

REVIEW COMMENTS ON QAPJP OF DOE/RL-90-08 RI/FS WORK PLAN DRAFT B FOR 100-BC-5

SUBJECT: Review of Project Specific Quality Assurance Plan (QAPJP) for the 100-BC-5 Operable Unit (Appendix "A" of 100-BC-5 Work Plan Draft B).

REFERENCE DOCUMENTS:

- #1 TPA Document #89-10 of 5/89 and Rev #1 of 9/90 and Rev #2 of 9/91
- #2 QAMS-004 of 9/80 and QAMS-005 of 12/80
- #3 DQO for Remedial Response Activities Document EPA/540/G-87/003 Of 3/87- Description of Requirements
- #4 DQO for Remedial Response Activities Document EPA/540/G-87/004 of 3/87- A RI/FS Example of a DQO Case Study
- #5 WHC-EP-0383 of 12/90 - QAPP for Env Engineering/Technology/Permitting
- #6 DOE Letter 91-ERB-171 of 9/30/91 (RI/FS Work Plan Review Instructions)

GENERAL COMMENTS:

- o The document reviewed, Appendix "A" of Work Plan, is the QAPJP, the project specific QA plan. It addresses QA requirements. The QAPJP frequently references sections of the Work Plan to fulfill QA requirements. The referenced sections were reviewed for compliances.
- o Each numbered comment below is a non-compliance to the indicated DOE/EPA QA criteria. The EPA QA criteria are found in the documents #1, #2, #3, #4, and #5 of "Reference Documents". The comments are in the specified format.
- o The document reviewed is a TPA Primary Document and represents the result of a continuous consensus/decision process between DOE/EPA/WDOE.
- o The QAPJP is a project specific document. The final version it is expected would consider and incorporate such comments, as necessary, appropriately.
- o The RI/FS Investigation work (LFI) in this Work Plan (WP) is limited to Surface Water and Sediment, Vadose Zone, Ground Water, Air, and Ecological Investigations. WP Table 2-1 and Table 3-1 show Contaminant Sources for investigation. Table C-2 scopes the investigation and analysis work.
- o The comments are made keeping in mind the above features and that quality achievement is a line responsibility.

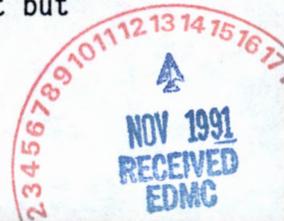
COMMENT #1: QAMS-005 Sec 5.5 & QAPJP Sec 3.0 (Pg A-3) -Data Quality Objectives for Measurements

- o The QAPJP refers to Work Plan (WP) Sec 4.1.1, Sec 4.1.2, and Sec 4.2.1.5. The QAPJP states that Sec 4.2.1.5 provides justification for established DQOs. Sec 4.2.1.5 is not present in the WP or in the QAPJP.
- o Table QAPJP-1 lists various pollutants and the analytical Methods to be used to quantify them. Precision and accuracy statements for the selected method (in Table QAPJP-1) are not linked to the experimental conditions or detection limits for each pollutant, as required by QAMS-005.
- o In Table QAPJP-1: "Precision" is defined "Relative Percent Difference" (RPD). The EPA document EPA/540/G-87/003 illustrates the use of the "Relative Standard Deviation" (RSD) and "Variances" (S) for evaluating data values of like samples analyzed with like procedures at various laboratories and to determine the acceptable range of values. WHC must formalise RPD usage as RPD use is not illustrated in the EPA/DQO documents.

COMMENT #2: QAMS-005 Sec 5.6 & QAPJP Sec 4.0 (Pg A-8) - Sampling Procedures  
QAMS-005 Sec 5.7 & QAPJP Sec 5.0 (pg A-12) - Sample Custody

The QAPJP refers to WHC-CM-7-7 for Project Specific Sampling Procedures. WHC-CM-7-7 has many procedures that describe segments of the Sampling Effort; but

91123651559



there is no procedure in WHC-CM-7-7 for project specific "Sample Labelling" or for "Frequency of Sampling" or for "Sampling Time Variant Data". The existing procedure for "Sample Custody" does not provide tracking mechanisms for the labelled sample that have the same rigor as that described in QAMS-005. Table QAPJP-2 has inadequate information to perform project specific "Sample Site Selection". Project specific procedures for Geodetic Control indicated in WP Sec 5.1.2.2 to be present in QAPJP are not found there. Procedures in Table QAPJP-2 are generic not project specific and some are yet to be done (TBD).

