

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

Advising:

US Dept of Energy
US Environmental
Protection Agency
Washington State
Dept of Ecology

June 3, 2011

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Jane Hedges, Program Manager
Washington State Department of Ecology
3100 Port of Benton Blvd.
Richland, WA 99354

Re: River Corridor Baseline Risk Assessment

Dear Messrs. McCormick and Faulk and Ms. Hedges,

Background

The Hanford Advisory Board (Board) thanks the U.S. Department of Energy (DOE) for the opportunity to review the River Corridor Baseline Risk Assessment (RCBRA). The RCBRA contains risk information that informs all future River Corridor documents. It identifies the contaminants of concern and the contaminant pathways that potentially cause risk to human health and the environment at remediated sites.

Cleanup verification sample data from 156 River Corridor remediated sites and monitoring well data were used to calculate exposure estimates for radiation and chemical risk for each exposure scenario identified in the RCBRA. Much of the risk was associated with only twelve sites. Risk was caused by unacceptable levels of arsenic, uranium, cobalt 60, cesium 137, europium 152, strontium 90, chromium, mercury, and cadmium.

Additional background discussion is included in the supporting information as the appendix to this advice.

EnviroIssues

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HAB Consensus Advice # 246

Subject: RCBRA

Adopted: June 3, 2011

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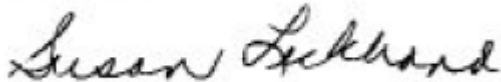
Advice

The Board is concerned about using the existing RCBRA for calculating risk in upcoming decisions. The following policy-level advice should be considered for future revisions to the RCBRA, in the remedial investigation/feasibility study (RI/FS) documents, and for future risk assessments.

- The Board advises DOE to employ a different risk assessment sampling methodology, per Environmental Protection Agency (EPA) guidelines. This methodology should capture the full range of future impacts of soil disturbance or natural soil mixing. It should address the impacts to risk coming from unremediated waste areas between waste sites and adjacent and upland areas, as well as from the waste site surfaces. The current use of clean-up verification sample data taken from the bottom of excavations 15 feet deep as the “estimated” contamination level for remediated waste sites, or using samples from the surfaces of the remediated waste sites that have now been filled with clean dirt, do not represent true exposure conditions.
- The Board believes the RCBRA should have included the risk derived from contaminated groundwater flowing from upland sites (i.e. Central Plateau) into the Columbia River, as described in the draft Tank Closure and Waste Management Environmental Impact Statement.
- The Board advises that the risk assessment, the final RI/FS documents and future risk assessments should consider the probability that future river-side residents will be obtaining their drinking and irrigation water from groundwater, rather than from the Columbia River. The RCBRA should discuss what restrictions exist, and are projected over extended time intervals, for the use of Columbia River water and groundwater.
- The Board reminds DOE of the applicable or relevant and appropriate requirements (ARAR) policy to use no less stringent standards than the Washington State Model Toxic Control Act (2007 as amended) for a final cleanup level of unrestricted use. At the same time, the Board does not support adopting a less stringent cleanup level for the final records of decision (RODs) than was employed in the Interim RODs. As a matter of future policy, the most recent scientific consensus on radiation exposure cancer risk from the National Academies of Science (BEIR VII) should be utilized for calculating risk to adults of both sexes and for children.
- The Board advises that the RCBRA calculations of residual risk should be the risk basis from which the final cleanup determination for waste sites along the River Corridor should be made, even though the initial cleanup met the requirements of the Interim ROD.

- The Board advises DOE to determine the amount of arsenic resulting from Hanford operations, and address the risk arising from both this source and arsenic from pre-Hanford agricultural practices. Both arsenic sources should be considered in the River Corridor cleanup plan.
- The Board advises the Tri-Party agencies to use the RCBRA as an opportunity to build public understanding of risk calculation and measures taken to reduce risk. The Tri-Party agencies should share risk-related information and the risk-evaluation process with the broader public to promote a global understanding of risk, instead of using individual proposed unit decisions. The Board further advises the Tri-Party agencies to work with the Board prior to communicating risk information with the public. The concept of risk should be made as understandable as possible and should include an explanation of what risk represents. The Board offers its assistance in developing an acceptable, understandable approach.
- The Board requests that the Tri-Party agencies provide workshops for the public and the Board where the completed risk evaluations (Human Health Risk Assessment, Ecological Risk Assessment, ARARs, Groundwater Baseline Risk Assessment, and Groundwater Pathway Risk Assessment) are discussed and presented in an integrated manner. These workshops should occur prior to the completion of the RI/FS proposed plan and final ROD process. This will give the Board and the public an opportunity to revisit this topic, garnering a more complete understanding of the total risk from River Corridor sites.

Sincerely,



Susan Leckband, Chair
Hanford Advisory Board

This advice represents Board consensus for this specific topic. It should not be taken out of context to extrapolate Board agreement on other subject matters.

cc: Scott Samuelson, Manager, U. S. Department of Energy, Office of River Protection
Stacy Charboneau, Co-Deputy Designated Official, U.S. Department of Energy, Office of River Protection
Nick Ceto, Co-Deputy Designated Official, U.S. Department of Energy, Richland Operations Office
Catherine Brennan, U.S. Department of Energy, Headquarters
The Oregon and Washington Delegations

APPENDIX

Supporting Information

The following information is provided for further clarification of the issues related to this advice.

The River Corridor Baseline Risk Assessment (RCBRA) is one important part of several inputs that are used for decision making in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 1980) process for the final River Corridor Records of Decision (RODs)¹. The decisions about whether further cleanup work should occur along the Columbia River Corridor will be informed by the projections of future health and environmental risks in the RCBRA.

