



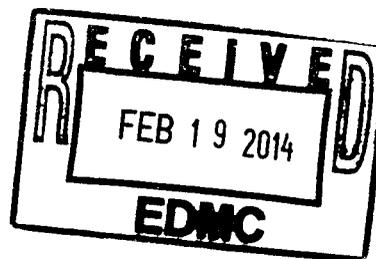
Confederated Tribes and Bands
of the Yakama Nation ERWM

Established by the
Treaty of June 9, 1855

February 12, 2014

Jane Hedges
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Subject: Review of the Proposed Plan and Remedial Investigation/Feasibility Study for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units (DOE/RL-2010-95, Draft A) and Propose Plan (DOE/RL-2011-111, Draft A).

Dear Ms. Hedges and Nguyen:

The U.S. Environmental Protection Agency (EPA) anticipates issuing the Record of Decision (ROD) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for the 100-NR-1 and 100-NR-2 Operable Units early next year. The Confederated Tribes and Bands of the Yakama Nation appreciate the opportunity to review and provide comments on these documents.

The Confederated Tribes and Bands of the Yakama Nation is a federally recognized sovereign pursuant of the Treaty of June 9, 1855 made with the United States of America (12 Stat. 951). The U.S. Department of Energy Hanford site was developed on land ceded by the Yakama Nation under the 1855 Treaty with the United States. The Yakama Nation retains reserved rights to this land under the Treaty.

The Hanford Reach is one of the most cultural resource-rich areas in the western Columbia Plateau. Pre-Hanford uses of the area included agriculture and use by Native American tribes. Archaeological evidence demonstrates the importance of this area to Native American tribes, whose presence can be traced for more than 10,000 years. The near-shore area of the rivers (Columbia, Snake, and Yakima) contained many village sites, fishing and fish processing sites, hunting areas, plant-gathering areas, and religious sites. Upland areas were used for hunting, plant gathering, religious practices, and overland transportation.

Chinook salmon, sockeye salmon, coho salmon, and steelhead trout use the river as a migration route to and from upstream spawning areas and are of economic importance. The Treaties of 1855 provide for the peoples of three Nations to "live along" and fish the River Corridor.

The Yakama Nation's vision for the cleanup and closure of the Hanford Site includes meeting the following objectives:

1. Compliance with Yakama Nation Treaty Rights, including full access to cultural (and natural) resources by the Yakama Nation and its members within its ceded land and aboriginal territory, including on the Hanford Site.
2. Official recognition that Native Americans living near the Hanford site are the most vulnerable people to environmental contaminants, as underscored by EPA's Columbia River Fish Contaminant Survey.
3. Protection of the health of Yakama Nation tribal members and the environment so that the Hanford Site and all its resources (including the Columbia River, its islands, other surface waters, geologic resources, groundwater, air, and biological resources such as plants, fish, and wildlife) are safe for all exposure scenarios and tribal uses.

The Yakama Nation supports cleanup actions that are complete, permanent, and are based on proven technology. We do not support remedial actions that leave large quantities of long-lived radionuclides or dangerous waste in place and rely on long-term stewardship or institutional controls to address future potential exposure scenarios. Long-term stewardship and institutional controls will not be effective for wastes that remain dangerous for hundreds or thousands of years. Assuming that contaminants remain in place implies that a Long-Term Stewardship Program Plan must be implemented which will remain effective longer than any human institution has ever existed.

The Yakama Nation further supports the following key principles for all remedial actions that are completed on the Hanford Site:

1. Cleanup decisions that follow the CERCLA RI/FS process and requirements through the finalization and approval of CERCLA documents (including risk assessments and supporting secondary documents) prior to development of Proposed Plans and final RODs.
2. Cleanup decisions based on adequate site-specific characterization, including for the vadose zone and groundwater.
3. Cleanup actions that comply with all applicable or relevant and appropriate federal and state regulatory requirements.
4. Cleanup actions that are compatible with clean closure criteria.

As mentioned above, the Yakama Nation does not support remedial actions that leave significant quantities of contamination in place at the Hanford Site, nor do we support remedial actions which would preclude clean closure. We request Washington State Department of Ecology asks the National Remedy Review Board review the Proposed Plan and supporting documents as well as our comments.

We look forward to discussing our vision of cleanup and our concerns regarding the current cleanup plans for Hanford with you further.

Sincerely,



Russell Jim
Yakama Nation ERWM Projects Manager

cc:

Matt McCormick, Manager, US Department of Energy

Ken Niles, Oregon Department of Energy

Stuart Harris, CTUIR

Gabe Bohnee, Nez Perce

Marlene George, YN ERWM

Administrative Record

Attachments: #s 1, 2, 3,4,5,6, 7, 8, 9 10, 10A, 11

Attachment #1:

Yakama Nation ERWM Comments on the 100-N Area Proposed Plan & Remedial Investigation / Feasibility Study:

1. Protection of Yakama Nation treaty rights, including full access to cultural resources on the Hanford Site by the Yakama Nation:

Ensuring Treaty compliance is a critical intergovernmental concern. By and through this document, USDOE supports the participation of Yakama Nation in activities related to remediation and restoration of resources affected by Hanford and implements its trust responsibility and enforceable obligations to the Yakama Nation. From the YN ERWM's perspective, efforts to include the tribal program in the development of the RI/FS/PP were weak.

- a. The Treaty, which reserves specific rights and resources for the Yakama Nation, should be acknowledged as an ARAR or a "must comply" standard for cleanup decisions. This includes the right to practice full subsistence activities in Yakama Nation usual and accustomed use areas. All future Interim and Final Record(s) of Decision(s) should be in harmony with treaty rights of the Yakama Nation under the Treaty of 1855 including upland treaty rights.
- b. All statements included in the Proposed Plan and RI/FS documents that convey the USDOE's "beliefs" or "positions" regarding the extent of tribal treaty rights, including statements that it is the USDOE's position that Hanford is not "open and unclaimed land," should be removed from the documents.
- c. All potential impacts to treaty-reserved rights and resources should be thoroughly evaluated and considered in a revised RI/FS and Proposed Plan and supporting documents. The preferred alternative should be consistent with the USDOE's American Indian Policy, with the federal trust responsibility, and with the terms of the Treaty of 1855.
- d. The YN ERWM Program believes Preferred Alternative is not protective; does not meet ARARs; is inconsistent with anticipated (*and feasible*) future land and groundwater use; and does not represent the maximum extent possible a permanent solution in a cost effective manner.

2. Land Use:

Language in the Proposed Plan and selected Preferred Alternatives indicates that DOE is not considering cleanup to unrestricted use and is striving toward a less stringent cleanup based on the Comprehensive Land-Use Plan (i.e. use of Method A-Industrial Standards for Arsenic vs. Method B-Unrestricted Standards). While cleanup decisions may ultimately be defined by management boundaries, the risk assessment should be based upon actual human behaviors.

The Preferred Alternative for groundwater with ICs for extended time periods is inconsistent with the CLUP (It is stated that cleanup actions will support reasonably anticipated future land uses consistent with the Hanford Reach National Monument and "Record of Decision: Hanford Comprehensive Land-Use Plan Environmental Impact Statement (the "CLUP") (HCP EIS) (64 FR 61615). CLUP is designated for 50 years operational and 100 years for institutional controls. Beyond that time period, the site could be used for any and

all types of land use; including irrigation. It is known that there will be continued releases above cleanup levels for over 100 years. Yakama Nation ERWM remains concerned that any remedy reviews (i.e. 5 year ROD reviews) will not include appropriate sampling actions or technological systems review to confirm performance of these IC.

- a. Furthermore, the final CLUP did not include any suggestions, or address any concerns provided by the Yakama Nation.¹
- b. All potential impacts to treaty-reserved rights and resources should be thoroughly evaluated and considered in a revised RI/FS and Proposed Plan and supporting documents, including use of the Yakama Nation Risk Scenario as the basis for setting cleanup levels.
- c. The preferred alternative should be consistent with the USDOE's American Indian Policy, with the federal trust responsibility, and with the terms of the Treaty of 1855.
- d. The CLUP was a Federal undertaking that determined what type of activities could occur within the Hanford landscape, yet traditional cultural properties (TCP) were never addressed. Areas designated for industrial use, research and development, and conservation mining could have significant impacts on the landscape, and adversely affect a TCP should one be present.

3. Cultural Resources & Institutional Controls:

Pgs ii-iii (RI/FS), states cultural surveys are routinely conducted to protect sensitive areas. Surveys are only conducted to support projects. The use of the word "routine" is misleading the reader. Section 110 surveys have not been conducted to fully understand the nature and extent of the cultural resources present. A traditional cultural property (TCP) study has not been conducted to determine if TCPs are present, therefore these resources are not being taken into consideration in determining adverse effects to these resources. Site wide undertakings and decisions such as clean up levels, restoration, vegetation management, land use plans, the use of barriers and institutional controls need to take into consideration their effects on TCPs. It is the obligation of DOE under the National Historic Preservation Act (NHPA), Section 110, to inventory and evaluate properties to determine eligibility under the agency's jurisdiction.

There is the assumption of, and over-reliance on, the use of Institutional Controls to ensure protectiveness rather the primary objective which is protectiveness of the environment and human health through selection of remedies that employ treatment technologies that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances, pollutants, or contaminants.

The philosophy underlying the cleanup of Hanford should be guided explicitly by the goal of allowing Native Peoples to safely live the lifestyle to which they are entitled. This way of thinking will be particularly important when considering how to incorporate non-quantitative elements into the Preferred Alternative such as the spiritual or cultural value of a site.

The Yakama Nation has previously expressed deep concern in leaving in place

¹ Yakama Nation letter to John Wagoner, Manager, Department of Energy, Richland Operations Office, June 30, 1998.

large quantities of hazardous radiological and chemical wastes on the site with the long-term use of institutional controls as protective measures. DOE has acknowledged Sr-90 is present throughout the vadose zone in the 100 Area, and it will continue to impact groundwater quality until the residual contamination is removed through radioactive decay. Within the timeframes that are realistically applicable to this scenario (estimated to be approximately 200 years) institutional controls will almost inevitably fail and allow some exposure to human health and the environment.

