table should include a reference to Appendix D-2 of the 100-FR-3 Operable Unit work plan in which the issue of state-sensitive species is addressed as part of the area-wide ecological investigation.

A space should be inserted between "persistent" and "sepal" in the section for endangered vascular plants.

14. **Deficiency:** Section 3.1.1, page WP3-2, second paragraph

The text does not list all the high-priority sites specified in the letter report (DOE 1991).

**Recommendation:**

All high-priority sites specified on pages 4 and 9 of the letter report (DOE 1991) should be listed.

15. **Deficiency:** Section 3.1.1.1, page WP 3-2

This section discusses the 116-F-14 retention basin. It is noted that sludge was removed from the basin on at least one occasion but the final burial location of the sludge is unknown. According to agreements reached during the comment resolution meeting held on October 15, 1991, it was agreed that if information gathered during the compilation task does not reveal the burial location then remote sensing methods could be employed to locate the sludge. This information needs to be included in the work plan.

16. **Comment:** Section 3.1.1.1.1, p. WP 3-3 and Table 3-1, p. 3T-1b

The length and depth of the 116-F-14 basin are given as 467 and 18 feet, respectively in Section 3.1.1.1. In table 3-1, these dimensions are given as 450 and 24 feet, respectively. The dimensions should be verified and corrected.

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17. Deficiency/Recommendation: Section 3.1.1.1.1, page WP3-4, first paragraph

The radionuclide  $^{152}\text{Eu}$  was found in concentrations as high as 14,000 pCi/g in the sludge sample; the reported value was 9,800 pCi/g for  $^{152}\text{Eu}$ . The higher value for  $^{152}\text{Eu}$  was not reported as the highest concentration of radionuclides found in the retention basin sludge sample and should be included.

18. Comment: Sections 3.1.1.1.1 and 3.1.1.1.2, p. WP 3-4

In the last paragraph of Section 3.1.1.1., it is stated that borehole L is several hundred feet southeast of the retention basin. However, in the first paragraph of Section 3.1.1.1.2, it is stated that the 116-F-2 basin is 200 feet southeast of the retention basin. Where is borehole L in relation to these two facilities? The text should be clarified.

19. Deficiency/Recommendation: Section 3.1.1.2, page WP3-7, first paragraph

The text incorrectly refers the reader to Section 3.1.1.6.6 for information on the 132-F-6 lift station. The correct section is 3.1.1.8.6.

20. Deficiency/Recommendation: Section 3.1.1.8.6, page WP3-13, second paragraph

The text incorrectly refers to Table 3-9 for analytical results. The appropriate table is Table 3-8. The text should be corrected.

21. Deficiency/Recommendation: Section 3.1.2.2, page WP3-15

This section should include the data collected for surface soil samples from source areas. Examples of data that should be included are:

<u>Location</u>	<u>Sample Number</u>
116-F-14 Retention Basin	AN, AS, DS, S, T, U (Table 3-3)
116-F-14 Retention Basin Perimeter Area	F, K, L, Q, R, V, W (Table 3-4)
Basin Leak Ditch	CC (Table 3-6)

22. **Deficiency:** Section 3.3.1.1, page WP3-22, first paragraph

The text does not discuss all the high-priority sites specified in the letter report (DOE 1991).

**Recommendation:**

All high-priority sites specified on pages 4 and 9 of the letter report should be discussed.

23. **Deficiency/Recommendation:** Section 3.3.1.5, page WP3-24, first paragraph

This section states that "the most likely point of exposure for terrestrial biota is the plant root zone". The sentence should state instead that the most likely point of exposure for terrestrial flora is the plant root zone.

24. **Deficiency:** Section 3.3.2.2, page WP3-25

This section is incomplete in regard to the criteria identified by EPA (1989b) for toxicity as a contaminant characteristic.

**Recommendation:**

This section should discuss the method of selecting of the most toxic contaminants. EPA (1991) provides an example of a risk-based screening method for selecting contaminants of concern.