COMMENT #3: QAMS-005 Sec 5.8 & QAPJP Sec 6.0 -Calibration Procedures/Frequency.  
QAMS-005 Sec 5.9 & QAPJP Sec 7.0 -Analytical Procedures (Pg A12/13)

The QAPJP refers to Tables QAPJP-1 and QAPJP-3 for achieving compliance with criteria requirements. These tables identify ASTM standards and EPA documents through which compliance would be achieved. Project specific Standard Operating Procedures (SOPs) describing Calibration of each pollutant measurement system, with planned recalibration frequencies with information on calibration standards is not in the QAPJP or the WP. Since all requirements of any analytical test standard may not be applicable to all situations, specific analysis procedures for each pollutant are required but are missing. The analysis work is partly a "Purchased Service" and partly performed in-house by WHC: example radio assays. Project specific procedures for in-house analysis, analytical levels, and instrument sensitivity/calibration/frequency are not stated. Analytical levels, which make precision and accuracy statements useful, are not given in the QAPJP or in Work Plan for the selected methods.

COMMENT #4: QAMS-005 Sec 5.10 & QAPJP Sec 8.0 (Pg A-13/15)-Data Reduction, Validation, and Reporting.

The QAPJP lists criteria that shall be contained in procedures used for the validation of data. The criteria that is listed does not provide adequate information or include the data reduction scheme for each measured parameter, the set of principal criteria to be used to validate data/integrity, or the reporting scheme and/or flow-chart for the planned data flow for the entire data collection process. This applies to the in-house effort and as applicable to purchased services.

COMMENT #5: QAMS-005 Sec 5.14 & QAPJP 12.0 (Pg A-19) - Routine Procedures to Assess Data Precision, Accuracy, and Completeness.

The QAPJP states that statistical techniques may be used to perform this activity. If such techniques are used then the required written instructions shall be generated. QAMS-005 requires that the specific procedures needed to perform any task(s) on a routine basis must include statistical detail and must be described for all environmental measurement and monitoring. These procedures are not described in the Work Plan or the QAPJP for the in-house work and/or applicable strategy for the purchased services as applicable.

COMMENT #6: QAMS-005 Sec 6.0 - QAPJP vs Project Work Plans

A significant number of the QA elements are addressed minimally in the QAPJP and the details on these elements are integral to the Work Plan. QAMS-005 requires a "QA Project Plan Locator Page" be provided that enables reference of QA elements/WP text for assessing QA compliance. This page is missing.

