Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

October 2, 2012

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U.S. Environmental Protection Agency
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Re: Yakama Nation Comments on *Columbia River Component Risk Assessment, Volume I: Screening-Level Ecological Risk Assessment,* DOE/RL-2010-117 Rev. 0 (June 2012) and *Columbia River Component Risk Assessment, Volume II: Baseline Human Health Risk Assessment,* DOE/RL-2010-117 Draft A (December 2011) 1215566

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Dear Mr. McCormick, Mr. Faulk, and Ms. Hedges:

The Yakama Nation has reviewed the U.S. Department of Energy's (DOE) document DOE/RL-2010-117 Volumes I and II, the Columbia River Component (CRC) Risk Assessment, Screening-Level Ecological Risk Assessment (SLERA) and Baseline Human Health Risk Assessment (BHHRA). We reviewed Draft A and Revision 0 of Volume I and Draft A of Volume II; as yet, we are unaware of a Revision 0 for the BHHRA.

The Yakama Nation is concerned that this document does not truly provide a baseline risk assessment and does not provide a complete evaluation of the risks that a Tribal member or ecological receptor could encounter on the site. Limited and selective characterization data, simplified scenarios of future use, no aggregation of upland and aquatic environmental risks, and unrealistic assumptions about indefinite, unfailing institutional controls of source contamination limit the utility of the risk assessment in supporting cleanup decisions. Furthermore, cleanup decisions are being made based on this incomplete assessment, including the current decision by DOE to not conduct remedial actions within the river itself. The SLERA is only screening-level with no further assessment plans and the BHHRA is not truly baseline. A baseline risk assessment is necessary to support subsequent selection of appropriate cleanup actions (EPA Risk Assessment Guidance for Superfund, 1989).

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We agree with many of the comments provided by U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) on the draft documents. We also agree with the Oregon Department of Energy (ODOE) that "problems with the study design; arbitrary inclusion or exclusion of data... and other issues" results in unsupportable risk conclusions (letter dated March 16, 2012). While the ODOE comment was made on Volume II (BHHRA), the same general approach for selecting and evaluating data was used for assessing risks to human health and ecological receptors and, therefore, also applies to Volume I (SLERA). It is unclear, however, why DOE used a different set of the data for each of the two risk assessments (Volumes I and II).

While we appreciate some improvements that were made in Revision 0 (Volume I), for example, including porewater data in the assessment and other corrections and modifications noted in the review matrices (DOE response to EPA and Ecology comments attached to the cover letter for Revision 0), many issues remain. Attached to this letter are the Yakama Nation's major comments on the CRC risk assessments, Volumes I and II, and recommendations to accurately assess baseline risks and be fully protective of tribal members and ecological receptors when making cleanup decisions. Many of these issues were introduced in our prior comments submitted on the *Data Summary Report for the Remedial Investigation of the Hanford Site Releases to the Columbia River,* Revision 0 (WCH-39),[1] which provided the data used in the CRC risk assessments. Our attached comments relate to:

- Data exclusions and limitations
- Reference site comparisons
- Toxicity thresholds / screening criteria
- Contaminant source identification
- Comprehensive risk evaluation
- Yakama Nation exposures and risks

Hanford's high-level, transuranic, low-level, and mixed radioactive wastes; nuclear facilities; proposed waste treatment operations; and contaminated soil, water, and biota pose threats to the Yakama Nation, the health of our people, and the vitality of our traditional subsistence lifeways. To protect Yakama Nation uses, all contaminant sources, migration, and hazards should be identified based on actual human and biological behaviors and assessed together to support appropriate cleanup decisions. The Yakama Nation continues to support adopting a holistic approach to assessing risks at the site, which incorporates interactions between multiple stressors projected over long timescales and over large areas, and integrates wellness related to the physical, mental, social, and ecologic well-being of Native Peoples.

[1] http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1107060712

I appreciate your consideration and look forward to resolution of our concerns.