The YN ERWM expects a discussion of the culturally sensitive areas with reference to both historic and prehistoric Native American use within the Proposed Plan. Implied agreement with implementation of a ROD change rather than an MOA or outlining actions within the ROD is misleading to the public. The YN ERWM requests consultation with DOE on this issue.

Use of institutional controls must be addressed in light of, and with appropriate deference to, Yakama Nation treaty rights which guarantee use of the land for specific purposes which are considered inseparable from the Yakama way of life.

- a. Regarding the use of institutional controls at DOE waste sites, the National Research Council pointed out: "While there is typically a tacit recognition that engineered barriers and waste stabilization approaches have limited periods of effectiveness, these technologies are frequently employed with inadequate understanding of, or attention to, the factors that are critical to their success. These include the need for well-conceived plans for performance monitoring that identify and correct potential failures and plans for maintenance and repair, including possible total system replacement." (NRC, 2000). This level of planning, both technical and financial does not appear to have been included in the analysis of alternatives. YN ERWM requests this level of detail be included in the Proposed Plan and ROD rather than simple statements that this will be in the RD/RAWP.
 - i. Footnote in Table 9-4 indicates additional IC maybe included through closure reclassifications. All potential costs estimates must be identified within the remedy selected for each waste site. It is assumed that ICs will be maintained for 5 years beyond the time that the cleanup goals are initially achieved. YN ERWM requests that DOE verify that cost estimates for each alternative are correct.
- b. Currently, there are several projects and major decisions that will be made that affect the entire Hanford Site, yet still a comprehensive Traditional Cultural Property (TCP) study has not been performed. Site wide undertakings and decisions such as clean up levels, restoration, vegetation management, land use plans, the use of barriers and institutional controls need to take into consideration their effects on TCPs. It is the obligation of DOE under the National Historic Preservation Act (NHPA), Section 110, to inventory and evaluate properties to determine eligibility under the agency's jurisdiction.
- c. Cultural resources have not been adequately addressed in either of the 100-D/H documents (RI/FS and PP). Please refer to the EPA document,

CERCLA Compliance with Other Laws Manual: Part II² (hereafter referred to as EPA Guidance), where it details out how to be in compliance with the NHPA during the CERCLA process in Section 4 (attached). Section 4.1.3 clearly states efforts should be made to identify cultural resources. Generally DOE carries out these efforts during the Section 106 process for each project, however between 2003 and 2011, 127 projects were carried out under the “no potential to cause effect” classification in the 100-D/H Areas. This means these projects were completed without proper Tribal consultation, and did not have a full Section 106 cultural review.

- d. As outlined in the EPA Guidance document Section 4, once cultural properties are identified it needs to be determined if they are eligible and if the proposed actions will have an adverse effect on the eligible properties. Further the EPA Guidance states any **adverse effects to eligible properties must be mitigated, “this mitigation plan should be included in an MOA signed by the consulting parties (page 4-10)”**. EPA Guidance 4.1.4.2 states “The remedial design process should provide for scheduling and funding of the development and implementation of a detailed cultural resources mitigation plan”.
- e. The EPA Guidance 4.1.5 (page 4-11) details proper documentation, “Compliance with the NHPA requirements should be documented in the RI/FS report, describing, as appropriate, the determination of whether cultural resources are or are not present; the results of the Cultural resource survey (CRS) process and recommendations on the eligibility of the identified cultural resources for the national Register; the impact, if any, on such resources; and the associated mitigation measures to minimize potential “no adverse” or “adverse” effects. When cultural resources are present, the ROD should identify the NHPA as an ARAR. For each alternative, the ROD should identify whether the alternative will comply with substantive NHPA requirements. **For the selected remedy, the ROD should also include a brief statement describing what compliance with NHPA entails, e.g. that there will be no impact on cultural resources or what mitigation measures will be required.**”
- f. The 40 CFR 300.435(b)(2) states; “During the course of the RD/RA, the lead agency shall be responsible for ensuring that all federal and state requirements that are identified in the ROD as applicable or relevant and appropriate requirements for the action are met.”
- g. It is evident the RI/FS and Proposed Plan documents do not meet EPA guidelines. DOE has not performed the necessary tasks to determine effects to cultural resources, **in consultation with the YN ERWM to determine effective avoidance, minimization, and/or mitigation measures. The final ROD must reflect compliance with NHPA**, which will be impossible with current data.
- h. YN ERWM requests EPA and DOE to complete the necessary task of

² RPA, CERCLA Compliance with Other laws Manual: Part II. Clean Act and Other Environmental Statues and State Requirements, EPA/540/G-89/009, OSWER Directive 9234. 1-02, August 1989

“describing what compliance with NHPA will entail” and if necessary based on proper field evaluation complete a necessary MOA to mitigate for any adverse effects to the newly discovered TCPs, in consultation with YN ERWM.

- i. Although the report speaks of ethnographic studies by PNNL, there has been no attempt to identify new cultural properties or traditional cultural properties in many years, as mandated under Section 110 of the national Historic Preservation Act. The Hanford Cultural Resource Management Plan outlined a process for identifying one TCP per year; however this has not been done. DOE has not been meeting their Section 110 obligation of identifying cultural properties on the Hanford site. There are known TCP that have not been evaluated that include:
 - i. White Bluffs
 - ii. Coyote Rapids
 - iii. Columbia River
 - iv. Wahluke Slope
 - v. Other potentially unknown TCPs in the Hanford area.

Cultural properties are only being addressed through the Section 106 process, on a project by project basis, which is entirely ineffective. This piecemeal method does not allow for a comprehensive landscape study and does not allow for proper consultation with YN ERWM. None of the Alternatives were evaluated against the nine balancing criteria based on effects on a TCP. The YN ERWM Program requests this be done.

- j. It is unclear as to what is in place to ensure compliance with the Antiquities Act of 1906. Under the Antiquities Act of 1906, the Hanford Reach National Monument (HRNM) was created by Proclamation 7319 in 2000. The Proclamation lists the resources that are to be protected including: riparian, aquatic and upland shrub stepped habitats, native plant and animal species as well as archaeological, historic and sacred sites throughout the monument. While the majority of the HRNM is managed by USFWS, the river corridor lands underlying the Hanford reactors and operational areas are managed by DOE. These lands contain high levels of contamination and significant cultural resources.
- k. It is recognized in the Proclamation that DOE has the responsibility to clean up hazardous substances and the restoration of natural resources. The Proclamation further states, “As Department of Energy and US Fish and Wildlife Service determine that lands within the monument managed by the Department of Energy become suitable for management by the US Fish and Wildlife Service, the US Fish and Wildlife Service will assume management by agreement with the Department of Energy.” Clearly it was the intent of the President that the HRNM land would be cleaned, restored and then managed by the USFWS.

The entire HRNM would then be managed according to the mission of the USFWS guided by the HRNM Comprehensive Conservation Plan (CCP), which states a primary purpose of, “Protect and restore biological, cultural, geological and paleontological resources.” Areas in the River Corridor 100

Areas are some of the most contaminated, and it remains the obligation of DOE to clean and restore these areas within the HRNM and areas that could affect the HRNM in consultation with the Department of Interior. Anything other than complete cleanup and restoration of the HRNM would be in direct conflict with the Antiquities Act, Proclamation 7319, and the HRNM CCP.

- l. Full compliance with government-to-government requirements are not fulfilled by the vague statements found in the Proposed Plan (page 10) and Table 10-7 (RI/FS): "The DOE and EPA consult with tribal governments before taking actions, making decisions, or implementing programs that may impact tribal traditional, cultural and religious values and practices; natural resources; and treaty and other federally recognized and reserved rights. The Tri-Parties take a proactive approach to soliciting input from tribal governments on Tri-Party Agreement (Ecology et al., 1989) policies and issues. Specifically, the Tri-Parties conduct periodic briefings for the affected tribal governments. DOE routinely provides copies of Tri-Party Agreement (Ecology et al., 1989) documents concurrently to tribal governments, Ecology, and EPA"
 - i. The Proposed Plan and decision documents do not adequately explain how cleanup meets the National Historic Preservation Act consultation process, including, for example, the specific and concrete steps for how cleanup in the cultural areas will proceed in a manner that prevents disturbances (e.g., specific soil sampling designs to protect artifacts).
- m. THE YN ERWM program requests consultation regarding decisions for D-Island. We remain concerned as it is as bounded by a casual recreational user scenario) (page 8-37, RI/FS) which is not protective of YN tribal members.
- l. It is the belief of the YN ERWM that a Federal interagency committee composed of the Department of Interior, the EPA, and USDOE should convene to define mutually the terms and conditions of habitability for native people of the Columbia River Basin (including residual contamination standards) and to establish an agreement with the Yakama Nation.
 - i. Porewater and aquifer sampling data shows exceedances of water quality cleanup standards.

4. Evaluation of the Comparative Analysis of Alternatives:

- a. Protection of the health of Yakama Nation tribal members and ensuring sustainable habitability of Hanford for Yakama Nation Tribal members including their safety and welfare or trust resources is a major concern of the Yakama Nation Environmental Restoration and Waste Management Program.
 - i. Accumulated scientific evidence demonstrates that Native Americans are, as a statistical cohort, subject to the highest risk of disease and cancer from exposure to environmental contaminants. The Columbia River Basin Fish Contaminant Survey is a technical report that assesses the amount of chemical pollution in certain species of fish, and the potential health risks from eating fish those fish. The study is based on fish samples collected between 1996 and 1998 from tribal fishing waters in Washington, Oregon and Idaho. EPA funded the study which was

coordinated by the four member tribes of the Columbia River Intertribal Fish Commission (CRITFC).