ATRI-100-BC-5-RI/FS

91123651560



<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 2 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
6.	Page WP-vii, Sec. 5.0, 5.1, 5.2, and 6.0: The titles of these sections on the outline and text have not been changed to agree with the "Letter Report" outline.			
7.	Page WP-viii, Appendix D: Subappendices D-1, D-2, and D-3 are not mentioned in the outline.			
8.	Page WP 1-3, Sec. 1-1, Par. 1, Sen. 3: The phrase "(RFI/CMS)" should be inserted after the existing acronym RI/FS.			
9.	Page WP 1-3, Sec. 1-1, Par. 2, Bullet 2, Sen. 1: The term "Interim remediation measure" should be added to the beginning of the sentence.			
10.	Page WP 1F-1, Figure 1-1: This figure is referenced in the text as containing the NPL sites at the Hanford Site. The title of the figure is very general. NPL sites are not mentioned on the figure.			
11.	Page WP 1F-2, Figure 1-2: The cross-hatched lines identifying 100-BC-1 operable unit could be deleted because the 100-BC-5 operable unit includes groundwater underlying the entire 100-B/C could Area.			
12.	Page WP 1F-2, Figure 1-2: The figure is cluttered and the key does not explain all of the listed building abbreviations. Table 2.1 could be placed closer to the text to clarify the building abbreviations. Reference is made to "Note 1" but only "Note" is found at the bottom of the page.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 3 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
13.	Page WP 2-1 to WP 2-31: The BC-1 document texts vary from the BC-5 document in many places. Changes in sentence construction were made and sometimes sentences were omitted or added. The content, for the most part, did not change. However, the two documents should be made to be uniform in the parts that belong in both sections.			
14.	Page WP 2-1, Sec. 2.0, Par. 2, Sen. 1: The same format should be used on all references. The references (General Electric 1963) and (AEC-GE 1964) differ in format from the other references.			
15.	Page WP 2-1, Sec. 2.1.1, Par. 4, Sen. 5: Minor discrepancies appear to exist between the operable unit boundary coordinates stated in the text and the groundwater/surface water operable unit boundaries delineated in Figure 1-2 (Sec. 1.0). The coordinate values should be rechecked and modified on either the text or the figure.			
16.	Page WP 2-2, Sec. 2.1.2.2.1, Par. 5, Sen. 4: In the text the 116-B-6A crib measures approximately 3.7m long and that the bottom of the crib is approximately 4.6m deep. Please resolve the apparent discrepancy with the dimensions listed in Sec. 2.1.2.2.1 of document DOE/RL-90-07.			
17.	Page WP 2-2, Sec. 2.1.2.2.1, Par. 6, Sen. 8: The location in the text should be given in the 100-BC-1 work plan in which the analytical results are presented.			
18.	Page WP 2-2, Sec. 2.1.2.2.1, Par. 5: A statement should be included about the crib being completely underground or aboveground. Only crib 116-B-6A is referenced as being subject to the ISV treatment, although crib 116-B-6B is later mentioned as			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 4 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
19. cont.	receiving the ISV treatment. The construction materials for the cribs are not mentioned in the text.			
19.	Page WP 2-3, Sec. 2.1.2.2.2, Par. 5: The regulatory agency may want to know the specific level of radiation that has been allowed to remain for decommissioned buildings by the ARCL methodology.			
20.	Page WP 2-5, Sec. 2.1.4, Par. 2: The sentence, "The cooling water effluent from C reactor is also included in the discussions, since the C reactor effluent system is located in the 100-BC-1 operable unit", has been omitted in this document.			
21.	Page WP 2-7, Sec. 2.1.4.1.1, Par. 3: The construction materials of the two waste water systems are not adequately described. The term "trench" is particularly confusing in that a trench could be naturally clay-lined or constructed of concrete. The construction materials would clarify how much potential these units had for leaking. The ultimate discharge of the cooling water is not clear. Did the cooling water infiltrate in the trenches or did the cooling water return to the basins to be discharged to the river?			
22.	Page WP 2-10, Sec. 2.1.4.3, Par. 5 and Page WP 2-11, Sec. 2.1.4.3, Par. 1: Buildings 132-B-4 and 132-B-5 are not shown on Figure 2-1.			
23.	Page WP 2-12, Sec. 2.1.4.5: Seven septic tanks are recorded in BC-1 while nine septic tanks are recorded in BC-5.			
24.	Page WP 2-15, Sec. 2.1.5, Par. 1, Sen. 2: The list of other operable units for which work plans are being prepared is not consistent with the list in DOE/RL-90-7. This difference should be rectified.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 5 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
25.	Page WP 2-15, Sec. 2.2.2: References to driller's logs (vs. drill logs) and geologic logs (vs. geology logs) should be consistent.			
26.	Page WP 2-15, Sec. 2.2.2: Figures for this section all have thicknesses and depths expressed in feet, with no metric equivalent. The text would more easily compare to the figures if the primary unit of measurement is feet, with equivalent metric values in parentheses.			
27.	Page WP 2-16, Sec. 2.2.2.1.3, Par. 2, Sen. 2: The acronym "Ma" needs to be defined and included in the List of Acronyms.			
28.	Page WP 2-16, Sec. 2.2.2.1.3, Par. 2, and Page WP 2F-4, Fig. 2-4: The text on page 2-16 contains a reference to an age for the Ringold Formation, but the age is not indicated on Figure 2-4.			
29.	Page WP 2-17, Sec. 2.2.2.1.6: This section should only be one paragraph.			
30.	Page WP 2-18, Sec. 2.2.2.2.1, Par. 2, Sen.5: A discrepancy exists between the measurement of 201m in BC-1 and 183m in BC-5.			
31.	Page WP 2-18, Sec. 2.2.2.2.1, Par. 4: The thickness of the sediments overlying the basalts is stated to be approximately 600 feet. In the BC-100-1 Work Plan, the thickness is stated to be 660 feet.			
32.	Page WP 2-18, Sec. 2.2.2.2.1, Par. 5, Sen. 2: The geology log..." should be "The geologic log..."			
33.	Page WP 2-20, Sec. 2.2.3.2.2, Par. 6, Sen. 2: Figure 2-9 should be referenced in addition to 2-7 and 2-8.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 6 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
