



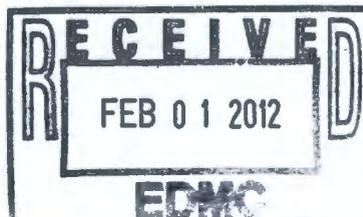
Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

0101389

12-AMCP-0062

JAN 24 2012

Mr. D. A. Faulk, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
309 Bradley Boulevard, Suite 115
Richland, Washington 99352



Dear Mr. Faulk:

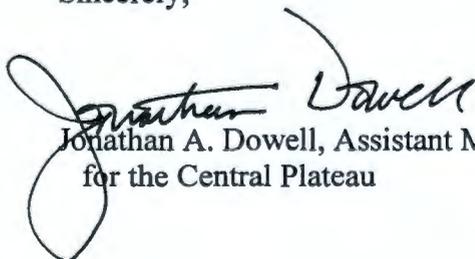
REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR THE 100-KR-1, 100-KR-2, AND 100-KR-4 OPERABLE UNITS, DOE/RL-2010-97, DRAFT A AND PROPOSED PLAN FOR REMEDIATION OF 100-KR-1, 100-KR-2, AND 100-KR-4 OPERABLE UNITS, DOE/RL-2011-82, DRAFT A

In reference to letter 12-AMCP-0043 dated December 27, 2011, attached are the U.S. Department of Energy Richland Operations Office's responses to the U.S. Environmental Protection Agency's (EPA) comments regarding the Remedial Investigation/Feasibility Study for the 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units, DOE/RL-2010-97, Draft A and Proposed Plan for Remediation of 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units, DOE/RL-2011-82, Draft A. Due to last week's adverse weather related office closures, these comment responses were provided to Christopher Guzzetti of your staff via e-mail on January 19, 2012.

A working copy of Revision 0 is currently under development incorporating EPA's comments, adjusting formatting, and will undergo completeness review. The modeling will be modified to incorporate a 70:30 vadose zone contaminant distribution for screening purposes as well as for Preliminary Remediation Goal (PRG) development. The screening model will utilize irrigation and the PRG development model will not include irrigation in the calculations.

The schedule for EPA review of Revision 0 is from April 17, 2012, to May 1, 2012. Submittal of Revision 0 to support public comment will be on July 17, 2012. If you have any questions, please contact me, or your staff may contact Briant Charboneau, of my staff, on (509) 373-6137.

Sincerely,


Jonathan A. Dowell, Assistant Manager
for the Central Plateau

AMCP:JPH

Attachments

cc: See Page 2

Mr. D.A. Faulk
12-AMCP-0062

-2-

JAN 24 2012

cc w/attachs:

G. Bohnee, NPT
L. Buck, Wanapum
R. E. Day, CHPRC
L. M. Dittmer, CHPRC
D. E. Dooley, CHPRC
B. H. Ford, CHPRC
C. J. Guzzetti, EPA
S. Harris, CTUIR
J. A. Hedges, Ecology
M. N. Jaraysi, CHPRC
R. Jim, YN
W. F. Johnson, WCH
R. A. Kaldor, MSA
S. L. Leckband, HAB
J. A. Lerch, WCH
N. M. Menard, Ecology
K. Niles, ODOE
T. W. Noland, MSA
R. E. Piippo, MSA
R. S. Popielarczyk, CHPRC
D. Rowland, YN
Administrative Record
Environmental Portal

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-001	<p>The process for remedy selection for waste sites falls short of what is required by the NCP. The discussion of the post-ROD sites is troubling. This is a final action remedy and the RI/FS should collect adequate data to select a remedy EPA recommends that the selected remedy for the majority of waste sites should be remove, treat, dispose, and the text discussing the post-ROD sites be re-examined.</p> <p>In addition, similar to the interim action RODs, the list of COCs should be expanded. As each waste site is remediated, the appropriate COCs can be selected and a sampling design developed to verify attainment of RAOs and cleanup levels.</p>			Accept	<p>Each waste site is evaluated and appropriate technologies identified to address the site risks. A summary table will be provided to present the basis for action for all waste sites including post-ROD sites. Text will be added to discuss this evaluation. In alternative 2 45 sites are selected for RTD, 17 sites include RTD with additional complementing technologies. Text describing the post-ROD sites will be clarified and expanded.</p> <p>There will be the COC and a COPC list (a broader list) for inclusion in the ROD. The approach will use the COPCs identified in the Integrated Work Plan Addendum.</p>
K-002	<p>Land Use/PRGs</p> <p>The reasonably anticipated future land use presentation in this document violates an agreement already reached on this topic by the Tri-Party Managers. EPA supports an unrestricted use scenario similar to the scenario used in the interim action RODs for the majority of the K Area and a casual user scenario for those areas near the Columbia River that are in the flood plain and may have cultural sensitivity. An unrestricted land use should include irrigation, but the RI/FS and proposed plan state that PRGs were calculated without irrigation. PRGs should be calculated with the irrigation scenario as was done in the interim actions.</p>			Not Accepted	<p>Although DOE believes that the reasonably anticipated future land use is conservation/preservation, DOE has proposed soil remediation goals for direct contact in the River Corridor based on residential use. This policy decision reflects DOE's interest in continuing the efficacy of the current cleanup program and also fulfills a commitment to select direct contact human health protection cleanup goals no less protective than those utilized under the IARODs. This approach has been referred to as a 'no backsliding' decision. While DOE and the regulators may disagree on the reasonably anticipated future land use at the site, cleanup goals will protect for the exposure scenarios that both DOE and the regulators consider to be appropriate.</p> <p>EPA and Ecology believe it is appropriate that irrigation be considered in determining net infiltration into the soil column to derive soil cleanup goals to protect groundwater. DOE believes, based on the reasonably anticipated future land use, that irrigation should not be considered in determining net infiltration rates, nor be considered in developing soil cleanup goals to protect groundwater. In the revised RI/FS, DOE will provide an analysis that includes an evaluation against representative screening levels based on irrigation.</p>

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-003	<p>Orchard Lands</p> <p>The Orchard Lands need to be carried into the FS with alternatives developed including ICs, RTD, and a barrier (1-2 feet clean fill as seen in other orchard impacted lands in other parts of the State) as potential alternatives.</p>			Not Accepted	The RI/FS will acknowledge that there are historic orchard lands present in the 100-K area and note that these areas will be considered with orchard lands in other River Corridor OUs as part of a sitewide strategy for addressing these properties.
K-004	<p>Reactor Structures</p> <p>The document states, "The specific reactor path forward will be addressed in a separate CERCLA decision." If this RI/FS and PP are for a final ROD, the reactor path and decision should be evaluated. It is very concerning when there is text in the document that states the nature and extent of contamination under and near the reactors is still unknown (Page 4-69 lines 36-42). The FS/PP needs to develop and evaluate alternatives for the waste sites near the reactor as some of them appear to be impacting groundwater. Deferring cleanup of these waste sites until the reactor is removed is not acceptable.</p>			Accept	Text will be modified to add clarity regarding the remedy for waste sites near reactors and to clearly identify these sites. The remedy is capping and when the reactors are removed these waste sites will be removed along with the reactor. Text will also be updated to clarify that the Reactors will continue to follow the NEPA ROD and will be implemented through a CERCLA action memo.
K-005	<p>River Effluent Pipelines</p> <p>EPA expects these to be carried to the FS /PP for a final decision. Alternatives need to be developed such as: 1) No action 2) Leave in place (with ICs) 3) Grout in place and 4) Remove.</p>			Accept with Modification	Text will be modified to discuss the risk assessments done on the river portion of the pipelines (note this is for the waste site below the high water mark) and reference the supporting documents (such as the EE/CA). Since these assessments have shown that there are no risks (or risks pathways) the river pipelines will not be evaluated for remedial action and will be presented as no-action sites. The land based portion of the river pipelines are undergoing RTD based on the IAROD.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-006	<p>Deep Vadose Zone/Groundwater</p> <p>It is not clear how groundwater COCs will be treated in the FS/PP. Although there is information in the FS for treatment of the groundwater COCs, it is not clear if the current system will treat the COCs or if injection standards will be met by blending the water. Please clarify. It is not clear what the remedy for the deep vadose zone is. Is it RTD or chemical manipulation/soil flushing? Again, each waste site with deep contamination needs to propose a remedy and clear rationale for why it was recommended in the FS. This information should then be carried forward into the PP. The FS indicates that treatability tests will need to be performed for several of the in situ technologies. This is not appropriate at this stage of the process. EPA and DOE discussed the need for treatability tests as part of the FS several years ago, and DOE decided no tests were needed to select waste site specific technologies.</p>			Accept with Modification	<p>Specificity will be added regarding how the groundwater treatment system addresses COC's. Contaminants are co-extracted with Cr(VI) plume, but must meet contaminant re-injection standards.</p> <p>Each waste site is evaluated and appropriate technologies identified to address the site risks. Text will be added to discuss this evaluation. In alternative 2 45 sites are selected for RTD, 17 sites include RTD with additional complementing technologies.</p> <p>Reference to treatability tests will be removed.</p>
K-007	<p>ARARs</p> <p>The ARAR identification needs to be consistent with RODs that have recently been completed, such as 200-PW-1,3,6 and 200-ZP-1.</p>			Accept	<p>PW-1,3,6 ARARs will be evaluated and augmented with River Corridor ARARs. The term 'potential' will be kept within the RI/FS. It is understood that the ARARs are 'potential' until defined in the ROD.</p>
K-008	<p>The RI/FS document states that it is thought that the existing interim groundwater pump and treat system has proven effective in remediating groundwater contamination, but there are no wells downgradient of the extraction wells to check the effectiveness of the system. The document should acknowledge additional wells are needed to delineate the plume boundary.</p>			Accept with Modification	<p>After discussion with EPA on 12-6-11, this comment pertains to the Cr(VI) plume at the 100-N boundary. 100-K will address this plume.</p>
K-009	<p>The text states that "mobile contaminants present in deeper soil are being addressed by continuing excavation where necessary to achieve interim action clean up objectives." This is not true in all cases; some sites such as the UPR under KE Basin and waste sites with C-14 have stopped excavation because the project has determined that it will undermine the reactor structure. The text should be revised accordingly.</p>	ES	vii	Accept	<p>Text will be clarified to indicate some sites, due to reactor proximity, are not fully remediated as part of the interim actions. Text will include clarification on how these waste sites will be addressed as part of this RI/FS.</p>
K-010	<p>The font used within this graphic makes it difficult to read. Please change the font. (Figure ES-3)</p>	ES	ix	Accept	<p>Graphic updated for clarity.</p>

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment									
K-011	The reference document number is incorrect for footnote #5.	ES	xi	Accept	Work Plan Addendum 2 reference corrected.									
K-012	Cs, Pu, U, PCBs along with other contaminants found in the KE fuel storage basin were not identified as COCs but should be. It is not apparent if characterization of the UPR was sufficient to determine nature and extent of what was discharged to the vadose and groundwater; please clarify. Also, Tc99 and Antimony 125 should be COCs.	ES	xvii	Accept	The team will evaluate information gained from the fuel storage basin and associated excavation and the appropriate additional COCs and/or COPCs will be added. The nature and extent is understood sufficient to select RTD for this area. The final data received from the direct pushes will be added to the discussion. Soil samples and lab analysis for a suite of constituents, including those found below the former fuel storage basin, are being proposed as part of the ongoing remediation project to further define nature and extent at the UPR and support continued remediation.									
K-013	Were they tracked as "waste sites" back when they were originally formed as part of operations or were they known as disposals areas?	1	1-1	Accept	Text modified for clarity. During operations these sites were operating facilities.									
K-014	What "processes" were done to "ensure no waste sites will be missed?" Please clarify.	1	1-1	Accept	The nonoperational evaluation process which includes orphan sites is used. The last sentence in paragraph was deleted.									
K-015	What were "priority investigations?" Please define.	1	1-4	Accept	Will clarify what the text did per the Hanford Past Practice Strategy (HPPS).									
K-016	All the LFI focused on was Cr(VI)? What about other COCs?	1	1-4	Accept	Will clarify that during the Limited Field Investigations (LFI), rads, metals and organics were also sampled. Furthermore, Chapter 4 presents the LFI information.									
K-017	Delete "potential." Known contamination is taken to ERDF.	1	1-5	Accept	Will delete potential.									
K-018	Need to call out ERDF. This statement makes it sound like soil is just being dumped in the Central Plateau.	1	1-5	Accept	Will call out ERDF.									
K-019	Why is the 1706-KEP Test Loop mentioned? Please describe the significance.	1	1-18	Accept	The test loop is a difference between the KE and KW reactors. This loop was a source of waste disposed to the 116-K-2 trench and is discussed within the section a few paragraphs down. No change in text.									
K-020	Short-lived vs long-lived radionuclides is vague. Put table divided into short-lived and long-lived radionuclides and give element name and half life. E.g. <table border="1" data-bbox="241 1307 892 1404"> <thead> <tr> <th></th> <th>Radionuclide</th> <th>Half life</th> </tr> </thead> <tbody> <tr> <td>Short-lived</td> <td></td> <td></td> </tr> <tr> <td>Long-lived</td> <td></td> <td></td> </tr> </tbody> </table>		Radionuclide	Half life	Short-lived			Long-lived			1	1-18	Accept	Will revise.
	Radionuclide	Half life												
Short-lived														
Long-lived														

