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

08-AMCP-0060

DEC 06 2007

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton
Richland, Washington 99354

RECEIVED
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EDMC

Dear Ms. Hedges:

RESPONSE TO COMMENTS FOR THE 200-IS-1 WORK PLAN AND SAMPLING AND ANALYSIS PLANS

The purpose of this letter is to transmit the response to comments for the 200-IS-1 Work Plan and Sampling and Analysis Plans as committed in the U.S. Department of Energy, Richland Operations Office (RL) letter (08-AMCP-0048) dated November 26, 2007. RL proposes to meet with the State of Washington Department of Ecology (Ecology) and come to agreement on comment resolution by January 11, 2008. RL will submit a revised work plan and sampling and analysis plans within 45 days to Ecology following agreement on the comment responses. Assuming the comments responses are agreed upon by January 11, 2008, the revised documents will be submitted to Ecology by February 25, 2008.

0074556

If you have any questions, please contact me, or your staff may contact Briant Charboneau, of my staff, on (509) 373-6137.

Sincerely,

Matthew S. McCormick, Assistant Manager
for the Central Plateau

AMCP:KDL

Attachment

- cc w/attach:
- G. Bohnee, NPT
- L. Buck, Wanapum
- N. Ceto, EPA
- S. Harris, CTUIR
- R. Jim, YN

- S. L. Leckband, HAB
- K. Niles, ODOE
- R. E. Piippo, FHI
- J. G. Vance, FFS
- Administrative Record
- Environmental Portal

200-IS-1
200-ST-1

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Document Number(s)/Title(s) Tanks/Lines/Pits/Boxes/Septic Tanks and Drain Fields Waste Group Operable Unit Remedial Investigation/Feasibility Study (RI/FS) Work Plan and Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) Unit Sampling Plan; Includes: 200-IS-1 and 200-ST-1 Operable Units, DOE/RL-2002-14, Revision 1, Draft B, Released: May 24, 2007.	Program/Project/Building Number	Reviewer J. B. Price, L.A. Fort, A. Huckaby, B. Rochette, D. Delistraty, J. Yokel	Organization/Group Washington State Department of Ecology	Location/Phone 3100 Port of Benton Blvd. Richland, WA 372-7984
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Comment Submittal Approval:

Agreement with indicated comment disposition(s)

Status:

Organization Manager (Optional)

Date

Reviewer/Point of Contact

Date

Reviewer/Point of Contact

Author/Originator

Author/Originator

Item	Page #, Line #, or Section and Paragraph	Comment (s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	Accept/Reject	Disposition (Provide justification if NOT accepted.)	Status
1.	General	The purpose of Phase I sampling requires modification/clarification within the document. It appears from the work plan that the intent of Phase I, which was discussed in the DQO as involving non-statistical sampling at locations with high likelihood of requiring pipe or soil removal, has changed to simply providing data to support remedial action. This may not be an efficient use of sampling resources, because judgmental sampling will not be defensible unless it leads to removal of contamination.		The intent of the Phase I sampling remains the same. The sampling locations selected represent areas of potential contamination from pipeline leaks. Not all the bins have known contamination zones associated with the pipelines.	
2.	Section 1, Scope and Objectives, General	The section should clearly identify each unplanned release considered to be within the scope of this operable unit. Unplanned releases are unique to the scope described on lines 27-28 on page 1-2 in that the nature and extent of the contamination has not been determined. It is recommended		Appendix C of the TPA identifies the waste sites assigned to the 200-IS-1 OU. The unplanned releases	

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	Comment.	<p>that each unplanned release associated with this operable unit and considered to be within this plan's workscope be identified in its own section as included workscope. For example, it is recommended that the following unplanned releases be identified, by bullet or table: waste pipeline between 242-B Evaporator and 207-B Retention Basin, 200-E-112 leaking pipeline, UN-200-E-80, UN-200-E-1, 200-E-114 pipeline, UN-200-E-7, UPR-600-20, UN-200-E-3, UN-200-E-3, UN-200E-85, UN-200-E-103, UN-200-E-44, 200-E-111 pipeline, UPR-200-E-68, pipeline from 222-U/22-4 Building and 216-U-8/12, 216-U-8/12 piping, UPR-200-E-82, 241-B-151/152/153 Diversion Boxes, etc.</p>		<p>associated with the 200-IS-1 OU will be identified and assign in accordance with the TPA-MP-14 process.</p>
3.	<p>Section 1.0, Page 1-1, 1st ¶</p>	<p>Change Text to read: This work plan supports the Comprehensive Environmental Response and Liability Act of 1980 (CERCLA) remedial investigation/feasibility study (RI/FS) activities for the 200-IS-1 Tanks/Lines/Pits/Boxes Waste Group Operable Unit (OU). <u>The U.S. Department of Energy (U.S. DOE) is completing an RI/FS to satisfy requirements under the Comprehensive Environmental Response and Liability Act of 1980 (CERCLA) and Washington's Hazardous Waste Management Act (HWMA). The HWMA and the corresponding regulations in Chapter 173-303 of the Washington Administrative Code (WAC) implement Washington's federally-authorized program under the Resource Conservation and Recovery Act of 1976 (RCRA).</u></p> <p>As discussed in the <i>Hanford Federal Facility Agreement and Consent Order</i> (Ecology et al., 1989b)(Tri-Party Agreement Action Plan), the RI/FS work plan is prepared to present information on how the remedial investigation (RI) and feasibility study (FS) processes will be conducted and eventually lead to proposed remedies for the waste sites in an OU. This work plan also integrates the <u>CERCLA investigation/response and HWMA corrective action Resource Conservation and Recovery Act of 1976 (RCRA) facility investigation/correctives measures study (RFI/CMS)</u>-requirements and uses the framework established in DOE/RL-98-28, <i>200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program</i> (hereafter referred to as the Implementation Plan), which is the implementation plan for integrating the RCRA treatment, storage and disposal (TSD) unit</p>	Accept	

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		closure process with the OU CERCLA RI/FS and RCRA facility investigation/correctives measures study (RFI/CMS) process-processes.		
4.	Section 1.1, Page 1-3, Scope and Objectives, Lines 3-5.	The text states: "Information presented in the RI report will support the evaluation of the remedial alternatives and closure options...." In Section 3.4.1 through 3.4.3, information is provided about past releases. However, the proposed work plan does not appear to further characterize the known releases. Due to the lack of information associated with these releases (i.e., extent of contamination), "remedial alternatives and closure options" cannot be adequately evaluated/considered. The workplan either needs to identify that further characterization and/or remediation will be performed in relation to the known releases. It is recommended that the text differentiate between characterization of known releases versus characterization of potential releases. In addition, it is recommended that the text identify that adequate characterization information is not available associated with known releases to support evaluation of the remedial alternatives and closure options unless the remedial alternatives and closure options include removal and decontamination.	Accept	This WP is phase 1 of a phased approach to characterizing the waste sites in the 200-IS-1 OU. The 200-IS-1 OU is comprised of several different types of waste sites, tanks, pipelines, diversion boxes, unplanned releases, etc. Each of these waste types will be investigated, characterized, as necessary, and evaluated through the CERCLA remedial action or RCRA corrective action regulatory processes.
5.	Section 1.1, Page 1-3, Scope and Objectives, Lines 8-9.	The text states: "This work plan focuses on identifying and gathering the information that will be needed for selection of the preferred remedy(s)." In Section 3.4.1 through 3.4.3, information is provided about past releases. However, the proposed work plan does not appear to further characterize the known releases. Due to the lack of information associated with these releases (i.e., extent of contamination), "preferred remedy(s)" cannot be adequately evaluated/considered. It is recommended that the text differentiate between characterization of known releases versus characterization of potential releases. In addition, it is recommended that the text identify that adequate characterization information is not available associated with known releases to allow selection of the preferred remedy(s) unless the preferred remedy for known releases is removal and decontamination.	Accept	This WP is phase 1 of a phased approach to characterizing the waste sites in the 200-IS-1 OU. The 200-IS-1 OU is comprised of several different types of waste sites, tanks, pipelines, diversion boxes, unplanned releases, etc. Each of these waste types will be investigated, characterized, as necessary, and evaluated through the regulatory process.
6.	Section 1.1.1, Pages 1-4 – 1-5.	The following text is from the DQO: "The purpose of the Phase 1 investigation will be to gather limited data in support of existing information that indicates contamination likely is present at concentrations above preliminary cleanup levels." While the basis for binning is provided, the scope and objectives description of Section 1.1	Accept	This WP is phase 1 of a phased approach to characterizing the waste sites in the 200-IS-1 OU. The 200-IS-1 OU is comprised of several different types of