- b. YN ERWM requests official DOE recognition that Native Americans living near the Hanford site are the most vulnerable people to environmental contaminants, as underscored by EPA's Columbia River Fish Contaminant Survey. Adults in CRITFC's member tribes who eat fish frequently (48 meals per month) over a period of 70 years may have cancer risks that are up to 50 times higher than those in the general public who consume fish about once a month.
 - i. We remain concerned the health of Yakama Nation tribal members with the needed extensive remediation of the groundwater as there will be continued effects and potential new COCs from the 100-D/H Area Reactors which are not considered in this Proposed Plan. CERCLA asks that all *primary sources* of contamination be included in RI/FS evaluations. To state remaining primary sources are minimal is misleading to the public as the 100-D/H Area reactors are the primary source.
 - ii. As upland plumes enter the river, we are concerned that any remedy reviews will not include actual sampling actions or technological systems review to confirm performance or to consider these missing source area contaminants.
- c. YN ERWM does not believe the Preferred Alternative as a remedy for the groundwater meets the selection criteria, in particular in its ability to demonstrate no adverse impacts to drinking water supplies, other groundwaters, surface waters, ecosystems, sediments, air, or other environmental resources. We believe Preferred Alternative is not protective does not fully meet and/or identify all ARARs; is inconsistent with anticipated (*and feasible*) future land and groundwater use; and does not represent the maximum extent possible a permanent solution in a cost effective manner.
- d. **Consideration of another alternative is requested: Alternative 4a:** RTD for Waste Sites; 'Strontium-90, Cesium-137, & Technicium-99 hot spot soil' remediation at waste sites adjacent to groundwater monitoring wells D-5-21, D-29, D-5-129, D-8-62, H4-49, H4-58, H4-61H4-63, H4-72, H4-69, H4-15(e.g., 116-H-1 Trench, the 116-H-7 Retention Basin); Groundwater treatment of Strontium plume; Additional remediation for these waste sites 100-D-49:2, 100-D-30, 100-D-46, 100-D-100, 100-D-104, 118-D-6:4, 116-D-1A/1B, 116-D-7, 116-DR-1&2, 116-H-1, 116-H-7, 118-H-6:2,3,6, 100-H-9/10/11/12/13/14/31[Deep3] ; and Increased Capacity Groundwater Pump & Treat for Groundwater as necessary [including treatments for Nitrates].

YN ERWM believes this alternative would result in best performance overall with less disadvantages or uncertainties when compared to the other alternatives along with the highest degree of certainty that the alternative will prove successful in meeting the RAOs and gaining public acceptance. Costs increases could be minimal as stated "modifications to the existing pump-and-treat facilities may provide the additional capacity."

- i. Tables 6-13 through 6-19; Tables G1-8, G1-9, and G-104; and information in Appendix M: Several sites indicate need for more remediation at reasonable depths (~16ft to 50ft) would minimize and/or eliminate the need for ICs with an overall reduction in costs of

- groundwater treatment systems, monitoring and maintenance and reliance on IC for protection of Human Health and the Environment, with the permanent removal of contamination.
- ii. The Proposed Plan lists 32 waste sites with deep radionuclide contamination that exceeds human health criteria, but claim the exposure pathway is incomplete. These waste sites include: 100-D-18, 100-D-19, 100-D-46, 100-D-48:1, 100-D-48:2, 100-D-48:3, 100-D-49:1, 100-D-49:2, 100-D-49:4, 100-D-5, 100-D-6, 100-H-1, 100-H-11, 100-H-12, 100-H-14, 100-H-21, 100-H-22, 116-D-1A, 116-D-1B, 116-D-7, 116-DR-1&2, 116-DR-6, 116-H-1, 116-H-3, 116-H-7, 118-D-6:3, 118-D-6:4, 118-H-6:3, 118-H-6:6, UPR-100-D-2, UPR-100-D-3, and UPR-100-D-4. Radionuclides associated with historical waste disposal contribute a majority of the ELCR (cesium-137, cobalt-60, europium-152, europium-154, nickel-63, and strontium-90). All of these radionuclides will decay to levels corresponding to EPA's target risk range within 2 to 185 years. These results indicate the potential for unacceptable exposure from deep soil excavation and drilling activities within these defined areas. Use of ICs for beyond 100 years is not supported by science. Furthermore Technetium-99 at the 118-DR-2-2 waste site has identified exceedence of standard for hundreds of thousand years.
 - iii. Current designation of short-term effectiveness of Alternative 3 is inconsistent with previous classification of similar Alternatives. Classification should be reduced to moderate.
 - iv. Current designation of reduction of toxicity, mobility, or volume by treatment should be the moderate across the alternatives. Discussion of cost (Section 10.3.7) state the RD/RAWP will determine if new facilities are needed or if modifications to the existing pump-and-treat facilities will provide needed capacity. There is not an affirmed design to support the current designation of Alternative #3 higher than other alternatives.
 - v. Current designation of long-term effectiveness and permanence should be higher for Alternative #4 than Alternative #3. We believe the weight applied to ranking of the effectiveness of the alternatives to be incorrect. Alternative 4 far better more fully meets this definition than the other alternatives (i.e., The NCP (40 CFR 300) defines effectiveness as the "degree to which an alternative reduces toxicity, mobility, or volume through treatment; minimizes residual risk; affords long-term protection; complies with ARARs; minimizes short-term impacts; and how quickly it achieves protection.") RTD for waste site certainly reduces the volume of contamination over grouting even given the statement that RTD is not treatment. RTD requires treatment should conformational sampling indicate cleanup levels are exceeded. Grouting does not "*permanently reduce*" the TMV.
- e. Alternative 4's evaluation should read Alternative 4 RTD for Waste Sites and Pump-and-Treat for Groundwater meets threshold criteria, performs well for long-term effectiveness and implementability, and performs well for short-term effectiveness and reduction of TMV.
 - f. Soil contamination should be documented in both vertical and horizontal directions from all potential sources (*EPA/540/G-89/004-Guidance for Conduction Remedial Investigations and Feasibility Studies Under CERCLA*). None of the Alternatives

fulfill this requirement. This would necessarily include contaminant plumes underlying the 100-D/H Area reactors.

- i. The 100-D/H Area site boundaries include the Columbia River and its shorelines. Portions of the site are within the boundaries of the National Monument. Interactions among media (i.e., soils and groundwater) at the 100-D/H Area are important. As such, the effect of source control actions on the remediation levels or time frames for other media should be evaluated. Data should *not* be selective (e.g., excluding waste sites or contaminants) but should include all data sources applicable to evaluating current and future conditions at all upland, riparian, and nearshore operational and non-operational areas. A holistic approach would ensure that protective decisions are made for the site in its entirety. YN ERWM request DOE include evaluation of risks due to area reactor plumes be included in the RI/FS.

- g. Consideration of the adequacy and reliability of controls does not appear to have been done during the evaluation of the Long-term Effectiveness and Permanence of the alternatives. Was there an assessment of the reliability of management controls for providing continued protection from residuals? Clarify if done location in document(s), and clarify if the evaluation include the assessment of the potential need to replace technical components of the alternatives, such as a cap, a slurry wall, or treatment systems (groundwater wells/treatment systems-see bullet below) and the potential exposure pathway and risks posed should the remedial action need replacement. YN ERWM requests DOE revise the Proposed Plan to address these deficiencies and include detailed cost information for each alternative.
 - i. From RI/FS page 5-80, line 11: Uncertainties remain regarding the potential for continued contribution of residual vadose zone contaminants to underlying groundwater. Strategies for addressing potential residual contamination will be discussed in the FS. Remedial alternatives evaluated in the FS portion of this report will consider monitoring requirements that will verify the assumptions for vadose zone contaminant behavior. Existing groundwater plumes of Cr(VI), strontium-90, and nitrate near the reactor condensate cribs, the FSBs, the retention basins, the cribs, and the cooling water head houses should be considered for specific monitoring of potential future vadose zone contributions. This action does not appear to be specifically included in the Alternatives.
 - ii. From RI/FS page 5-72 line 28: The monitoring well network and performance monitoring program will be defined in the remedial design phase of the project. This is required to be presented in the Preferred Alternative and discusses in the Proposed Plan with all costs estimates presented.

- h. Alternative design details (i.e., specific provisions for sustainable elements) are to be identified in the RDR/RAWP to be prepared after the ROD is issued. EPA guidance (EPA 540-R-98-031) states this information should be included in both the Preferred Alternative Section of the Proposed Plan and the Selected Remedy Section of the ROD, not in the workplan. YN ERWM program requests this information be included.
 - i. Examples in Proposed Plan: "Specific pumping rates, numbers of wells, and remedial action duration were developed for comparison purposes

and will be further refined during remedial design.” “Void fill grouting is a proven technology, but will require design input for implementation.”

- i. Footnote in Table 9-4 indicate additional IC maybe included through closure reclassifications. All potential costs estimates must be identified within the remedy selected for each waste site. It is assumed that ICs will be maintained for 5 years beyond the time that the cleanup goals are initially achieved. YN ERWM requests that DOE verify that cost estimates for each alternative are correct.
- j. Nothing in the Alternatives has discussed disposition of boiler sludge as noted in Bullet #2, page 31 of RI/FS. YN ERWM program requests clarification of disposal of boiler sludge. If not yet disposed, YN ERWM requests this waste stream and its disposal be included in the preferred alternative and ROD remedy.
- k. None of the Alternatives discuss a remedy for coal ash piles at 100-D area. YN ERWM program requests discussion of remediation of coal ash piles to be included in the RI/FS/PP and ROD and how any subsequent necessary changes will be made to the remedy.
 - i. Case 1:12-cv-00523-RBW Document 44-1 Filed 01/29/14: The EPA Administrator shall, by December 19, 2014, sign for publication in the Federal Register a notice taking final action regarding EPA’s proposed revision of RCRA subtitle D regulations pertaining to coal combustion residuals.
- l. It is unclear if any of the Alternatives were evaluated against the nine balancing criteria based on what happens with transition to Long-term Stewardship prior to completion of remediation under the Record of Decision (e.g., Was a cost benefit analysis of remedy costs including long-term stewardship costs done?) The environmental consequences of doing this action or not doing it have not been evaluated. It is unclear how any of the Alternatives can ensure compliance with the balancing criteria with transition into Long-term Stewardship. These analyses should be done as this action will clearly need to be reflected and integrated into the final ROD.