Tracking ID	Comment				Response to Comment
		Chapter	Page (from Review Dft)	Disposition	
K-021	Need amount of C-14 for red and yellow. High and Low is too vague. Also, the Carbon 14 concentration plume is larger than shown in the figure.	1	1-29	Accept	Will revise the key to the figure to provide a value. Figure indicates sources of C-14. Groundwater plumes are not shown in this figure.
K-022	This figure appears to be inaccurate. Action Memos for facilities shouldn't flow into RODs. Please revise.	1	1-34	Accept with Modification	It was not the intent of the figure to imply the facility EE/CAs would progress into a ROD. Figure will be updated to clarify this concern. Also, there is an arrow going the incorrect direction that will also be corrected.
K-023	Why is FYR first thing listed under Previous and Ongoing Investigations and Remediation? Should have a summary of these before FYR issues are mentioned.	1	1-38	Accept	Will amend the language to take the emphasis off of the five year review (FYR).
K-024	Need to carry pipelines into FS for evaluation. Cannot dismiss in Chapter 1. See General Comment.	1	1-43	Accept with Modification	Pipelines will be addressed consistent with response to general comment #5.
K-025	Please explain if roof runoff from the proposed reactor ISS is taken into account.	1	1-45	Accept	The recharge calculation is described for natural conditions. A statement regarding facilities states that the recharge will be higher around buildings. Will add text to discuss roof runoff and collection.
K-026	This is not the only ROD that laid out remediation for 100-K waste sites. See Table 1-2. This ROD is referenced in more locations as the only ROD for waste sites at K.	1	1-45	Accept	Will list additional RODs.
K-027	This says 163 waste sites, but Table 1-4 below it and in several other places it says 165 waste sites. Which is correct?	1	1-46	Accept	Including or not including subsites account for the number differences. Text will be added to discuss this and waste site accounting will be corrected.
K-028	There are fundamental differences between the proposed actions and the remaining sites ROD. The remaining sites ROD only has one remedy (RTD). What is contemplated by this RI/FS and PP is a diverse range of remedies. It is unclear how discovery sites will be addressed. (See General Comment.)	1	1-52	Accept	Discovery sites post K ROD will be evaluated through the MP-14 process and included if appropriate in a ROD change.
K-029	This language is repeated exactly from pg 1-51. Don't need in both places.	1	1-53	Accept	Will delete.
K-030	What information was used to determine that reactor stack emissions were minor sources?	1	1-54	Accept	DOE/RL-2005-49, Rev. 0. <i>RCBRA Stack Air Emissions Deposition Scoping Document</i> June 2005. Will add reference.
K-031	This is good supporting information- move up to line 28.	1	1-54	Accept	Text will be moved per comment.
K-032	Not sure why this is relevant here.	1	1-55	Accept	The statistical evaluation is one of the investigations that took place at 100-K. This discussion can be included as part of the orphan site evaluation. Will provide clarification and move text.
K-033	The use of the term "hot spots" should be clearly defined or omitted.	1	1-68	Accept	Will delete the term.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-034	Don't need disclaimer on the River Corridor Risk Assessment. All relevant information should be in this RI/FS.	1	1-69	Accept	Will delete.
K-035	Data Need states, "Characterize around the reactor structures to assess the nature and extent of contamination in the vadose zone." There is no explanation on how this data need was obtained. Please explain how a barrier remedy could be considered protective if the text indicates the nature and extent of contamination is unknown.	8	2-3	Accept	Text will be updated to state existing and ongoing actions (investigations and remediation) around the reactor and how this supports the data need and resultant path forward. The protectiveness of the barrier remedy will be discussed in Chapter 8 through 10.
K-036	Remedial technologies were somewhat evaluated for groundwater; they were not investigated for contaminated soils, or excavation methods. The contaminated soil remedial technologies need to be investigated and included in additional alternatives.	8	2-7	Not Accepted	Table 8-6 identifies technologies evaluated, retained, and not retained, including various ex-situ and in-situ technologies for soils. Table 8-7 identifies the technologies for groundwater. Appendix I in Draft A lists technologies that were not retained.
K-037	This refers the reader to section 2.1.9.1 for data to support contaminant fate and transport modeling, but referenced section does not contain this information.	2	2-34	Accept	Will change to reference the correct section.
K-038	It is not clear how cultural resources were accounted for in the RI/FS or the PP. Are culturally significant sites or areas still under the same land use? Same scenario? See General Comments.	3	3-162	Accept with Modification	Potential impacts to known cultural resources are considered during evaluation of balancing criteria for alternatives. The same RAOs, land use, and scenarios are applied throughout the project. Cultural resources may or may not be identified during evaluation of balancing factors. There are ARARs that address protection of cultural resources. The cultural resources review will occur during the design phase. If the review identifies new cultural information or determines that the alternative selected is not appropriate, then the ROD will be amended. No change to text in Chapter 3 is recommended at this time.
K-039	This chapter does not acknowledge that: 1) the extent of hexavalent chromium contamination migrating into 100-N Area has not been delineated, and 2) the existing extraction well network will need to be expanded to address hexavalent chromium contamination from K Area.	4	4.1	Accept	A focused discussion of the migration of hexavalent chromium into the 100-N Area is presented in Section 4.2.6.9. An expanded discussion of the extent of hexavalent chromium plume at the east end of 100-K Area will be added, including reference to the estimated plume extents described in the groundwater fate and transport simulations presented in Chapter 5.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-040	Primary contaminants vs. Secondary contaminants: Provide adequate explanations/descriptions why primary contaminants are no longer present at this time although the type of contaminants and the nature of the released mechanism are more or less the same (e.g. discharged to the same trench, ditch, etc.) for the secondary waste as well. It seems, from the history of the disposal, it is difficult to distinguish the primary waste from the secondary waste. Please provide adequate explanation to address the issue and how the characterization approach so far is adequate to explain any differences and similarities between primary and secondary contaminants.	4	4-6	Accept	Text will be revised with focus on clarifying the differences between primary <u>sources</u> and secondary <u>sources</u> , acknowledging that the <u>contaminants</u> involved with each source may be in fact one and the same. The text should adequately describe the difference between primary <u>releases</u> and secondary <u>releases</u> of the same contaminants. The reviewer is correct in stating that there are no primary and secondary <u>contaminants</u> .
K-041	Make sure it's consistently written Cr(VI).	4	4-6	Accept	The document will be checked for consistent use of hexavalent chromium descriptors.
K-042	Give number of waste sites, not percentages.	4	4-7	Accept with Modification	The statement regarding the percent of waste site remediated vs. remaining to be remediated is not essential to the discussion at hand and is deleted.
K-043	Did K ever have solid sodium dichromate or just concentrated liquid? Please clarify.	4	4-7	Accept with Modification	Text was added to indicate that solid granular sodium dichromate dihydrate was not used at 100-K.
K-044	Why decayed to 1986? Either give original amount (preferred) or decayed to 2011.	4	4-9	Accept with Modification	The text was changed to indicate the initial activity released.
K-045	Need to make it clear that these are just for groundwater.	4	4-10	Accept with Modification	The text was changed to indicate that these are COPCs that have impacted both soil and groundwater.
K-046	Why "ideally, slightly greater" when dissolved Cr is usually all Cr(VI)?	4	4-11	Accept with Modification	Text was added to better describe the relationship between total and hexavalent chromium measurements.
K-047	Why is this section here where groundwater COCs are discussed? Should be under vadose zone.	4	4-11	Accept	Will review organization and move section to appropriate location. The indicated text was relocated to a new Section 4.2.2.1 under Section 4.2.2 Vadose Zone.

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K-048	Section 4.2.2.6-There should be a map showing the location of where this borehole (well) was installed and referenced in this section. It should be explained how the data from this location applies to the areas or waste sites it's being used to characterize. It should be made clear how this information is being used in the RI/FS. From what is explained, it seems the borehole is being used to characterize waste sites 330 feet away, with other waste sites in between. It should be explained how this particular borehole can provide the needed information.	4	4-33	Accept	As stated in the text, the purpose of this well (199-K-185) is to provide additional measurements of the downgradient extent of contaminants known to have originated in the vicinity of 105-KW reactor (e.g., Cr(VI), C-14, TCE, and Sr-90). Soil data collected from this boring is not used to describe conditions at any particular waste site. The information derived from this well is used primarily to support understanding of groundwater contamination distribution. The text has been changed to clarify that the borehole in question was completed as a monitoring well (1990-K-185). No other changes to the text are recommended.
K-049	The text states that the full nature and extent of contamination under and near the reactor is still unknown. This is inconsistent with Data Gap 3 in table 2-1 which states that data need was filled. Please clarify.	4	4-69	Accept	Data Gap 3 need, as stated in the Integrated Work Plan Addendum, is fulfilled by continued contaminated soil removal and sampling at waste sites associated with 105-KE and 105-KW Reactor sites. The remediation we have done to date does indicate that we have deep and shallow contamination and has improved our conceptual site model associated with these waste sites sufficient to support alternatives evaluation and remedy selection. The discussion presented to describe waste site UPR-100-K-1 is accurate; residual vadose zone contamination beneath 105-KE reactor is not completely described. No change to the text in this section is recommended. The description of work conducted in Table 2-1 has been modified to indicate the status of on-going soil remediation in the vicinity of the reactors.

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K-050	It is unclear how nature and extent of groundwater contamination could be considered known, when waste site 116-KE-3 has not been fully characterized. 116-KE-3 is a vertical well that extends into the water table and has had discharges of radioactive waste. The COPCs evaluated do not include what could have been discharged directly to groundwater. In addition to this waste site, the UPR under the KE basin has still not been fully characterized to groundwater.	4	4-86	Accept	Although vadose zone contamination is obviously closely linked to current and historical groundwater contamination, the groundwater contamination condition can be understood while some uncertainty remains with respect to residual vadose contamination. Waste Site 116-KE-3 is an apparent contributor to historical groundwater contamination by radionuclides and other inorganic contaminants. Groundwater monitoring conducted to date in 100-K has defined numerous contaminant plumes. Plume evaluation indicates the sources of most of these plumes. 116-KE-3 is an apparent source of Sr-90 observed in groundwater in that vicinity. Evaluation of concentration time series for Sr-90 and related contaminants provides a basis for inference of the potential and/or magnitude of ongoing contributions from that waste site. The same logic applies to the vadose zone contamination beneath the reactor. Complete vadose zone characterization is not available. Soil samples and lab analysis for a suite of constituents are being proposed as part of the ongoing remediation project to further define nature and extent at the UPR. However, a groundwater monitoring network has been established that provides on-going basis for evaluation of potential contributions from that source. This network has evolved through the RI/FS process and further refined during the Integrated Work Plan Addendum. No changes to the text are recommended at this time.
K-051	The TCE plume is not listed.	4	4-106	Accept	Information describing the extent of the TCE plume was added to the table.