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		does not appear to address characterization of unplanned releases from pipelines and/or pipeline structures. It is recommended that, where applicable (i.e., where unplanned releases have occurred) the workplan include characterization of unplanned releases associated with each waste category (i.e., bin). For example, UPR-200-W-29 and UPR-200-W-38 may represent releases of which characterization would support the above quoted purpose for Bin 5. As another example, contamination characterization associated with the suspected 216-A-10 pipeline leak would support the above quoted purpose for Bin 1.		waste sites, tanks, pipelines, diversion boxes, unplanned releases, etc. Each of these waste types will be investigated, characterized, as necessary, and evaluated through the regulatory process.	
7.	Section 1.1, Page 1-3, Scope and Objectives, Lines 10-12	The text states: "Results of the characterization activities will be used for evaluating risk to potential receptors and for the FS remedial alternative analyses." The text neither identifies how the known releases will be characterized nor how the lack of characterization will allow risk to be evaluated. It is recommended that the sentence be re-written to indicate that after <u>all</u> characterization activities have been completed, risk will be evaluated. Consider: "Ultimately, after all characterization activities are completed, results will be used for evaluating risk to potential receptors and for the FS remedial alternative analyses."	Accept		
8.	Section 1.1, Page 1-3, Scope and Objectives, Lines 19-29	The referenced text does not clearly identify if known releases will be characterized. Although the text does identify the WIDS database as the "data-management tool" for listing waste sites and providing site-specific information, it does not specifically identify if the nature and extent of known releases will be characterized during this phase or another phase of this RFI. It is recommended that text be included which indicates if sampling will be conducted to characterize the nature and extent of contamination associated with known releases.	Accept	This WP is phase 1 of a phased approach to characterizing the waste sites in the 200-IS-1 OU. The 200-IS-1 OU is comprised of several different types of waste sites, tanks, pipelines, diversion boxes, unplanned releases, etc. Each of these waste types will be investigated, characterized, as necessary, and evaluated through the regulatory process.	
9.	Section 1.1.4.1, p. 1-8, 1 st paragraph	Please revise the paragraph starting with the third sentence as follows: The purpose of the first phase (Phase 1) of investigation is to gather characterization data in support of existing information <u>that indicates contamination likely is present</u> . The characterization data collected will be used to determine <u>whether if</u> contaminants are <u>consistently</u> at concentrations above preliminary cleanup levels and <u>remediation is</u>	Reject	The revised wording will state: The purpose of the first phase (Phase 1) of investigation is to gather characterization data in support of existing information. The characterization data	

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		<p>required. to support remedial decision making (other than the no-action alternative). Preliminary cleanup levels are based on potential applicable or relevant and appropriate requirements (ARAR) and preliminary remediation goals, which are regulatory thresholds and/or standards or derived risk-based thresholds. Preliminary cleanup levels also are established based on the requirements of WAC 173-340 for non-radionuclide contaminants and total uranium as a toxic metal, and RESRAD modeling for radionuclides, taking into account levels identified in previous Central Plateau cleanup actions (e.g., RPP PLAN 23827 R1, 200 UW 1 Proposed Plan, Single Shell Tank Sampling and Analysis Plan Preliminary remediation goals are provided in Tables 3a and 3b of the Data Quality Summary Report for the IS-1 Operable Unit Pipelines and Appurtenances (D & D-30262). Preliminary cleanup levels provide the basis for establishing final cleanup levels in the CERCLA record of decision....</p>		<p>collected will be used to determine whether contaminants are consistently at concentrations above preliminary cleanup levels and to support remedial decision making (other than the no-action alternative). Preliminary cleanup levels are based on potential applicable or relevant and appropriate requirements (ARAR) and preliminary remediation goals, which are regulatory thresholds and/or standards or derived risk-based thresholds.</p> <p>Preliminary cleanup levels provide the basis for establishing final cleanup levels in the CERCLA record of decision (ROD) and dictate analytical performance levels (i.e., laboratory detection limit requirements). Preliminary cleanup levels identified for use in determining analytical detection limit requirements are provided in Tables 3a and 3b of the Data Quality Summary Report for the IS-1 Operable Unit Pipelines and Appurtenances (D & D-30262).</p>	
10.	Section 1.1.4.1, p. 1-9, lines	<p>Please modify the text as shown: These data may be determined to be sufficient for proposing a remove, treat and dispose remedy. a steamlined remedial decision-making process</p>	Reject	<p>The purpose of Phase 1 sampling and the decisions to be made with the data collected</p>	

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	2-5	(i.e., contingent remedy, plug-in approach, focused package, or observational approach for remedial action). The purpose of Phase 1 sampling, as was discussed in the DQO, is to sample areas that are expected to be contaminated above cleanup levels so that cleanup can begin at those waste sites and pipelines.		are identified in the Steps 5 and 7 of DQO (D&D-30262). Review of Phase 1 results and determining the need for Phase 2 sampling would be completed prior to conducting the remedial alternative analysis. Phase 1 sampling results may identify candidate pipelines for RTD.	
11.	Section 1.1.4.1, p. 1-9, lines 6-9	Please modify the text as shown: Phase 2 characterization activities will be initiated when there is considerable uncertainty concerning whether contamination above a preliminary cleanup level is present. The Phase 2 investigation will be used if Phase 1 results show a range of concentration values both above and below, or close to, or below preliminary cleanup levels. As previously discussed in the DQO process, Phase 2 will be used in all cases except those where contamination exists above cleanup levels and remove, treat and dispose is clearly necessary.	Reject	The text provided in this section is consistent with the language developed in section 6.1 of the DQO (D&D-30262).	
12.	Section 1.2, Page 1-10, 3rd ¶	Correct to read: The content and structure of this work plan follow the CERCLA <u>and</u> <u>HWMA</u> format, with modifications to concurrently satisfy the additional RCRA <u>closure</u> requirements.	Accept		
13.	Section 1.2.1, Pages 1-10 – 1-11.	RCRA TSD ancillary equipment within work plan scope. Section needs to identify and describe ancillary piping associated with landbased TSDs (eg, 216-U-12, 216-S-10, etc....). Closure performance standards are required for TSD ancillary equipment. Any characterization information obtained via this workscope should be acknowledged and documented for future use during RCRA TSD closure actions.	Accept	Identification of all ancillary equipment is beyond the scope of this project. Characterization information obtained in this effort will be part of future RCRA TSD closure actions.	
14.	Section 1.2.1, Page 1-11, lines 9-11 and 29-33 and Appendix D.	The text generally describes the structures in the workscope and Appendix D lists the workscope structures in table form. The text references the WIDS database and the TPA Action Plan, Appendix C. There are so many pipelines and structures within the scope of this workplan, there needs to be a method for confirming that all pipelines are included. If the TPA action plan, the WIDS database, unit-specific	Reject	DOE has completed a comprehensive mapping effort of the 200-IS-1 Central Plateau pipelines. This mapping effort has identified all known pipelines to known waste sites	

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		maps/documents were compared there would very likely be different pipes and structures identified via each source. Because it is very difficult to determine which pipelines and structures are within the scope of this workplan, it is recommended that a process be included for querying the various sources. For example, for the WIDS database, the text should describe the various queries that were made to identify and determine which pipelines and structures are within the scope of this workplan. Similarly, for the TPA action plan Appendix C, the workplan should include an appendix which individually identifies all pipelines and structures identified by the TPA that are within the scope of this workplan. Lastly, the workplan should include a "crosswalk" between database queries and document "downloads" to identify pipelines and/or structures which are identified multiple times via different methods.		and transfer lines associated with the tank farms. It is DOE's intention to place the known pipelines into the WIDS data base and into Appendix C of the action plan.	
15.	Section 1.2.1, Page 1-11, lines 31-33	The workplan should include a description of when addition of new waste sites and reclassification of accepted waste sites will be performed in relation to this workplan. If this is not within the scope of this workplan, the text should describe how the new waste sites will be tracked for entry into the WIDS database. Lastly, the workplan should clearly identify all "new" waste sites and proposed "reclassifications" which have been identified to date.	Accept	It is beyond the scope of this work plan to include the description of all the new waste sites. Appendix C of the TPA is the official identification of waste sites by operable unit. The M-14 process is the process used to enter new waste sites into the WIDS data base. Currently there are 163 proposed new waste sites for the 200-IS-1 OU.	
16.	Section 1.3, Page 1-13, section heading and 1 st ¶	Change to: 1.3 STREAMLINING APPROACHES TO THE CERCLA PROCESS Five streamlining approaches to the CERCLA process <u>for the regulatory pathway and documentation requirements</u> have been identified as having application to the 200-IS-1 OU and are described below. The first four approaches also are discussed in the Implementation Plan (DOE/RL-98-28). The fifth approach, a graded approach, is a process that ensures that the level of analysis, documentation, and actions are appropriate for decision making associated with the pipelines. These streamlining approaches could be used to meet the requirements for site evaluations	Accept		