The RCBRA is a U.S. Department of Energy (DOE) document that contains risk information to inform for all future River Corridor documents¹. The two basic functions of the RCBRA are to provide potential bases for action for post-Interim Record of Decision (IROD) actions and to identify multiple preliminary remediation goals (cleanup levels) for several alternatives for the final round of cleanup². It identifies the contaminants of concern and the contaminant pathways that potentially cause the most risk to human health and the environment at post remediated sites. The Human Health Risk Assessment, Ecological Risk Assessment, applicable or relevant and appropriate requirements (ARARs), groundwater protection assessment, and groundwater baseline risk assessment will feed the Remedial Investigation/Feasibility Study process. The feasibility study results are used to determine the preliminary remediation goals, and whether further remediation is needed. From the feasibility study, the proposed plan is created and presented for public comment. Then the final RODs are drafted.

Risk for the River Corridor was evaluated through the development of exposure scenarios³. Using the 156 waste sites that had been remediated when the RCBRA process started in 2004, cleanup verification sample data⁴ were used to calculate exposure estimates for radiation and chemical risk for the residential and industrial scenarios. Regional surface soil sample data was used for the Broad Area scenarios that include fishermen, hunters, casual visitors, and non-resident tribal users⁵.

¹ EPA Guidance Memorandum "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions" (OSWER Directive 9355.0-30.)

² RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 1.1 Purpose, p. 1-4.

³ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 3.3.1 Present Day and Potential Future Human Health Exposure Scenarios, p3-43.

⁴ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 3.2.1.3 Waste Site Verification Data, p.3-23 to 3-24.

⁵ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 5.0 Local Area Risk Assessment Results, p. 5-1 to 5-147.

The calculated results presented in the draft RCBRA, Human Health Risk Assessment, Volume II, Draft C, shows that, without further remediation, there is low chemical and radiation risk to casual users of the River Corridor⁶. The current risk calculations show unacceptable risk for residential and tribal use at one or more of the waste sites. The Board believes that it is reasonable to predict that future use of the River Corridor will include more than casual use in key areas, and that the Treaties of 1855 provide for the peoples of three tribal nations to “live along” and fish the River Corridor. Much of the risk was associated with approximately twelve of the 156 waste sites sampled. Some of the risk was associated with arsenic uptake in plants, animal products and water consumed, some of which is likely to have resulted from pre-Hanford agricultural use. But, some risk was also associated with unacceptable levels of uranium, cobalt 60, cesium 137, europium 152, strontium 90, chromium, mercury, and cadmium⁵.

The Board does not believe that the risk estimated by the Groundwater Screening-Level Assessment from unfiltered groundwater (from 330 wells sampled in 1998-2008) fulfills requirements for baseline assessment for groundwater⁷. According to the U.S. Department of Energy (DOE) - Richland Operations Office (RL), the screening-level assessment was used to identify Contaminants of Potential Concern (COPC) and define spatial distribution of contaminant plumes. The wells were sampled with a lot of spatial and temporal variability, which may have also had some impact on the data quality.

The Board believes that key assumptions that were made about exposure deserve to be discussed with the public and reconsidered. For example, the Broad Area exposure assumptions include use of river water⁸, not groundwater. However, withdrawing water from the Columbia River is currently highly restricted, while small to moderate groundwater withdrawals have no regulatory restrictions. This situation leads to a reasonably foreseeable future use of groundwater, the risk of which should be considered.

Further, studies have projected likely agricultural use of the River Corridor utilizing groundwater, along with residential and associated commercial and educational uses for the southern portion of the River Corridor (Battelle 2003). The Washington State Model Toxics Control Act (MTCA) provides that notices for proposed decisions should specify what restrictions on resource and land use would be reasonably expected. The Board believes that all of these future use assumptions, along with how use of resources and land would be restricted should be the subject of a public educational and input effort.

⁶ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 4.1.1 Summary of Broad Area Risk Assessment Results, p. 4-2 to 4-5.

⁷ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 6.0 Screening-Level Groundwater Risk Assessment, p. 6-1 to 6-71.

⁸ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), Figure ES-2 Broad Area Exposure Scenarios, p. ES-11.

The current version of the RCBRA is based on assumptions that risk levels arising from radionuclides at 15 millirems of exposure per year are acceptable⁹, despite the fact that this places the cancer risk level for adult males several times higher than the CERCLA and MTCA allowable maximum risk levels. The RCBRA does not incorporate the latest scientific consensus report on radiation exposure risk from the National Academy of Sciences¹⁰ (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). The allowable exposure and risk levels utilized in the RCBRA do not include consideration of the significantly higher risk posed to children and women compared to men from the same dose as found by the National Academy of Sciences.

The public and the Board have only been provided with Volume II of the RCBRA, not Volume I, which is the Ecological Risk volume. The two volumes are inextricably linked, and reviewing them in a piecemeal fashion limits the Board's and public's ability to review and discuss the human health and ecological combined risks as they relate to each other.

The Board appreciates the opportunity given by DOE-RL to examine and evaluate the River Corridor Baseline Risk Assessment and looks forward to continued conversations with the Tri-Party Agencies and the public regarding risk and cleanup along the Columbia River.

⁹ RCBRA, Vol. 2, Part 1, Human Health Risk Assessment (DOE/RL-2007-21, Draft C), 7.2.2. IAROD Cleanup Levels, p. 7-7.

¹⁰ BEIR VII Report, the National Academy of Sciences, 2005.