34.	Page WP 2-20, Sec. 2.2.3.2.2, Par. 6: This discussion is confusing, as no table of water level elevations is provided. The reader must calculate elevations from data on one table and three different figures. The discussion begins by pointing out that the elevations are not accurately known, thus the reader (and ultimately the regulatory reviewer) is left to evaluate the adequacy of comparing data from two different locations to determine vertical ground water flow gradients. The paragraph should include a rationale for considering these elevations adequate for comparison even though the elevations are not accurately known and the measurements are from different locations.			
35.	Page WP 2-22, Sec. 2.2.3.2.3, Par. 1, Sen. 2: Whether the reversals are in the horizontal or vertical gradients should be indicated.			
36.	Page WP 2-22, Sec. 2.2.3.2.3, Par. 1, Sen. 4: The sentence of BC-1, "The upper surface of the unconfined aquifer is in silty, sandy gravels of the Hanford formation," is different in content than the sentence in BC-5.			
37.	Page WP 2-22, Sec 2.2.3.2.3, Par. 2, Bullet 4: Units are not given for the hydraulic gradient (m/m).			
38.	Page WP 2-23 Sec. 2.2.3.2.5, Par. 3: More detail should be provided on the cause of the recharge to the groundwater. What was the frequency and quantity of discharge that caused the recharge?			
39.	Page WP 2-23, Sec. 2.2.3.2.5, Par. 4: The reference to Figure 2-22 is incorrect and should be Figure 2-23.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 7 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
40.	Page WP 2-24, Sec 2.2.4.4: Low flow characteristics of the Columbia River are not mentioned in adequate detail. These flows may be needed to determine the ARARs for affects on aquatic life.			
41.	Page WP 2-29, Sec. 2.2.6.2, Par. 3, Sen. 3: The word "then" should be changed to "than".			
42.	Page WP 2F-1, Figure 2-1: The legend does not include all the buildings on this drawing. Table 2.1 contains a description of many of the buildings but is not referenced or located in close proximity to this figure.			
43.	Page WP 2F-15, Figure 2-15: This Figure and Figure 2-20 are the same sized maps yet their scales are different.			
44.	Page WP 2F-15, Figure 2-15; Page WP 2F-17, Figure 2-17; Page WP 2F-18, Figure 2-18; and Page WP 2F-20, Figure 2-20: Portions of these figures are illegible.			
45.	Page WP 2F-16, Figure 2-16: Geologic descriptions for the Middle Ringold Formation are written on the cross section on either side of well B3-2 (assumed to be 199-B3-2). The descriptions differ, but no other well is shown or described to have been drilled in that area of the cross section. Only one geologic description should be shown on the cross section unless the source for the difference in geologic materials north versus south of well B3-2 can be described.			
46.	Page WP 2T-1, Table 2-1: Buildings 118-B-8, 185-B, 187-B1, 1707-B-B are not on Figure 2-1. The buildings 186-B and two 182-Bs are not described on Table 2-1.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 8 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
47.	Page WP 3-1, Sec. 3.0-3.1: Chapter 3 of the "Letter Report" presents the overall data quality objective (DQO) with a bias for action and the observational approach for conducting the LFIs and then the IRM. These introductions do not include the LFI or IRM strategy in adequate detail.			
48.	Page WP 3-4, Sec. 3.1.1.2.2-3: The referenced areas 1706-C and 118-C-2 are not shown on Figure 3.1.			
49.	Page WP 3-9, Sec. 3.1.3.1, Par. 5: Where were background groundwater samples collected? Show location(s) of background groundwater monitoring wells on a figure.			
50.	Page WP 3-12, Sec. 3.1.3.3.6, Title: The title of the section is "Cobalt-60, Cesium-137, Technetium-99, and Uranium." However, Ruthenium-106 is mentioned in the second sentence. The Ru-106 should be mentioned in the title. The sentence continues to state that the detection limit for Ru-106 was considerably higher than the "MCL of 30 pCi/L." Under current regulations, no promulgated MCL for Ru-106 exists. For anthropogenic (man-made) radionuclides, the sum of the annual doses from the total number of radioactive constituents present cannot exceed 4 million/year. Since other man-made radionuclides besides Ru-106 exist in groundwater, an MCL would need to be calculated based on the total annual dose received from the total number of man-made radionuclides present.			
51.	Page WP 3-12, Sec. 3.1.3.3.6, last sentence: The last sentence of the paragraph states that uranium (assuring total uranium) concentrations were "below the standard of 600 pCi/L." Unless this is based on a 4 million annual dose then no current promulgated standard exists. However, according to the proposed National Primary Drinking Water Regulations 141.64			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 9 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
52. cont.	(56FR33050; July 8, 1991), the proposed MCL for total uranium is 20 ug/L which is equivalent to approximately 30 pCi/L. This should be taken into account in the text.			
52.	Page WP 3-16, Sec. 3.1.5.2, Par. 4, Sen. 5: The date "1987" should be "1989".			
53.	Page WP 3-17, Sec. 3.1.6.2, Par. 4, Sens. 3 and 4: "Data concerning radionuclide contamination ... for whitefish muscle and carcass ... are given in Tables 3-20 and 3-21". Tables 3-20 and 3-21 present radionuclide data for vegetation and pheasant/rabbits, respectively.			
54.	Page WP 3-19 and WP 3-20, Sec. 3.2: Although there is little difference in meaning, the EPA refers to "contaminant-specific ARARs" as chemical-specific ARARs in the guidance document <u>CERCLA Compliance With Other Laws Manual</u> (OSWER Directive 9234.1-01, August 8, 1988).			
55.	Page WP 3-21, Sec. 3.2.1.1.5: Insert the abbreviation "MCLs" after the words "maximum contaminant levels".			
56.	Page WP 3-23, Sec. 3.2.4.1, Sen. 1: Most contaminants in the vadose zone soil, with the exception of PCBs, do not have clean-up standards (i.e., ARARs). Therefore, clean-up standards are developed considering potential effects on (1) humans or other sensitive receptors (e.g., plants and animals) and (2) other environmental matrices such as groundwater beneath the vadose zone. This section only discusses the first type (item (1)).			
57.	Page WP 3-23, Sec. 3.2.4.1, line 8: Insert the word "excess" after the phrase "...no more than one...". This is important since the average person has about a one in four chance of getting cancer during the			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 10 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
58. cont.	average lifetime (70 year exposure duration assumed by EPA). Thus, the $10^{-4}$ to $10^{-6}$ excess upperbound lifetime cancer risk means that the odds for cancer increase from 25 percent to a range of 25.01 to 25.0001 percent.			