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		and/or for development of the ROD <u>recommended remedy</u> for the 200-IS-1 OU.			
17.	Section 2.1.3, Page 2-6, Vadose Zone.	The description of artificial recharge doesn't include routine applications of water for dust suppression. Also, the description of artificial recharge doesn't adequately acknowledge periodic recharge events associated with raw water line failures. For example, relatively recently, there was a raw water line failure in 200 West Area that resulted in the "release" or leakage of ~450,000 gallons of water. Such events can mobilize preexisting vadose zone contamination. It is recommended that the text include descriptions of such periodic and routine artificial water "recharges" or "applications".	Accept		
18.	Section 3.2.2.1, Page 3-6, Technetium-99, 1 st paragraph.	The first paragraph describes one major plume for which concentrations exceed 900 pCi/L. There are actually two major technetium-99 plumes in the 200 East Area. The second plume occurs near A-AX WMA. PNNL-16346 describes the plume in Section 2.11.1.5. It is recommended that a description of the second major technetium-99 plume be added to the first paragraph.	Accept		
19.	Section 3.3.1	Note that Sampling and Analysis Plans (SAPs) have been produced for Phase 1, II, and III Data Quality Objectives (DQO) reports, as well (i.e., DOE/RL-2004-42, Rev 0 [Phase I]; DOE/RL-2005-30, Rev 0 [Phase II]; DOE/RL-2006-27, Rev 0 [Phase III]). Incorporate into the document this information.	Accept		
20.	Page: 3-3, Line: 32,33	Provide and identify the relationship between pipe leaks and groundwater constituents where applicable; and correlate to the leak history described on page 3-15 (indicating a possible link to groundwater contamination).	Reject	Assessment of the potential impact to groundwater from pipeline leaks can not be made at this time with the existing information. Contaminant concentrations in soils adjacent to the pipelines will not be known until Phase 1 sampling is completed. The analysis of Phase 1 and Phase 2 data (if needed) and potential to be source areas for existing groundwater plumes will be presented in the RI report	

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21.	Section 3.3.2	<p>According to Table 3-1, in addition to Cs-137, Pu-239/240, Tc-99, Th-232, total Sr, U-234, and U-238, several other nuclides were detected in vegetation (i.e., Ac-228, Be-7, K-40, Pb-212, Pb-214, Ra-224, Se-79, Th-234).</p> <p>Please include wildlife radionuclide data from PNNL-13910.</p> <p>Please comment on the potential for other biological mechanisms of contaminant transport (e.g., deep rooting plants, burrowing mammals).</p>	Accept	
22.	Section 3.4.4, p. 3-23, 2 nd bullet	<p>The limited list of major COPCs does not seem useful for the work plan or sampling because analysis will include contaminant suites and will include organic contaminants and cyanide. Notice how the contaminants detected in the 241-CX-71 neutralization tank sludge included MEK, xylene, toluene and cyanide, and the 276 S-141 tank had 98.4% hexone as well as NPH and TBP. Please delete this assumption.</p>	Reject	<p>As stated in the text, the bulleted statements are assumptions included with the conceptual contaminant distribution models. It is agreed that at certain sites other constituents maybe present. But the major COPCs (i.e., those occurring most frequently and/or at highest concentrations) for the process waste pipeline systems are those identified. It is also acknowledged that the suite-type analytical approach being used with the 200-IS-1 pipeline investigations will detect those constituents that occur with less frequency.</p>
23.	Section 3.4.5.4, p. 3-27, lines 16-19	<p>The text mentions clean closure for the CX tanks but does not mention sampling soil to verify clean closure. Please add text mentioning that soil will be sampled to verify clean closure.</p>	Reject	<p>Closure plans for the 241-CX Tanks systems will address the soil sampling for clean closure</p>
24.	Section 3.6.1.2	<p>An evaluation of unrestricted land use must be assumed to evaluate long-term effectiveness of the remedy, considering uncertainty about the likelihood of failure of institutional controls.</p>	Reject	<p>DOE will collect samples at detection limits that are consistent with both unrestricted and industrial land use assumptions. Land use assumptions and concomitant</p>

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				preliminary cleanup levels will be defined in the feasibility study.	
25.	Section 3.6.1.2, p. 3-32, lines 21-23	<p>Ecology's expectations for risk assessments in the Core Zone are below. Please evaluate risk in the Core Zone using the scenarios listed below.</p> <p><u>For the next 50 years:</u> Industrial exclusive with DOE HGET/GERT-trained workers and DOE trained Rad workers.</p> <p><u>From 50 to 150 years:</u> A. Industrial Scenario – For non-radiological contaminants and uranium:</p> <ol style="list-style-type: none"> 1) Soil direct contact concentrations are derived using WAC 173-340-745. 2) Soil concentrations must be protective of groundwater and are derived using WAC 173-340-747 Method B; any use of subsection (5), (7), (8) or (9) methods requires Ecology approval. 3) Soil concentrations must be protective of surface water and are derived using WAC 173-340-730, (not including subsections (2) and (4)) in combination with WAC 173-340-747 Method B. Tri-Parties may not agree on this issue. Site-specific groundwater modeling beyond waste site boundaries may be needed to address attenuation and anticipated concentrations at the Columbia River from Core Zone and down-gradient sources of contamination. 4) Groundwater cleanup levels are derived according to WAC 173-340-720, Method B. 5) Groundwater ingestion must be included as a pathway in risk assessments. 6) Site risk for individual carcinogens is not to exceed 1E-05. 7) Total site risk for carcinogens, for all contaminants, all pathways and all media, is not to exceed 1E-05. 8) Site hazard quotient for individual hazardous contaminants is not to exceed 1. 9) Site hazard index is not to exceed 1. 10) Air protection values are derived according to WAC 173-340- 	Reject	DOE will collect samples at detection limits that are consistent with both unrestricted and industrial land use assumptions. Land use assumptions and concomitant preliminary cleanup levels will be defined in the feasibility study.	