5. General Comments on the Analysis of the Alternatives:

- a. The YN ERWM disagrees with footnote ‘b’, ‘e’ and ‘g’ (Proposed Plan Table: Summary of 100-D/H OU Proposed Soil Cleanup Levels Based on Human Health, Groundwater Protection, and Surface Water Protection PRGs). The purpose of verification sampling is to determine if cleanup levels have been met or if further excavation is required. The PRGs listed are the proposed cleanup levels to be met are they not? YN ERWM program requests details of the process for ‘additional protectiveness evaluations’ be included in the Proposed Plan.
 - i. Footnote ‘b’ states “In instances where verification sampling exceeds irrigated PRGs but achieves non-irrigated PRGs, the Tri-Party Agencies may elect to apply ICs to ensure protectiveness rather than continue excavation”. The purpose of verification sampling is to determine if cleanup levels have been met or if further excavation is required. The PRGs listed are the proposed cleanup levels to be met are they not? This is an over-reliance on the use of ICs rather than appropriate RTD or other remediation.

- ii. Footnote 'e' states "Arsenic PRG is compared to the WAC 173-340-900, "Model Toxics Control Act—Cleanup," "Tables," Table 740-1, "Method A, Soil Cleanup Level for Unrestricted Land Use." YN ERWM Program does not support use of Method A cleanup values for Arsenic.
 - iii. Footnote 'g' states "The irrigation and no irrigation PRG values for Cr(VI) were set to 6.0 mg/kg because the distribution coefficient value used in the model was derived from experiments with soil concentrations less than 6.0 mg/kg. Cr(VI) proposed cleanup level is set to the interim action remedial action goal (RAG) of 2.0 mg/kg (DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*). YN ERWM believes the distribution coefficient value used was incorrectly derived and should be set at 0.0, supporting Hexavalent Chromium=0.19 mg/kg (soil protective of groundwater).
- b. The Preferred Alternative (or Proposed Plan) does not include the required description of the contingency measures that will be implemented should the monitoring show that natural attenuation is unable to achieve the cleanup goals. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-98-031). Update and provide details in the Proposed Plan for public review including cost of implantation of contingency measures.
 - c. The YN ERWM Program believes there are some noted incorrect applications of regulations which need correction and re-evaluation of risks to the groundwater (e.g. Text in the Proposed Plan states "For sites in the Columbia River...protect aquatic life in the Columbia River by achieving ...state water quality standards at groundwater discharge points to the river." It is noted that aquatic water quality criteria are only directly applicable where groundwater discharges to surface water." WAC 173-340-720(4)(b)(ii) (2007) indicates that WAC 173-340 Method B for potable groundwater applies for the protection of surface water beneficial uses, and references WAC 173-340-730; in this way, water quality standards are incorporated in WAC 173-340-720. WAC 173-340-730(3)(b)(i) also gives the relationship of water quality standards and WAC 173-340.) We believe the aquatic water quality criteria do apply to the ground water because the property abuts the surface water and should be applied at 100-D/H.
 - d. Not all ARARs have been included. See Attachment #10/10a.
 - e. Monitor wells are assumed to have a design life of 30 years yet monitoring will continue for hundreds of years. Clarification is needed to ensure that cost estimates include replacement of wells over time.

5. Groundwater:

The Proposed Plan for cleanup of the 100-D/H Area and the associated RI/FS Report does not support an adequate cleanup of the area groundwater or soils. While identified waste sites were heavily contaminated, the fact remains that a significant quantity of strontium 90 and Cr(VI), cesium-137, technicium-99 (and other radionuclide contaminants and RCRA metals [e.g.s., arsenic, antimony barium, cadmium, , carbon tetrachloride, cobalt, copper, lead, nickel, silver, and zinc] and nitrates) will remain unaddressed under the current Preferred Alternative. In order to achieve long-term protection of the Columbia River, these

contaminants will need to be removed from the vadose zones in the 100-D/H Areas. YN ERWM Program believes the Preferred Alternative is not protective does not meet ARARs; is inconsistent with anticipated (*and feasible*) future land and groundwater use; and does not represent the maximum extent possible a permanent solution in a cost effective manner.

- a. Exposure pathways to contaminated media have been documented to be complete. Both the Proposed Plan and the RI/FS assert that there are “no complete exposure pathways for risk to human populations” based on the formally designated land use and existing institutional controls. However, this statement is contradicted by DOE’s own description of the 100-D/H Areas. Natural seeps are observed along the shoreline, in the riparian zone, associated with the early summer drop of the Columbia River water levels. These seasonal seeps represent secondary contaminant sources to the riparian zone.” The seeps are monitored by the DOE’s Public Safety and Resource Protection Program. None of the Alternatives address remediation of this complete pathway.
- b. YN ERWM believes there are areas of uncertainty within the groundwater modeling approach (STOMP-1D), and its application is inappropriate until all issues are resolved. The graded approach to evaluating groundwater protection and STOMP-1D modeling has many uncertainties (e.g., what criteria will be used to assess the validity of the Preliminary Remediation Goals [PRGs] as they apply to site conditions).
 - i. Application of this model for making cleanup decisions is inappropriate until all issues are resolved. (See Ecology staff memo regarding modeling; Attachments #3 and 7. YN ERWM joins in support of Ecology staff concerns and request concerns be treated as YN ERWM comments.)
- c. The most important deficiency in this alternative is the decision not to deal with the strontium-90 plume. Given that strontium was reported to be above the Drinking Water Standard in 38 percent of detected unfiltered groundwater samples in the 100-H Area, a more aggressive approach to the strontium is necessary. Using 44 years of recirculating pump-and-treat groundwater and monitored natural attenuation (MNA) does not seem prudent. The Columbia River is a discharge boundary for the aquifer system, and the unconfined aquifer is in direct communication with the river along the shoreline of 100-D/H. By their inter-connectedness, to ensure continuity of the Hanford site groundwater remediation efforts, treatment of Strontium-90 should also be included in the 100-D/H ROD GW remediation plan.
 - i. The YN ERWM Program request DOE revise the RI/FS and Proposed Plan action alternatives to incorporate proven treatment technologies, or technology that is supported by a full CERCLA Feasibility Study as the best alternatives to reduce volume, toxicity, and mobility of the strontium-90 contaminated groundwater. Any contamination that is mobilized as part of the proposed remedial actions should be contained, containerized, and disposed of according to the applicable legal requirements.
 - ii. There is also no provisional remediation plan (i.e., Contingency Plan) for strontium if MNA is found not to work.
 - iii. What contingencies are planned should the selected groundwater remediation remedy not meet RAOs as described for other COCs?

- iv. Clarify if short-term effectiveness evaluations for all alternatives were based on only the time to build/implement the remedy or if it includes the time to achieve all remedial action PRGs.
 - v. Clearly the discussions within these documents (and other reports; aquifer tube samples) supports the need to define the Columbia River adjacent to the Hanford site boundaries as an Operable Unit. YN ERWM program requests clarification as to what consideration is being given to establish an operable unit for the Columbia River.
- d. Groundwater discharges to the Columbia River via springs and areas of upwelling. Contaminant concentrations in some springs are above applicable water quality standards (as noted in DOE/RL-2013-18, Revision 0 Hanford Site Environmental Report for CY2012).
- i. Wells # 199-H4-5 and 15 A, B, C. should be in the RCRA TSD groundwater monitoring network for the 183 H unit as it is closely associated. See Attachment #9 comments regarding the groundwater monitoring and permit for the 183-H TSD unit. YN ERWM requests responses to comments on 183-H.
 - ii. Minimum Standards for Construction and Maintenance of Wells” (WAC 173-160 & -162), should be the ARAR regulations for the location, design, construction, and abandonment all 100-N Area wells.
 - iii. Ecology has consistently requested use of hexavalent chromium $K_d=0$ mL/g, based on field observations of chromium mobility and results of site-specific leaching and batch sorption tests. The Proposed Soil cleanup levels for Hexavalent Chromium to ensure protection of groundwater should be set at 0.2 mg/kg. This value is found using a K_d value of 0 mL/g and more accurately depicts movement of this contaminant through soils. Fate and transport simulations presented in DOE/RL-2010-98 should be recalculated using 0.0 K_d value. The YN ERWM Program requests the use of 0.0 K_d value and that concentrations in the groundwater and along the shoreline and the subsequent timeline should be re-evaluated for decline in concentration.
- e. Groundwater is not generally considered a primary source, yet the YN ERWM Program is concerned that any remedy reviews will not include appropriate sampling actions or technological systems review to confirm performance or to consider missing source area contaminants (i.e. the 100-D/H Area reactors/fuel basin plumes).
- i. Clarify how and demonstrate (using travel times, etc) that contamination from these COCs will be prevented downstream and/or from reaching the river in exceedence of the DWS, MCLs, AWQS.
- f. The YN ERWM Program requests EPA use of the new RfD value (0.0006) for Uranium by EPA’s Office of Drinking Water as the basis of the Maximum Contaminant Level for drinking water is noted in the Tri-Party approved comment resolution document attached to DOE letter (13-AMRP-0041) to EPA and Ecology, 11/21/2012. YN ERWM program also requests uranium be evaluated in the FS.
- g. Missing from the alternatives analysis are all of the co-extracted contaminants of concern. Antimony, arsenic, cadmium, carbon tetrachloride, chloroform, cobalt, copper, fluoride, gross alpha, gross beta, iron, lead, manganese, mercury, nickel, nitrate, nitrite, selenium, silver, strontium-90, sulfate, technetium-99, tetra-

chloroethene, thallium, tritium, uranium, vanadium, and zinc are COPCs that have been detected above the 90th percentile Hanford Site background level, risk based levels, or maximum contaminant levels (MCLs). The pump-and-treat alternatives all appear to be solely aimed at chromium reduction. The pump-and-treat alternatives fail to address any type of treatment of non-chromium contaminants, and don't plan for how these co-extracted contaminants will be treated and reduced before reinjection. The YN ERWM program requests clarification within the RI/FS/PP and preferred alternative of specific treatments for these co-extracted contaminants of concern.