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K-052	The text states: "Cr(VI) is present in groundwater in 100-K and into the southwestern portion of the 100-NR-2 Groundwater OU, to the N Reactor fence line." The extent of hexavalent chromium contamination migrating into 100-N Area has not been delineated. Considering hexavalent chromium observations at wells 199-N-189, 199-N-74, 699-87-55, etc., the hexavalent chromium contamination from 100-K may also extend well into the eastern portion of the 100-NR-2 Groundwater OU (i.e., not limited to the southwestern portion). Although page 4-110 (lines 21-22) acknowledges the isopleths for the 100-K North plume will likely move to the east when data from well 199-N-189 is considered, the total footprint of the plume areas exceeding the 10 ug/L AWQS has likely been significantly underestimated. Any expansion of the existing pump-and-treat systems should address hexavalent chromium contamination migrating from 100-K Area.	4	4-107	Accept	Hexavalent chromium concentration measured in well 199-N-189 at the time of drilling and well construction were about 30 ug/L. This concentration is higher than observed at well 199-K-164 to the northwest, but about half of that measured in well 199-K-182, located to the southwest. This early measurement does extend the inferred plume area exceeding 10 ug/L, but is consistent with our understanding of the historical distribution of hexavalent chromium that was discharged to the 116-K-2 Trench. We agree that any expansion of the pump-and-treat system should address chromium contamination migrating from 100-K. It would appear the chromium observed in 199-N-189 is not "migrating from" 100-K, but was likely placed there during historical reactor operations and is now migrating toward the river in a manner similar to the rest of the plume associated with the 116-K-2 Trench. No change to the text is recommended.
K-053	Title says "Fall 2009 and Spring 2010" but Spring isn't shown.	4	4-195	Accept with Modification	The figure caption has been revised to read: "Fall 2009 TCE Plume in 100-K".
K-054	Columbia River Studies: The document did not include all the pertinent data gathered through the Columbia River RI and related work. The document did include some studies made earlier on the river but not the latest information reported/presented to the Agencies.	4	4-208	Accept	The report cites CRC studies in the vicinity of 100-K up through the Phase III sampling. Additional available data will be evaluated and incorporated into the text.
K-055	Why is there an upward trend for these contaminants in 2008? Please explain.	4		Accept	The uptrends were apparently related to a demolition-related release that was reported to the state in 2008. This is discussed in Section 4.3.5 and no change is recommended.
K-056	Remediation does NOT typically go to 15 feet. Numerous waste sites were remediated much shallow and numerous were excavated much deeper than 15 feet. This is a common misconception and the text must be fixed.	4	4-257	Accept	Remediation to date has focused on achieving PRGs for direct contact to a depth of 15 feet and achieving GWP/SWP PRGs regardless of depth. The text was changed to reflect this understanding.
K-057	"...is the result of reduction to Cr(III) with some..."	4	4-262	Accept	The text has been changed as suggested.
K-058	Is this hypothesis supported by the pore water sampling?	4	4-263	Accept with Modification	The statement in the document is speculative and has been removed.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-059	<p>Use of STOMP 1-D Modeling for the determination of preliminary remediation goals: The following needs to be clarified:</p> <ul style="list-style-type: none"> Peak groundwater concentration (section 2.4): It is not clear how the average concentration over the 5 meter thickness would give the most conservative groundwater concentration (section 2.3) Recharge: The text mentions about three recharge periods in the post-2010 simulations. There is no rationale behind the selection of these three scenarios and the selection of those periods (section 3.2.1). Aquifer flux: The hydraulic gradient for the 100K source area is too far off (in order of magnitudes) of the mean value (section 3.2.2). <p>Hydraulic and transport parameters (section 3.3): Provide a better rationale for why the 100 K Horizontal saturated hydraulic conductivity for the Ringold Formation is 10 times less than Hanford formation, without any field or lab data. Please note that the numbers sometimes exceed more than two orders of magnitude.</p>	5	5-1 Appendix F	Accept with Modification	<p>Additional text will be added to provide explanation of these issues. The following discussion is provided in response to this comment: a) with respect to groundwater concentrations, the average concentration across the hypothetical screen length is used to provide an estimated concentration that may be representative of an actual well screen construction for a water supply well. b) The varying recharge periods were selected to describe expected changes in the recharge conditions over time as surface conditions change and are ultimately restored to a more natural condition. c) The value indicated for hydraulic gradient will be reviewed. d) The discussion of hydraulic conductivity will be expanded to explain the selected values, which are intended to represent the unsaturated hydraulic conductivity of the Ringold E and Hanford formations in the vadose zone. Unsaturated conductivity is dramatically different from saturated hydraulic conductivity, for which the Hanford formation is typically much larger than the Ringold. Under unsaturated conditions, the two formations are much more similar.</p>
K-060	<p>Were the waste sites in fact dug to 15'? Many waste sites were shallower than 15'. Please clarify.</p>	5	5-19	Accept with Modification	<p>The fifteen-foot excavation assumption is a hypothetical configuration for a remediated waste site. Remediation to date has focused on surface and near-surface contamination, with the intention of reducing risk posed by direct contact exposures; the remediation also took into account excavation to meet groundwater protection standards. These actions frequently included excavation of contaminated soil to remove mobile contaminants that may pose a threat to groundwater as well. Although direct contact exposures are generally assessed within the upper 4.6 m (15 ft) of the vadose zone, the interim remedial actions were implemented to achieve defined remedial action goals and were not constrained to a specified depth of remediation. The text was changed to reflect this understanding.</p>
K-061	<p>Should have actual Kds. The range isn't very helpful.</p>	5	5-22	Accept	<p>The table has been changed to include the selected Kd values for the indicated COPCs.</p>

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-062	Line 25 on page 5-29 says the Kd was from below 0 to 32 L/kg with a median value of 0.7 L/kg; however page 4-34 says that more than 90 percent of the values are higher than 1.2 mL/g and more than 95% are higher than 0.65 mL/g. How is this possible?	5	5-29	Accept with Modification	This comment refers to the discussion of derived Kd values based on the results of batch leach testing of soil samples. The reviewer is directed to the discussion of "Uncertainty in Batch Leach Testing Results" for further information (near the end of Section 5.6.1). No changes to the text are recommended.
K-063	EPA doesn't agree that no irrigation should be used to develop PRGs. See General Comment.	5	5-36	Not Accepted	See response to General Comment #2.
K-064	A general discussion on how the Kds in this table were determined is needed.	5	5-37	Accept	With the exception of the Kd for Cr(VI), which was derived from batch leach test results, these Kds were identified in published documents. The source documents are identified in the vadose zone modeling calculation brief in Appendix F. An additional explanatory footnote was added to the table.
K-065	Table 5-6 states the selected Kd for carbon-14 is 200 L/kg. In contrast, page xiv states that carbon-14 is highly mobile and migrates at the same velocity as groundwater. Page 5-3 lines 12-13 also present carbon-14 as highly mobile. These contradictory ideas should be clarified.	5	5-37	Accept	Two literature-based distribution coefficient values for C-14 were identified; a Kd of 200 ml/g for graphite, and a Kd of 0 for carbon in organic or inorganic ionic forms. The value in Table 5-6 is erroneous; although both Kd values are presented in the vadose simulation calculation, the transport results using the Kd of 0.0 ml/g were actually used to derive the SSLs and PRGs. The Kd value for Carbon-14 shown in Table 5-6 has been corrected to read "0".
K-066	Table 5-6, first page, presents a number of radionuclides with large Kd values but for the time to peak groundwater concentrations uses the symbol " * " which means "Radionuclides are conservatively assumed to have a time to peak groundwater concentration of less than 10,000 years." It is not clear the technical basis for assuming radionuclides with a Kd of 200 L/kg would impact groundwater much sooner than a chemical like chromium or chrysene with the same Kd. These two latter chemicals are described as reaching the groundwater in the year 48,293 and having a peak concentration in the year 115,056.	5	5-37	Not Accepted	Recent discussions with the regulators on 12/14/11 and 1/11/12, and consistent with PW-1-3-6 decision making process, the modeling and associated PRGs will be revised based on a 1,000 year evaluation period for radionuclides and non-radionuclides. This text will be updated accordingly.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-067	Table 5-6 has a footnote for all the radionuclides that states that there were no STOMP 1D soil screening levels. Where is the discussion in the text to why STOMP didn't calculate soil screening levels for radionuclides? Page 5-39 line 10 states that scaling computations were used for all the remaining COPCs. It isn't clear why these values were not used in table 5-6. In contrast to this table, on page F-210 the document states that STOMP modeling was used to develop PRGs for 12 radionuclides.	5	5-37	Accept with Modification	Soil screening levels for radionuclides were calculated. The indicated table footnote will be corrected and the estimated peak times will be indicated.
K-068	Need to provide justification for choosing 10,000 years as a cutoff.	5	5-39	Accept with Modification	Recent discussions with the regulators on 12/14/11 and 1/11/12, and consistent with PW-1-3-6 decision making process, the modeling and associated PRGs will be revised based on a 1,000 year evaluation period for radionuclides and non-radionuclides. This text will be updated accordingly.
K-069	Page 5-39, lines 29-30 state "In keeping the time and resource constraints, simulation periods were limited to 10,000 years." In contrast Page F-210 states the simulation period was 3,000 years. Such apparent inconsistencies need to be corrected.	5	5-39	Accept	Peak concentrations for constituents reaching peaks at time periods beyond 3,000 years were estimated by scaling from the zero to 3,000 year results using retardation coefficients based on the Kd for each constituent. This scaling calculation is described in Section 2.5 of the calculation brief in Appendix F. So, this is not an inconsistency because the numerical simulation results for the first 3,000 years were subsequently used to scale results for constituents exhibiting peak times up to 10,000 years. Additional text was added to explain this.
K-070	Why was the 1 mg/kg contaminant concentration vadose zone distribution used when the highest concentration found in borehole data was 1.6 mg/kg?	5	5-40	Accept with Modification	The use of a unit-concentration source, typically 1 mg/kg, is a common practice in simulation of transport of multiple contaminants in a simulated system where transport is controlled by distribution coefficient. The transport results for individual constituents can then be estimated by simply scaling the results for the unit-concentration source against the actual constituent concentration, or, as in the case of SSL and PRG development for this project, the unit-concentration source results are used to back-calculate soil concentrations from the selected water concentration criteria. Additional text was added to describe the use of the unit source.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-071	No Cr(VI) sites?	5	5-41	Accept	The CVP for 116-K-2 did exceed the PRG of 2, subsequent borehole data did not identify Cr(VI) above the PRG. This will be clarified in the text. In addition, the RI and LFI data are being evaluated and incorporated in this Chapter.
K-072	This is it for COPCs? What about post-ROD waste sites? There will be more COPCs than just the radionuclides listed here.	5	5-50	Accept	The COPCs indicated in Table 5-10 for Groundwater and/or Surface Water Protection (i.e., arsenic and mercury) are the only constituents in soil in the previously-remediated waste sites that exceeded both the SSL and PRGs. We will include an evaluation of the COPCs to account for those waste sites that have not been remediated. These COPCs will be based on the initial list identified in the Work Plan as well as any changes based on ongoing remediation (such as the fuel storage basin area).
K-073	There should be historic river stage data from Priest Rapids dam.	5	5-52	Accept with Modification	The historical data available from Priest Rapids Dam are limited to discharge data. As stated in the text, the correlation between recent river stage data and dam discharge data were used to derive a correlation factor that was then applied to those historical discharge data from Priest Rapids Dam to derive estimated river stage at 100-N (and other OUs along the river). No change to the text is recommended at this time.
K-074	Take out reference to 100-D, 100-H and 100-F.	5	5-54	Not Accepted	The discussion in Section 5.6.3 indicated by the reviewer is part of the discussion of overall methods of simulating groundwater flow and transport. The numerical model for the 100 Area OUs was developed in a model grid that encompasses all of the 100 Areas, as stated in the text under the subheading "Model Structure". The references to conditions within the other, non-100-K, areas are appropriate description of the model domain. No change to the text is recommended at this time.
K-075	Why is the ISRM referenced for 100-K?	5	5-55	Accept with Modification	The ISRM report is cited as a source for specific reported recharge rate values. No change to the text is recommended at this time.