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		<p>750.</p> <p>11) Soil concentrations must be protective of terrestrial ecological receptors and obtained as specified in WAC 173-340-7490 and using Table 749-3.</p> <p>B. Industrial Scenario – For radiological contaminants:</p> <ol style="list-style-type: none"> 1) 15 mrem/y dose limit (total effective dose from all pathways) applies to industrial workers (consistent with CERCLA risk range of 1E-4 to 1E-6 per OSWER 9200.4-18). 2) Groundwater concentrations are not to exceed MCLs for radionuclides from all current (e.g., groundwater plumes) and future (e.g., soil leaching) contaminant sources. 3) Groundwater ingestion must be included as a pathway in risk assessments. 4) Annual dose from the airborne pathways is not to exceed 10 mrem/y for the maximally exposed individual at the site boundary, based on National Emission Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61). 5) USDOE Biota Dose Assessment Committee (BDAC) methods should address site biota. Biota Concentration Guidelines (BCGs) represent the general screening phase and apply to soil, sediment, and water. Pathways to sediment and water should be protected to avoid exceeding BCGs at the river. BCGs correspond to 0.1 rad/d for terrestrial and riparian animals and 1 rad/d for terrestrial plants and aquatic animals. <p><u>Other scenarios to support remedy decisions:</u></p> <ul style="list-style-type: none"> • According to 40 CFR 300.515(f), the State may opt for an enhanced remedy, different than the remedy chosen using the CERCLA 9 criteria, if the State is willing to pay the additional cost. In order to evaluate enhanced remedies, the State needs an unrestricted use risk assessment for each remedial alternative to evaluate protectiveness. The State may choose a more protective alternative even if it is not the preferred alternative based on the CERCLA 9 criteria. • WAC 173-340 indicates that “traditional industrial use” requires that access by the general public be restricted; an unrestricted scenario may apply for the period after active institutional 			
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		<p>controls.</p> <ul style="list-style-type: none"> • WAC 173-340-708(3)(d) states that Ecology can "use alternate reasonable maximum exposure scenarios to help assess the protectiveness to human health of a cleanup action alternative that incorporates remediation levels and uses engineered controls and/or institutional controls to limit exposure to the contamination remaining on the site." WAC 173-340-708(3)(d)(ii) states that other scenarios can be used for evaluating protectiveness of remedies. • Ecology may require evaluation of additional pathways for non-radionuclides. WAC 173-340-720(1)(d) states that "The department may require more stringent cleanup levels than specified in this section where necessary to protect other beneficial uses or otherwise protect human health and the environment." For example, inhalation of ground water during showering is an important pathway for Cr (VI) because it is carcinogenic by this pathway and it is expected to be a risk driver at Hanford. Other important pathways for Hanford contaminants include food ingestion pathways such as ingestion of garden produce (including fruit). For information purposes and remedial decision making, a scenario including inhalation of vapors or aerosols during showering with groundwater, and ingestion of garden produce grown on the site using groundwater, should be evaluated. • The Core Zone may shrink in the future. Areas near the current edge of the Core Zone may end up outside of the Core Zone if the zone shrinks. • CERCLA allows consideration of additional scenarios for remedial decision making. <p>A. Unrestricted Use (restrictions on use of the site or natural resources affected by hazardous substance releases are not required to protect human health and the environment); both child and adult versions should be evaluated.</p> <p>For non-radiological contaminants and uranium:</p> <ul style="list-style-type: none"> • Soil direct contact concentrations are derived using WAC 173-340-740. 		
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- Soil concentrations must be protective of groundwater and are derived using WAC 173-340-747 Method B; any use of subsection (5), (7), (8) or (9) methods requires Ecology approval.
 - Soil concentrations must be protective of surface water and are derived using WAC 173-340-730 (not including subsections (2) and (4)) in combination with WAC 173-340-747 Method B.
 - Groundwater concentrations are derived according to WAC 173-340-720, Method B.
 - Groundwater ingestion must be included as a pathway in risk assessments.
 - Site risk for individual carcinogens is not to exceed 1E-06.
 - Total site risk for carcinogens, for all contaminants, all pathways and all media, is not to exceed 1E-05.
 - Site hazard quotient for individual hazardous contaminants is not to exceed 1.
 - Site hazard index is not to exceed 1.
 - Air protection values must be derived according to WAC 173-340-750.
 - Soil concentrations must be protective of terrestrial ecological receptors (i.e., plants, soil biota, and wildlife) and are obtained as specified in WAC 173-340-7490 and using Table 749-3.
- B. Unrestricted Use** – For radiological contaminants (both child and adult versions should be evaluated):
- 1) 15 mrem/y dose limit (total effective dose from all pathways) applies to all human receptors (consistent with CERCLA risk range of 10^{-4} to 10^{-6} per OSWER 9200.4-18). The 15 mrem/y dose limit is the target dose limit for the reasonably-anticipated future land use.
 - 2) Groundwater concentrations are not to exceed MCLs for radionuclides from all current (e.g., groundwater plumes) and future (e.g., soil leaching) contaminant sources.
 - 3) Groundwater ingestion must be included as a pathway in risk assessments.
 - 4) Annual dose from the airborne pathways is not to exceed 10 mrem/y for the maximally exposed individual at the site

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		<p>boundary, based on National Emission Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR 61).</p> <p>5) USDOE Biota Dose Assessment Committee (BDAC) methods should address site biota. Biota Concentration Guidelines (BCGs) represent the general screening phase and apply to soil, sediment, and water. Pathways to sediment and water should be protected to avoid exceeding BCGs at the river. BCGs correspond to 0.1 rad/d for terrestrial and riparian animals and 1 rad/d for terrestrial plants and aquatic animals.</p> <p>C. Scenario including additional pathways – include all contaminants (non-radiological and radiological) and present a scenario that considers showering, inhalation during showering, and ingestion pathways for consumption of residential produce and livestock, and game (including fish from the Columbia River), in addition to all of the Unrestricted Use pathways; both child and adult versions should be evaluated.</p> <p>D. Native American Scenario – include all contaminants (non-radiological and radiological); the scenarios should be evaluated as specified by the tribes.</p> <p>E. Intruder - evaluate potential exposures to intruders with acute exposure (ex. driller, trencher, miner) to all contaminants (non-radiological and radiological). Include a scenario for post intrusion residents (children and adults) who raise produce (a garden) and have chronic residential exposure (including groundwater ingestion and groundwater use in the garden) to all contaminants (non-radiological and radiological).</p>			
26.	Section 3.6.1.4, p. 3-33, lines 4-6	Ecology appreciates that groundwater protection remediation goals for chemicals will be based on WAC 173-340-720. In order to protect groundwater, soil is protected using the methods in WAC 173-340-747. Please reference this regulation also. Additionally, the text states “Given the local hydrogeology at the 200-IS-1 OU, protection of the groundwater from the contaminants, by design, also will result in protection of the Columbia River.” Unfortunately, some ambient water quality criteria for the river are lower than groundwater protection criteria based on WAC 173-340-720 (example: the hexavalent chromium groundwater protection criterion is 48 µg/L, while the water quality criterion is 10 µg/L). Because WAC 173-340-730(6)(b) requires	Reject	<p>The title of Section 3.6.1.4 will be changed to “Potential Future Groundwater Uses”</p> <p>Revised text in the section will state: “The groundwater-protection remedial action objective for the 200-IS-1 OU will be based on the WAC 173-340-720, “Ground Water Cleanup</p>	

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		assuming that there is no mixing zone at the groundwater – surface water interface, protecting groundwater is not always sufficient to protect surface water. This influences the concentration goals in groundwater and consequently the soil cleanup levels. Please discuss compliance with WAC 173-340-730 in the document and use remediation goals sufficient to protect surface water.		Standards,” and 40 CFR 141, “National Primary Drinking Water Regulations.” Protection of the Columbia River is achieved through protection of groundwater. The 200 East and West Areas are approximately 8 km (5 mi) from the Columbia River, and there is no surface water in the immediate vicinity. The following text will be deleted: Given the local hydrogeology at the 200 IS-1 OU, protection of the groundwater from the contaminants, by design, also will result in protection of the Columbia River. It is anticipated that current uses of the Columbia River will continue in the future.	
27.	Section 3.6.3	Add groundwater to each bullet for ingestion, inhalation, dermal contact, and external radiation, consistent with Figure 3-4 for unrestricted groundwater (at least for areas outside the Core Zone). Sediments are specified as an exposure medium in the text but are absent in Figure 3-4. Please clarify use of this term.	Reject	A sentence will be added to this section to state: Under an unrestricted future-land-use scenario, exposure pathways would also include ingestion, inhalation, dermal contact and external radiation from groundwater (Figure 3-4).	
28.	Section 3.6.3, p.3-33, lines 23-26	Include a bullet for ingestion of contaminated groundwater. Industrial scenarios include ingestion of contaminated groundwater. The industrial scenario in WAC 173-340 (see WAC 173-340-720) includes drinking water in industrial areas. Also, Risk Assessment Guidance for Superfund (RAGS; EPA/540/1-89/002), Vol. 1, Part A, Exhibit 6-7 lists groundwater ingestion as a pathway for risk assessments for the commercial/industrial population. Please include this pathway in the	Reject	Groundwater protection data will be collected and analyzed for this OU if the phase 2 DQO identifies a need. However groundwater data will not be collected or analyzed as part of this OU. Groundwater and	

