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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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March 5, 2009

Ms. Susan Leckband, Chair  
Hanford Advisory Board  
713 Jadwin, Suite 4  
Richland, Washington 99352

Re: Hanford Advisory Board (HAB) Advice #214, System Criteria to Guide Selection of Optimum Paths for Treating Hanford Wastes, February 6, 2009

Dear Ms. Leckband:

Thank you for your advice providing criteria to guide tank waste treatment decisions. HAB advice #214 complements recent HAB advisements (#189, #192, and #209). These recommend an integrated systems approach to decision-making that considers the interconnectedness of the tank waste retrieval, treatment, and disposal systems. We agree with those objectives, as stated in our previous responses. We also agree that the criteria in HAB advice #214 provide appropriate and useful principles to guide decisions on related aspects of tank waste treatment, storage, and disposal. Decisions that would benefit from an integrated systems approach include the following:

- What treatment and immobilization technologies should be applied to secondary waste streams?
- How should tank farms be closed?
- What technology should be selected for supplemental treatment of low activity waste (LAW)?
- How much supplemental treatment capacity should be provided?
- Should additional double-shell tank storage space be provided?
- What technologies and operating practices should be used for waste retrieval and waste feed delivery to Waste Treatment Plant (WTP)?
- What tank farm infrastructure upgrades supporting waste retrieval and waste feed delivery are needed?
- In what sequence should single-shell tanks be retrieved?
- What strategy should be adopted for managing the quantity of sodium that needs to be treated and disposed?
- Should startup of WTP's LAW facility be accelerated?
- How much on-site storage capacity should be provided for high-level waste (HLW) canisters?



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- What disposal capacity is needed for the Integrated Disposal Facility (IDF)?
- How should HLW and LAW glass be formulated to optimize waste loading and long-term performance?
- Should throughput of WTP's HLW and LAW facilities be increased with higher-capacity melters?

While we agree in principle with the criteria in HAB advice #214, we also have the following concerns and observations.

#### Criterion T5

Ecology strongly supports the first part of Criterion T5, "Establish funding priorities that increase the probability of meeting or accelerating the end state." The second part of Criterion T5 states, "If feasible, mitigate the highest risks in the shortest time, provided that does not conflict with other criteria."

In the Appendix addressing Criterion T5, you suggest focusing on zone closure rather than individual higher risk tanks. Retrieving waste from all tanks in a farm before moving on to the next farm would likely reduce costs such as those for retrieval and maintenance. It would also allow earlier closure of some tank farms. We believe that the benefits derived from this path must be evaluated systematically. This would include considering possible benefits of targeted tank waste blending -- which could decrease the number of high-level waste canisters and limit the duration of waste treatment operations.

We believe an integrated systems approach that considers tradeoffs between potentially competing objectives is the best way to approach these decisions. Integrated systems modeling, addressed in HAB advice #209, will be necessary to better understand those tradeoffs.

#### Criterion G1

In the Appendix addressing Criterion G1, you refer to the large amount of technetium that would be sent to land disposal in undefined waste forms. Advice #214 characterized that as a principal issue for treatment of the secondary waste streams.

Ecology agrees this would be important for early startup of WTP's LAW facility. For that scenario the LAW facility's submerged bed scrubber liquids for melter offgas treatment would be sent directly to the Effluent Treatment Facility (ETF) instead of being recycled to WTP's Pretreatment Facility. For the current tank waste treatment baseline (without early LAW), only 0.2 percent of the technetium inventory currently in tank waste would be sent to ETF. Only 0.8 percent (including the 0.2 percent in liquid effluent sent to ETF) would eventually be disposed in IDF in a to-be-determined solid waste form. (See Figure C-4 in Revision 3A of the United States Department of Energy (USDOE) River Protection Project (RPP) System Plan.) Ecology agrees

that even this small fraction of the technetium inventory requires development of suitable waste forms that minimize impacts to groundwater.

We are also concerned with the iodine in the secondary waste streams. This constituent becomes a significant contributor to groundwater contamination, if a suitable waste form is not determined.

#### Criterion G3

In the Appendix addressing Criterion G3, you recommend consideration of new technologies that isolate or destroy contaminants.

Ecology remains open to viable technologies USDOE may propose for treatment of secondary waste or to address other technical challenges. However, we oppose delaying decisions on secondary waste treatment pending new technology development, when those delays begin to jeopardize startup of WTP and supplemental treatment facilities.

#### Criterion G4

Criterion G4 recommends optimizing waste stream blending to maximize uniform isotope concentration in the glass to improve waste form performance. The Appendix also addresses potential cost and schedule benefits associated with blending.

Ecology agrees that retrieving and staging waste in a manner that optimizes blending could have large benefits in reducing the number of HLW canisters WTP will produce. This would shorten the treatment mission duration and reduce operating cost.

Ecology has not been presented with evidence that waste stream blending would be effective in improving waste form performance. Waste performance is optimized through glass formulations that are designed to accommodate wide variation in waste chemistry.

#### Criterion G6

Criterion G6 is similar to Criterion T5 in that both recommend focusing on early tank farm closure to reduce the overall cost of operations ("hotel costs"). This allows USDOE to redirect funding to other cleanup activities.

Ecology believes that a focus on early closure of tank farms needs to be evaluated carefully to identify any impacts to other considerations. These would include optimized blending and treatment mission duration.

#### Criterion G7

Criterion G7 recommends extracting materials such as sodium and aluminum to minimize the time WTP must operate.

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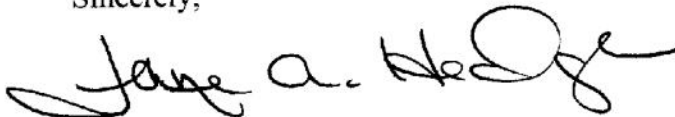
Ecology strongly supports actions that improve WTP efficiency and minimize the waste treatment mission duration. These include:

- Tests at the Pretreatment Engineering Platform.
- Studies outlined in USDOE's Sodium Issue Management Plan for the River Protection Project (DOE/ORP-2008-03, October 2008).
- USDOE-sponsored studies at the Vitreous State Laboratory, Catholic University to increase waste loading in glass.

Ecology will be closely following progress in all of these areas over the next few years. We appreciate the HAB's continued emphasis on applying systems engineering principles to tank waste treatment, storage, and disposal decisions.

Thank you for the opportunity to share our views on criteria for making those decisions. If you have questions or wish to have further discussions with us on this topic, please contact Ed Fredenburg of the Nuclear Waste Program at 509-372-7899.

Sincerely,



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Program Manager  
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ef/dbm

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