Tracking ID	Comment				Response to Comment
		Chapter	Page (from Review Dft)	Disposition	
K-076	Is this part of an alternative? If so, then mention in description of alternative. It's out of place where it currently is.	5	5-63	Accept with Modification	The reference to hydraulic containment in 2012 is a reference to an objective of interim remedial actions implemented in the river corridor. Although the initial plume conditions vary across the OU, the plume conditions at the end of 2012 represent the effective starting point of all of the final remedial alternatives discussed in the FS. The simulated conditions at the end of 2012 are an important part of the no-further-action base case that is described in this section of the report. No change to the report text is recommended.
K-077	Why is there an alternative description here? This section and Figures 5-20 through 5-40 are important to the No Action alternative and should be moved to chapter 9.	5	5-63	Accept with Modification	Because a robust interim remedial action for groundwater contamination is already in place and operating, the "No Action" alternative actually means "No Further Action" after some future date. For the purposes of this illustration of contaminant migration, the plume conditions at the end of 2012 are simply the initial conditions for any other subsequent remedial alternative. No change to the text is recommended.
K-078	Clarify that PRGs are based on no irrigation.	5	5-90	Accept	Text within chapter discusses PRGs. Text will be modified to indicate that base case is the 100:0 with no irrigation.
K-079	This language suggests that characterization will be taking place post-ROD, during "remedial design activities." The FS states that these sites (100-K-30-33) will fall within the footprint of sites that will be remediated so it is unclear as to why additional characterization is needed/suggested?	5	5-90	Accept	The referenced text referring to characterization and remedial design activities is deleted.
K-080	Title should say something about Risk Assessment. It's the summary of the whole risk assessment to support the RI/FS, not just a supplemental evaluation.	6	6-1	Not Accepted	No change to title. The risk evaluation for the RI/FS is considered supplemental to the RCBRA.
K-081	This is redundant. Table 6-4 covers all of the changes. Just make sure Table 6-4 is VERY clear as to the differences, and delete the additional text.	6	6-3	Accept with Modification	Table 6-4 will be updated for clarity. Redundant text will be removed from the text where appropriate. Sufficient text will be provided to make sure that the tie between the text and the table is clear.
K-082	Not sure what "Not Analyzed" means. Was there not a chemical risk driver at these sites?	6	6-4	Accept	Text in table will clarify the meaning of "not analyzed" indicating the sample was collected but not analyzed for these constituents.
K-083	This Table needs to be VERY clear. This is explaining why the RCBRA has different answers than the RI/FS and the CVPs/RSVPs regarding risk and what is considered safe.	6	6-8	Accept	Text and table content will clarify the purpose of Table 6-4.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-084	Add another column "Method used in CVPs/RSVPs."	6	6-8	Accept	An additional column will be added to define the method used in CVPs/RSVPs (closeout documentation) to strengthen the linkage with the revised table.
K-085	Do not refer to a document just by its document number (DOE/RL-96-17). Refer to it by its title.	6	6-8	Accept with Modification	Text will be updated consistent with reference standards.
K-086	"...but incorporates updates to reflect..." Be specific about what these updates are.	6	6-8	Accept	Text will be revised to identify what assumptions or methods were updated based on guidance.
K-087	Column under "Overall Effect on RI/FS," first row. This is very general. Needs to be specific as to how it affects the numbers.	6	6-8	Accept	Table will be revised to be more specific about how updates affect the numbers.
K-088	Need to explain what this is based on (refer to specific EPA guidance).	6	6-8	Accept	Table will be revised to identify the guidance that updates were based upon.
K-089	This is jumping past the alternatives to say that the results can disposition the waste sites from interim to final closure. What if there is still risk?	6	6-10	Accept	Table will be revised to indicate the results will be used to identify the waste sites that warrant evaluation of remedial alternatives. It will also indicate that the results of the RI/FS can be used to disposition waste sites from an interim to final closure status when risk thresholds are not exceeded.
K-090	"The approach used to evaluate...is similar to that used for the closeout documentation." Need to state what was used in the closeout documentation.	6	6-10	Accept	Table 6-4 will describe the approach used for closeout documentation.
K-091	Don't refer to section in RCBRA- needs to be in RI/FS and refer to RI/FS section.	6	6-11	Accept	Table will be revised to point to section in Chapter 6.
K-092	Again, need to state what is done in closeout documentation (see earlier comment re: create new column for CVP/RSVP).	6	6-11	Accept	Table will be revised to define the COPC process for CVPs/RSVPs.
K-093	Methodologies are "similar"? If not the same, then describe differences.	6	6-11	Accept	Table will be revised to add more detail about the differences in COPC selection.
K-094	EPA does not agree with the reasonably anticipated future land uses.	6	6-14	Not Accepted	No change to land use. The receptors selected to represent reasonably anticipated land use.
K-095	This table does a good job explaining the differences, but does not say WHY they were calculated differently.	6	6-15	Not Accepted	The two paragraphs that precede Table 6-5 explain why the resident Monument worker exposure scenario was modified and why there are differences in exposure assumptions. No text changes anticipated
K-096	Need to rework- EPA doesn't view residential as an "Other Land Use Scenario."	6	6-16	Accept	This section title is changed to "Other Unrestricted Land Uses in RCBRA", text will be clarified to explain that the RCBRA evaluated three additional residential scenarios in addition to the rural residential scenario used in the RI/FS.

Tracking ID	Comment	Chapter			Disposition	Response to Comment
		Chapter	Page (from Review Dft)	Page (from Review Dft)		
K-097	Good to have this, but need a list of what actual analytes this list includes.	6	6-20	Accept	Text will be revised to provide a forward reference where these analytes are listed.	
K-098	This should be the same as pg 6-20.	6	6-25	Accept	The exclusion criteria are the same between the two sections. The text will be clarified to indicate that "water quality or soil physical property measurements" include the subset of analytes defined as "Analytes without known toxicity information".	
K-099	Say what small sample size is (<5).	6	6-28	Accept	Text will be revised to define what a small sample size is.	
K-100	Do not need to define contaminant sources again.	6	6-30	Accept	Text will be revised to point reader to contaminant sources described in the previous chapter.	
K-101	Cannot say that ICs are in place already- they are in place for the interim ROD, but need to be evaluated as part of the final Remedy.	6	6-34	Accept	Text will be revised to say that ICs are in place for the interim ROD, but need to be evaluated as part of the final Remedy.	
K-102	This scenario (Casual Recreational User) was to be used to develop PRGs for waste sites that are down along the river that a residential scenario is not a reasonable scenario for. This wasn't done, and needs to be done to address some waste sites in K.	6	6-35	Not Accepted	All waste sites were compared to the PRGs developed for the casual recreational scenario and are presented in Section 6.2.5.1.	
K-103	Need to pull tables from appendices that are important to RI/FS.	6	6-56	Accept with Modification	Text will include additional tables that summarize the results from Appendix G.	
K-104	Title is misleading. There shouldn't be any uncertainty that radioisotopes decay.	6	6-61	Accept	Section header will be revised to clarify there are uncertainties with risk results due to radioactive decay.	
K-105	COPC selection for groundwater was already covered in section 4.2.6.4. Only need all the information in one place.	6	6-66	Accept with Modification	Nature and extent of groundwater contamination is discussed in Section 4.2.6.4 and is not intended for COPC selection. The data set used in the nature and extent evaluation is used to supplement the RI data set for COPC selection. The COPC identification process will be clarified in Section 6.3.	
K-106	Contaminant sources has been covered numerous times by now.	6	6-102	Accept	Text will be revised to point reader to contaminant sources described in the previous chapter.	
K-107	There is a state requirement for Cr (VI). Please add.	6	6-111	Not Accepted	Washington Department of Ecology, 2011 Group A Public Water Supplies 246-290-310 WAC, does not report a state MCL for Cr(VI). WAC 173-201A, "Water Quality Standards for Surface Waters of the State of Washington," Washington Administrative Code, Olympia, Washington reports acute and chronic freshwater criteria which are used in this analysis.	
K-108	CCC is not common term used. AWQC is more common at Hanford.	6	6-112	Accept	Text will be revised to use the term AWQC rather than CCC.	