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		evaluation.		associated exposure pathways will be evaluated by the 200 Area Groundwater OUs.	
29.	Section 3.6.4, p. 3-35, lines 9-11	Please see the previous comment on Ecology's exposure scenario expectations for the Core Zone and delete the sentence: "Therefore, based on land-use decisions...."	Reject	DOE will collect samples at detection limits that are consistent with both unrestricted and industrial land use assumptions. Land use assumptions will be defined in the feasibility study.	
30.	Section 3.7.1	Re first bullet, specify half-life criterion. Re third bullet, identify naturally occurring radionuclides. Re fourth bullet, provide rationale for atomic mass exclusion. Re fifth bullet, define "insignificant," and delete "and/or." Re sixth bullet, treat COPCs with no toxicity factors as an uncertainty. Re seventh and eighth bullets, these dilution exclusions should be deleted or need quantitative criteria. Re the last bullet, define "persistent," and note that some transient COPCs (e.g., ammonia) may exert acute toxicity.	Reject	The first sentence will be revised to state: "The rationale used in the DQO summary report (D&D-30262) for the process waste pipeline systems to exclude selected constituents from the comprehensive master COPC list is presented below. The COPCs in the following categories were excluded from further consideration in development of the COPC list proposed for characterization activities:	
31.	Section 3.7.1, p. 3-36, lines 3-29	Please include the following based on the DQO workbook (D&D-30262): "This project has elected to use general "suite type" analytical techniques, which yield results on many metals and organic compounds, providing a cost-effective approach for detecting waste constituents." This text can be placed before or after the bullets.	Accept		
32.	Section 3.7.2, Table 3-3	Re "Semivolatile Organics," the parenthetical descriptor after PAHs (i.e., WHO congeners) should be appended to PCBs instead. Both PAHs and PCBs should be assessed with the toxicity equivalency factor (TEF) method. Dioxin-like PCB congeners use WHO TEFs (reference compound is 2,3,7,8-TCDD), while carcinogenic PAHs use MTCA/CalEPA TEFs (reference compound is benzo[a]pyrene). It is	Accept		

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		Ecology's understanding that dioxin-like PCBs will be evaluated in a subset of samples, supplementing Aroclor analyses.			
33.	Section 3.7.3, Table 3-4	Re "Other Inorganics," formate, glycolate, and oxalate are not inorganics and should analyzed as organic anions. Include degradation products of tributylphosphate (i.e., monobutylphosphate, dibutylphosphate). In addition to Aroclors, dioxin-like PCB congeners should also be evaluated in a subset of samples. The seven MTCA carcinogenic PAHs (i.e., BaA, BbF, BkF, BaP, Chry, DahA, IcdP) should also be included in Table 3-4 and evaluated with TEF methods.	Reject	Agree to add monobutyl phosphate, dibutyl phosphate, seven MTCA carcinogenic PAHs, molybdenum, chloride, and sulfate to Table 3-4. Disagree to add dioxin-like PCB congeners to this table because the congeners have not been determined to be COPCs for Tank Farms pipelines but have been agreed to be analyzed in a separate test described in Appendix A. However, the following note will be added to Section 3.7.3: "In addition, dioxin-like PCB congeners will be analyzed using EPA Method 1668 on 20% of the samples according to the test described in Appendix A.	
34.	Table 3-3, p. 3-38 and Table 3-4, p. 3-41	Ecology continues to expect analysis of PCB congeners on 20% of samples taken. These are not listed on the tables. Please add them to the tables.	Accept		
35.	Page: 4-3, Line: 10	Provide, list, the preliminary cleanup goals. Describe how they where derived. This is a major data gap for this project.	Reject	Page 4-3, Line 10 states " ... above preliminary cleanup levels. " A comparison of preliminary cleanup levels (CULs) for all COPCs and potential exposure pathways are presented in the DQO (D&D-30262) in Tables	

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				<p>3-5a and 3-5b. This comparison was completed in order to identify the lowest CULs for consideration in determining the analytical detection limit requirements for characterization sampling. In the RI report, detected constituents are compared to applicable potential cleanup values (See section 5.4.2, second bullet).</p> <p>Preliminary cleanup goals associated with remedy implementation will be presented in the FS.</p>	
36.	Section 5.1, Page 5-3, 3 rd ¶	Change to: An integration of CERCLA RI/FS work-plan and RCRA RFI/CMSHWMA RI/FS work-plan requirements was used to develop this RI/FS work plan, which satisfies the content requirements of both regulations.	Accept		
37.	Section 5.1, Page 5-3, last	Change to: The RCRA closure options (i.e., landfill, modified alternative , and clean closure, as defined in Condition II.K of the Hanford Facility RCRA Permit [WA7890008967]) . . . ¶	Reject	DOE agrees with the comment but requests the following wording change – “The RCRA Closure options (i.e., landfill, clean closure, and alternative as provided in WAC 173-303-610[1][e]) will be integrated with...”	

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38.	Section 5.3, p. 5-10, lines 23-26	<p>Modify the text as follows: Based on the results of Phase 1, an assessment will be completed concerning the need for additional data collection completed for each of the process waste pipeline bins. If the need for additional data collection is determined to be required to support risk assessment and remedial decision making, planning for Phase 2 will be initiated.</p> <p>The Phase 1 sampling is to target sites that probably exceed cleanup levels. Since many locations will remain that are less obviously contaminated, Phase 2 will be needed for all bins.</p>	Reject	<p>The text presented restates the language developed for the Phased sampling approach presented in the DQO report. The text should remain as is to be consistent with the DQO report.</p>
39.	Section 5.4, General	<p>See the previous comment regarding Ecology expectations for Core Zone risk assessments and modify this section to be consistent with the expectations (ex. Section 5.4.3.1, p. 5-12 – 5-14, Section 5.3.3.3, p. 5-15, lines 4-8).</p>	Reject	<p>DOE will collect samples at detection limits that are consistent with both unrestricted and industrial land use assumptions. Land use assumptions will be defined in the feasibility study.</p>
40.	Section 5.4.2	<p>Re the second bullet, compare the data 95% UCL to the cleanup level. Re the last bullet, if sufficient data are not available, collect sufficient data for statistical analysis. Exposure point concentrations (EPCs) for both human health and eco risk should use 95% UCL, rather than max (e.g., see p. 29 in: http://www.epa.gov/nerlesd1/tsc/images/proucl4user.pdf).</p>	Reject	<p>Use of the 95% UCL is only applicable to the data evaluation process proposed for Phase 2, not Phase 1. Additional text will be added to clarify this distinction.</p>
41.	Section 5.4.3	<p>Human health risk should be evaluated for both direct contact (e.g., soil ingestion) and indirect exposure (e.g., food pathways). The baseline risk assessment should also address protection of surface water (i.e., Columbia River).</p>	Accept	<p>Waste sites assigned to the IS-1 OU reside inside and outside the core zone boundary. For waste sites that lie inside the core zone boundary, exposure related to food chain pathways is considered incomplete because of the industrial land use designation and will not be evaluated. For waste sites that lie outside the core zone boundary, exposure related to food chain pathways is considered potentially</p>

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complete. Currently, exposure from food chain pathways is included in the rural residential scenario evaluated for radiological contaminants. RESRAD has equations and assumptions built into the software code that allows for modeling and estimating radiological dose and risk from the various exposure pathways including food chain pathways. The RESRAD methodology and assumptions used for modeling the food chain pathway exposure from radiological contaminants has been accepted by the Department of Energy and the Environmental Protection Agency. However, WAC 173-340 currently does not provide the methodology, equations, assumptions, or soil to food transfer factors that are needed for developing a cleanup level that integrates exposure from both direct contact and indirect contact exposure pathways. Based on these current limitations, exposure from food chain pathways resulting from nonradiological contaminants cannot be incorporated into the risk assessment. Protection of the Columbia River is achieved

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				through protection of groundwater. The 200 East and West Areas are approximately 8 km (5 mi) from the Columbia River, and there is no surface water in the immediate vicinity.	
42.	Section 5.4.3.1, p. 5-14	Re the third bullet ("Land use will be industrial after 150 years"), this assumption conflicts with text on p. 3-35 (lines 11-13) which states that an unrestricted land use will be assumed for pipeline systems located outside of the Core Zone.	Accept	A fourth bullet will be added to state: Potential impacts from waste-site contaminants for portions of the pipelines systems that are located outside the core zone would be assessed based on unrestricted land use	
43.	Section 5.4.3.2	Re the last bullet (p. 5-14, lines 18-19), this document has been updated with more recent guidance (EPA. 2002. Calculating the upper confidence limits for exposure point concentrations at hazardous waste sites, OSWER 9285.6-10), along with accompanying software (Singh et al. 2007. ProUCL, version 4.0, EPA/600/R-07/038). 95%UCL soil concentrations should be compared with WAC 173-340-745 (industrial) and -740 (unrestricted) cleanup levels. Cancer risks from non-radionuclide carcinogens and radionuclides should not be summed, due to methodological differences in derivation. RESRAD can evaluate both direct contact (e.g., soil ingestion) and indirect exposures (e.g., food pathways) to radionuclides.	Accept		
44.	Section 5.4.3.2, p. 5-14, lines 20-26	Change the text as follows: <u>Human direct contact risks for non-radionuclides</u> initially will be evaluated by comparison to risk-based standards such as WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties," or WAC 173-340-740....[Insert the following:] <u>Risks associated with the vadose zone and groundwater pathways will be evaluated in accordance with WAC 173-340-747</u> [prior to] "Contaminants present at concentrations exceeding...."	Accept		
45.	Section 5.4.3.2, p. 5-14, lines	Modify the text as follows: Additional analysis may be performed using other appropriate fate and transport models when approved by Ecology and USEPA (e.g., PNNL-12028, STOMP Subsurface Transport Over	Accept		