58.	Page WP 3-26, Sec. 3.3.1.4, Par. 1: Access to contaminated groundwater by on-site workers may need to be included.			
59.	Page WP 3-29, Sec. 3.3.2.6, Par. 2: The basis for selection of the listed constituents (i.e., detected most frequently in past monitoring, detected most recently, detected at the highest concentrations) should be stated.			
60.	Page WP 3-31, Sec. 3.4: This section, although wordy, presents a good discussion of preliminary remedial response objectives, technologies, and alternatives. As such, it does not require any changes.			
61.	Page WP 3-31, Sec. 3.4, 3.4.1: The Preliminary Response Action Objectives are very general and do not emphasize the specific DQO for the stages of the project (before, during, and after remediation). The specific LFI objectives are not mentioned for the soil borings, groundwater sampling, data validation, and physical properties and analyses as discussed on pages 29-32 of the "Letter Report".			
62.	Page WP 3-32, Sec. 3.4.2: Pages 35-37 of the "Letter Report" concern this section. From the "Letter Report", "The work plans will make recommendations as to the range of preliminary interim remedial action alternatives that will be considered. The alternatives will be developed on a preliminary basis to provide information on the impacts of various potential ARARs, point of			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 11 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
63. cont.	compliance, and land use scenarios with respect to differing process technologies". Although the alternatives can be more fully developed and evaluated in the focused feasibility study, the document writers have interpreted this in a very general sense. The "Letter Report" appears to require more detail on the different interim remedial technologies and discussion with specific technologies feasible for specific units. Also, which ARARs are suspected of being limiting at different land units and what are some of the specific land uses of concern that may be affected by the potential treatment technologies?			
63.	Page WP 3F-3, Fig. 3-3: The tritium handling area has not been indicated on the drawing.			
64.	Page WP 3F-15, Figure 3-15: Symbols in the legend are not consistent with the figure. Primary sources are shown in circles in the figure, but circles are not included in the legend.			
65.	Page WP 3F-16, Figure 3-16: The column "Potential Conflicts with ARARs or Future Land/Water Use", has conclusions that are not discussed in the text.			
66.	Page WP 3T-1, Table 3-1: The sites 118 B-8, 116 B-13, and 128 B-1 were not on Figure 2-1.			
67.	Page WP 3T-12, Table 3-12: The "Less Than Detection" row is not adequately explained. What does the presence of a "-" indicate in that column? Does the number in that row indicate the detection limit?			
68.	Page WP 3T-13 to 16, Table 3-13 to 16: The drinking water standard is used for the comparison with monitoring data. However, a more stringent ARAR may be a more appropriate comparison.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 12 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
69.	Page WP 3T-23, Table 3-23: Other non-radioactive waste is mentioned in the text as potential sources of pollutants such as coal, oil, fuels, and solvents. Constituents for these materials are not mentioned as potential pollutants. Additionally, PCBs that may have been present in certain hydraulic fluids and aluminum in the alum from the water plant are also not mentioned as potential pollutants.			
70.	Page WP 4-1, Sec. 4.0, Par. 2, Sen. 2; and Page WP 4-6, Sec. 4.1.2.2, Par. 1, Sen. 2: In the text, the term "threshold concentrations of contaminants" is to be used to determine whether or not an IRM is required. However, nowhere in the document or in any of the Hanford facility guidance documents are the threshold concentrations identified. The purpose of the "threshold concentrations" needs to be stated, and the time in the RI/FS process at which the concentrations are to be determined needs to be specified. Figure 1-3 (Page WP 1-3) should be checked for uniformity with the text in Chapter 4.0.			
71.	Page WP 4-3, Sec. 4.1.1.1, Par. 1, Sen. 1: Steps 2 and 3 are presented in Chapter 3.0 only. The reference to Chapter 2.0 (Background and Setting) should be deleted.			
72.	Page WP 4-3, Sec. 4.1.1.2, Par. 5: A sentence should be added stating that the data types are discussed in Sec. 4.1.2 and Chapter 5.0.			
73.	Page WP 4-3 to 4-7: The data needs are not adequately divided into "general needs" and "limited investigation needs".			
74.	Page WP 4-4, Sec. 4.1.1.2, Par. 1, Sen. 6: The subject/verb agreement in the final clause of the sentence should be addressed (i.e., "IRMs is").			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 13 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
75.	Page WP 4-4, Sec. 4.1.1.2, Par. 3, Sen. 1: The section in this document including the sampling and analysis options should be referenced.			
76.	Page WP 4-5, Sec. 4.1.2.1, Par. 2, Sen. 5; Page WP 4-7, Sec. 4.1.2.4, Par. 2, Sen. 2; and Page WP 4-8, Sec 4.1.2.5, Par. 1, Sen. 2: These sentences should be modified to read "...,surface water and sediment,...".			
77.	Page WP 4-5, Sec. 4.1.2.1, Par. 2, bullet 4: The sentence contains double parentheses.			
78.	Page WP 4-6, Sec. 4.1.2.2, Par. 1, Sen. 1: The implication of Figure 1-3 (page WP 1F-3) is that the purpose of the qualitative risk assessment is to determine whether or not an IRM will be necessary. If so, this first sentence in Sec. 4.1.2.2 needs to be clarified to state that purpose.			
79.	Page WP 4-6, Sec. 4.1.2.2 and Sec. 4.1.2.3: Table 4-1 is not referenced in these sections, in contrast to Sec. 4.1.2.1, 4.1.2.4, 4.1.2.5, and 4.1.2.6 which reference the table. These sections should be checked for consistency.			
80.	Page WP 4-7, Sec 4.1.2.3, Par. 0, Bullet 6: Are treatability studies a part of the Hanford Site Past-Practice RI/FS process? No mention of treatability studies appears in Chapter 1.0 or Figure 1-3. A discussion of the purpose, extent, and timing of treatability studies should be added to the document.			
81.	Page WP 4-7, Sec. 4.1.2.3, Par. 1: The phrase "where the data will be collected" is not in agreement with the preceding gerund phrases.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 14 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
