Oregon

Tina Kotek, Governor

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Attn: Jennifer Colborn
U.S. Department of Energy
P.O. Box 450, H5-20
Richland, WA 99352
Sent via email: HLW_AOA@rl.gov

RE: Oregon Department of Energy comments on the DOE Analysis of Alternatives related to High-Level Waste treatment

Dear Jennifer Colborn,

The State of Oregon appreciates this opportunity to comment on the High-Level Waste (HLW) Treatment Analysis of Alternatives (AoA).[1] The report supports decision making by providing a well-presented general overview of the potential facilities needed to progress the Hanford HLW vitrification mission with an estimate of timelines and range of costs. Like all Hanford stakeholders, Oregon strongly supports moving forward with the mission to treat, solidify, and properly dispose of tank waste in an efficient manner, and we are excited to see DOE taking progressive actions on the technical analysis and with budget prioritization.

Oregon generally agrees with use of the three primary decision criteria in the AoA, with minor modifications:

1) Tank waste classified as HLW shall be immobilized by vitrification.
2) The HLW processing system will operate concurrently with Direct Feed Low Activity Waste (DFLAW) Treatment, and may be used to treat waste determined to be incidental to reprocessing.
3) HLW processing alternatives shall use proven and established technologies, while being informed by emerging research and best practices at other facilities.

Enforcing these decision criteria eliminated most of the considered alternatives, leaving six viable options, one of which is Alternative 18 added in Addendum 1 and 2. [2,3] Oregon supports the decision to eliminate from further consideration scenarios which would not effectively complete the mission. Each considered alternative consists of HLW preparation for vitrification and processing of effluent from the treatment train. Generally, each alternative proposes a

1) High Level Waste Analysis of Alternatives Addendum 1 https://www.hanford.gov/files.cfm/2023-01-12_-_WTP_HLW_AoA_Addendum_1_Rev01.pdf

2) High Level Waste Analysis of Alternatives Addendum 1 https://www.hanford.gov/files.cfm/2023-01-12_-_WTP_HLW_AoA_Addendum_1_Rev01.pdf

3) High Level Waste Analysis of Alternatives Addendum 2 https://www.hanford.gov/files.cfm/2023-01-12_-_WTP_HLW_AoA_Addendum_2_Rev0.pdf

location to complete the physical and chemical preparations such as mixing, characterization, solid/liquid separation, solid washing, caustic treatment, feed concentration, and staging for vitrification delivery. All alternatives include construction of a new facility to manage effluent from the treatment process.

Specific technical comments on the report are presented at the end of this letter. Generally, Oregon understands and agrees that DOE needs to find a way to balance mission duration, cost, and effectiveness in the evaluation. We understand that based on discussions with the Tri-Party Agencies, additional alternatives were added to the analysis as addendums; however, it appears that the scenarios included in Addendums 1 and 2 (Alternatives 18 and 19) were not subjected to the same scrutiny as the other 17 scenarios that were evaluated in the "original" Analysis of Alternatives report. Oregon would like to see a revision of the AoA which includes all the impacts associated with these scenarios rather than a piecemeal approach using addenda.

Whatever scenario is most representative of the selected alternative should have built-in redundancy and room for updating over the decades of the mission. If sufficient tank space and capacity is not available or created by treatment of low-activity tank waste or otherwise, this redundancy could be found in newly constructed vessels for waste treatment. Sufficient volume to serve as contingency storage is vital should the current double shell tanks fail or sufficient capacity is not otherwise available.

It is imperative to complete the Hanford tank waste treatment and vitrification mission in a safe and timely manner while also building nimble systems with redundancies. The tank waste treatment mission cannot proceed unless several vital pieces of equipment function as designed. For example, we understand that if the 242-A evaporator is not operational, tank retrievals cease as there is no capacity in the tanks to manage treatment. All the tanks on the site are past their design life. Managing and treating tank waste is a key risk reduction item, but without sufficient storage space progress halts. Oregon sees potential value in building resilience, capacity, and redundancies as it increases the chance that the mission will be successful with minimal environmental and schedule impact from unexpected events.

Thank you for the opportunity to add our thoughts to the Analysis of Alternatives. The State of Oregon looks forward to continued interaction and participation in the HLW conversation. Beginning safe and effective treatment of HLW advances the tank waste mission and is a key component of the overall Hanford cleanup effort. HLW treatment will also protect the environment, including reducing potential future impacts to the Columbia River, and reduce overall risks on site.