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-109	The statements about how many sites were included in the RCBRA do not appear to be consistent. Several examples: Page 7-1 states "The RCBRA used multiple measures of exposure, ecological effect, and ecosystem/receptor characteristics to evaluate risks at 20 study sites across the River Corridor associated with remediated waste sites (10 excavated/backfilled sites and 10 surface removal/native soil sites) and 10 reference areas." Page 7-2 (line 18) states "Sixteen waste sites from the 100-K Source OUs were evaluated in the RCBRA." Page 7-3 "The RCBRA included evaluation of 20 waste sites and CVP data from 16 waste sites. Of the 20 waste sites directly evaluated, only 2 were from within the 100-K OUs." A global search through the document would be appropriate to ensure accuracy.	7	General Chapter 7	Accept	Text discussing the number of sites will be revised and more context provided so that inconsistencies are eliminated.
K-110	The document states, "The study design of the ecological risk assessment in the RCBRA provided risk conclusions that applied across the entire 100 Area." This should be "...the entire 100 and 300 Areas."	7	7-1	Accept	Text will be revised as suggested.
K-111	Should also refer to table of what these analytes are.	7	7-4	Accept	Text will point reader to information presented in Chapter 6.
K-112	CSM should refer to Chapter 2, not Appendix L.	7	7-5	Accept	Appendix L is referring specifically to the conceptual model developed to disposition COPECs in the River with respect to 100-K sites being a potential source. The text will be reviewed and the title of Appendix L revised to reflect the content presented in Appendix L and to be consistent with the RI document structure.
K-113	Document states "the 100 Area is predominantly developed and use of this area by wildlife is expected to be minimal." In fact most of the 100 Area is undisturbed or partially/fully recovered from pre-Manhattan era farming community activities. There is extensive wildlife in the 100 Area, and the wildlife is not exclusive to the habitat rich areas.	7	7-6	Accept	Text will be rewritten to acknowledge the presence of wildlife and habitat disruption.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-114	This section, "Simplified Ecological Exposure Model" would be more accurately named "Simplified Ecological Exposure Model for upland sites." The first paragraph of that section emphasizes that the scope is the upland environment. With that the case, another section needs to be added for a "Simplified Ecological Exposure Model for riparian and near-shore river areas." Note that the 100-K ROD scope includes these areas and is to have a baseline ecological risk analysis, including the exposure model.	7	7-6	Accept	The ecological exposure model for riparian and near shore environment is provided in Appendix L, although not labeled as such. Appendix L will be revised as suggested.
K-115	Lines 21-32 list organism groups and which were evaluated at the community level verses which were evaluated at the population level. An explanation of why the different levels were used for the different organism groups would be a good addition.	7	7-7	Accept	Text will be revised to provide an explanation.
K-116	Document states "endpoint species should preferably be ones that have ecological relevance, are of societal value, are susceptible to chemical stressors at the site, and allow risk managers to meet policy goals." he last "and" should be an "or" to be clear that endpoint species do not have to satisfy all of these criteria.	7	7-8	Accept	Text will be revised as recommended.
K-117	Document states "both dermal and inhalation exposure were assumed negligible." This should be explained. In the RCBRA, some receptors were specifically selected because their activities (such as mice which burrow in the soil of waste sites) suggest a high dermal exposure.	7	7-45	Accept	Text will be revised to provide additional explanation.
K-118	Document states "exposure pathways associated with water were not addressed because drinking water sources for wildlife are not available at the 100-K Source OUs waste sites." Clearly most wildlife utilizing upland 100-K waste site areas can and do move down to the river shore and ingest water. The risk assessment should also show what the combined risk would be to support selection of protective cleanup levels for upland soil and groundwater/seeps (similar to RCBRA)..	7	7-45	Accept	Drinking water ingestion does not normally constitute a significant contribution to total exposure. Small mammals maintain water balance through excreting concentrated urine, obtaining water from food and water generated during metabolism (Verts and Kirkland, 1988, "Perognathus parvus"). Thus, risk need not be modeled for small mammals. For other larger wildlife, a drinking water component will be added to the existing risk assessment.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-119	In the discussion of estimating doses from external exposure, lines 20-21 state, "The exposed organism is very small; consequently, 100 percent of the radionuclide energies are absorbed." This should be changed to just the latter part of the statement, i.e. "100 percent of the radionuclide energies are absorbed." The DOE Graded Approach takes a conservative tack in the calculation by assuming all the radionuclide energies are absorbed DESPITE THE FACT that the organism is very small.	7	7-49	Accept	Text will be revised as recommended.
K-120	Regarding the statistical evaluation in closeout documentation, the document states, "For small data sets (N<10), the calculations were performed assuming a nonparametric distribution, so no test for distribution was performed (i.e., the maximum detected concentration was used as the EPC)." In reality, the waste site closeout documentation for different waste sites is not always consistent regarding handling small data sets. Typically there was not a calculation involved. So it would be good to remove the "calculations" part of the statement. An accurate replacement statement would be, "For small data sets, typically the maximum detected concentration was used as the EPC."	7	7-49	Accept	Text will be revised as recommended.
K-121	Document states, "no life history data specific to the Hanford Site were available..." It is understood that this data is available. Please clarify.	7	7-82	Accept	Text will be modified to clarify which types of Hanford Site-specific data are unavailable for the assumptions that were made. This sentence is referring to specific components of the desktop food web model. The food web model has not been studied at length for some of the species or wildlife in the same feeding guilds. These include food ingestion rate, incidental soil ingestion as a percent or as a rate, home range, and dietary composition established as the percent of stomach contents.
K-122	Document states, "no site specific data on COPC concentrations..." It is understood that this data is available. Please clarify.	7	7-83	Accept	Text will be revised to provide further clarification. An initial set of "screening" values were used that relied on the assumptions described, a second set of PRGs were calculated with site-specific tissue data. However, for some chemicals (primarily organic constituents), the site-specific tissue data were insufficient and in those cases the text is accurate.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-123	Regarding the interim actions, the document states they "did not directly address risks to ecological receptors." In fact the interim actions did have a limited qualitative ecological risk assessment. For example, the interim action ecological risk assessment for 100-K concluded that hexavalent chromium posed a risk to aquatic organisms within the river bottom, and an interim action pump-and-treat remedy to capture hexavalent chromium before it enters the river bottom has been operating since the 1990s.	7	7-85	Accept	The language will be modified to refer specifically to terrestrial ecological risks that were not directly addressed in the interim actions in addition to the surface water actions. The language will be expanded to explain what was and was not addressed through the interim actions.
K-124	Should know at this point is these types of waste will be encountered. Cannot just say DOE order will be followed if waste needs to be disposed of differently.	8	8-6	Accept	Subsequent paragraphs identify applicable WAC and CFR regulations for management of wastes. Delete sentence that reads "In the event that waste is managed as either SNF or as transuranic, the appropriate management procedures as outlined in DOE Orders will be followed." Line 38 already identifies that "Radioactive waste is managed by DOE under the authority of the AEA."
K-125	The ARAR table must establish the regulations that are applicable, relevant and appropriate for the 100-K operable unit. Throughout the text in the column rationale for including is the use of the work "may." This is an FS for the final cleanup action and the FS must state the contaminants and the remedy that is needed to meet the RAOs for those contaminants. With that knowledge, it should be apparent which regulations apply. The word "may" is not appropriate for a final decision.	8	8-8	Accept	The table does not differentiate between 'applicable' or 'relevant and appropriate'. The use of the term 'may' will be deleted where appropriate in the rationale for including column.
K-126	The ARAR WAC173-303-64620(4) regulatory requirement column is not correct. The corrective action requirement takes into account more than standards for groundwater protection. Rewrite as follows: Requires Corrective Action to be "consistent with" specified sections in WAC173-340. Locate this ARAR with the rest of the WAC173-303 regulatory requirements.	8	8-9	Accept	This regulator citation will be moved to the other WAC 173-303 regulations.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-127	The ARAR WAC173-303-64620(4) rationale for including column is incorrect. Corrective Action applies to the entire Hanford site. Corrective Action applies to all releases of dangerous waste and dangerous constituents. WAC173-303-64620(1). Although CERCLA may be the authority being used to clean up the release, that cleanup must be "consistent with" corrective action. Rewrite as follows: "The substantive portions of WAC173-340 establish minimum requirements for HWMA corrective action."	8	8-9	Accept	This regulation will be relocated to a more appropriate location and the text updated.
K-128	The ARAR WAC173-303-64620(4) possible application column is incorrect. Corrective Action applies to the entire Hanford site. Corrective Action applies to all releases of dangerous waste and dangerous constituents. WAC173-303-64620(1). Corrective action does not apply only to groundwater. Rewrite as follows: "corrective action applies to environmental media on the Hanford site where dangerous waste and dangerous constituents have been placed whether intentional or unintentional."	8	8-9	Accept	This regulation will be relocated to a more appropriate location and the text will be updated.
K-129	Needs to be based on residential scenario.	8	8-40	Not Accepted	Section 8.1.3.3 has been modified to state that PRGs have been developed for a number of exposure scenarios, one of which is the residential scenario.
K-130	How is the "and risk-based thresholds" met by just using federal and state standards?	8	8-42	Accept with Modification	RAO 1 - risk-based threshold met through "reduce to levels that would not exceed the human health risk assessment procedures (WAC 173-340-708)" RAO 2 - modify to add "...would not exceed state and federal water quality standards, or risk-based thresholds, at the point of compliance..."
K-131	Why just 1x10 ⁻⁴ instead of range defined in RAO?	8	8-45	Accept	Text will be revised to cite the 10 ⁻⁴ to 10 ⁻⁶ range.
K-132	Does containment = capping?	8	8-46	Accept with Modification	Capping is not containment. Containment is a broader general response action. Capping is a technology for containment. Other technologies include jet grouting, soil freezing, compaction, which are evaluated in the technology screening.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-133	Need to be specific. Decay to what? Nothing or below risk levels? Which site is 10 years and which is 140 years?	8	8-47	Accept	Updated to: "However, contaminants will decay to activity levels less than residential RBSLs in the following years: 100-K-56:1 - in year 2072 116-K-1 - in year 2059 116-K-2 - in year 2148."
K-134	This process is not clear.	8	8-47	Accept	Will update to clarify and add that any modification to a ROD will follow the NCP.
K-135	Why is this NEPA language under an IC section?	8	8-54	Accept with Modification	Will take out paragraph and move to page 8-46 following first paragraph under section 8.2.1.1 which is the Waste Sites section under Target Remediation Areas.
K-136	How is soil segregation automated?	8	8-54	Accept with Modification	Will delete parenthetical text referring to automated (i.e., "either by automated or laboratory based approach")
K-137	The language regarding shallow and deep excavation being at 20 ft is very confusing, considering shallow has always been referred to as 15' in the past. Either change to 15' or give new labels.	8	8-54	Accept	The associated graphic (8.5) identifies this as 'standard' excavation. The figure will be updated to clarify the depth is based on the typical reach of the equipment. This is differentiated for 'deep excavation' (figure 8.6) with respect to the technology discussion. The text will be updated to clearly state 'standard' rather than 'shallow'.
K-138	There have to be more advantages than just worker safety (e.g. less disturbed vegetation).	8	8-55	Accept	Will update to add other advantages associated with in situ treatment.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-139	<p>Table 8-7, middle of first page, "Chemical Reduction /Softening and Precipitation" for C-14. Regarding using water softeners for C-14 removal (which this document assumes is as a bicarbonate which is what water softeners are designed to remove), this table correctly states that vendors and equipment are readily available. But it is puzzling that the table also states that there is no experience with the technology at Hanford. Are there really no water softeners at Hanford, and if that is true, does that raise concerns as to the implement ability of this technology? Note that C-14 is in a limited part of the 100-K groundwater, so only a portion of the water being extracted for hexavalent chromium treatment would need pretreatment for C-14 removal. This table states that the relative capital cost is moderate/high. Is that a fair assessment for water softeners which are mass-produced for household consumer use? The water softener technology was not retained. The table states that "For C-14, not retained in favor of air stripping due to large volume of sludge generated." Note that dig-and-haul is a retained technology for waste site remediation despite the large volume of waste it generates, especially in comparison to the volume of sludge that would result from a parallel bank of water softeners. On the second page of table 8-7 is the description of air stripping. Implement ability is rated "high" but it states testing is required for C-14. It is not clear why implementability would be rated "high." Both air stripping and softening need to be proven effective for C-14 removal.</p>	8	8-67	Not Accepted	<p>Softening was not retained in favor of air stripping for C-14 treatment. There is a difference between softening using lime addition/precipitation versus ion exchange softening (like people have in their homes). IX units exchange the Ca for Na and leave the HCO₃ (bicarbonate and carbonate) in the water, so they would not remove the C-14.</p> <p>Lime softening results in precipitation of CaCO₃, so it removes the C-14 in the sludge. The lime softening system would include a lime addition system, a mixing tank, a flocculation tank, a clarifier, a pH adjustment system (raise the pH back up), and a sludge dewatering system (filter press).</p> <p>This compares to air stripping which involves pH adjustment (and maybe a chem addition system to control scaling), tray air stripper system, and GAC for offgas treatment (preliminary evaluation of C-14 concentrations indicate that off-gas treatment may not be necessary).</p>
K-140	ICs are a very important part of the alternatives. Cannot just refer to existing ICs and assume that they will be kept in place.	8	8-73	Accept	Table 8-8 provides examples of ICs that are currently in place at Hanford and that are retained for development and evaluation of alternatives in Chapter 9. Chapter 9 alternatives descriptions will be revised to include more specific ICs.
K-141	Engineering controls are not ICs as defined by EPA.	8	8-74	Accept	Engineering controls as ICs will be deleted.
K-142	ERDF provides for treatment (if necessary) and disposal, not removal.	8	8-78	Accept with Modification	Will change to read "provides for treatment (if necessary) and disposal of contaminants"
K-143	There is no existing ISRM at K.	8	8-79	Accept	ISRM will be removed
K-144	Typical excavation is NOT 15 ft.	8	8-80	Accept	See response to #137. In addition, we will remove the statement "typically done at Hanford to 15 feet" on the graphic and clarify the depth is based on equipment constraints.

Tracking ID	Comment				Response to Comment
		Chapter	Page (from Review Dft)	Disposition	
K-145	"Extent of excavation required can will be determined.."	8	8-80	Accept	Will replace "can" with "will" as commented.
K-146	More specific examples- B-27, C-7, etc.	8	8-81	Accept	Will add more specific examples.
K-147	If cannot dispose at ERDF, then need to identify disposal in alternative.	8	8-82	Accept	Will identify "or an EPA approved disposal facility."
K-148	Why no O&M cost for ERDF?	8	8-82	Accept with Modification	There is no additional O&M costs above the O&M costs already incurred from maintaining ERDF operations.
K-149	Examples- 100-N has this in ROD.	8	8-83	Accept	Will add 100-N as example.
K-150	Any treatability tests that need to be performed to decide if a technology is viable should be completed by the RI/FS stage. It cannot be proposed to be done after the ROD. Need to decide if there is already enough information to support this technology or cannot use.	8	8-84	Accept with Modification	Treatability tests, as mentioned, were associated with Post-ROD RD/RA development to collect data for detailed design, cost, and to confirm performance. This will be changed to design evaluations. We will clarify and state that these are remedial design data needs. Will update to identify example applications conducted at other locations (100-D, PG&E in CA, Walla, Walla).
K-151	"Results of the study are pending." See previous comment.	8	8-85	Accept with Modification	Treatability tests, as mentioned, were associated with Post-ROD RD/RA development to collect data for detailed design, cost, and to confirm performance. This will be changed to design evaluations. We will clarify and state that these are remedial design data needs. Will update to identify example applications conducted at other locations (100-D, PG&E in CA, and Walla Walla). Graphic and technology evaluation will be updated to reflect the current status of the 100-N tests.
K-152	This isn't a technology, it's a delivery method.	8	8-86	Accept	Will delete.
K-153	Same as above- not a technology.	8	8-87	Accept	Will delete.
K-154	Cannot lump all surface barriers together. Need to evaluate separately and recommend one specific type in the proposed alternative.	8	8-89	Accept with Modification	Chapter 8 identifies technologies and chapter 9 provides specifics on barrier type. Will clarify what barriers are applicable for the alternative and associated waste sites.
K-155	Tables are not good examples. Summarize how effective has been under the interim action.	8	8-90	Accept	Will modify table to show volume and mass treated.
K-156	Not a technology.	8	8-93	Accept	Will delete.
K-157	Need summary of example of how this has been successful (not just refer to Appendix).	8	8-94	Accept	Will add examples.
K-158	Why is this in here for 100-K?	8	8-96	Accept	ISRM is not being implemented at K, will delete.
K-159	What about GW sites?	9	9-2	Accept with Modification	The risk evaluation for completed waste sites with CVP data indicated waste sites passed criteria for GW/SW protection.
K-160	Any modification to a ROD needs to follow the NCP as outlined in EPA-540-R-98-031, OSWER 9200.1-23P.	9	9-2	Accept	Will update to clarify and add that any modification to a ROD will follow the NCP.