82.	Page WP 4-11, Sec 4.2.1.2: No specific information regarding the investigation strategy for the 100-BC-5 operable unit is given. Perhaps a flowchart (like those contained as Figure 4-1 through 4-5) which incorporates tasks such as the "fitness for use" evaluation could be added. A table like Table 4-2, which enumerates the number and nomenclature of priority one and two wells, could also be added.			
83.	Page WP 4-11, Sec. 4.2.2, Par. 4, Sen. 2: Details regarding field screening methods for volatile organics and radionuclide screening should be added to Chapter 5.0 and referenced in Sec. 4.2.2.			
84.	Pages WP 4T-1a, -1b, and -1c, Table 4-1: The six column "Purpose of Data" headings should be retitled and rearranged from left to right to correspond with the titles of Sec.s 4.1.2.1 through 4.1.2.6 (pages WP 4-5 through WP 4-9). In the current fifth and sixth column headings, the RCRA terminology (corrective measures study) should be changed to the corresponding CERCLA terminology. In the sixth column heading, the word "corrective" is incorrectly spelled.			
85.	Page WP 5-1, Sec. 5.1, Par. 4: A statement is not provided in the text about which tasks are part of BC-1 or BC-5. The locations of the schedules for tasks not included in this workplan are not referenced.			
86.	Page WP 5-1, Sec. 5.0 and Sec. 5.1: The titles of Sec. 5.0 and 5.1 have not been changed to correspond to the outline.			
87.	Page WP 5-1, Sec. 5.1: The described tasks are for the LFI and not the RI as stated.			
88.	Page WP 5-8, Sec. 5.1.5.4, Par. 1, Sen. 4: "... gross-gamm..." should be "... gross-gamma..."			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 15 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
89.	Page WP 5-9, Sec. 5.1.6, Par. 0: Define threshold concentrations or refer reader to the section of the work plan describing how those will be developed or defined.			
90.	Page WP 5-19 and WP 5-19: The use of "operable unit" is confusing. The first paragraph in this section states that the FS process for the 100 Areas will not be conducted on an operable unit basis while the second paragraph states that selected sites in the operable unit will have remedial action implemented. It should be specified if one FS will be done for each 100 Area or if a focussed FS will be done at each site (solid wastes, soil, river sediments, groundwater, and 100-N Area). Part of the basis for streamlining remediation at Hanford is the use of LFIs, focussed feasibility studies, and IRMs.			
91.	Page WP 5-20, Sec. 5-2, Par. 1: The final ROD and the public notice process is described in detail while the public process for the IRA, which is the first step, is not adequately explained.			
92.	Page WP 5-20, Sec. 5.2.2, Par. 4: Four general tasks are identified, but these tasks are difficult to find on Figure 6.2. The Feasibility Study tasks should be more specifically identified and numbered to facilitate tracking these tasks on the schedule. These tasks should be distinguished from the general 100-Area aggregate studies. Will the focused Feasibility Study for the 100 Aggregate Area delay the IRM for BC-5?			
93.	Page WP 5-21, Sec. 5.2.3: The focused feasibility study is difficult to follow on Figure 6.2.			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 16 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
94.	Page WP 5-25, Sec. 5.2.3.5: The proposed remedial action plan is discussed, but the LRI and IRM are not discussed.			
95.	Page WP 5F-1, Figure 5-1: The approximate location of proposed monitoring wells does not agree with the locations shown in Figure 2-1 (page 25) of the "Letter Report" for Rescoped Work Plans".			
96.	Page WP 6-1, Title: The title should be changed to "PROJECT SCHEDULE".			
97.	Page WP 6-1, Sec. 6.2: The reason for deleting assumptions should be given because this was a requirement of the "Letter Report".			
98.	Pages WP 6F-1, 6F-2, 6F-3, and 6F-4, Figures 6-1, 6-2, 6-3, and 6-4: All figures should have "100-BC-5 Operable Unit Remedial Investigation/Feasibility Study Work Plan" in the figure title.			
99.	Page WP 6F-1, Figure 6-1: Task 1 - Project Management is applicable to this Operable Unit and is integrated into the schedule throughout the course of work. Task 2 - Source Investigations will be conducted according to source (unit) specific work plans. Task 3, Subtask "3.1" should be 3a. Also, subtasks "3b", "3c", and "3d" need to be added. Task 5, Subtask "5.1" should be "5a". Also, subtasks "5b", "5c", "5d", and "5e" need to be added. The subtasks under Task 6 on the figure should correspond to the subtasks discussed in the text in Chapter 5.0. On Figure 6-1, under Task 6, why is there a gap between "6.2.1 Evaluate Existing Wells" and the next subtask "6.2.2 Well Installation"? In the bar chart no work is shown during these two subtasks (a time period of 10 months). If work for this time period is shown on another figure, perhaps this should be stated as such on Figure 6-1. Tasks			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 17 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
100 cont.	8, 9, 10, 11, and 12 will also be performed. A time-frame for performance of these tasks should be shown on the schedule. If it is considered unnecessary to show performance periods for these tasks on the schedule, the reasoning for the omission should be explained in a footnote. In addition, Well Siting and Aquifer testing are not included on the figure but are discussed in Chapter 5.0, and it might be helpful to show submittal dates of documents. The footnote at the bottom of the figure does not appear technically correct.			
100.	Page WP 7-2, Sec. 7.1.2.3, 7.1.2.4, and 7.1.2.5: The job positions of Quality Assurance Officer, Quality Coordinator, and Health and Safety Officer are not referenced to Figure 7-1 (page WP 7F-1). These positions should be referenced and subsequently added to the figure in order to be consistent with the remainder of Sec. 7.1.2.			
101.	Page WP 7-3, Sec. 7.1.2.9, Par. 1, Sen. 3: Do Figure 7-3 through 7-6 refer to organizational structures of Westinghouse Hanford Company (WHC) technical teams only, or do these figures depict the structure of RI/FS contractor teams under direction of the WHC Environmental Engineering Group? The relationship should be clarified in Sec. 7.1.2.9 and also in the four figures.			
102.	Page WP 7-3, Sec. 7.2, Par. 2, Sen. 1: For clarity, the words "Tri-Party" should be inserted before the existing words "Action Plan".			
103.	Page WP 7-3, Sec. 7.3.1, Par. 3, Sen. 3: In this sentence, the management control system must meet the requirement of DOE Order 2250.1C (DOE 1988b). However, in Work Plan DOE/RL-90-07, the system must			