Sincerely,

Russell Jim
ER/WM Projects Manager

Attachments

cc: RHW Committee
Phillip Rigdon, YN
Gabe Bohnee, NPT
Stuart Harris, CTUIR
Ken Niles, OR-DOE
Administrative Record

Yakama Nation Comments on:
***Columbia River Component Risk Assessment, Volume I: Screening-Level Ecological Risk Assessment* (DOE/RL-2010-117 Rev. 0)**
And
***Columbia River Component Risk Assessment, Volume II: Baseline Human Health Risk Assessment* (DOE/RL-2010-117 Draft A)**

These comments pertain to Volume I Revision 0 (and Draft A, where comments still apply) and Volume II Draft A; as yet, we are unaware of a revision for Volume II. Similar to the River Corridor Baseline Risk Assessment (RCBRA), the Columbia River Component (CRC) Screening-Level Ecological Risk Assessment (SLERA, Volume I) and Baseline Human Health Risk Assessment (BHHRA, Volume II) inappropriately blend risk assessment with risk management. Management decisions eliminate sources of potential risk before they can be fairly assessed. A more conventional risk assessment should evaluate more contaminants of potential concern (COPCs), greater risk factors associated with many of the COPCs, and a more comprehensive assessment of the risks to Tribal people and natural resources in the Columbia River. Our major comments are discussed below, many of which have also been identified by the U.S. Environmental Protection Agency (EPA)[2] and the Washington State Department of Ecology[3] (Ecology) on Draft A (and which still apply to Rev. 0).

1. Data Exclusions and Limitations

Since the SLERA and BHHRA rely on data presented in the Data Summary Report (DSR) for the Columbia River (WCH-39), our issues noted previously on the DSR[4] still apply. Key issues related to the data presented in the DSR and applied in the SLERA and BHHRA include:

- The number of samples collected in the Columbia River was low compared to the area of interest, particularly with many of samples being collected in proximate groups.
- Samples were collected in targeted areas (non-random); yet were not collected in locations of past sources to the river, such as the old cooling water discharge diffusers.
- Sample data from the "right side" of the river were excluded in the assessment.
- All contaminants of potential interest were not measured in all samples.
- Some analytical detection limits exceeded the screening thresholds.
- The analysis of uranium isotope data to estimate total concentrations was incomplete.

These limitations in the data make it difficult to ascertain the true extent of potential risks in the river. A quick "spot" check of the data used in the SLERA revealed minor errors that suggest the need for better quality assurance / quality control of the data to ensure that they are accurate for application in the risk assessment. For example, PCBs in the Lake Wallula sediments were identified in Section 8.4.1.3.8 of Draft A at concentrations

[2] http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1112281628
[3] http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1112281624 and http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1203200659
[4] http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1107060712

of 0.000336 mg/kg, citing DOH (2005) as the reference. However, the DOH source states that PCBs were undetected in those samples at a detection limit of 33 μg/kg (i.e., 0.033 mg/kg). Although DOE responded to Ecology's comment on PCB Aroclors (comment #65), text describing PCBs as a COPC was removed altogether in Revision 0, which presents another question (why).

In addition, the data used in the BHHRA are different than those used in the companion SLERA, with no clear explanation of the differences. Some of the differences seem substantial, for example, selecting different ranges of historical data to include; while others are more subtle, for example, differences in the number of Remedial Investigation (RI) island soil samples that were used in the two risk assessments. Substantially fewer RI samples of sediments and water, and apparently slightly fewer fish, were selected for the BHHRA compared to the SLERA. It is unclear why a different data set was used between the two risk assessments and also presents a challenge in comparing the approaches used for the two assessments.

2. Reference Site Comparisons

Sample concentrations measured in the Hanford Reach were screened against concentrations found in the reference areas to eliminate COPCs. This was done prematurely prior to a toxicity screen in the SLERA and reduces the number of contaminants evaluated for toxicity; as such, this results in a reduction in the associated estimates of risks to ecological receptors. A risk assessment should first determine whether risk exists from the presence of any and all substances in the exposure area. If risks are found, comparisons to reference data may be appropriate for some substances to help identify sources and determine the feasibility of risk reduction. Although the BHHRA did not eliminate contaminants as COPCs based on comparison to reference areas, such comparisons were used to infer that the source(s) of any contaminant measured at concentrations similar to the reference areas were not Hanford related. As discussed below, this inference is not correct.