25. **Deficiency:** Section 3.3.2.5, page WP3-26

This section discusses bioconcentration factors for certain contaminants and provides an informational list in Table 3-19. However, it is not clear why these specific bioconcentration factors are presented. That is, it is not clear if these contaminants are of special concern with respect to their ability to bioaccumulate or bioconcentrate. It is also unclear why bioaccumulation is illustrated with a table listing bioconcentration factors because bioaccumulation is the process that results in increased concentrations of contaminants in organisms with increasing trophic levels in the food chain, whereas bioconcentration is the ratio of the contaminant concentration in tissue to the concentration in a specific medium (EPA 1989a).

**Recommendation:**

The rationale for providing the bioconcentration factors for the set of contaminants listed in Table 3-19 should be given. The use of bioconcentration factors to illustrate

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bioaccumulation should be explained. Bioaccumulation is the primary mechanism for food chain effects in the aquatic environment of the Hanford reach (Becker, 1990). Contaminants that bioaccumulate, and are found in sensitive habitats for example, should be considered contaminants of concern.

26. Deficiency/Recommendation: Section 3.3.2.6, page 3-27

The contaminants detected list does not contain all of the constituents detected in the soil and groundwater. Examples included are arsenic, cadmium, barium, boron, lithium, sulfate, acetone, and methylene chloride. The list should be revised to include all contaminants detected at the 100-F Area (Table 3-13, 100-FR-3 Work Plan).

Since gross alpha, gross beta, and radium ( $^{226}\text{Ra}$  and  $^{228}\text{Ra}$ ) are primary drinking water contaminants and were detected in groundwater, they should also be included in the list of contaminants detected.

27. Deficiency: Section 3.3.3, p. WP 3-27

The fourth sentence discusses the fact that radioactive daughter products must be considered when evaluating human and environmental impacts of radionuclides but does not discuss how daughter products will be addressed.

Recommendation:

The work plan should discuss how impacts from daughter products will be considered during the investigation process.

28. Deficiency/Recommendation: Section 3.3.4, p. WP 3-28

This section should be titled "Use of Qualitative Risk Assessment to Make Interim Action Decisions", not "Imminent and Substantial Endangerments", according to the outline provided in the letter report (DOE 1991). In addition, the section should be revised to discuss how the qualitative risk assessment will be used in making interim action decisions.

29. Deficiency/Recommendation: Section 3.4.1, p. WP-3-29

The second bullet potential CARs should be changed to read potential ARARs.

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30. **Deficiency:** Section 3.4.4, p. WP 3-34, first paragraph

In the last sentence, the statement "Macroengineering removal alternatives may be effective in meeting remedial action objectives for residential or agricultural land uses, but may be inconsistent with wildlife and recreational land uses" is vague and uninformative.

**Recommendation:**

Since macroengineering removal action is selected as one of the final remedial actions to meet the preliminary remedial action objectives, the manner in which macroengineering removal action may be inconsistent with the overall objectives should be explained.

31. **Deficiency:** Figure 3-13, p. WP 3F-13

There are several deficiencies in the contaminant exposure pathway model, as follows:

- The figure legend shows a hexagonal symbol for primary contaminant sources and known contaminated media; however, in the figure primary sources (process effluents) and contaminated media (soil) are identified with a circle.
- The arrow between biota and ingestion is pointed both ways.

**Recommendation:**

The legend symbol should be used for identification of all the appropriate components in the figure. The arrow between biota and ingestion should point to ingestion only.

32. **Deficiency:** Figure 3-14, p. WP 3F-14

Potential conflict with ARARs or future land and water use is shown as yes and no for various interim remedial technologies. There is no discussion in the text about this potential conflict with ARARs.

**Recommendation:**

A brief discussion should be included in Section 3.0 on the potential conflict of each process option with ARARs or with future land and water use.

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33. **Deficiency:** Section 4.1.2.1, pp. WP 4-5 and 4-6

The data needed for "An understanding of the relationship between water-table fluctuations and release and transport of contaminants from the lower vadose zone and capillary fringe to groundwater..." is described as being derived from 100 Area aggregate investigations. The collection of these data are not explicitly described in Milestone M-30 and we know of no other 100 Area aggregate investigation that would address this issue.