If you have any questions, please reach out to Matthew Hendrickson (matt.hendrickson@energy.oregon.gov) of my staff.

Sincerely,

Maxwell Woods

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Cc: Dave Einan, U.S. Environmental Protection Agency
David Bowen, Washington Department of Ecology
Matt Johnson, Confederated Tribes of the Umatilla Indian Reservation
Laurene Contreras, Yakama Indian Nation
Jack Bell, Nez Perce Tribe
Oregon Hanford Cleanup Board
Susan Coleman, Hanford Advisory Board

Technical comments

It is understood and clearly described that variables outside of the core criterion such as size, technology maturity, and costs are subject to change. This fluidity is demonstrated in Addendum 2 where Alternative 18 is presented. Alternative 18 is based on Alternative 14 but assumes that some portion of the Supplemental Low Activity Waste (SLAW) derived from the vitrification is grouted.[4] Whether grout is an acceptable treatment strategy for SLAW remains unanswered and it is appreciated that this option remains in addendum until further clarity on the grouting question is reached.

The five alternatives carried forward for additional assessment can be grouped into three categories. *Table 62 on page 57* of the AoA illustrates this concept. Briefly, Alternatives 2 and 14 utilize a new high level waste feed preparation and effluent management (HFPEM) facility, but Alternative 14 includes filtration capabilities at the HFPEM. Alternatives 15 and 16 utilize space in East-Double Shelled Tanks (E-DST) to perform much of the feed preparation but require additional effluent management in the high-level waste effluent management facility (HEMF), but Alternative 16 includes feed concentration to 15% in the HEMF. Alternative 5 repurposes the partially designed and constructed pretreatment facility (PT) as the location to pretreat waste and manage effluent. Using the PT facility poses challenges fitting new equipment into a facility partially designed and constructed decades ago. Since all other categories are non-exceptional, the technical challenges associated with the PT facility alone cause alternative 5 to compare poorly to the other alternatives.

Table 28 on page 25 on the AoA shows the composite risk ratings for all the options. The HFPEM group has the lowest technical risk of the alternatives. The HFPEM group outperforms the in-tank group in all risk categories. A large factor in the poorer performance of the In-tank group is the tanks themselves. While the tanks to be used are some of the newest on the site, they are all past their anticipated design life. With potential extensions of their working life, the treatment proposed within the tank would include a caustic leaching step to reduce aluminum concentration. This slurry must be heated to 55 degrees C, settled for 14 days, and then may require additional hold and latency times reaching 120 days. While the steel tanks can theoretically withstand these temperatures, the extended mission poses undue risk to failure. A purpose-built facility is within the same lifecycle cost and mission completion range will not rely on decades old tanks. Additionally, the retention time removes valuable DST capacity from an already limited system. Between the treatment and system capacity issues, several "Very High Threats" are present in the In-tank group (p.36-37) that are not present in the other options.

There are comparative charts in the AoA which present evaluation criterion, life cycle costs (both constrained and unconstrained), and risk scores. However, there is little discussion of

4) Follow-on Report of Analysis of Approaches to Supplemental Treatment of Low-Activity Waste at the Hanford Nuclear Reservation
https://www.nationalacademies.org/documents/embed/link/LF2255DA3DD1C41C0A42D3BEF0989ACAECE3053A6A9B/file/D4CEF266CFFA179C08BE6805425C9D551545376C5F21?noSaveAs=1[4]

comparative value versus cost. When evaluating these alternatives, it is difficult to assess exactly what is being bought. A critical component of any impending decision document must be methods to compare value other than life cycle cost. For example, the All HPFEM Group are similar though Alternative 2 is more expensive. An additional investment of $1.1 billion results in a mission that is completed 3 years earlier. Is this 3 year earlier completion worth only $1.1 Billion? What is the value of adding 2.1 million gallons of high-level waste capacity in a highly constrained and aging system, and does that value include the removal of waste from leak susceptible SST's? Has the operational flexibility added been properly accounted for? The above are a sample of the valuation questions that will need answers for a true decision document, as there are more aspects to judge than only cost.

Addendum 2 introduces alternatives 18 and 19 but fails to present a comprehensive updated cost analysis. Instead, the cost analysis was limited to Alternatives 2, 14, and 18. Oregon would like to see the impact of grouting SLAW on the other alternatives so that a fair judgement can be made. Indeed, Alternative 2 becomes far more competitive with a capital expense only 1% ($.2 Billion) higher than Alternative 14 when previously, Alternative 2 was 21% ($7.1 Billion) more costly.