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	33-35 and p. 5-15, lines 1-2	<p>Multiple Phases, Version 2.0, Application Guide) to assess impact to the groundwater from chemicals and radionuclides....</p> <p>Ecology is still working with consultants to determine if STOMP is appropriate for waste-site scale modeling. Ecology has not yet accepted STOMP as an alternative fate and transport model.</p>			
46.	Section 5.4.3.3, p. 5-15, lines 10-12	The text "The pipelines in each bin, with the exception of tank-farm waste-transfer pipelines, will be considered as one entire unit in risk calculations" is unclear. Explain. Ecology is not convinced that the pipelines within a bin are homogenous enough to treat them as a single unit.	Reject	The final sentence in the paragraph lines 13-14 provides for additional subdivision of the bins if needed. "Subdivision of Bins 1-5 may be necessary in some instances because of unique, facility-specific, heterogeneity." Completion of the sampling phases is required prior to determining whether subdivision of bins will be necessary.	
47.	Section 5.4.3.3, p. 5-16, line 2	Replace the second bullet with: Concentrations of contaminants relative to concentrations considered protective of groundwater (e.g. compared with WAC 173-340-747 values).	Reject	The second bullet will not be replaced. An additional bullet will be added to include the requested text and will state: "A comparison of concentrations of contaminants relative to concentrations considered protective of groundwater (e.g. compared with WAC 173-340-747 values."	
48.	Section 5.4.4	<p>Re the screening ERA to be performed in this risk assessment, please refer to soil concentrations in Table 749-3 (WAC 173-340-900) for non-radionuclides and soil biota concentration guides, i.e., BCGs (DOE-STD-1153-2002) for radionuclides.</p> <p>In order for the ongoing Central Plateau ERA to effectively encompass the 200-IS-1 OU, contaminant data from 200-IS-1 facility and tank farm processes (e.g., pipelines, transfer lines, soils) will have to be integrated</p>	Reject	DOE has produced a Phase 1 WP and SAPs to collect data at the appropriate analytical detection limits to comply with WAC-173-34-7490.	

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		into the Central Plateau ERA.			
49.	Section 5.5.1.2, p. 5-18, line 19	The text lists circumstances under which MESC/ICs/MNA may be preferable and includes "When contaminant concentrations are very close to remedial goals". Please delete this circumstance. If there are exceedences of non-degradable and non-radionuclide contaminants and/or uranium (as a toxic element), cleanup levels (even if close to remedial goals), natural attenuation and long-term maintenance of ICs cannot be assumed; active remediation would be necessary for compliance with regulations.	Accept		
50.	Appendix A, Page: A-1, General Comment	Provide in the introductory statements for the SAP that it has all the elements required in the EPA document QA/G-5 and Ecology publication 04-03-030.	Reject	Inclusion of content requirements per EPA QA-R5 is discussed in the introductory section A1.0 in the last paragraph. These QA elements are compliant with the TPA.	
51.	Appendix A, p. A1-1, lines 18-19	Please provide citations/descriptions for "preliminary cleanup levels" for both human health and ecological risk.	Reject	An additional sentence will be added to state: "Preliminary cleanup levels used for determining detection limit requirements for characterization sampling are presented in Tables 3-5a and 3-5b of the 200-IS-1 DQO report (D&D-30262).	
52.	Appendix A, p. A1-1, lines 33-34	Provide an introductory statement as to when will the Phase II SAP is to be prepared.	Accept		
53.	Appendix A, p. A1-7, line 21	Given the relatively high concentrations of Pu-239/240 (38,200,000 pCi/g) and Am-241 (2,590,000 pCi/g), additional soil samples may be informative.	Accept	Following review of Phase 1 results, additional soil samples will be collection if needed as part of Phase 2	
54.	Appendix A, p. A1-9, line 18 and p. A1-12, line 28	Based on Aroclor results (9 mg/kg), PCB congener analysis may be appropriate near these pipelines.	Accept		
55.	Appendix A,	It may be informative to collect additional soil samples, as result of the	Reject	Following assessment of the	

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	p. A1-10, line 1-2	relatively long length of the pipeline (5830 m).		Phase 1 sampling results, collection of additional samples as part of a Phase 2 effort may be needed for remedial decision-making.	
56.	Appendix A, p. A1-13, lines 29-32	It may be informative to collect additional soil samples, as result of the relatively large leak (1.1 ML).	Reject	Following assessment of the Phase 1 sampling results, collection of additional samples as part of a Phase 2 effort may be needed for remedial decision-making.	
57.	Appendix A, p. A1-19 to A1-20, Table A-2	Please add pipeline length to table.	Accept		
58.	Appendix A, p. A2-3, lines 28-30	Please specify the percent of data that will be validated.	Reject	Section A2.4.2 provides this percentage.	
59.	Appendix A, p. A2-7, lines 1-5	When regulatory standards or risk screening levels are unavailable for a particular COPC, this should be noted as an uncertainty. If a COPC is nondetect (but assumed to be present on site or has been analyzed with a poor/unconventionally high detection limit), one half detect limit should be employed in risk estimation.	Reject	Agree with the statements, but this section of the SAP is not intended to address those particular elements of the risk assessment methodology.	
60.	Appendix A, p. A2-7 to A2-8, Table A-4	Note that max (or detected) value is allowed for Phase I but that 95%UCL is required for Phase 2 characterization (per the DQO).	Accept		
61.	Appendix A, p. A2-10, lines 28-34	It is difficult to see how "representativeness" can truly be achieved with the non-statistical approach in Phase I. Please acknowledge or clarify.	Reject	Representativeness is discussed here in terms of laboratory analytical results. In other words, how close is the reported value to the actual concentration in the sample matrix.	
62.	Appendix A,	Please provide a footnote for the column, "Lowest Overall CUL" that cites the DQO report (D&D-30262) as the source for these values.	Accept		

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	p. A2-11 to A2-18, Tables A-6 and A-7				
63.	Appendix A, p. A2-16 to A2-17, Table A-7	PCB #123 has an incorrect description (should read "2',3,4,4',5-pentachlorobiphenyl"). Method 1668 for PCB congeners lists the detection limit for the 12 WHO congeners as 50 ng/kg (pptr) for soil. This is 20 times lower than the target detection limit listed in Table A-7 (0.001 mg/kg=1000 ng/kg). Dioxin-like PCBs should be quantified as 2,3,7,8-TCDD toxic equivalents (TEQ) with the WHO toxicity equivalency factor (TEF) method. PCB #126 has the largest TEF (0.1). For example, PCB #126 at 50 ng/kg (detection limit) yields 5 ng/kg TEQ. MTCA examples of dioxin CULs are 6.7 ng/kg TEQ (MTCA Method B soil ingestion), 1.7 ng/kg TEQ (MTCA Method B soil protection of groundwater), and 2 ng/kg TEQ (MTCA Terrestrial Wildlife, Table 749-3).	Reject	The target detection limits provided for the PCB congeners using Method 1668 are those currently available by the laboratories supporting this project.	
64.	Appendix A, p. A2-21, lines 8-12	It should be noted that the non-statistical approach for Phase I sample collection precludes any type of statistical analysis. As such, Phase 2 samples may be needed for further characterization when Phase I is inconclusive.	Accept		
65.	Appendix A, p. A2-53 to A2-56, Table A-11	The small number of samples may result in considerable uncertainty and require either some type of action or Phase II sampling.	Accept		
66.	Appendix A, Page: A2-66 lines 32-35	Should the total volume of sample available be limited provide a priority listing of the volumes for the different sample methods.	Reject	Sample volume requirements are provided on Table A-15 on pages A2-62 and A2-63. Minimum sample quantities are identified in the table for each method and footnotes discuss specific matrix, method and volume considerations.	
67.	Appendix A, A2-68 lines 4,5,6	Provide a statement as to whether all data is to be available before it is corrected and submitted. Furthermore, provide a discussion on the corrective action process for tracking data and re-testing samples if needed.	Accept		