**Recommendation:**

Providing data to evaluate the release of contaminants to groundwater as a result of fluctuating water levels should fall within the scope of the 100-FR-3 operable unit RI/FS and should be noted as such here and in the 100-FR-3 work plan.

34. **Comment:** Section 4.1.2.2, p. WP 4-6

It is noted that determining the nature and vertical extent of contamination in the vadose zone should be sufficient for conducting a qualitative assessment at individual waste sites. This information may indicate what contaminants are present, but provides little guidance on potential future exposures. At a minimum, at least semiquantitative information on infiltration rates, soil hydraulic characteristics, and contaminant transport characteristics will be required for a qualitative risk assessment. For this reason, a 100 Area-wide physical properties strategy was developed. In Section 4.1.2.2., note that information on contaminant transport characteristics will also be required for a qualitative risk assessment.

35. **Comment:** Section 4.1.2.4, p. WP 4-8

In the fourth bullet, it is noted that "...physical characteristics of site contaminants are needed. We are confused by this statement. Should this read "...physical characteristics of contaminated sites are needed"? If not, please specifically describe exactly which physical contaminant characteristics are being referred to.

36. **Comment:** Section 4.2.1.2, p. WP 4-10 and Table 4-2

The information contained in the table and mentioned in this section pertaining to the borehole location would be more effective if a map of each waste site were included in the work plan.

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37. Deficiency/Recommendation: Section 4.2.1.2.4, page WP4-12, second paragraph

132-F-3 and 132-F-5 facilities are presented in the work plan as low-priority sites. However, the letter report specifies that these should be listed as high-priority sites. The work plan should be corrected.

38. Comment: Section 4.2.2, p. WP 4-13, last sentence

To state that "A well defined lateral extent of contamination and complete chemical characterization are not required,..." is an inappropriate definitive statement. Complete characterization may not be required under the macroengineering philosophy. The initial investigations themselves will determine whether or not further characterization is required.

39. Comment: Section 4.2.2.1, p. WP 4-13, first paragraph

The second sentence sites that "borings will continue to 2 m (5 ft) below detectable contamination". First, 2 m is more than 6 ft, and the following paragraph refers to 1.5 m as 5 ft. This inconsistency should be corrected.

40. Comment: Section 4.2.2.1, p. 4-13

The appropriate EIIs for sampling should be listed in either this section or in section 5.1.5.

41. Comment: Section 4.2.2.1, p. WP 4-13, second paragraph

The TCL and TAL constituents should be listed in table form in this section or in section 5.1.5.

42. Comment: Section 4.2.2.1, p. WP 4-13, second paragraph

The methodology for chemical analysis will be determined in the sample protocol meetings for the 100 Areas. EPA has not agreed to the use of SW -846 methods for sample analysis and in fact are requesting CLP procedures to be used during source investigations.

43. Deficiency/Recommendation: Table 4-2, page WP4T-2a to 4T-2c

Table-2 indicates that 116-F-3 is intended for the LFI/IRM pathway. As discussed above, confusion exists regarding the correct pathway for 116-F-3. This table may need to be corrected.

Several facilities specified in the letter report are missing from Table-2. The missing facilities include: 118-F-8, 126-F-2, 132-F-2, 132-F-4, 182-F, and 183-F. These facilities should be included in the table or an explanation regarding their exclusion should be presented in the text.

Table-2 lists 132-F-3 and 132-F-5 facilities as low-priority sites. As specified in the letter report (DOE 1991), these facilities should be listed as high priority sites.

As stated in Table 2-1 (DOE, 1991), the names of analogous facilities data to be evaluated, including the name of the operable unit, should be specified for low-priority facilities.

The names of remaining facilities where no waste contamination is suspected should be specified to allow a comparison with the facilities listed in Table 2-1 (DOE 1991). Also, the investigation approach should specify whether data exist for these facilities to identify potential waste sources for further investigation.

The text states that analogous facilities are being sampled at the B, D, and H areas. The specific operable unit, including the names of analogous facilities being sampled and the type and number of samples being collected, should be indicated instead of B, D, and H areas to verify the statement. The rationale to remediate 116-F-11 (105-F Cushion Corridor French Drain) at the same time as the reactor should be explained or the investigation approach to the reactor should be included or referenced.