Tracking ID	Comment			Disposition	Response to Comment
		Chapter	Page (from Review Dft)		
K-161	Need to determine what needs to be done at these sites when reactor is removed and look at alternatives to remove them now (soldier piles?)	9	9-3	Not Accepted	Will modify text to clearly state that RTD will be conducted as part of the Reactor removal and that, in the interim, barriers will be placed to be protective. This was discussed with EPA and an alternative to excavate now (prior to Reactor removal) will not be included in the FS.
K-162	Clarification is needed on how the carbon 14 will be treated. How many wells will require an air stripper?	9	9-3	Accept	Text will be modified to identify number of wells for extracting and treating C-14.
K-163	How will tritium meet DWS? Please explain.	9	9-4	Accept	Text will be modified to identify tritium contamination is extracted via extraction wells for treating Cr(VI) and combined with GW from other Cr(VI) extraction wells. The combined extracted GW is processed through the P&T IX system. Tritium does not get removed via the IX system, but tritium concentration in the P&T system effluent is less than DWS. Over time, tritium concentrations throughout the aquifer will reduce to less than DWS through radiological decay. Monitored natural attenuation is a component of the remedy.
K-164	Cannot defer decision until reactors are moved. Need to make decision now on these waste sites.	9	9-9	Accept	We will modify the sentence to read: At that time, the remedy will be implemented
K-165	Design samples should have been collected in time for the RI/FS report.	9	9-9	Accept with Modification	We will clarify in the text that 'design sampling' will be collected for engineering design. This paragraph will be deleted from Alternatives 2 and 3.
K-166	Does this take into account the possibility of continued source? If not, that is a big assumption and should be made clear.	9	9-11	Accept	The model assumes no continued source. The text will be revised to clarify this assumption.
K-167	"...are expected to confirm..." How will this be verified?	9	9-13	Accept with Modification	This is confirmed through comparison against the ROD cleanup levels. The pre-ROD sites that have CVPS in place are compared to the PRGs, as discussed in Chapter 8 (See Page 8-47 lines 23 - 38, Draft A). Text will clarify this approach.
K-168	Need to clearly lay out here, cannot just refer to what is already done.	9	9-13	Accept	ICs will be identified at each waste site and area.
K-169	"Other approved disposal facility." What would this be?	9	9-13	Accept with Modification	This could include disposal of non-contaminated materials at an on-site landfill or provide an option to dispose at another EPA approved disposal facility. We will include clarification.
K-170	Or is not cost efficient to do another alternative.	9	9-13	Accept with Modification	We assume this comment is related to the portion of the table called "perform cost/benefit evaluation". Consistent with the response to 171, this portion of the table is removed.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-171	To meet requirements of the NCP, a remedy needs to be selected for each waste site/groundwater. It is not appropriate to perform a cost/benefit post-ROD to select the remedy. Please remove.	9	9-13	Accept	Remedy is selected for each waste site and groundwater based on site specific knowledge. This row will be removed from the table and additional text included that clarifies the technology evaluation conducted. We will also update the figure 9-7.
K-172	How long will it be monitored?	9	9-14	Accept	Monitoring to achieve the cleanup criteria in the RD/RAWP.
K-173	Calls for air stripping for C-14, but what about the other COCs?	9	9-14	Accept	The timing associated with implementation of air stripping for C-14 is concurrent with Reactor removal. Other COCs will be remediated prior to this time. The role of soil flushing for C-14 will be re-evaluated during revisions to the RI/FS.
K-174	Need to be specific. Is this just for Cr(VI)? Monitoring until when?	9	9-14	Accept	This is specific to Cr(VI). Monitoring to achieve the cleanup criteria in the RD/RAWP.
K-175	Need to be specific about what COCs are treated in each part of the operation.	9	9-15	Accept	Will modify text to be more specific on the COCs treated for each component of the alternative.
K-176	Be very specific about ICs.	9	9-15	Accept	Will add specific ICs expanding on table 8-8. The text will clarify ICs for each waste site and area within Chapter 9.
K-177	Same comments as made in Table 9-2.	9	9-23	Accept	Will change per comment responses on Table 9-2.
K-178	What about other GW COCs?	9	9-28	Accept	Will clarify air stripping for C-14. Also, the other COCs are co-extracted with Cr(VI) treatment and combined GW stream meets DWS for the other COCs.
K-179	Same comments as those for Alternative 2.	9	9-31	Accept	Will change text per comment responses on Alternative 2.
K-180	This section should be part of 9.2.2 and then the parts that are the same in Alt 3 can refer to Alt 2. It's very confusing to go through the details of the alternatives, and then have a following section with more details.	9	9-42	Accept	Will move this section up.
K-181	Change to "extent of removal is increased."	9	9-43	Accept	Will change as recommended.
K-182	Again, need to be specific about barrier type.	9	9-43	Accept	Will modify text to be specific on barrier type.
K-183	Table 9-4 shows current conditions, but the paragraph above says the system would build on it. How would it need to be expanded?	9	9-44	Accept	Will modify text to identify what is needed to expand current systems.
K-184	This section should be combined with 9.2.2.	9	9-49	Accept	Will move this section up as per comment K-180.
K-185	Need COC list.	9	9-55	Accept	Will add list of COCs to table.
K-186	Sites near reactor. Need to do confirmation/verification sampling first before capping.	9	9-55	Accept with Modification	Text added to clarify that design sampling will be required to appropriately size the barriers.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-187	How will soil flushing on a liquid waste site work? How much water has already been disposed of at this waste site?	9	9-56	Accept with Modification	Text will be modified to state these waste sites will be excavated to meet PRGs in Alternative 2 rather than implement soil flushing. Soil flushing will still be proposed for persistent groundwater plumes and incorporated into the text.
K-188	Implementability should be high for deep RTD. It has been successfully performed at Hanford at numerous waste sites.	10	10-14	Accept	Text will be modified to reflect experience with deep RTD.
K-189	Annual O&M for alternative 3 should be lower because with RTD it's more definitive that the source was removed. With soil flushing or other technologies, there will probably need to be more money spent verifying that the contamination was flushed/removed.	10	10-14	Accept with Modification	Waste Site recurring costs are split between O&M and periodic costs. Additional costs associated with comment are reflected in the periodic costs for waste remediation. GW remediation O&M costs are lower in alternative 3 than alternative 2, reflecting the longer operating period of the P&T system(s) in alternative 2.
K-190	RTD should rank higher here. One of the biggest concerns for soil flushing or bioinfiltration is how to determine if all of the affected areas were reached.	10	10-15	Accept with Modification	Comparative evaluation considered both waste site and groundwater remedies between the two alternatives. Soil flushing and biological treatment better addresses the continuing source where RTD may not resolve the continuing source uncertainty (such as the KE head house). In either alternative, performance monitoring would need to be conducted to ensure RAOs are achieved.
K-191	EPA does not support developing PRGs with no irrigation. They should be developed using an irrigation scenario and if they fail with irrigation, but pass without, then do an alternative with ICs to prevent irrigation at those specific waste sites (not just no irrigation at Hanford).		Appendix F	Not Accepted	See response to K-002. In addition, waste sites that exceed the soil screening levels but meet PRGs will identify ICs that prohibit irrigation.

Tracking ID	Comment	Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-192	<p>The Kds as listed in Table 4-1 are, for the most part, taken directly from those used in the Interim Work Plan (DOE-RL 96-17, Rev 6, App E). This Kd documentation contains numerous errors including incorrect references and incorrect values. New Kd values have also been issued for Hanford-specific sites since the references used in the work plan. Many Kds reference to Ames & Serne (1991). Kincaid (1998) is in some cases but not other, with no explanation. Newer references include PNNL-16100 and PNNL-18564.</p> <ol style="list-style-type: none"> 1. Justify why old Kd values were used when newer Hanford-specific values are available. 2. Justify why some of the new values are lower (i.e., more conservative) such as Co-60 which is listed as 50 mL/g in Ames & Serne (1991) and PNNL-18564 which lists values between 4.8 and 10 mL/g (Table 6-9). Justify the value used. 3. Explain why a Kd for beryllium of 790 mL/g is used (Ecology, 2009) when Hanford specific values are available which are an order of magnitude lower (e.g., Ames & Serne (1991) lists a value of 20 mL/g). 4. The Kd for Ni is incorrect. It is listed as 30 mL/g for Ni-63 and 65 mL/g for Ni metal. DOE-RL 96-17 lists the reference as Ames & Serne (1991) for both values. Ames & Serne (1991) lists one value, 30 mL/g for Ni (not specific to Ni-63). Explain or correct this value. 5. The Kds for U (U-233/234, U-235, U-238) all equal 2 mL/g. The reference given in DOE-RL 96-17 lists Serne and Woods (1990) which does not contain those values. Newer references such as PNNL-18564 show Kds varying between 0.26 and 4 mL/g depending on the assumed soil composition. Correct that reference and justify the values. 		Appendix F	Accept with Modification	Table 4-1 will be omitted in the revision of this environmental calculation file. The Kd values were only shown for reference, but are not used directly in this calculation. Instead, Kds will be presented in the environmental calculation file where these values are used (in STOMP modeling) and the sources for those values noted there.
K-193	<p>In Section 2.5, the text states "KD is constant in time and space." This statement is not true. KD varies with very slight changes in soil or sediment characteristics and the concentration of the contaminant, all of which vary in space. KD is also dependent on water content, which varies in both time and space.</p>		Appendix F	Not Accepted	This passage is not asserting that Kd is constant in time in space in reality, rather that it is treated as such for the purposes of this calculation. Note the sentence in question begins "For the STOMP one-dimensional flow and solute transport simulations used to calculate the peak groundwater concentration, ...". Whether this treatment of Kd is appropriate depends on the specific application; in this instance it is deemed appropriate, but in other instances (e.g., 300-FF-5 RI/FS simulations of uranium) this would not be appropriate. Note that Equation 1 already includes the dependency on volumetric water content.

Tracking ID	Comment		Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-194	The text states, "Those non-radionuclide analytes with a time to peak groundwater concentration of greater than 10,000 years are removed from further consideration." Table 4-1, however, gives both minimum and maximum times until peaks. The text does not indicate which were used.		F-7	Accept with Modification	Calc is being updated to incorporate recent decisions to have a 1,000 year decision period.	
K-195	No references for the Kd values in this table are provided.		F-13	Accept	References for the Kd value listed in Table 4-1 will be added.	
K-196	Several of the values in the Fixed-Parameter Three-Phase column do not match values that would be calculated with the CLARC default values. The regulations allow for use of other values calculated using site-specific parameters. However, in cases where the defaults are not used, the method is the Variable Parameter Three-Phase model.		F-15	Not Accepted	The MTCA 3 phase equation (Eq 747-1) specifies all parameter values to use except three – groundwater cleanup level, Henry's law constant Hcc, and distribution coefficient Kd. Of these three, Ecology's online CLARC application provides "defaults" only for Hcc and Kd. A review of our 3 phase calculation ECF-100KR1-11-0073 indicates that for all 32 non-rad analytes detected in 100-K soil, the Hcc value used in ECF-100KR1-10-0442 is consistent with CLARC. The lack of a match in 3 phase values as referred to in the comment relates to differences in Kd values. The primary reason the Kd values in ECF-100KR1-11-0073 differ from CLARC is that ECF-100KR1-10-442 makes a key assumption that Kd values are obtained preferentially from the 100 Area RDR/RAWP DOE/RL-96-17, and these frequently differ from the CLARC default Kd values. The Kd values from DOE/RL-96-17 are summarized in Table 4-2 of 7-1 ECF-100KR1-10-0442 .	
K-197	The use of "Alternatives" here is confusing since they don't align with the alternatives in the FS.		F-94	Accept	Will revise Alternative titles to align with titles used in the FS. Alternative 1: No Action; Alternative 2: RTD and Groundwater Pump-and-Treat Optimized with Other Technologies; and Alternative 3: RTD and Expanded Groundwater Treatment	
K-198	All the pertinent details about the modeling should be in the RI/FS, not in another document not approved by the Tri-Parties.		F-98	Accept	The modeling support document will be placed in the RI/FS as an appendix.	
K-199	All of the figures from Appendix F that show groundwater modeling need to be in the FS itself, not an appendix. This can be done effectively if 6 figures are put on one large sheet.		F-100	Accept with Modification	Appropriate figures to aid text discussion will be placed in the FS.	
K-200	Expand. Cannot see new injection wells.		F-110	Accept	Will enlarge to 11 x 17. Will also enlarge Figure 3-9 to 11 x 17.	