<b>REVIEW COMMENT RECORD (RCR)</b>	1. Date 10/31/91	2. Review No. 0
	3. Project No.	4. Page 18 of 19

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
104 cont.	meet the requirement of DOE Order 2250.1B (DOE 1985). This difference should be corrected or explained.			
104.	Page WP 7F-1, Figure 7-1: The word "Figures" in the lowermost box on the right is misspelled.			
105.	Pages WP 7F-3 and WP 7F-4, Figures 7-3 and 7-4: The work "Remedial" in the second box in the center is misspelled.			
106.	Pages WP 7F-3, Figure 7-3 through WP 7F-6, Figure 7-6: The figure titles need to be modified to show if these are WHC teams or RI/FS Contractor Teams.			
107.	Appendix A: Quality assurance and quality control references should be upgraded from 1989 to 1991 where applicable, to conform to those stated in Work Plan DOE/RL-90-07, Draft B.			
108.	Page A-1, Sec. 1.3, Par. 3, Sen. 6: This sentence contains double parentheses.			
109.	Page A-3, Sec 3.0, Par. 3: The "goal" for the detection limits has not been established as required on p. 31 of the "Letter Report".			
110.	Page A-8, Sec. 4.1.1: "EIIs" should be initially defined.			
111.	Page B-3, Sec 1.6: Should a sentence be added stating that contractor or subcontractor personnel regularly working at sites governed by an HWOP will undergo annual whole-body radiation scans?			
112.	Page B-4, Sec. 1.7, Par. 1, Sen. 2: The abbreviation for "hour" should be deleted and the word "hour" should be written.			