44. Deficiency: Table 4-2, p. WP 4T-2a and Section 5.1.5.2, p. WP 5-8

The vadose-zone borings are proposed to be installed to a depth of 5 feet below detectable contamination as determined by field screening. The work plan does not describe how "detectable contamination" will be defined.

Recommendation:

Describe the criteria by which "detectable contamination" will be defined.

45. Deficiency: Section 5.1.2.3.1, page WP5-5

The work plan states, "No source sampling is currently proposed at any high-priority waste unit." This statement is confusing because "source sampling" is not clearly defined in relation to the vadose zone investigation proposed in Task 5. The work plan often refers to the high-

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priority sites as sources. Therefore, the statement implies no sampling will be done at the high-priority sites.

The proposed one or two surface samples for the 132-F-1 facility may not be adequately representative to indicate whether the facility is contaminated.

**Recommendation:**

The text should define source sampling and clarify the relationship between source sampling and the vadose zone investigation.

The 132-F-1 facility was demolished and buried sometime after 1980. The contaminants remaining on the concrete floors and walls of the demolished facility may have migrated to groundwater by infiltration during heavy rainfall and snowmelt. This facility should be included under the vadose zone investigation. Fielding screening results should be used to locate at least one borehole for subsurface data.

46. **Deficiency:** Section 5.1.2.2, p. WP 5-5

The geodetic/topographic survey and base map development are described in this section. It does not indicate how data from these surveys will be compiled into a map.

**Recommendation:**

Specify how these base maps will generally be compiled. For a project of this size, all base map information needs to be automated either using CAD or GIS computer mapping system.

47. **Deficiency:** Section 5.1.2.3.1, p. WP 5-5

This section lacks adequate detail in regards to source sampling. The Sampling Analysis Plan prepared in Draft A contained a table (table FSP-1) which outlined the number of samples and types of analysis for various locations.

**Recommendation:**

Amend Section 5 to include the table.

48. **Comment:** Section 5.1.5.2, pp. WP 5-8 and 5-9

It is stated that the soil sampling strategy will result in a biased or censored data set because cobbly soils cannot be effectively sampled by core barrel methods. Since the soil sampling plan was written, we have experienced significant success in the 300-FF-1 operable unit in obtaining

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representative samples using a backhoe. The possible use of a backhoe for obtaining usable samples for physical properties should be investigated.

49. **Comment:** Section 5.1.5.3, p. WP 5-9, first paragraph

This paragraph states that EPA approved non-CLP methods will be used for chemical analysis. EPA has not agreed that SW-846 methods will be used for chemical analysis. At this time, EPA requires the use of CLP methods for soil sample analysis.

50. **Deficiency:** Section 5.1.5.4, pp. WP 5-9 and 5-10

It is stated that gross-gamma logging will be conducted in "selected boreholes".

**Recommendation:**

Gross-gamma logging should be conducted in all boreholes. Where gross-gamma logging indicates significant contamination, spectral-gamma logging should be conducted.

51. **Deficiency/Recommendation:** Section 5.1.11, page WP5-12, second paragraph

The text states, "Both the qualitative and baseline risk assessments will be developed in accordance with EPA (1989a). . ." This reference is for human risk assessment guidance from EPA Headquarters. Ecological risk assessment guidance from EPA Headquarters should also be referenced and is already listed in Section 8.0, References, as EPA 1989b. In addition, EPA Region 10 risk assessment guidance should be referenced (EPA 1989b, 1991) and included in Section 8.0.

52. **Deficiency:** Section 5.1.11.3, page WP5-14

Toxicity assessment criteria listed under this subtask do not include ecological parameters.

**Recommendation:**

The toxicity assessment criteria should include ecological parameters (as discussed in EPA 1989a,c).

53. **Deficiency/Recommendation:** Section 5.1.11.4, page WP5-14

The text states that "ecological receptors are evaluated based on assessment of appropriate endpoints." The text should include a rationale or reference for endpoint identification.

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54. **Deficiency/Recommendation:** Section 8.0, page WP8-4

The reference section should include additional EPA Region 10 risk assessment guidance (EPA 1991).