- i. YN ERWM program requests Manganese be retained as a co-contaminant of concern as it exceeds DWS of 50ug/L and is measured at very close to surface water cleanup levels (i.e., 814ug/L)
 - ii. YN ERWM program does not support exclusion rationale for Iron and Zinc exceedances. Although they may be due to a function of the ISRM barrier, the chosen alternative includes continued use of the barrier and as such these should be evaluated in the FS.
 - iii. Anion discussion beginning on page 4-105 in RI/FS need text edits. Fluoride is referenced inappropriately in Nitrate/Iron evaluations.
 - iv. Concentration values for Tc-99 are inconsistent. Check pages 4-103 and 4-113. Clarify.
 - v. It is noted that both filtered and unfiltered samples were taken. YN ERWM program requests that all sampling data be reviewed and additional samples taken were only filtered samples were taken.
- h. The Preferred Alternative puts at risk the TPA groundwater cleanup requirements in Milestone M-016-110-T02.
- i. Potential data gaps noted in Table 2-1, RI/FS. YN ERWM program requests clarification as to whether the supplemental survey (as required by data gap #4) to be conducted at 100-D when remediation has been completed. If not identify when this will be done and potential affects to alternative selection, costs, etc.
- j. Nitrates are identified as co-contaminants and concurrently removed. YN ERWM program request details of their treatment are included in the PP and the ROD.
- i. Caution is appropriate if young children might be exposed, such as in the Nonresident Tribal scenario, because they are particularly at risk for methemoglobinemia, the critical effect for nitrate exposure (IRIS 2009).
- k. The Proposed Plan's Preferred Alternative 3 does not include all the required information: The Preferred Alternative does not include the required description of contingency measures that will be implemented should the remedial alternative monitoring show that the alternative is meeting remedial action objectives and performance criteria.
- i. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-98-031). The Proposed Plan and Preferred Alternative should incorporate remedial actions that will meet these thresholds and state explicitly the contingency measures and additional actions that will be taken should CERCLA monitoring demonstrate the Preferred Alternative has not worked as planned. YN

- ERWM requests DOE update the Proposed Plan to provide details for public review including cost of implementation of contingency measures.
- ii. Use of natural attenuation as a component of a groundwater remedy requires contingencies for additional or more active remedial actions to be incorporated that are triggered by specific contaminant concentration levels in the site groundwater monitoring network (or other criteria as appropriate).³ These contingencies were not developed or included in the RI/FS or the Proposed Plan.

6. Comments Regarding Human Health Risks:

The Yakama Nation Exposure Scenario was developed to describe a traditional subsistence lifestyle, including dietary patterns and seasonal activities. The lifestyle may result in exposure to radioactive and hazardous chemical contamination, now and in the future, from Hanford. The project resulted in a conceptual site model that was developed to illustrate potential exposure pathways from Hanford Site contaminant releases to not just soil and groundwater, but also plants (shoots, roots, leafy material, and berries), fish, and other animals such as wild game. Not only do these resources provide food and medicines, but also material for tools, shelter and accessories. The scenario isn't just for information and comparison, but it compiles information specific to the Yakama Nation to be considered in evaluating potential risk from contamination and to support *appropriate* cleanup decisions. Exposure parameters were estimated for inhalation, dermal contact, and ingestion of air, soil, water, fish, meat, vegetables, fruit, and milk, and reflect a current and anticipated subsistence lifestyle. The Yakama Nation expect that the scenario will be used to evaluate risk *comprehensively* for Hanford, incorporating all sources, radiological and chemical contaminants, exposure pathways, and natural resource uses.

There remains unacceptable risk to the YN tribal members from both chemical and radiological contaminants. Much of the risk assessments are based on the RCBRA and other supporting documents. In the Proposed Plan, PRGs are described as "PRGs are more specific than RAOs and establish acceptable exposure levels for specific contaminants and exposure pathways that are intended to be protective of HHE." However, since PRGs were not developed for any tribal scenarios they do not represent levels that are protective of tribal health. DOE should incorporate the YN Exposure Scenario into the risk assessments used to determine appropriate remedial actions. DOE should develop cleanup plans that are protective of human health & the environment, and allowing safe unrestricted Tribal uses.

The YN ERWM program requests DOE apply the Yakama Nation Exposure Scenario to develop cleanup levels protective of tribal members who will be living and utilizing the resources on the Hanford site, upland areas, nearshore, and Columbia River.

YN ERWM program request DOE include (for clarification) in RI/FS/PP how many sites would fail if the YN risk scenario were applied.

- a. Accumulated scientific evidence demonstrates that Native Americans are, as a statistical cohort, subject to the highest risk of disease and cancer from exposure to environmental contaminants. The Columbia River Basin Fish Contaminant Survey is a technical report that assesses the amount of chemical pollution in certain species of fish, and the potential health risks from eating fish those fish. The study is based on fish samples collected between 1996 and 1998 from tribal fishing waters in

³ EPA; Directive 9234.2-25

Washington, Oregon and Idaho. EPA funded the study which was coordinated by the four member tribes of the Columbia River Intertribal Fish Commission (CRITFC).

- i. Official recognition that Native Americans living near the Hanford site are the most vulnerable people to environmental contaminants, as underscored by EPA's Columbia River Fish Contaminant Survey. Adults in CRITFC's member tribes who eat fish frequently (48 meals per month) over a period of 70 years may have cancer risks that are up to 50 times higher than those in the general public who consume fish about once a month.
 - ii. One scenario utilized to calculate risk to YN Tribal members is incorrectly identified as non-resident use. Even as such, there remains unacceptable risk to the YN tribal members from both chemical and radiological contaminants. Much of the risk assessments are based on the RCBRA and other supporting documents (unapproved or has unresolved comments by the Tri-Party Agencies). See following excerpts (and risk values) from the RCBRA (River Corridor Baseline Risk Assessment Volume II, Part 1: Human Health Risk Assessment August 2011), the Proposed Plan, and 100-F & UI 2/6 RI/FS.
 - iii. Vol. II, Part 1: Human Health Risk Assessment August 2011 pg 7-34: For the Nonresident Tribal scenarios, the total cancer risk estimates exceed 10^{-4} and HIs exceed 1.0 for all ROD areas, mostly due to exposures that are associated with ingestion of plants assumed to be gathered from the Hanford Site. A large proportion of Nonresident Tribal cancer risk and HI is related to arsenic soil concentrations that are approximately equivalent to levels in areas unaffected by Hanford Site activities. When cancer risk estimates are calculated without the contribution of arsenic, the total cancer risk estimates still exceed 10^{-4} for all six ROD areas. The key risk drivers other than arsenic are technetium-99, carbon-14, strontium-90, benzo(a)pyrene, and Aroclor-1254, predominantly by the plant and game ingestion pathways.
 - iv. Because the Native American resident scenarios include very high food ingestion rates, strontium-90 continues to play a significant role in food-related exposures at year 2075.
 - v. By year 2150, Native American resident cancer risks above 1×10^{-4} are also dominated by arsenic exposure from ingestion of garden produce. Average arsenic concentrations at remediated waste sites range between 1.1 and 17.3 parts per million. Some of these arsenic concentrations exceed the Hanford Site background value of 6.5 parts per million (DOE/RL-92-24). However, all of the RME values for arsenic are less than the IAROD cleanup value of 20 parts per million, which is based on the MTCA Method A cleanup level. YN ERWM does not support the proposed cleanup value for arsenic. YN ERWM joins with Ecology staff in support of not using Method A. See Attachment#2.
- b. Tribal risk information from the Remedial Investigation/Feasibility Study indicates unacceptable ranges of over the allowed risk for cancer/ noncancer health effects. Native American scenarios indicate Tribal risks are greater than the EPA upper target risk threshold of 1×10^{-4} and HI of 1.
- i. Sections under 6.2.5.5 Summary of Risk Estimates by Exposure Scenario (RI/FS): This summary indicates that several interim closed out waste sites do not meet risk criteria and need additional remedial actions.

- ii. Table 6-13 indicates unacceptable radionuclide risk level exceedances in the shallow zone (outside the risk range of 1×10^{-4} to 1×10^{-6}) at multiple sites at waste sites; in particular the 118-DR-2-2 waste site for Technetium-99 and Strontium-90. This risk extends in the 100,000s of years. It is incomprehensible that DOE intends to do nothing to remediate the long-lived radionuclide Tc-99. Shallow zone is defined as fifteen feet or less and rather easily accessible by the public should IC fail. Additional remedial action is necessary for all waste sites which do not meet the risk range criteria.
 - iii. Table 6-14 indicates several wastes sites where additional remediation is necessary for all shallow zone waste sites not meeting the cancer risk criteria of less than 1×10^{-6} with a HQ of less than 1.
 - iv. Table 6-19 indicates several deep zone waste sites with radionuclide risk level exceedances. Deep is defined as below fifteen feet. Additional remediation is warranted at some waste sites & associated waste sites (e.g., 116-DR-1&2, 118-D-6:4, 100-D-49:2, 100-D-46, and 118-DR-2:2) given the projected time until risk is within acceptable ranges.
- c. Page 6-224 of the 100-D/H RI/FS states: The total cumulative ELCRs for the CTUIR and Yakama Nation for the 100-D Source exposure scenarios are 8.9×10^{-4} and 9.3×10^{-4} , respectively, when groundwater is used as a drinking water source. The total cumulative ELCRs for both Native American scenarios are greater than the EPA upper target risk threshold of 1×10^{-4} . The primary contributors to risk for the CTUIR scenario are arsenic, carbon tetrachloride, chloroform, tetrachloroethene, strontium-90, and tritium. The primary contributors to risk for the Yakama Nation scenario are arsenic, carbon tetrachloride, chloroform, tetrachloroethene, strontium-90, and tritium. The total HI for the 100-D Source exposure area is for both the CTUIR and Yakama Nation exposure scenarios.