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68.	Appendix A, p. A2-69, lines 8-15	Please define "verification" and "validation."	Accept		
69.	Appendix A, A2-69 lines 17, 22	Provide a discussion on the data validation protocol to be used for data validation.	Accept		
70.	Appendix A, p. A2-70, lines 11-13	Text states, "If the null hypothesis [Ho] is rejected, the overall performance of the sampling design should be evaluated by performing a statistical power calculation to assess the adequacy of the sampling design." According to EPA/240/B-06/002 (p. 22 in: http://www.epa.gov/QUALITY/qs-docs/g9r-final.pdf), this recommendation applies when the statistical hypothesis test fails to reject Ho (not when the test rejects Ho). Please address.	Accept		
71.	Appendix A, p. A3-3, lines 9-17	Re pipeline interior samples, please provide rationale for specified screening criteria (i.e., if rad>3x background, then do rad analyses on available sample material; if VOC>1 ppm, then do organic analyses; if VOC<1 ppm, then do inorganic analyses).	Accept		
72.	Appendix A, Sections A.3.3.2 and A.3.3.3, pages A3-5 and A3-5.	The text describes direct-push soil boring. December 2006, well regulations (<i>Minimum Standards for Construction and Maintenance of Wells Chapter 173-160 WAC</i>) were revised. The regulations now include a definition for "driven well" (WAC 173-160-111). The regulations also include requirements for geotechnical soil borings (WAC 173-160-420) which include decommissioning and a notice of intent to construct or decommission. The text should reference the applicable regulations and describe how the standards will be satisfied.	Accept		
73.	Appendix A, Section A.3.3.3, page A3-5.	The text describes direct-push soil sampling and identifies sampling intervals. If possible, it is recommended that geophysical logging results be used to select biased soil sampling intervals/locations.	Reject	Agree, but this approach was discussed in a previous section. See page A3-2, Section A3.2 Characterization Approach , second bullet. The text indicates that geophysical logging results will be used in determining the sample interval to be selected for laboratory analysis.	
74.	Appendix A,	TBP is not a PAH, as incorrectly shown. Please correct.	Accept		

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	p. AA-5 and p. AA-14, Table ATT-2				
75.	Appendix B, Table 5-1	Method 1668 is not included in this SAP. The Appendix A SAP has included identification of Method 1668. Provide references to Method 1668 in this SAP for project consistency.	Reject	Reference to Method 1668 is provided in the note included in the response to comment 33. The reference is not included in Table 6-3 because PCB congeners will be tested separately per Appendix A. The laboratory performing the work outline in this SAP (Appendix B) will not use Method 1668 and including it could cause confusion in the future	
76.	Appendix B, A-4 p 49	Provide a better description and process of the phrase "reviewing sample data against existing knowledge mean."	Accept		
77.	Appendix B, Table 6-3, p. 31-34	Please make the following changes to the table: <ul style="list-style-type: none"> • Add a detection limit for manganese • Add molybdenum • Set the silver cleanup level at 2 mg/kg to protect plants and soil biota • Add chloride and sulfate • Change the CUL for TCE to the updated value of 7.21E-04 mg/kg • Update the values for aroclors to 0.0942 mg/kg (Aroclor-1016), 0.0092 mg/kg (Aroclor 1221), 0.0394 mg/kg (Aroclor 1242), 0.0386 mg/kg (Aroclor 1248), and 0.072 mg/kg (Aroclor 1260); these values are for protecting groundwater; even lower values would apply for protecting surface water. 	Accept		
78.	Appendix C, Table C-2, p. C2-5	Please make the list of contaminants equivalent to or longer than that of Table 3-6b in D&D-30262 (the DQO document). For instance, TBP and other complexing agents are not on this list but are on Table 3-6b.	Reject	Development of the list of COPCs shown on Table C-2 for the 241-CX-72 tank is not based on D&D-30262. Development of the COPC list for the 241-CX-72 tanks is	

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				discussed on lines 1-9 on page C2-5.	
79.	Appendix C, C2-7 lines 6-11	Please describe in detail the reason for choosing a non-statistical sampling design. Provide this information, in detail, in this portion of the work plan.	Reject	The rationale for the selected sample design is presented in section C2.2.1.	
80.	Table C-3b, p. C2-9	<p>Please change values in the table as follows:</p> <ul style="list-style-type: none"> Change the arsenic GW protection value to the Hanford site background value, 6.5 mg/kg; the GW protection value for arsenic is lower than the site background value. The terrestrial ecological value also needs to be decreased accordingly. For Cr (VI) use a direct contact value of 2.1 mg/kg for inhalation/dust resuspension. Change the GW protection value for Cr (VI) to 0.2 mg/kg, based on a site-specific Kd value of 0 mL/g and WAC 173-340-747(5). Ecology considers Cr (VI) to be a significant source of hazard at Hanford and considers it necessary to use a site-specific Kd value to protect human health and the environment. Change the lead GW protection value to 270 mg/kg based on the 3-phase model and a Kd of 900 mL/g from ORNL. Change the 1,1,2-trichloroethane direct contact value to 2300 mg/kg Change the 1,1-dichloroethylene value to the updated value of 5.22E-04 mg/kg. Change the methylene chloride GW protection value to 2.18E-02 mg/kg Change the tetrachloroethylene value to the updated value of 243 mg/kg, and the GW protection value to the updated 8.59E-04 mg/kg Change the toluene direct contact value to 2.8E04 mg/kg, and the GW protection value to the updated 4.65 mg/kg Change the trichloroethylene direct contact value to the updated 328 mg/kg, and the GW protection value to the updated 7.21E-04 mg/kg Add Method 1668 for PCBs for 20% of the samples For the Terrestrial Biota column, use the lowest values from Table 749-3, rather than using just the wildlife values. Ecology has not yet determined that Hanford habitat qualifies as industrial according to WAC 173-340. Please provide the source of the water and soil required target 	Reject	<p>All changes are accepted except:</p> <p>The objective for sampling the tank contents is for waste disposition decisions. Congener analysis is not needed for waste characterization.</p> <p>Terrestrial wildlife values will be used for determination of detection limit requirements.</p>	

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		quantization limits.		
81.	Appendix C, Section C2.2.1, p. C2-17, lines 15-16	Change the text to: A non-statistical sampling design (professional judgment) was used to determine sample locations <u>for Phase I sampling at this waste site.</u>	Reject	Characterization of the 241-CX-71 tank contents is not a Phase 1 sampling activity association with the pipeline systems. This sampling is being performed to gather data needed for evaluation of RCRA tank closure options. Additional discussion is provided in section 1.1.4.3 of the work plan.
82.	Appendix D.	<p>The following elements need to be validated:</p> <ul style="list-style-type: none"> ▪ The pipeline associated with the 241-B-361 Settling Tank and the 216-B-5 Reverse Well does not appear to have been included in Appendix D. Confirm the pipeline's inclusion. ▪ The pipeline associated with the 291-C Filter Building, the 216-C-2 stack, and the 200-E-41 Stabilized Area does not appear to have been included in Appendix D. Confirm the pipeline's inclusion. ▪ The pipeline associated with the 231-W-151 Vault and the 216-Z-10 reverse well does not appear to have been included in Appendix D. Confirm the pipeline's inclusion. ▪ The pipeline associated with the 292-B Building and the 216-B-4 well does not appear to have been included in Appendix D. Confirm the pipeline's inclusion. ▪ The pipeline associated with the 216-T-3 Reverse Well and 241-T-361 Settling Tank does not appear to have been included in Appendix D. Confirm the pipeline's inclusion. ▪ Reverse well structures sometimes include "inlet lines", "vertically set concrete pipes", etc. Confirm if these "structures" should be included within the IS-1 workscope. 	Reject	<p>Table D-1 summarizes pipeline information and evaluations of pipelines that are described in the referenced documents (column 3 in the table). This table only indicates what information is provided in the documents that were reviewed and summarized.</p> <p>Table D-2 summarizes 200-IS-1 Waste site information provided in WIDS at the time the DQO and WP were created.</p> <p>These two tables (D-1 and D-2) summarized available information from different sources (reports =D-1, WIDS = D-2) that were compiled at the time the WP was prepared.</p> <p>The two tables do not address all pipeline information that</p>