55. **Deficiency:** OAPjP-A-2, Section 1.4

No description is provided of how the project activities are inter-related and how they will achieve the project objectives. No description is provided of the proposed sampling frequency and locations.

**Recommendation:**

The text should provide more detail about the project design, or reference documents that contain more specific information. Section 4.2.1 of the QAPjP should be expanded to discuss sampling frequency and locations.

56. **Deficiency/Recommendation:** QAPjP-A-2, Section 2.0

A brief description of the procedure used to screen environmental samples for total radioactivity and alpha activity should be given, including calibration techniques, calibration frequency, calibration standards and their sources.

57. **Comment:** QAPjP-3, p. A-15

Footnote A states that a method for bulk density shall be developed and submitted to Westinghouse Hanford for review and approval prior to use. It should also be noted that this method will require regulatory review and approval as well.

58. **Deficiency/Recommendation:** QAPjP-A-4, Table OAPjP-1

This table refers to Test Methods for Evaluating Solid Waste (EPA 1986) when presenting target quantification limits, distinctions between target quantification limits and estimated quantification limits specified by EPA (1986) should be addressed. In addition, EPA has not determined that the QA program specified in Test Methods for Evaluating Solid Waste is adequate to allow for use of these procedures in place of CLP procedures.

59. **Deficiency:** QAPjP-A-13, Section 6.0

The information provided for calibration procedures is insufficient.

**Recommendation:**

A table should be included with type of equipment, frequency and type of calibration, and reference document(s) for performing the calibration.

60. **Deficiency/Recommendation:** Appendix B, Section 5.0, page B-11, second paragraph

General occupational health standards for Washington (DLI 1990) should also be listed.

61. **Deficiency/Recommendation:** Appendix D2

Appendix D is missing from the work plan. It should be included.

**Typos, Miscellaneous Comments**

1. Section 2.2.3.1, p. WP 2-18, second paragraph, ninth line; "be neath" should be "beneath".
2. Figure 2-22, p. WP 2F-22; wells 199-F5-3 and F5-1 have sections with no symbols (this is not included in the legend).
3. Figure 2-23, p. WP 2F-23; wells 199-F8-1 and F5-4 have sections with no symbols (this is not included in the legend).
4. Section 3.1.1.1.1, p. WP 3-4, first paragraph, sixth line; "Tables 3-3" should be "Table 3-3".
5. Section 3.1.1.4.6, p. WP 3-10, second paragraph, third line; "238/239 PU" should be "239/240 PU".

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## REFERENCES

- Becker, C.D., 1990. Aquatic Bioenvironmental Studies: The Hanford Experience 1944-84. Studies in Environmental Science 39. Elsevier.
- DLI 1990. General Occupational Health Standards, Chapter 296-62, Part H, Air Contaminants. Division of Industrial Safety and Health, Washington Department of Labor and Industries. December 1990.
- DOE 1991. Letter Report for Rescoped Work Plans for the 100-FR-1 and 100-FR-3 Operable Units. U.S. Department of Energy. October 1, 1991.
- EPA 1986. Test Methods for Evaluating Solid Waste. SW-846, Third Edition. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency. Washington, D.C.
- EPA 1989a. Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, Interim Final. EPA/540/1-89/001. U.S. Environmental Protection Agency. March 1989.
- EPA 1989b. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual Interim Final. EPA/540/1-89/002. U.S. Environmental Protection Agency. December 1989.
- EPA 1989c. Statement of Work for the RI/FS Environmental Evaluation for Superfund Sites. U.S. Environmental Protection Agency, Region 10. November 1989.
- EPA 1991. EPA Region 10 Supplemental Risk Assessment Guidance for Superfund. U.S. Environmental Protection Agency. August 16, 1991.

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**Subject:** REVIEW OF THE DRAFT RI/FS WORK PLAN FOR THE 100-FR-1 OPERABLE UNIT, HANFORD SITE, RICHLAND, WA, DATED NOVEMBER 1991

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The Work Plan was submitted to RL via outgoing letter 9103020B R1. RL sent the Work Plan to EPA/Ecology via letter 9105647. ldp, 6-7049

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