

## Hanford Advisory Board Response to the “Price Challenge”

At the March 2018 Hanford Advisory Board (Board) meeting, John Price of WA Ecology challenged the Board to provide the TPA agencies with a preferred scenario based on System Plan 8. This challenge is associated with the ongoing milestone negotiations between the Tri-Parties related to the Hanford tank waste retrieval and treatment mission.

Upon review of the System Plan, and in consideration of risks and vulnerabilities in the analysis described in HAB advice #295, the Tank Waste Committee of the Board has developed the following proposal.

### Common Base Assumptions

For any scenario that forms the basis for negotiation, the Board believes the following assumptions should apply.

Assumption	Rationale	Purpose
Direct-Feed LAW proceeds on schedule.	The Board supports initiation of tank waste treatment as soon as possible.	Commit necessary resources to achieve DFLAW as a top priority.
ORP will have flat funding from 2018 levels, plus a small degree of escalation, through the duration of the tank mission.	Comment from Brian Vance at the 4/10/18 HAB Committee of the Whole meeting expressed that flat funding is DOE ORP’s expectation going forward.	Provide more realistic schedule expectations to compare against funding-unconstrained scenarios shown in System Plan 8. Assist in communicating site funding needs.
Additional Double-Shell Tank failures will occur periodically prior to completion of the tank mission. The total number and rate of failures is uncertain and should be based on expert judgment or a reasonable range.	The Board has low confidence that all existing DSTs will be serviceable for the duration of the longer mission represented in System Plan 8, especially considering a flat funding scenario. See accompanying HAB advice XXXX.	Estimate the “inflection point” when DST failures interfere significantly with retrieval/treatment, estimate the optimal number of DSTs needed (if any) to ensure no significant mission delays, and account for costs of DST failure response in planning.
The 11 identified tanks with TRU waste may be retrieved and sent to WIPP for disposal.	The Board acknowledges the legal and policy difficulties of sending Hanford tank waste to WIPP, and the technical and fiscal difficulties of treating the waste for disposal at WIPP, but prefers that these wastes are disposed offsite rather than onsite or through the WTP to a deep geologic repository.	Reduce demand on the WTP and achieve earlier offsite disposal of tank waste.
Once retrieved, SSTs are put into an interim stabilization	Tank closures divert funding away from waste treatment and	Preserve site funding that would otherwise be dedicated to

condition rather than undergo final closure.	are not a near-term health/safety priority.	maintaining min-safe conditions or tank closure costs.
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### Board-Preferred Scenario for Consideration

Given the base assumptions above, the Board would like to see the model outputs of a “Scenario 34” that combines the elements in the table below. The Board notes that the original request from Ecology was to identify a single scenario (which may be a combination of already modeled scenarios) as the preferred basis for milestone negotiation. However, the Board believes it would be prudent to first see model results for this preferred combination to avoid unintended mission effects.