REVIEW COMMENT RECORD (RCR)		1. Date 10/31/91	2. Review No. 0	
		3. Project No.	4. Page 19 of 19	
12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
113.	Page B-9, Sec. 4.0, Par. 5, Sen. 2: The emphasis of the 100-BC-5 investigation should be to characterize ... the saturated (rather than the unsaturated) subsurface soils.			
114.	Page B-14, Sec. 10.0, Line 1: The first acronym should correctly read "ACGIH".			
115.	Page C-5, Table C-2: The work plans that include the other tasks are not identified in this table.			
116.	Page D1-3, Sec. 3.2, Par. 2, Sen. 4: Did the EG&G survey detect radiation levels in excess of background? A brief description (i.e., 1-2 sentences summarizing) of the EG&G study results may need to be given to explain why no "additional surveys" are planned after conducting the one stated in this section.			
117.	Page D1-3, Sec. 3.4, Par. 4, Sen. 1: Are an adequate number of accessible springs and seeps anticipated to be found to make this a meaningful study?			
118.	Page D1-4, Sec. 3.5: The fact that no target compound list (TCL) of organic constituents will be analyzed needs to be explained.			
119.	Page D1-5, Sec. 3.4, Par. 1, Sen. 1: Are an adequate number of "adjacent groundwater monitoring wells" available to make this a valid comparative study? How great a distance from the river can a well be located and still be close enough to detect an impact from river level changes.			