Reference comparisons are only valid if it can be shown that the reference locations are ecologically comparable to the site and are not impacted by contamination from the site. Differences in habitats and sediment grain-size among the sampled locations should be considered (e.g., behind dams versus main channel) in determining ecological comparability. The agriculture return flows sampled as reference sites in the SLERA are known to be contaminated (although from other sources). Despite the findings of the supplementary analysis of the wasteways and irrigation return data conducted in the SLERA Revision 0 (Appendix I), the fact remains that these samples are inappropriate for use as reference samples since they do not provide a reasonable comparison to baseline conditions. Once appropriate reference locations are identified for comparison to site data, the identification of a contaminant from another source does not suggest that Hanford is not also a source. Some contaminants, such as PCBs, are known to have been released at the Hanford site as well as elsewhere.

Finally, the statistical comparisons made among the data may be based on flawed tests. Sampling in many areas did not appear to be based on randomly selected samples.

Although DOE responded to Ecology comment #5 that "the resulting data can be classified as sufficiently random," it is unclear what is meant by sufficient. Statistical tests designed for normally-distributed randomly-collected data may yield erroneous results when applied to non-random data.

3. Toxicity Thresholds / Screening Criteria

The SLERA discusses and repeatedly refers to the toxicity reference concentrations used in the data screening as No Observable Effects Concentrations (NOEC s) or *de facto* NOECs. However, a number of the toxicity benchmarks, such as the Federal Ambient Water Quality Criteria (AWQC), are derived from combining the results of numerous studies and are considered to be protective of most, but not all, exposed biota. The use of the NOEC term is misleading and should be limited to situations where species- and substance-specific NOECs were actually used; the proper name of the toxicity criteria that were used in all other instances and the protectiveness of those values should be clearly identified and critically discussed. For example, some of the "NOECs" were selected from non-standard sources, including DOE Hanford-specific sources, which were not as low (protective) as other values found in the literature and more commonly used in risk assessments. In comments to DOE on Draft A,[5] Ecology identified a recent paper from European researchers that recommended a much lower threshold (dose limit) for radioactivity, for example, than was used for developing radiological thresholds in the SLERA.

Ecology also commented on some NOECs that were derived by applying an uncertainty factor to a "lowest observable effects concentration" (LOEC) or lethal concentration for 50% of the population (LC50); DOE used a much smaller uncertainty factor (by an order of magnitude) than is recommended by EPA. This resulted in higher (less protective) concentrations for the derived NOECs used in the SLERA. In the review matrix of Ecology's comments (#36), DOE explains this as being "consistent with EPA Region 10 guidance" but does not cite which guidance.

A comparison of thresholds to those used at other Superfund sites indicated that the sediment screening criteria used in the SLERA were higher (less protective) than those used in the downstream Portland Harbor Superfund Site for a number of contaminants. The SLERA used the higher LOEC values instead of NOECs to screen the fish data, thus potentially underestimating the risks to fish. The SLERA also used LOECs as additional screening thresholds for other media as part of a "refined" screen, which eliminated even more contaminants from being assessed for ecological risk. This screening step is not appropriate and the LOECs have similar issues as the NOECs described above.

In the uncertainty section, the SLERA should discuss the fact that for many contaminants, toxicity data are limited, especially for the types of effects that have been assessed in the species and in the number of species that have been tested. These limited data create a substantial uncertainty as to the protectiveness of the toxicity thresholds used for comparison in the screening. The lowest available threshold may not be truly

[5] http://www2.hanford.gov/ARPIR/index.cfm?content=findpage&AKey=1112281624

representative of all risks to the important species that are being exposed in the Hanford Reach. The text should note the limitations of the data used to derive toxicity thresholds.