Scenario Component	Rationale
Scenario 7 - Reduced Throughput	Scenario 7 seems like a likely possibility based on the 36% availability of the vitrification facility at Savannah River and the 17% efficiency of the vitrification at the West Valley Demonstration Project <sup>1</sup> . Scenario 7 also provides a bounding case for estimating the consequences of other unanticipated project delays, such as tank vapor issues slowing SST retrieval.
Scenario 8 - Early U Farm Retrieval	Completion of 16 SST retrievals instead of 8 in the same time span, as well as retrieval of 4 assumed leakers instead of 1, are worth the risk of solids buildup in the DSTs. The latter risk may be mitigated by incorporating Scenario 10.
Scenario 9 - Offsite Effluent Treatment (if waste is disposed offsite)	The modeling tells us this scenario saves both time and money. It further benefits the overall mission by allowing more SST retrievals during DFLAW, extending the life of glass melters, and accelerating the ability to remediate “Group A” tanks. Due to the potential for Tc-99 to be retained in effluents in significant quantities to make long-term performance of grout at the IDF uncertain, the Board only supports this scenario if grouted waste forms are disposed offsite in a suitable facility.
Scenario 10 – Retrieval Contingency	See accompanying HAB Advice #XXXX regarding potential DST failure. When considering the model outcomes of System Plan 8 and the expected further lengthening of the mission schedule under the assumptions provided herein, the Board believes that additional DST failures are a near certainty. A reduction in total DST capacity not only poses potential risk to the environment, but it risks limiting the SST retrieval rate and thereby delaying the whole tank mission. The Board recommends that these DST failure-related risks be proactively managed, even if it costs additional time before full WTP treatment starts.  Note: The Board accepts that fewer than 12 new DSTs may be acceptable for contingency storage. A final amount of necessary tank capacity should be determined based on an analysis consistent with the assumptions in this document. As an alternative, the Board is interested in the possibility of accelerating and enlarging the storage capacity of the planned Tank Waste Characterization & Staging (TWCS) facility in lieu of constructing new standalone DSTs. TWCS would add potential emergency storage capability, is a critical component in treating HLW, and could potentially provide future support for the Supplemental LAW facility <sup>2</sup> .

<sup>1</sup> [https://www.hanford.gov/files.cfm/15-WTP-0151.LAW-D\\_O-report-sm.pdf](https://www.hanford.gov/files.cfm/15-WTP-0151.LAW-D_O-report-sm.pdf)

<sup>2</sup> At the 2/28/18 National Academies of Sciences meeting in Richland focused on Hanford’s Supplemental LAW, members of the FFRDC recommended the addition of a lag storage capability upstream of the Supplemental LAW facility to support consistent treatment flowrate.

## Scenarios to Rule Out

The Board could not reach consensus regarding scenarios in System Plan 8 that should be ruled out from negotiation.

## Potential Variations to Evaluate in Future System Plans

The Board would be willing to entertain the following potential scenario variations in future discussions, depending on the results of an adequate analysis in the next System Plan.

- Treat LAW to remove long-lived mobile radionuclides (Tc-99 and I-129), then grout the LAW for offsite disposal. Incorporate the extracted radionuclides in the WTP HLW feed.
- Accelerate and enlarge the TWCS facility to support HLW treatment, Supplemental LAW, and potential emergency storage needs in the event of additional DST failures.
- Under a constrained funding profile, evaluate delaying the retrieval of SSTs for a negotiable number of years to allow prioritization of sufficient mission-scale tank capacity and commencement of treatment as soon as possible.
- Some members of the Board may entertain a scenario wherein select SSTs are closed without prior retrieval, but such a decision should be made on the basis of residual cumulative environmental risks rather than an arbitrary percentage of remaining curie content.
- Manage the non-elutable Cs-137 ion exchange resins from LAW treatment via “greater confinement” in an **offsite** facility. [Note: we should better define this terminology]

## Contributing Values

In addition to the values described in HAB Advice #295, the Board identified the following values that provided a basis for this proposal:

1. All Hanford tank wastes must be stored safely until treatment. No preventable leaks to the environment are acceptable.
2. Any “bad actors” removed from waste should be disposed offsite in a suitable facility.
3. The Board has a preference to retrieve all SSTs to the extent practicable.
4. The Board considers DFLAW to be a priority, and all efforts should be made to ensure that it proceeds safely and on schedule.
5. If new tank capacity is added to the system, tanks should be designed to facilitate retrieval of wastes.

## Extras

(from the “what we want” category. We should decide whether these are incorporated into values or saved for a future topic)

- Agree to a realistic course and schedule and achieve it.
- Finish pretreatment capacity (PT Facility, TSCR, etc.)
- Offsite disposal must meet Waste Acceptance Criteria and Transportation safety/cask requirements.
- DOE should evaluate dry mining alternatives in the event that SSTs are too corroded for liquid-based retrieval.
- The Waste Treatment Plant should not be starved of feed.

- Consider additional sludge-only storage to accelerate retrievals and provide WTP HLW feed.

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