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				may occur. As additional pipeline information is assembled and associated with pipeline waste site codes, the information will be presented in WIDS.	
83.	Appendix D, Table D-1.	The table includes five columns for "pipeline attributes". WIDS descriptions (eg 200-E-111PL) were noted to describe certain lines as "direct buried". The meaning of this term is not understood. As supporting information included in Appendix A includes the engineering drawing references for the pipelines, this information may already be available for inclusion in Table D-1. It is recommended that an additional column be added to Table D-1 which specifies whether the pipeline was constructed directly in soil, in fill material, in concrete, in an encasement, etc.	Reject	See response 82	
84.	Appendix D, Table D-1	<p>Several inconsistencies and missing information needs to be added to or modified as listed below:</p> <ul style="list-style-type: none"> ▪ Page D-4, Line LW-1. Piping associated with 224-T Building doesn't appear to be included. ▪ Page D-3, Line CW-1. Information of 5 leaks in waste pipeline between 242-B Evaporator and 207-B Retention Basin is provided. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-3, Line CW-1. Information of a detected leaking line (200-E-112) is provided. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-5, Line TW-1. Information stating: "leak suspected – unplanned release site" is included. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-6, Line IS-1. Information stating: "leak suspected – unplanned release site" is included. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-7, Line UW-1. The statement: "leaks suspected because of joint condition" is included in the table. In addition, information is included about "rad survey pattern". It is requested that a WIDS UPR number be provided in the table. ▪ Page D-8, Line UW-1. The statement: "leaks suspected because of 	Reject	See response 82	

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		<p>joint condition” is included in the table. In addition, information is included about contamination near “dislodged” joints. It is requested that a WIDS UPR number be provided in the table.</p> <ul style="list-style-type: none"> ▪ Page D-8, Line UW-1. The statement: “leaks suspected because of joint condition” is included in the table. In addition, information is included about soil/vegetation contamination. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-9, Line Waste Management Area. The text indicates there is an unplanned release site, but does not include the UPR number. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-9, Line Various. The text indicates there was a pipe leak, but does not include the UPR number. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-11, Line 2. The text indicates the tank leaked, but does not include an UPR number. It is requested that a WIDS UPR number be provided in the table. ▪ Page D-11, Line 7. The table indicates “none” for “Radiation Survey/Soil Sampling Information”. However, WIDS indicates for UPR-200-E-84 (which is also 241-ER-151 Catch Tank Leak) a survey result of “90,000 counts per minute inside the chain link fence”. It is requested the information be included in the table. ▪ Page D-16, Line 38. Related to UPR-200-E-3, the WIDS entry states: “The exact date of the occurrence is unknown, but the reference document, HW-22610, was written on November 21, 1951.” It is recommended that this information be inserted in the “dates of operation” column. ▪ Page D-16, Line 39. Related to UPR-200-E-42, the WIDS entry indicates that “cleanup activities” occurred in 1972. It is recommended that the information entered under the “dates of operation” column indicate contamination was detected in 1972 and that “cleanup activities” occurred in 1972. ▪ Page D-16, Line 40. Related to UPR-200-E-44, the WIDS entry indicates the UPR is a duplicate of UPR-200-E-103. It is recommended that under the “associated UPR waste site(s)” column, it be indicated that UPR-200-E-103 is a duplicate. Also, the WIDS entry indicates the Occurrence Report for UPR-200-E-103 for the release indicates March 1972 rather than August 1972. 		
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		<ul style="list-style-type: none"> ▪ Page D-17, Line 44. The description of UPR-200-E-80 doesn't describe the cave in. The WIDS entry states: "After covering the contamination, the dose rate was reduced to 100 millirad per hour". It is recommended that this survey information be included in Table D-2. ▪ Page D-17, Line 50. The WIDS entry states: "In 1950, the 241-TX-155 Diversion Box overflowed and ran down the hillside to the west, contaminating the soil. No information related to the approximate radioactive contaminate levels spilled to the ground are available." It is recommended that this description be added to Table D-2. ▪ Page D-18, Line 52. The WIDS entry indicates there are multiple releases associated with UPR-200-W-28. The description on line 52 should reflect the occurrence of multiple releases from the 241-TX-155 diversion box. ▪ Page D-13, Line 24. It is noted that UPR-200-W-135 describes releases from the 241-TX-155 Diversion Box. It is recommended that line 24 include a reference of UPR-200-W-135 under column entitled "Contaminant Inventory/Volume Released". It is also recommended that the radiation survey estimate of 300 rad per hour be included under column entitled "Radiation Survey/Soil Sampling Information". ▪ Page D-19, Line 59. It is recommended that the line identify detection of Sr-90 and Cs-137 found in Russian thistle growing over the site. ▪ Page D-20, Line 61. The WIDS entry describes a radiation survey on 8/9/99 and notes: "while surveying the underground pipelines in the vicinity of the 241-TX-155 Diversion Box, widespread contamination was identified, extending approximately 1.5 acres north of the diversion box." If the widespread contamination is associated with the 241-TX-155 Diversion Box, Table D-2, it is recommended that line 61 include this information. ▪ Page D-20, Line 62. The WIDS entry describes the release and includes pertinent information about what was released. It is recommended that the line include information that the release resulted from a leak in the TBP feed jumper and that attempts to neutralize the released material resulted in an eruption from the 		
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		<p>catch tank riser causing surface contamination.</p> <ul style="list-style-type: none"> ▪ WIDS UPR-600-20 identifies 3 associated structures (241-ER-151 Diversion Box, 241-EW-151 Vent Station, and 241-UX-154 Diversion Box). However, Table D-2 appears to only include 2 of the associated structures (241-ER-151 Diversion Box and 241-EW-151 Vent Station) that are specifically called out. Although UPR-600-20 on page D-22 describes the three associated structures, the table doesn't specifically identify 241-UX-154 Diversion Box by line. It is recommended that a line for 241-UX-154 Diversion Box be included in the table. 			
85.	Appendix D, Table D-1, page D-9, Line Waste Management Area	The table indicates that "samples may be collected near corners of Diversion Boxes..." From the wording, it is not clear whether samples will be collected or not. Clarify text.	Reject	See response 82	
86.	Appendix D, Table D-1, Page D-1, Line PW-2.	The statement: "Leaks suspected since acidic waste destroyed VCP integrity" is included in table. Similarly, on page D-3, Line CW-5, the statement is included: "leakage suspected". Similarly, on page D-3, Line CW-1, the statement is included: "leaks inferred in Table 2-6. Such statements are not consistently included in the WIDS site descriptions. If information of releases or probable releases has been obtained through this workplan's generation, it is recommended that information be provided to the WIDS database contact to be used to update the database descriptions. As the workplan acknowledges that not all pipelines within the 200-IS-1 OU workscope are mapped and/or identified, provision of information to the WIDS database contact will be necessary.	Reject	See response 82	
87.	Appendix D, Table D-1, Page D-1, Line PW-2	The WIDS description states: "On April 19, 1962, the clay distributor pipe to the 216-A-10 crib collapsed and caused a surface depression. A new distributor (replacement) line was installed parallel to the collapsed line. The replacement line failed in 1966." It is requested that this information be included in Table D-1.	Reject	See response 82	
88.	Appendix E	Appendix D provides excellent information concerning integrity of certain pipelines. However, the source of the information isn't consistently provided. If routine line leak tests were conducted, this	Reject	The reference sources of the information provided in Table D-1 is provided in column 3.	

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		<p>information may be valuable to include as an appendix. It is requested that either an additional appendix be added which provides all available line leak test information for all pipelines within the scope of this workplan or available line leak information be added to Appendix D, Table D-1.</p>	<p>The source of the information presented in Table D-2 is from WIDS. Specific references for the information associated with each waste site code listed in the D-2 table are provided in the WIDS waste site summary sheets. Characterization activities to be conducted in conjunction with this work plan will provide direct evidence concerning the integrity of the pipelines.</p>	
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