The cumulative ELCR is 5.0×10^{-1} for the CTUIR scenario and 7.6×10^{-1} for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat lodge. The cumulative risk for the Native American scenarios is greater than the EPA upper target risk threshold of 1×10^{-4} . The individual ELCR values for cobalt and Cr (VI) are greater than the EPA upper target risk threshold of 1×10^{-4} . The HI for the 100-D Source exposure area is 99 for the CTUIR scenario and 205 for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat lodge, which is greater than the EPA target HI of 1. The primary contributors to the noncancer HI are Cr (VI), cobalt, nickel, and barium.

- d. Page (6-225) of the 100-D/H RI/FS states: The total cumulative ELCRs for the 100-H Source exposure area for the CTUIR and Yakama Nation exposure scenarios are 4.0×10^{-4} and 4.3×10^{-4} , respectively, when groundwater is used as a drinking water source. The total cumulative ELCRs for both Native American scenarios are greater than the EPA upper target risk threshold of 1×10^{-4} . The primary contributors to risk for the CTUIR scenario are arsenic, carbon tetrachloride, chloroform, strontium-90, technetium-99, and tritium. The primary contributors to risk for the Yakama Nation scenario are arsenic, carbon tetrachloride, chloroform, strontium-90, technetium-99, and tritium. The total HI for the 100-H Source exposure area is 3.3 for both the CTUIR and Yakama Nation exposure scenarios.
- The cumulative ELCR is 1.8×10^{-2} for the CTUIR scenario and 3.7×10^{-2} for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat

lodge. The cumulative risk for the Native American scenarios is greater than the EPA upper target risk threshold of 1×10^{-4} . The individual ELCR value for Cr (VI) is greater than the EPA upper target risk threshold of 1×10^{-4} . The HI for the 100-H Source exposure area is for the CTUIR scenario and for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat lodge, which is greater than the EPA target HI of 1. The primary contributors to the noncancer HI are Cr (VI), cobalt, nickel and barium.

- e. Page 6-226 of the 100-D/H RI/FS states: The total cumulative ELCRs for the horn exposure area for the CTUIR and Yakama Nation exposure scenarios are 5.7×10^{-4} and 6.2×10^{-4} , respectively, when groundwater is used as a drinking water source. The total cumulative ELCRs for both Native American scenarios are greater than the EPA upper target risk threshold of 1×10^{-4} . The primary contributors to risk for the CTUIR scenario are 1,2-dichloroethane, arsenic, carbon tetrachloride, chloroform, tetrachloroethene, trichloroethene, strontium-90, and tritium. The primary contributors to risk for the Yakama Nation scenario are 1,2-dichloroethane, arsenic, carbon tetrachloride, chloroform, tetrachloroethene, trichloroethene, strontium-90, and tritium. The total HI for the horn exposure area is 4.5 for both the CTUIR and Yakama Nation exposure scenarios. Cr (VI) is the primary contributor to the noncancer HI for the Native American scenario.

The cumulative ELCR is 4.9×10^{-2} for the CTUIR scenario and 9.9×10^{-2} for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat lodge. The cumulative risk for the Native American scenarios is greater than the EPA upper target risk threshold of 1×10^{-4} . The individual ELCR value for Cr(VI) is greater than the EPA upper target risk threshold of 1×10^{-4} . The HI for the horn exposure area is 14 for the CTUIR scenario and 29 for the Yakama Nation scenario when groundwater is used as a source of steam for a sweat lodge, which is greater than the EPA target HI of 1. The primary contributors to the noncancer HI are Cr(VI) and barium.

- f. The methodology used to assess risks for the RI/FS uses PRGs developed in the RCBRA (DOE/RL-2007-21).
 - i. The YN ERWM has outstanding issues with the use of River Corridor Baseline Risk Assessment and its 'sub-documents'[i.e. Tier 1 document for wildlife or the Tier 2 document for plants and invertebrates] as a major supporting document in cleanup decisions for the River Corridor Areas. These documents are not finalized or approved nor have our comments and concerns been addressed.⁴
 - ii. RCBRA (River Corridor Baseline Risk Assessment Volume II, Part 1: Human Health Risk Assessment August 2011): Volume II, Part 1: Human Health Risk Assessment August 2011, pg 7-34: For the Nonresident Tribal scenarios, the total cancer risk estimates exceed 10^{-4} and HIs exceed 1.0 for all ROD areas.
- g. Conservation/mining land use is as a part of the basis for the preliminary remediation goals (PRGs). YN ERWM program disagrees with this land use designation to develop PRGs. Yakama Nation Treaty rights guarantee (among other rights) use of

⁴ YN ERWM, February 28, 2011 letter to the Tri-Party Agencies (DOE-Matt McCormick, EPA-Dennis Faulk, and Ecology- Jane Hedges)

groundwater for sweat lodge activities. Groundwater is to be restored to its most beneficial use, which is drinking water standards (i.e. Method B, unrestricted land-use values). All PRGs should be calculated based on unrestricted land-use (at the very minimum.) YN ERWM has submitted previous comments on the development of the PRGs.

- h. Calculation of radionuclide PRGs based on use of a risk ELCRs of a 1 in 10,000 risk or radionuclide dose (15 mrem/year) is in opposition the EPA guidance which states the point of departure for risk is 1 in a million. The allowable target risk range is 1×10^{-4} to 1×10^{-6} but DOE continues to drive cleanup with the lowest level rather than initially striving to meet the highest standard of 1 in a million (1×10^{-6}). 1×10^{-6} is consistent with MTCA (WA States regulations) and it should be DOE's cleanup goal.⁵ As MTCA explicitly defines radionuclides as hazardous substances, the combined limit for radionuclides and chemicals should correspond to a lifetime cancer risk of 1×10^{-5} or less at the minimum.
 - i. Clarify the need for an additional evaluation of HH ELCR and hazards were performed when MTCA Method B would suffice.
 - ii. Exposure Point Concentrations (EPCs) were used to calculate the ELCRS and noncancer hazards. Frequently these EPCs resulted in deletion of COPCs when used to compare COCs against the applicable standard or risk-based concentration. What was the process used to validate the results from which the EPCs were derived? Please refer to our prior discussions of EPCs in response letter to Hanford Risk Assessments, etc.
 - iii. Years to attain mature plant revegetation is more correctly identified as a range of 80 to 100 years. Recalculate infiltration rates using this more appropriate range of years. Adjust Alternatives to incorporate these values to reflect a more accurate timeline in achieving remediation goals.
 - iv. Many PRGs have been inappropriately developed and uncertainties remain as these documents still require revision. Our concerns remain regarding the methodology used to calculate the EPCs. EPA's ProUCL methods were identified yet in some instances a 95UCL was not calculated (a maximum value used instead). Use of the max ignores most of the information in the data set.
 1. Example of EPC calculation issues: Agreed to use max for focused samples basically because there were not enough samples taken and they did not want to take more. In many waste site decision unit samples this response or a simple one was the justification for using the max concentration as the default EPC when in fact frequency of detection was 100% (4 samples taken). More samples should have been taken and the data processed to reflect a more accurate EPC. The following comment was made "Warning: This data set only has 4 observations. Data set is too small to compute reliable and meaningful statistics and

⁵ The 15 millirem per year (mrem/yr) dose limit used by DOE in the past is not protective enough; this dose equates to a lifetime cancer risk of 3×10^{-4} , which is three times the maximum allowable value under CERCLA. Note: If the EPA's own risk coefficients for radiation are used, it equates to a fatal cancer risk of more than 5×10^{-4} and a cancer incidence risk of 1×10^{-3} , which is well outside the CERCLA target range of 10^{-4} to 10^{-6} .)

estimates.” In this example, the data set for variable arsenic was not processed.

- v. When the number of measurements is small (e.g., $n < 5$) or the detection frequency is low ($< 5\%$), ProUCL ultimately recommends collection of more samples to compute defensible statistics.⁶ Collection of additional samples was not done. Some unremediated waste sites may have exceedances of PRGs, which would provide the basis for remedial action or further evaluation.

- i. These documents are basically ‘cookie-cutter’ documents, similar to the 100-F & 100-N Areas RI/FS/PP. As such, YN ERWM supports similar applicable Ecology comments on the risk assessment process (e.g., determination of EPCs, comparison of EPC to PRGs for elimination, etc) as indicated in Ecology’s comments on 100 D/H (Attachment #10/10a). EPA’s review of Ecology’s comments on these issues and our earlier correspondence on the RCBRA, etc would provide further clarification of YN ERWM concerns. See attachments #3, 4 & 5.
 - i. YN ERWM requests responses to concerns presented by Ecology staff as demonstrated in Attachments #2, 3, 4, 5, 6, 7, and 10/10a be included in response to direct YN ERWM comments [i.e. YN ERWM requests to know the disposition of Ecology staff comments as they are reflective of our similar concerns].

- j. A review of CVP documents for a number of waste sites raised concerns. Several indicate the use of outdated standards or as of yet agreed to (by the Tri-Parties) values (i.e. the 100 Area Analogous Sites RESRAD Calculations (BHI 2005a) to calculate non-radiological COCs, [e.g. copper, lead, selenium, TPH; Aroclor-1254]. Many state use of MTCA 1996 values or soil RAGs based on “100 time groundwater cleanup rules and 100 times dilution attenuation factor times surface water quality criteria. Provide a more detailed explanation of the review of all CVPs including the comparison process and whether additional characterization and/or sampling was performed for those CVPs where filtered sampling results, etc where utilized. Adjust the need for addition site-specific remediation as warranted.
 - i. YN ERWM requests responses to concerns in Attachment #7.
 - ii. The YN ERWM Program does not support “backsliding” on any of the more stringent IROD cleanup values.