4. Contaminant Source Identification

The SLERA and BHHRA are based on an inadequate consideration of contaminant sources. The source of a COPC should be considered during the risk management phase of the cleanup process; the total risks from exposure to all COPCs, regardless of source, should be presented in the risk assessments. Without a much more substantial analysis, the importance of any contaminant shown to cause risk in the Columbia River scenarios should not be discounted at this point. Contaminants that pose risk but that were not fully assessed because DOE considered a Hanford source unlikely included petroleum hydrocarbons, PCBs, and copper. These substances are known to have been released at Hanford. Rather than discounting these data, DOE should review the information to ensure that there are no data gaps and commit to further investigations of whether sources of these COPCs might be located at Hanford.

5. Comprehensive Risk Evaluation

The SLERA and BHHRA need a more comprehensive discussion comparing the concentrations of the COPCs among the different media at different locations. As outlined in the conceptual site model, the concentrations in the water, sediment, and biota are all related to each other; thus, such a discussion would help clarify the contaminant transport to better understand the connection between sources and exposures. This discussion should include data from the "right bank" to provide a picture of the whole river and its relationship to potential Hanford releases.

Similarly, the risk assessments need a more comprehensive discussion of the distributions of the COPCs by location in the river, i.e., how many different contaminants and at what concentrations are characteristic of the major river reaches. This discussion would provide a much better understanding of the risks to human and ecological receptors. There also needs to be more detail about the process for selecting the sampling locations. As presented, it is not clear how the sampling locations may be related to releases from Hanford, or how representative they may be of other locations in the Hanford Reach. While at first glance there seem to be a substantial number of samples of the various media, when examined in relation to the geographic area and temporal periods covered by the samples, the sampling is inadequate, especially when many of the samples were targeted for collection proximate to non-Hanford sources of contamination.

The conclusion of the risk assessments should provide a more concise and comprehensive statement describing the overall risks to humans and natural resources in the Columbia River. Risks to a number of receptors, such as birds and mammals, were not included directly since they were felt to be adequately addressed by comparison to the risk estimates presented in the RCBRA. In other instances, risks were identified for some contaminants, but concerns associated with those risks were discounted because the

source(s) at Hanford are expected to be addressed under the ongoing CERCLA RI/FS cleanup program.

6. Yakama Nation Exposures and Risks

The risk assessments are geographically limited to the Columbia River, which excludes potential risks from exposure to contaminants in the near shore, riparian, and upland areas. Tribal members using river resources at Hanford would also most likely encounter the adjacent near shore and riparian habitats as well as inland terrestrial habitats. DOE should assess exposure scenarios that include use of the River Corridor in addition to the Columbia River, such as exposure to groundwater seeps and upwelling, near shore sediments and biota, and terrestrial soils and biota. The segregation of the river from the River Corridor is not a realistic exposure scenario. The Yakama Nation Treaty of 1855 should be acknowledged by DOE in the CRC risk assessments. Traditional subsistence uses, including use of plant and animal materials for consumptions, sweats, and building, as described in the Yakama Nation Exposure Scenario, should be fully factored into the BHHRA. Assessing such risks separately in the RCBRA is inadequate; cumulative risks should be assessed. Also, a "hypothetical future resident" also includes Tribal members and, as such, the Tribal scenario should be applied to assessing risks from upland exposures, including dredged spoils.

Similarly, contaminants that migrate from the Central Plateau and River Corridor areas should be evaluated as part of the river assessment. Contamination in the Central Plateau is transported to groundwater via the vadose zone. Contaminated groundwater from the Central Plateau has already reached the Columbia River and will continue far into the future, as shown by DOE's own modeling. By definition, baseline risks are risks that would exist if no remediation or institutional controls are applied at a site, and institutional controls that are expected to control contaminant migration or contaminant exposure cannot be factored into a baseline risk assessment. A complete baseline risk assessment is necessary to support subsequent selection of appropriate cleanup actions.