Tracking ID	Comment		Chapter	Page (from Review Dfs)	Disposition	Response to Comment
K-201	Why does the river stage vary until 2037 and then switch to a constant rate?		F-123	Accept		Effects of river stage are modeled through duration of active remediation (i.e., through 2037) and then "turned off" beyond 2037 because of significant simulation computation time associated with river stage effects. Post 2037 is considered conservative concentrations since dilution effects of river stage are not reflected past 2037.
K-202	It would be very helpful to have a table identifying each COC and what date each COC would be below cleanup level at the river and in the main plume.		F-123	Accept with Modification		Graphs will be provided for comparison trend of each alternative for each COC (similar to Figures 5-7 and 5-8 with trend lines for each alternative) to show remediation of COCs over time depicting time to reach cleanup levels.
K-203	Good figure. Would be good to have for other COCs also. Extend out to when Cr (VI) would clean up to 10 ppb at river. Also, why does river stage change at 2037?		F-129	Accept		See responses to comments K-202 and K-201.
K-204	Good figure, but need to expand low concentration so it is possible to see when Cr(VI) drops below 10 ppb.		F-130	Accept		See response to comment K-202
K-205	Big jump between 20-37 and 2087. What year does tritium meet the DWS?		F-134	Accept		See response to comment K-202
K-206	Still showing Sr-90 above cleanup level. What year would it meet the DWS?		F-139	Accept		See response to comment K-202
K-207	Still showing nitrate above cleanup level. What year would it meet the DWS?		F-144	Accept		See response to comment K-202
K-208	Still showing TCE above cleanup level. What year would it meet the DWS?		F-151	Accept		See response to comment K-202
K-209	Need more information regarding bioinfiltration. When, where and how often?		F-154	Accept		Will update the ECF to add narrative describing how bio-infiltration is modeled.
K-210	Still showing Sr-90 above cleanup level. What year would it meet the DWS?		F-165	Accept		See response to comment K-202
K-211	Still showing Sr-90 above cleanup level. What year would it meet the DWS?		F-190	Accept		See response to comment K-202
K-212	The last paragraph of section 1.0 on page F-211 should be removed. Equivalent paragraphs elsewhere in the document should be removed.		F-211	Accept		Concur. This paragraph plus an equivalent on page F-243 will be removed.
K-213	All equations are missing.		F-213	Accept		This was caused by a fault in Microsoft Word and the PDF generator, and will be corrected.

Tracking ID	Comment		Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-214	This should be specific to 100-K. Remove information regarding D and H unless it has a specific purpose.		F-215		Not Accepted	This calculation file was written for 100-D, 100-H, and 100-K source areas; hence, removal of 100-D and 100-H information from this table would not be compatible with the rest of this calculation file.
K-215	Page F-225 states that bare soil was assumed to be the land cover above the waste site during the first recharge period, which spanned 2010 to 2015. That is reasonable for many of the 100-K waste sites governed by Tri-Party agreement milestone M-016-143. It would be appropriate to model the remaining 100-K waste sites based on the M-016-00C milestone for those sites to be completed by the year 2020. Interim actions are being performed to support future irrigation. That should be one of the scenarios following the 2015/2020 period. For land that does not receive irrigation water, past history at Hanford and for this part of central Washington show that the brush fire cycle is too frequent for establishment of mature shrub steppe. Therefore what the document terms the "second recharge period" should be forecast indefinitely into the future along with the irrigation scenario. The preceding change will eliminate odd calculations of changing infiltration rates under irrigation such as on page F-225 which states "For example, the irrigation scenario for the Ephrata soils set the recharge rate to 17 mm/yr from 2010 to 2015, 71.4 mm/yr from 2015 to 2045, and 69.9 mm/yr from 2045 to 5010." Irrigation is for crops so there isn't a transition from "grasses and shrubs covering bare soil" to "mature shrub steppe" in irrigated crop land.		F-225		Not Accepted	Technical support materials have been developed to establish that 30 years is a conservative estimate for the land surface to revegetate. It is not reasonable to assume that a wildfire type of event will impact all of the river corridor, but only some smaller area.

Tracking ID	Comment		Chapter Page (from Review Dft)	Disposition	Response to Comment
K-216	Page F-240 states "PRG values calculated for the 100-0 source distribution model with irrigation represent the "worst case" estimate of potential impacts and were adopted to serve as a screening tool for preliminary site screening. PRGs for the 100-0 source distribution and base case recharge were selected for use in the RI/FS document process." Since this entire document is part of the RI/FS document process, the last part of this statement is confusing. Do the authors mean to state that remedial alternatives were NOT evaluated to be protective if there is irrigation? If so, that is not appropriate. The first bullet on page 5-89 should be changed so the PRGs are protective of groundwater with irrigation.		F-240	Accept	Phrasing will be changed to the text in question (and also to Section 3.5 of this calculation file) to reflect that this calculation file is itself a part of the RI/FS. This paragraph will be revised to reflect that the SSL values was set based on the most conservative irrigation scenario, while the PRG values were set based on the most conservative base recharge scenario.
K-217	Need an explanation of how Kd for Cr(VI) was calculated. Not clear.		F-259	Accept	ECF-Hanford-11-0165 (last calculation file in Appendix F) is entirely devoted to providing a detailed explanation of the evaluation of hexavalent chromium leach test data conducted on vadose zone sediments samples from the 100 Area. Section 5 of that calculation file indicates how the value selected based on analysis of leaching data to select a conservative value from the distribution of Kd data for this contaminant.
K-218	This contains RESRAD calculations of PRGs including radionuclide transport to groundwater. It can be confusing to have this document include calculations to protect groundwater from leaching using the RESRAD code, but the Graded Approach document explains that STOMP will be used for this task. Please clarify.		Appendix G	Not Accepted	The RESRAD code is specifically used to calculate PRGs for the direct contact pathway. The leaching portion of this code provides an approximation of groundwater concentrations that are used in the direct contact calculation. The RESRAD code is not used for the purpose of determining a soil screening level or PRG for the groundwater or surface water protection pathway.
K-219	Section 1 on page G-124 states, "that exposure assumptions have been updated to reflect current EPA guidance. Exposure assumptions that were updated include the external gamma shielding factor and the outdoor time fraction." For the interim action, the outdoor time fraction was 0.2 (i.e. 20 percent of the time). In this RI/FS the outdoor time fraction is 0.12. What is the reference for this change? Also, it is good that section 1 alerts the reader to two changes from the interim action. Unfortunately the reader is apt to think those are the only changes. In fact soil ingestion is cut in half, reduced from the interim action of 73 g/yr to 36.5 g/yr.		G-124	Accept	Appendix G will be revised to be consistent with the information presented in Section 6.1.

Tracking ID	Comment		Chapter	Page (from Review Dft)	Disposition	Response to Comment
K-220	<p>Page G-124 states "This Environmental Calculation documents assumptions and methods for development of radiological soil Preliminary Remediation Goals (PRGs) for the Interim Action Record of Decision (IAROD) exposure scenario for use in the 100 Areas and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Reports." EPA supports that approach. But elsewhere in the RIFS and proposed plan it states that PRGs were calculated without the irrigation scenario. PRGs should be calculated with the irrigation scenario as was done in the interim actions.</p>		G-124	Not Accepted	<p>The RESRAD code is specifically used to calculate PRGs for the direct contact pathway. The leaching portion of this code provides an approximation of groundwater concentrations that are used in the direct contact calculation. The RESRAD code is not used for the purpose of determining a soil screening level or PRG for the groundwater or surface water protection pathway.</p>	
K-221	<p>Table 7-1 provides PRGs for a longer list of radionuclides than presented in the proposed plan. The 100-K proposed plan needs to have a more complete list of PRGs. Just because some radionuclides such as Tc-99, I-129, or U-238 weren't identified as COCs doesn't mean they aren't likely contaminants that will be encountered during the remaining remediation of the 100-K Area. The list should be similar to the list of PRGs (RAGs) in the 100 Area RAWP.</p>		G-129	Accept	<p>Table 7-1 will be revised to include a list of analytes similar to that in the 100 Area RAWP.</p>	

Tracking ID	Comment	Page (from Review Dft)	Disposition	Response to Comment
K-01	<p>This PP seems to fall short of the purpose and intent of a PP under the NCP and does not follow EPA guidance, and it is difficult to understand what is being proposed.</p> <ul style="list-style-type: none"> Section 300.430(f)(2) of the NCP requires that the lead agency identify and present to the public, via the PP, the alternative that best meets the requirements of section 300.430(f)(1). Further, it outlines that the PP shall "briefly describe" the remedial action alternatives analyzed, propose a preferred remedial action alternative, and summarize the information relied upon to select the preferred alternative. The subparts of this section of the NCP call out the requirements that the PP provide a brief summary description of the remedial alternatives evaluated, identify and provide a discussion of the rationale that supports the preferred alternative, and provide a summary explanation of any proposed ARAR waivers. Section 7.3.7 of the Action Plan states: "The proposed plan must describe an analysis of the feasible alternatives and clearly state why the proposed remedy is the most appropriate for the operable unit, based on written EPA guidance and criteria." <p>A PP is supposed to be a brief summary that presents information clearly to the public. This draft contains a lot of unnecessary and, in some cases, problematic language. For example: 1) pg 21 lines 20-23: tribes = government to government, not simply part of the regulatory process; ARARs?; and 2) pg 47 RCRA Corrective Action section: suggest deleting all but the first sentence (with "and HWMA" added after RCRA on line 25) as this language is not necessary and some of it is problematic (e.g., the PP doesn't fulfill the standards, it simply presents a preferred alt, etc.); Ecology has the lead on corrective action.</p>		Accept	<p>The plan will be modified to clearly state the waste site and associated technology implemented within the alternative. This document will be made consistent with the PW1-3-6 and 300 Area Proposed Plans.</p> <p>No change to RCRA corrective action text on page 47. Meeting NEPA and RCRA corrective action is a responsibility of the lead agency DOE.</p> <p>With regards language on tribes it will be made consistent with the wording in PW1-3-6 ROD responsiveness summary and 300 Area.</p>

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K-02	<p>The analysis of the 9 CERCLA criteria is inconsistent in treatment of modifying criteria. Important to make the role of all 9 criteria clear and to apply them appropriately. For example:</p> <p>1) the introductory language to the evaluation of remedial alternatives section (pg 40 lines) does not clearly present the role of modifying criteria (does not speak to state acceptance at all), and then the preferred remedial alternative section on pg 46 indicates that Alt 2 "meets the threshold criteria and provides the best balance of tradeoffs compared with Alternative 3 with respect to the balancing and modifying criteria." This statement is not only inconsistent with the analysis that was presented immediately preceding this section (which did not analyze modifying criteria and indicated that at least part of this analysis could only be done after the PP comment period), it is also inaccurate since community acceptance cannot be fully analyzed until after the comment period etc.; and</p> <p>2) some of the criteria seem to be inadequately addressed/misrepresented. See, e.g., pg 46 lines 9-11 regarding implementability - this criterion relates to the ability of the agency to implement a given alt, whereas the language cited seems to actually be speaking to the likely "success" of the remedy overall. This really gets at how well the criterion are understood and analyzed by the authors.</p>		Accept with Modification	<p>1) Text on page 40 will be updated to include modifying criterion discussion. Text on page 46 referring to meeting the 'modifying' will be deleted as we don't have input on either State and Community Acceptance.</p> <p>2) The text is written reflect a true comparison of the alternatives. However it is acknowledge that these alternatives have similar components and are close in comparison with regard to implementability and time to achieve RAOs.</p>
K-03	<p>The overall format is cumbersome and there is too much focus on the introduction. It should not take the reader until page 10 to find out the number of wastes sites to be remediated. Recently, the PW-1,3,6 PP has gone through the review process; should look to that for format.</p>		Accept	<p>The proposed remedy will be identified within the first few pages. We will review the PW-1-3-6, 300 Area PP, and EPA guidance and develop a revised format for 100-K.</p>

Tracking ID	Comment	Page (from Review Dft)	Disposition	Response to Comment
K-04	The introductory language speaks only of hazardous substances, no mention of pollutants or contaminants at Hanford. It also on refers to releases, what about situations in which it is a threat of release? In the section titled "What are the contaminants at this site?" all are referred to as contaminants. The NCP defines hazardous substances as well as pollutants and contaminants. These definitions should be considered and the terms appropriately used throughout the document.		Accept	Appropriate terms will be used in the update of the document.
K-05	There is language in the PP that suggests the RI/FS is not adequate (e.g., pg 23 lines 20-24, pg 33 lines 7-11). Is there adequate information in the record to meet the requirements of the NCP and support the decision?		Accept	Yes information is adequate to support the decision. Text will be revised to present the certainty of the data and information.
K-06	Alternative 2 should state what technologies will be applied and where. For example, RTD, Soil Flushing and Bioinfiltration for waste sites and Pump and Treat and Bioinjection for groundwater.	2 L9	Accept	Text will be modified to identify the waste sites where technologies will be applied. A table will be added to aid in the clarification.
K-07	This is not a clear and accurate portrayal of what is required by CERCLA vs what is a preference. This issue recurs within the document. Suggested text below, assuming it is accurate to say the preferred alternative meets all statutory requirements and satisfies all statutory preferences/biases: "This alternative meets the statutory requirements under CERCLA and the NCP to select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (ARARs) (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. In addition, this alternative satisfies the statutory preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and the statutory bias against off-site disposal of untreated wastes."	2 L27-30	Accept	Will modify text as suggested.

Tracking ID	Comment	Page (from Review Dft)	Disposition	Response to Comment
K-08	Title should be Background/Site Characterization or something similar. The previous section is the Introduction correct?	3 L7	Accept	Based on discussion, this text is slightly different than the PW-1/3/6 document but is consistent with the format we thought was previously agreed to with the Tri-Parties. It is our understanding now that EPA prefers the PW-1/3/6 format. We will modify text to follow PW 1-3-6 format as applicable.
K-09	Change to: ...has been organized by DOE into three major...	3 L12	Accept	Will modify text as suggested.
K-10	Change to: IRAs were initiated in 1994 for River Corridor OUs to...	4 L8	Accept	Will modify text as suggested.
K-11	change the word "cleanup" to "control"	5 L2	Accept	Will modify text as suggested.
K-12	Delete "...and anticipates the ROD."	5 L8-9	Accept	Will modify text as suggested.
K-13	ISS for the reactors with eventual one-piece removal.	5 L30	Accept	Will modify text to include one-piece removal.
K-14	This paragraph is missing information, it makes no point.	5 L32-35	Accept	Will modify text to clearly state the path for addressing the reactors.
K-15	The document states "The specific reactor path forward will be addressed in a separate CERCLA decision." If this RI/FS and PP are for a final ROD, the reactor path and decision should be included.	5 L32-35	Accept	We will clarify that the Reactors are being addressed under the NEPA ROD and CERCLA action memo.
K-16	Delete "recently completed"	8 L5	Accept	Will modify text as suggested.
K-17	What does this sentence mean? Addressing environmental risk?	8 L8-9	Accept	We will clarify the text to address the risk being managed by the IRA.
K-18	Need to explain that the groundwater IRA only addressed hexavalent chromium.	8 L9-10	Accept	Will modify text to indicate groundwater IRA only addressed hexavalent chromium.
K-19	This section is redundant.	10 L1-21	Accept	Redundant text will be deleted
K-20	See comment above. First time the number of waste sites addressed by this PP is mentioned.	10 L44	Accept	Will modify document so that this information is presented earlier.
K-21	This figure really is not helpful.	11 fig 8	Accept with Modification	Figure intended to show the 100 K area and operable unit boundaries, and other items per guidance. We will revisit the guidance and delete figure if all elements are captured elsewhere.
K-22	Why does the public need to know this?	12 L30-31	Accept	Statement on concentration intended to give readers information on the 'strength' of the potential initial contamination. No text changed proposed.

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K-23	The sentence states that arsenic is not routinely detected in groundwater above naturally occurring concentration. Clarify the term "naturally occurring" by whether that is a local background concentration, or some other source of a reference concentration. Add text stating the values for arsenic, and where arsenic occurs.	17 L3-4	Accept	Clarification will be added.
K-24	Some of the waste sites described in the RI/FS could be considered principal threat waste. Soil near the reactors is over 4 million pCi/g Cs-137 (Page 4-69 line 34). Discussion is warranted.	17 L6-16	Accept with Modification	<p>Discussion will be added in the RI/FS and summarized in the PP. Principal threat wastes are those source materials considered highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to public health or the environment should exposure occur. Based on information presented in the RI/FS report, the waste sites and groundwater remaining after completion of the interim remedial measures and structure decontamination and decommissioning are not considered principal threats at 100-K.</p> <p>Examples of materials and historical conditions that could have been considered principal threats at 100-K include the spent nuclear fuel which was stored in the 100-K fuel storage basins, the contaminated sludge that remained in the basins after fuel removal, and the contaminated fuel storage basin water. These materials were removed from KE and are planned to be removed from KW. Processing and management of associated wastes and placement in secure storage eliminates the potential for immediate releases related to former conditions. Contaminated soil in contact with these principal source wastes were excavated, contained, and properly disposed. These materials are no longer present in a location or condition that poses a principal threat.</p> <p>Some residual conditions may pose on-going low level threats. An example of a residual low level threat condition is the 4 million pCi/g Cs-137 in subsurface soil remaining beneath the location of the former fuel storage basin and beneath the remaining 105 KE Reactor structure. The contaminants present at elevated levels of contamination (e.g., Cs-137, Sr-90, transuranic elements) generally exhibit low mobility. They are also located largely beneath the reactor building, which provides a substantial barrier to both direct contact as well as a barrier to infiltrating water in the near term.</p>
K-25	10 ⁻³ is wrong value for the excess lifetime cancer risk (ELCR). Change value to 10 ⁻⁴ which is the value to determine if a remedial action is needed. The CERCLA cleanup has a range 10 ⁻⁶ to 10 ⁻⁴ .	17 L11	Not Accepted	The text in question is pertinent to principal threat wastes and is correctly stated in this context.

Tracking ID	Comment	Page (from Review Dkt)	Disposition	Response to Comment
K-26	What "required" an integrated 100-K ROD for soil and groundwater? Not CERCLA or the NCP. The text in this section is problematic. Is the intent to indicate that a final ROD is necessary where there have been interim RODs?	17 L22-27	Accept	We will remove the word required. An integrated decision is needed for soil and groundwater to implement the final remedial actions. We will modify text to clearly state this.
K-27	Burial grounds need to part of this Proposed Plan as well	20 L9	Accept	Will modify text to clarify the burial grounds are included in this decision process.
K-28	50 USC 2582 is misrepresented, because it omits the word "plans" and omits the term "of at least 50 years". Revise as follows: "Under 50 USC 2582, DOE was assigned the authority to develop future land use plans for Hanford and Other DOE sites, for a planning period of at least 50 years."	21 L2	Accept	Will modify text accordingly.
K-29	Most of the 100 Areas are NOT part of the Monument.	21 L30-33	Accept with Modification	Will modify text to indicate the area of the monument.
K-30	Replace "hypothetical" with "a number of" or "several"	21 L38	Accept	Will modify text as suggested.
K-31	EPA completely disagrees with the statements in this paragraph.	21 L40-41 22 L1-2	Accept with Modification	Text will be modified to explain the residential scenario similar to the explanations given for the other scenarios. Text indicating scenario does not reflect actual future exposures will be deleted, as it is not relevant to this discussion.
K-32	Remove the word "supplemental" from every place it is mentioned in this section.	22 L21	Accept with Modification	Text will clearly state how the baseline risk assessment was developed, including the supplemental evaluations conducted in concert with the RCBRA.
K-33	This should explain how the data from the RCBRA was used? Does not account for back fill.	22 L26-40	Accept	The results from the RCBRA are currently presented on page 17 lines 29-38. This text will be revised to more clearly present the results from the RCBRA including the data used. For completeness text on page 22 will also be clarified to indicate the use of overburden (back fill).

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K-34	Delete last sentence. EPA disagrees	22 L33-34	Not Accepted	While the reasonably anticipated future land use for the River Corridor is casual recreational user and resident monument worker, DOE is proposing surface cleanup levels (top 15 feet) that would be protective of a residential land use.
K-35	This section needs to be expanded.	23 L25	Accept	The summary of the ecological risk assessment will be expanded.
K-36	List the sites and the basis.	29 L9-16	Accept with Modification	Sites are listed in Table 5. Text will be modified to indicate basis. Additional table will be included that identifies the waste sites and technologies associated with the preferred remedy.
K-37	Change to: ...by the time the ROD for this action is signed. It is confusing when the PP refers to "the ROD" is it referring to the Interim Action ROD or the final ROD that will follow from the PP?	29 L34	Accept	Will modify text as suggested. Document will be modified so that the ROD being referred to is clear.
K-38	A combination of this information and Tables should be used to generate a table that gives more information about each waste site and the technology to be used at the waste site. (Similar to table 9-5 in the RI/FS report)	29 L39-44 30 Tab 5 32 Tab 6	Accept with Modification	A new table will be generated to give summarize the information presented in Table 9-5 of the RI/FS report for inclusion into the PP.
K-39	Why is this information called out?? NHPA is just one of many important laws (or ARARs).	31 L1-11	Accept	The cultural and historical aspects of the 100-K Area is an important consideration when determining the types of remedial alternatives that can be implemented. These aspects are highlighted to show the public that the Tri-Parties listen to their concerns and will be used as a part of the balancing criteria.
K-40	EPA is requiring that the Orchard Lands be carried into the FS with ICs, RTD, and a barrier (one foot clean fill as seen in other orchard impacted lands in the State) as potential remedies.	32 L1-16	Need Discussion	The RI/FS will acknowledge that there are historic orchard lands present in the 100-K area and note that these areas will be considered with orchard lands in other River Corridor OUs as part of a sitewide strategy for addressing these properties.
K-41	What does "a risk management approach" mean? Clarify.	32 L18	Accept	Text will be modified to remove 'risk management approach' and identify that applicable technologies where developed and combined into remedial alternatives applicable to remediate the groundwater issues at hand.

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K-42	The text states: "The groundwater COCs lie largely within the extent of the hexavalent chromium plumes. The extraction well network installed for the pump-and-treat systems for remediating the hexavalent chromium plumes will capture these contaminants." The extent of hexavalent chromium contamination migrating into 100-N Area from the 100-K Area has not been delineated.	32 L19-21	Accept	Text will be clarified to include the potential plume boundaries extending into the 100-N area.
K-43	Alternative 2 is not clear and does not seem to be adequately defined. The role of ICs should also be clear (in both alternatives 2 and 3) – what does it mean to "control 100-K access and groundwater use" and how would that be done?	36 L1-15	Accept	Alternative components will be clarified, including the role of ICs.
K-44	The statement that buildings will be demolished "when necessary" is not adequate for the implementation of a remedy or to cost out the remedy.	36 L9	Accept	The text 'when necessary' will be deleted. We will also add a table that clearly identifies the waste sites (including structures) included in this PP.
K-45	<p>Institutional controls are not defined in one or more alternatives as required by 40 CFR 300.430(e)(3) and the CERCLA nine criteria evaluation [40 CFR 300.430(e)(9)(iii)(C)(2)]. The institutional controls component of alternatives should be described in more detail, including the institutional controls implied (but not called out) in the PP:</p> <ul style="list-style-type: none"> a. Tribal members fishing along the River will not be allowed to gather roots and berries inland from the river b. Resident rangers will not be allowed to have children live at a ranger residence c. Resident rangers will not be allowed to maintain a garden d. Irrigation will not be allowed 	37 L15-16	Accept with Modification	ICs specific to each waste site and area will be clearly identified.
K-46	Language infers that the vadose zone will be flushed and monitored to determine whether contaminants are mobilized. Clarify language with how the contaminants will be captured and treated.	37 L26-28	Accept	Text will be added for clarification specific to capture.
K-47	The text states that Alternative 2 will operate until COC plumes are less than DWS. The groundwater CULs may not be the DWS so this statement is incorrect.	37 36-39	Accept	Text will be clarified consistent with ARARs and anticipated cleanup levels.

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K-48	From figures included in the proposed plan (Figures 16 and 18) and the FS, it is apparent that extraction wells will be used for compliance monitoring. It is inappropriate to use extraction wells for compliance wells as pumping draws water from all directions from the well, which could dilute contaminant concentrations. Compliance wells should not be part of the pump-and-treat well network. Compliance wells should be monitoring wells.	38, 41 Fig 16 and Fig 18	Accept	Agree that it is inappropriate to use extraction wells as compliance wells. Text will be clarified. Compliance wells will be determined as part of the RD/RAWP.
K-49	As written on pg 43, it is not clear that Alts 2 and 3 are protective of human health and the environment as required by CERCLA and the NCP.	43 L4-8	Accept	Text will be modified to show protectiveness.
K-50	The ARARs are incomplete in the PP. Reference the complete list of ARARs that are in table 8.2 in the FS.	43 L9-17 44 L1-30	Accept with Modification	The PP does not state these are all the ARARs nor does the guidance suggest that all the ARARs be listed in the PP. A reference to the ARAR table contained in the RI/FS report will be added.
K-51	EPA does not include NEPA values in CERCLA RODs. Functional equivalency applies and no NEPA is required for CERCLA actions (see e.g., pg 47). NEPA language throughout the PP should be streamlined and consistent with TPA section 5.7.	47 L9-22	Accept with Modification	NEPA language will be focused on this section of the PP, consistent with how this was addressed in the PW-1/3/6 PP.
K-52	Delete section.	47 L23-38	Not Accepted	RCRA Corrective Action statements are appropriate in this PP, consistent with the PP outlines previously approved by the Tri-Parties.
K-53	Change to DOE and EPA	48 L18	Accept	Text will be modified as suggested.