- k. Text (Proposed Plan table: *Summary of 100-D/H OU Proposed Soil Cleanup Levels Based on Human Health, Groundwater Protection, and Surface Water Protection*

⁶ quotes from EPA sources, supporting use of the 95% UCL: 1) Dec 2002 OSWER 9285.6-10 (<http://www.hanford.gov/dqo/training/ucl.pdf>) “It is important to note that defaulting to the maximum observed concentration may not be protective when sample sizes are small, because the observed maximum may be smaller than the population mean. The use of the maximum as the default EPC is reasonable only when data samples have been collected at random from the exposure unit and sample size is large” (p. 20). 2) ProUCL Ver. 3.0 (Singh et al, 2004) (<http://www.epa.gov/nerlesd1/tsc/images/proucl3apr04.pdf>)

“It is recommended that the maximum observed value NOT be used as an estimate of EPC....It should be noted that for highly skewed data sets, the sample mean indeed can even exceed the upper percentiles (e.g., 90%, 95%), and consequently, a 95% UCL of the mean can exceed the maximum. This is especially true when dealing with log normally distributed data sets of small sizes” (page 55).

PRGs) within the document identifying 20 mg/kg for arsenic as an unrestricted land use clean up value is misleading. It implies Washington State Department of Ecology concurrence with use of this value on the Hanford site as background. The 20mg/kg cleanup level is the WAC 173-340 (1996) Method A value.

- i. The YN ERWM Program believes it is incorrect to apply Method A on the complex Hanford site as it is used for sites which contain a small number of hazardous substances. We cite Ecology staff memo dated July 25, 2013. See Attachment #2.
 - ii. Its application (20mg/kg) has resulted in residual levels for arsenic which do not reflect the Unrestricted Land Use Soil Cleanup Standards WAC 173-340-740(3)) 2007 Method B value (0.67 mg/kg) and the MTCA ("Deriving Soil Concentrations for Groundwater Protection" [WAC 173-340-747(3)(a)]), groundwater protection value (0.00737 mg/kg) cleanup values (which would default to site background levels of 6.5mg/kg). The proposed 20 mg/kg value for arsenic exceeds the 1×10^{-6} individual cancer risk based on the MTCA.
 - iii. In simple terms, the risk analysis showed that casual users of the River Corridor as it is have low enough risk to be safe. However, all of the residential user scenarios have unacceptably high risk. Some of the risk was associated with uranium, mercury, chromium, cadmium, and radiological contaminates. But a major part of the high risk levels found in the residential scenarios is from consumption of arsenic contaminated plants, animals and water. A large proportion of Nonresident Tribal cancer risk and HI is related to arsenic soil concentrations that are approximately equivalent to levels in areas unaffected by Hanford Site activities. When cancer risk estimates are calculated without the contribution of arsenic, the total cancer risk estimates still exceed 10^{-4} for all six ROD areas.
 - iv. While much of the arsenic is assumed to be from pre-Hanford agricultural practices, there was a portion that could be attributed to Hanford operations. That amount of the Hanford process arsenic load should be determined, and the cleanup of that arsenic should be a part of the Hanford cleanup plan.
 - v. YN ERWM questions the statement on page 6-226 of the RI/FS wherein it is implied that arsenic is considered only naturally occurring on the Hanford site while elsewhere you identify it as a known soil applicant and used by DOE. Clarification is requested.
- l. The Proposed Soil cleanup levels for Hexavalent Chromium to ensure protection of groundwater should be set at 0.2 mg/kg. This value is found using a Kd value of 0 mL/g and more accurately depicts movement of this contaminant through soils. YN ERWM program requests fate and transport simulations presented in DOE/RL-2010-98 be recalculated using 0.0 Kd value. Concentrations in the groundwater and along the shoreline and the subsequent timeline for decline in concentration re-evaluated.
 - m. The YN ERWM Program disagrees with the statement "As a result, risks are overstated because the UCL and the EPC do not take credit for the existing clean backfill that covers the remediated waste site." Risk from remaining contamination is what is supposed to be evaluated; YN ERWM requests this text be deleted.

- n. Alternatives should be identified to establish remedies which meet or exceed the combined excess lifetime cancer risk level of 1×10^{-5} . PRGs for individual radionuclides based on a 1×10^{-4} target cancer risk are not supported by EPA guidance as outlined in bullets below.
- i. EPA's Regulatory risk 'Point of Departure' (target risk cleanup value) is 1×10^{-6} . Although a risk range of 1×10^{-4} to 1×10^{-6} is permissible, to state that the 'regulatory risk target threshold of 1×10^{-4} ' has met is misleading to the public. Edit language throughout document to clearly clarify that the preferred risk target is 1×10^{-6} . Based on the requirements of MTCA and CERCLA regulations the radiological and nonradiological cancer risks should be combined and compared to the standard that Washington State has determined is protective of human health. This standard has an upper limit of lifetime risk for combined carcinogens of 1×10^{-5} .
 - ii. While the USDOE's practice has been to apply MTCA risk requirements only to nonradiological contaminants, MTCA defines radionuclides as hazardous substances. Although MTCA does not include cleanup levels for individually named radionuclides, it clearly states that "radionuclides are hazardous substances under the act." [Washington Administrative Code (WAC) 173-340-200]. Radionuclides are carcinogens, and MTCA defines the maximum allowable incremental cancer risk level for individual carcinogens as 1×10^{-6} . It defines the maximum allowable incremental lifetime cancer risk level for multiple carcinogens and multiple exposure pathways as 1×10^{-5} .
 - iii. MTCA's inclusion of both chemicals and radionuclides in assessing cancer risks is consistent with U.S. Environmental Protection Agency (USEPA) guidance on establishing cleanup levels for CERCLA sites with radioactive contamination (USEPA, 1997). That guidance states that:
 1. The USEPA is aware of "no technical, policy, or legal rationale for treating radiation risks differently from other risks addressed under CERCLA."
 2. The USEPA uses a consistent methodology for assessing cancer risks at CERCLA sites no matter the type of contamination.
 3. The USEPA classifies radionuclides as known carcinogens.
 4. Cancer risks for radionuclides should generally be estimated using the slope factor approach.
 5. Cancer risks from radiological and non-radiological contaminants should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants.
 6. Note: Radiation exposure risk from the National Academy of Sciences (BEIR VII Report, 2005), from which acceptable risk levels are supposed to be updated, indicates 15 millirem of annual exposure is projected to cause a lifetime cancer risk of 8 fatal cancers in adults for every 10,000 exposed – this is 8 times the CERCLA maximum risk level and 80 times the state MTCA level. Annual exposure values would be more representative if reduced to approximately 5 millirem.

- o. YN ERWM has reviewed in detail the comments of the Washington State Department of Ecology submitted on the 100-D/H Area RI/FS documents and join in their comments (as supplemented by this submission. We particularly highlight and join the comments regarding human health and ecological risk and groundwater modeling. These are attached and YN ERWM requests responses to issues raised by Ecology staff as they are reflective of our concerns.⁷
 - i. The YN ERWM disagrees with many of the scientific management decision point (SMDP) reasons given for elimination of a waste site from the being carried forward into the FS. A review of this process is requested.
 - 1. Example: *There is ample unaffected habitat for terrestrial invertebrates available in adjacent area and along the River Corridor. For plants, if adverse effects did occur, habitat fragmentation in the Source OUs would not be likely given the current level of ecological services the habitat is providing in the current condition and the available habitat refugia nearby.*
 - ii. The YN ERWM request additional clarification of RBSL development and use as screening values for convenience in evaluation of deep zone contamination. RBSL are industrial in nature and we question their validity/usefulness as measures of impact to residential groundwater Method B cleanups.
- p. YN ERWM requests all sites with the status of 'no further action' and requiring IC for deep soil zones be evaluated against current MTCA 2007 standards, while not backsliding from previously more stringent IROD cleanup values.
- q. YN ERWM disagrees with Ecology position to allow alternative cleanup levels for hexavalent chromium above 2 mg/kg to be applied to the excavated area of the Waste Site 100-D- 104 for the sidewall samples collected along its southeast wall from 65 feet to groundwater.⁸ This site (and waste sites 100-D-30 and 100-D-100) was specifically identified in the RI/FS document as needing additional material removal. This is an reduction in a cleanup standard and should not have occurred. The YN ERWM requests additional remediation be performed at the 100-D-30 (and other noted sites) to meet cleanup standards of at least 2mg/kg.
- r. YN ERWM requests DOE include in the Proposed Plan tables that list the interim cleanup values and the final cleanup values for each contaminant.
- s. YN ERWM requests response: Was there an evaluation and cost analysis done regarding impacts of EPA's new ruling on remediation of coal ash for the 100-D Area coal ash sites and what was the determination? None of the alternatives included this new ruling. See Attachment #11.

⁷ Ecology letter 13-NWP-025 to Briant Charboneau, DOE-Richland Operations Office dated March 12, 2013 regarding the *Remedial Investigation/Feasibility Study for the 100-DR-1/2, 100-HR-1/2, and HR -3 Operable Units*, (DOE/RL-2010-95), *Draft A and Proposed Plan for Remediation of the 100-DR-1/2, 100-HR-1/2, and HR -3 Operable Units* (DOE/RL-2011-111, Draft A). (See Attachment #1)

⁸ Ecology letter 13-NWP-1 10 to Mr. Mark S. French, Federal Project Director Richland Operations office dated October 24, 2013 regarding application of alternative standard of 6 mg/kg for hexavalent chromium.

7. **Orchard Lands:**

The Proposed Plan makes little mention of waste sites to be addressed under a separate CERCLA decision as a part of the Orchard Lands OU. The only clear language for discussing the relationship between the 100-D/H scope and the Orchard Lands is found in Section 4.1 pages 4-2 to 4-4 in the RI/FS. Similar language needs to be included in the PP to discuss the overlap between these two projects.

The RI/FS makes the statement “An RI of the 100-OL-1 OU will be conducted to determine if actions are needed to mitigate potential environmental or human health impacts. If results from the RI indicate a need for action, an FS will be conducted to identify and evaluate a range of remedial alternatives.” Clarifying text needs to be inserted regarding the evaluation of impacts to known/unknown cultural resources within the Orchards Lands OU.

- a. The YN ERWM disagrees with suggested approach with regards to not chasing waste site contamination COCs into ‘orchard land’ waste sites or vice versa. This approach is not in alignment with the observational approach and risks leaving unacceptable levels of contamination (see page 4-2, line 38-40).
- b. The YN ERWM provided unofficial comments on the 100-OL-1 OU draft workplan and has yet to receive a response (see Attachment #8). We request a response to these comments concurrent with those for the 100-D/H documents.
- c. There seems to be a discrepancy between Figures 1-4 and 1-5. Please clarify.

8. **General Comments on Principal Threat Wastes & Current and Future Exposure Scenarios:**

- a. It is unclear in the discussion of the Alternatives why there is no treatment included for long-lived the identified radionuclide of technicium-99. Clarify in this section and also in the Alternatives discussions.
- b. Scope and Role:
A holistic approach would ensure that protective decisions are made for the site in its entirety. We disagree with exclusion of contaminants emanating from offsite. The Preferred Alternative does not include an evaluation of contribution from other sources (i.e. the D/H Reactor plumes) nor does it include upgradient contaminant sources.
 - i. YN ERWM Program recommends the 100-N Area ROD includes a detailed schedule for completion of the reactor removal, and the event that removal does not occur, a contingency to address the remaining soil contamination.

9. **General Comments on the Remedial Action Objectives:**

- a. The purpose of Remedial Action Objectives (RAOs) is to explain and address site risks and to include an action (and specifics/details) to be taken achieve the objective. RAOs are the measurement tools for evaluating the success of the ROD remedy during the CERCLA 5 year review process. Without a specific action, the metrics for measurement are filled with subjectivity and uncertainty.

- i. Four of the five (5) RAOs do not have a definitive task or standard to be met. An Example of a specific action to include using RAO#3: Prevent COCs migrating and/or leaching through the soil that will result in groundwater concentrations exceeding federal and state standards and risk-based thresholds for protection of surface water and groundwater *by treatment of the contaminated soils or RTD.*
 - ii. Clarify all RAOs with specific action(s) to be performed and/or standard(s) to be met.

- b. Calculation of radionuclide PRGs based on use of a risk ELCRs of a 1 in 10,000 risk or radionuclide dose (15 mrem/year) is in opposition the EPA guidance which states the point of departure for risk is 1 in a million. The allowable risk range is 1×10^{-4} to 1×10^{-6} but DOE continues to drive cleanup with the lowest level rather than initially striving to meet the highest standard of 1 in a million (1×10^{-6}). 1×10^{-6} is consistent with MTCA (WA States regulations) and it should be DOE's beginning remediation point and ultimate cleanup goal.

- c. Cleanup levels (i.e., PRGs) should reflect the current MTCA Method B standards and in cases where they are less stringent than before, there should be no back-sliding from previous cleanup commitments in the Proposed Plan or RI/FS.
 - i. YN ERWM Program requests the following edits to Proposed Plan Table: *Summary of 100-D/H OU Proposed Soil Cleanup Levels Based on Human Health, Groundwater Protection, and Surface Water Protection PRGs* and in corresponding RI/FS table(s): Note Table needs to define PRG units/values(mg/kg):. Delete the column titled "No Irrigation", cleanup should be to unrestricted (including irrigation) use:
 1. Arsenic = 6.5mg/kg (direct contact)
 2. Barium=1,600mg/kg (soil protective of groundwater)
 3. Hexavalent Chromium=0.19 mg/kg (soil protective of groundwater)
 4. Nitrogen in Nitrate=40 mg/kg (soil protective of groundwater)
 5. Mercury=2mg/kg (soil protective of groundwater)
 6. Pu-239/240=23.5*
 7. Thorium-228=2.2*
 8. Thorium-232=2.2*
 9. Tritium=241*

* Note: Proposed PRG "backslides" from current IROD for RCRA TSD.

- d. YN ERWM Program requests the following edits to Proposed Plan Table: Summary of 100-D/H OU Proposed Soil Cleanup Levels Based on Human Health, Groundwater Protection, and Surface Water Protection PRGs) values(mg/kg): Note Delete the column titled "No Irrigation", all cleanup should be to unrestricted use (with irrigation):
 - i. Strontium-90=0.35 pCi/L⁹

- f. Include the following RCRA COCs/PCOCs. As historical COPCs but since their presence was not associated with a specific location or trend and the analytical methods deemed not of sufficient accuracy, they were eliminated from the risk

⁹ Nez Perce Tribe' July 15, 2010 letter to Matt McCormick regarding DOE/RL-2009-54, Rev O; Proposed Plan for Amendment of 100-NR-1/NR-2 Interim Action Record of Decision

characterization. YN ERWM program does not support elimination of COPCs based on these assumptions.

- i. Arsenic
- ii. Antimony
- iii. Barium
- iv. Cadmium
- v. Carbon tetrachloride
- vi. Cobalt
- vii. Copper
- viii. Lead
- ix. Nickel
- x. Silver
- xi. Zinc

- g. More clarification is needed on how cleanup levels will be adjusted to account for waste site-specific residual contaminations and for sites with multiple residual contaminants. The same is needed for evaluation of groundwater exceedances.
- h. Clarification and inclusion of information is need in the Proposed Plan and analysis of the appropriate alternatives in several areas:
 - i. Cost analysis for required well-conceived plans for performance monitoring that identify and correct potential failures and plans for maintenance and repair, including possible total system replacement is missing (NRC, 2000). This level of planning, both technical and financial (i.e., costs, does not appear to have been included in the Proposed Plan or the analysis of alternatives).
 - ii. The Preferred Alternative (or Proposed Plan) does not include the required description of the contingency measures that will be implemented should the monitoring show that natural attenuation is unable to achieve the cleanup goals. Conditions that would trigger the contingency should also be specified (e.g., continued plume migration or contaminant levels are well above levels predicted for a specified time) (EPA 540-R-98-031). Update and provide details in the Proposed Plan for public review including cost of implantation of contingency measures.
 - iii. Design elements for Alternatives selection should be described in sufficient detail in the Proposed Plan so that the public can evaluate and comment on the proposal (EPA 540-R-98-031). The Proposed Plan provides the foundation for the ROD to defer the final technology selection to the remedial design phase. Implied design changes (e.g., through the RD/RA work Plan) or design studies for implementation of the remedy need more discussion within the Proposed Plan. Any associated costs should be included in the Proposed Plan.
 - iv. It is unclear if any of the Alternatives were evaluated against the nine balancing criteria based on what happens with transition to Long-term Stewardship prior to completion of remediation under the Record of Decision (e.g., Was a cost benefit analysis of remedy costs including long-term stewardship costs done?) The environmental consequences of doing this action or not doing it have not been evaluated. It is unclear how any of the Alternatives can ensure compliance with the balancing criteria with transition into Long-term Stewardship. These analyses

should be done as this action will clearly need to be reflected and integrated into the final ROD.

- v. See additional comments in Cultural & Alternative Evaluation sections.

10. General Comments on Void Filling:

- a. Discussion of details of void fillings should be included in the ROD per EPA guidance and the RCRA permit not within the RDR/RAWP. Include this statement in the Proposed Plan for clarification.
- b. Clarify if there are pipelines at deeper depths which will not be removed. Include this information in the Proposed Plan.

11. NEPA:

The relationship of NEPA and NEPA values to related information is not clearly presented. While Table 10-7 identifies the NEPA Values evaluated in relationship to the Alternatives presented, more clarity and discussion is needed to clarify that some of the required assessments supporting NEPA values that are not yet made until after the RI/FS is approved. The statement, "NEPA values were incorporated into the assessment conducted as part of the FS" gives the impression that NEPA values were done in the FS, and that is the end of NEPA values. Many of NEPA values are incorporated and enforce implementation of applicable laws and regulations into later phases of the CERCLA documentation process, including the ROD and RD/RAWP. Correct text and provide reference in RI/FS where these applicable laws and regulations are to be discussed and how they will be applied. The CERCLA law requires long-term positive impacts of remediating the applicable waste sites; otherwise there would be no need to remediate.

Rewrite for clarity and include discussion that some of the required assessments supporting NEPA values are not yet made until after the RI/FS is approved. The statement, "NEPA values were incorporated into the assessment conducted as part of the FS" gives the impression that NEPA values were done in the FS, and that is the end of NEPA values. This is totally incorrect. Many of NEPA values are incorporated and enforce implementation of applicable laws and regulations into later phases of the CERCLA documentation process, including the ROD and RD/RAWP. For example, applicable cultural, historic, and ecological resources are evaluated for, and implemented through *Hanford Cultural Resources Management Plan* (DOE/RL-98-10) and *Hanford Site Biological Resources Management Plan* (DOE/RL-96-32) at a time closer to the actual remediation activities. Rewrite the Proposed Plan to reflect these changes.

12. General Comments on Future Interim ROD changes:

Future Interim ROD changes: Incorrect statement made: "There will be a period of time between when the final action ROD is approved and the required RD/RAWP is prepared and issued. During this period, DOE-RL plans to continue remedial activities, such as waste site RTD. In order for these actions to be consistent with the final action remedy selection, the current interim action RD/RAWPs will be modified using the TPA (Ecology et al., 1989a) change notice process to include the final cleanup levels specified in the final action ROD when it is issued."

The CERCLA process for changes in cleanup values in a ROD requires, at a minimum, an Explanation of Significant Difference (ESD) and maybe a ROD amendment. The TPA cannot circumvent the required CERCLA process. YN ERWM expects review opportunities.

13. Corrective Action:

Text throughout the Section (an elsewhere in document) poorly communicates closure requirements for RCRA TSD units and the proper integration of corrective action for past practice units. Corrective action (WAC-173-303-64620) is for past practice units and not for Treatment, Storage, and Disposal units (TSDs). TSDs use WAC 173-303-610 for closure not corrective action (-64620).

Rewrite text to more clearly state 1) closure plans for TSDs are necessary for integration. This authority comes from the Site-wide permit not the RI/FS, and 2) the intent of the Tri Parties' CERCLA remediation at the Hanford Site is to fulfill the corrective action requirements at the Site for past practice units remediated under CERCLA authority. Include citation referencing Sitewide Permit II.Y.1 corrective regulatory citations in text discussions.

Attachment #2:
Attachment #3:
Attachment #4:
Attachment #5:
Attachment #6:
Attachment #7:
Attachment #8:
Attachment #9:
Attachment #10/10a:
Attachment #11: