



# System Plan Revision 5

## Assumption Briefing for HAB Tank Waste Committee

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Office of River Protection



washington river  
protection solutions

# Drivers for System Plan Revision 5 (SP5)

- **Contract deliverable – annual system plan update**
- **Support detailed operational and project plans**
  - Align utilization of the DSTs with planned equipment, capabilities, and limitations
  - Align retrievals with revised SST Retrieval Plan and underlying assumptions
  - Align near-term transfers and evaporator operations
  - Understand tank space limitations
- **Summarize key issues and uncertainties and mitigating actions**
  - Risk Management Plan
  - Technology Roadmap
  - Expand discussion of key pending decisions

# Policy Level Guidance

- **Continuous improvement on life-cycle cost and schedule baseline**
- **Potential TRU tank waste to be packaged and stored pending final disposition**
- **Use Aluminum Removal Facility\* to mitigate sodium (aluminum solubility) issue**
- **HLW Glass final disposal alternative**
  - To be determined
  - Interim storage on-site pending assumed decision in 2022
- **Effluent Treatment Facility to be upgraded as needed**
- **Continue with System Plan Rev 4 (SP4)-era assumptions until TC&WM EIS ROD released:**
  - Cs/Sr capsules addressed by RL
  - FFTF Sodium not addressed
  - Spent HLW melters to IDF
  - Contents of ORP-managed MUSTs/IMUSTs treated with other tank waste

\*Development of ARF has been suspended, pending development of alternative solutions.

# Plans for System Plan Rev 5 (SP5) Production

- **Since SP4 issued in September, many Hanford Tank Waste Operations Simulator (HTWOS) model improvements have been made:**
  - Aligned with WTP flowsheet (BARD Rev 4, MDD Rev 10).
  - Aligned DST use with Integrated WFD Plan
  - Aligning SST retrieval assumptions with SST Retrieval Plan and underlying assumptions
  - Implemented new HLW glass formulation model
  - Use updated BBI (includes free OH<sup>-</sup> estimates)
  - “Under-the-hood” improvements
- **Schedule (next page)**
  - Scope, outline and assumptions formally approved by ORP on April 16, 2010
  - Transmit draft to ORP by August 31, 2010 for approval
- **Scope:**
  - Similar in detail to SP4
  - Add / expand discussions of key pending decisions: supplemental treatment, HLW disposal, potential TRU tank waste, etc.
  - Two Cases:
    - Baseline Case – similar to SP4 Baseline Case
    - Sensitivity Case – all potential TRU tank waste treated as HLW

# SP5 Schedule - Summary Rollup

RPP SYSTEM PLAN																	
Activity ID	Activity Name	Early Start	Early Finish	2010													
				Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
<b>SUMC: JAA-261010</b>	<b>Prepare RPP System Plan (FY10)</b>	<b>10-May-2010</b>	<b>30-Sep-2010</b>														
JAA-261000	Prepare & Issue System Plan Revision 5	10-May-2010	30-Sep-2010														
JAA-261005	Define Scope & Assumptions																
JAA-261120	Modeling & Verification	11-May-2010	07-Jul-2010														
JAA-261160	Baseline Case	10-May-2010	01-Jul-2010														
JAA-261240	Sensitivity Case A (TRU)	10-May-2010	07-Jul-2010														
JAA-261340	Generic Writing (Before Model Results) (Wells)	10-May-2010	21-May-2010														
JAA-261400	Specific Writing (After Model Results) (Certa)	24-May-2010	12-Jul-2010														
JAA-261460	Internal Review Cycle (Wells)	08-Jul-2010	23-Jul-2010														
JAA-261500	ORP Review Cycle (Certa)	12-Jul-2010	10-Aug-2010														
JAA-261560	Final Preparation, Approvals & Printing (Wells)	11-Aug-2010	14-Sep-2010														

Milestone: WRPS to transmit draft SP5 to ORP by August 31, 2010 for approval.

# SP5 Will Include Two Cases

## Baseline Case

- **Similar to SP4 BC & PMB/OPER**
- **Align to:**
  - WTP flowsheet BARD Rev 4
  - Integrated WFD Plan
  - Revised SST Retrieval Plan
- **Add simple ARF flowsheet**
- **Enhance blending (incidental and/or intentional)**
- **Success criteria**
  - Draft consent decree milestones
- **Key mission dates may change from SP4; details will change**

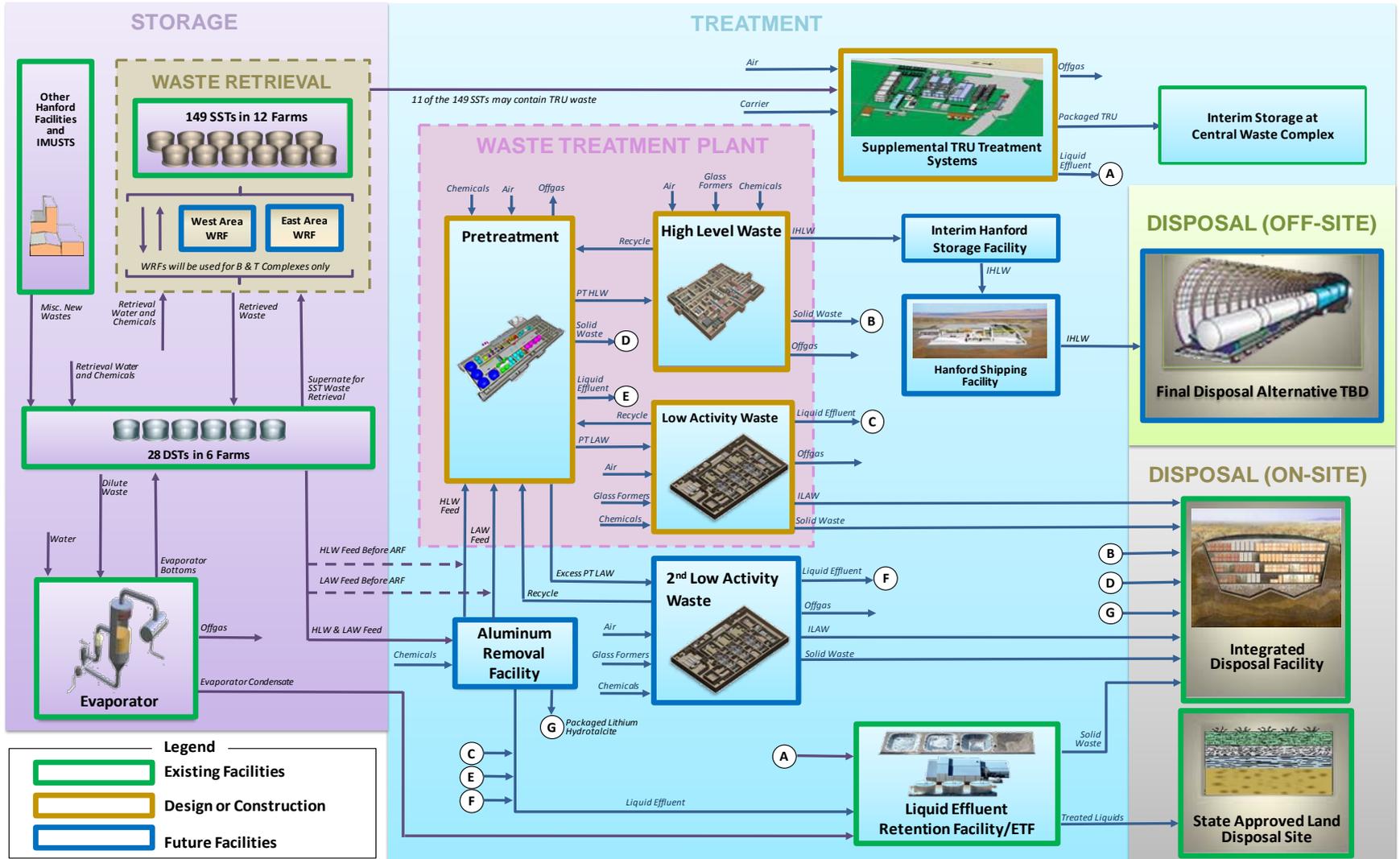
## Sensitivity Case - A

- **Start with SP5 Baseline Case**
- **Explore the impacts of treating potential TRU tank waste at WTP and disposing with IHLW**
- **Success criteria:**
  - Draft consent decree milestones
- **Cost profile will change from PMB/OPER**

# Success Criteria Taken from Draft Consent Decree

Item	SP4 BC	SP5 BC and SC-A
Complete C-Farm retrievals	9/30/2014	9/30/2014
Start 5 more retrievals beyond C-Farm	12/31/2017	12/31/2017
Close C-Farm	6/30/2019	6/30/2019
Complete 9 retrievals beyond C-Farm	9/30/2022	9/30/2022
Retrieve all SSTs	12/31/2040	12/31/2040
Close all SSTs	1/31/2043	1/31/2043
Treat all waste	12/31/2047	12/31/2047
Close all DSTs	9/30/2052	9/30/2052

# Simplified Process Flow Diagram for SP5



# WTP - Capacity

Item	SP4 BC	SP5 BC and SC-A
Original HLW melter	2 melter 3 MTG/d/melter 70% ----- 4.2 MTG/d net	2 melter 3 MTG/d/melter 70% ----- 4.2 MTG/d net
2 <sup>nd</sup> Generation HLW melter	2 melter 3.75 MTG/d/melter 70% ----- 5.25 MTG/d net	2 melter 3.75 MTG/d/melter 70% ----- 5.25 MTG/d net
Original LAW melter	2 melter 15 MTG/d/melter 70% ----- 21.0 MTG/d net	2 melter 15 MTG/d/melter 70% ----- 21.0 MTG/d net
2 <sup>nd</sup> Generation LAW melter	None	None

## 2<sup>nd</sup> LAW Facility

Item	SP4 BC	SP5 BC and SC-A
Flowsheet	Same as WTP	Same as WTP
LAW Glass model	DOE 2004	DOE 2004
Modeled as	Lumped w/WTP	Separate
Feed	PT LAW from WTP PT	PT LAW from WTP PT
SBS / WESP Recycle	To WTP PT back-end evaporator	To WTP PT back-end evaporator
Net Capacity	37 MTG/d net	Size as needed

# Treatment Facility Schedule

Item	SP4 BC	SP5 BC and SC-A
WTP Hot Comm. (start / end)	May 1, 2018 Dec 1, 2019	May 1, 2018 Dec 1, 2019
WTP "Routine" Operations	Dec 2, 2019	Dec 2, 2019
HLW 2 <sup>nd</sup> Gen Melters	Feb 6, 2025	Feb 6, 2025
LAW 2 <sup>nd</sup> Gen Melters	None	None
ARF	July 19, 2022	July 19, 2022
2 <sup>nd</sup> LAW Facility Hot Comm. (start / end)	n/a September 30, 2021 [not modeled]	n/a <b>September 30, 2022</b> [not modeled]
2 <sup>nd</sup> LAW Facility "Routine" Operations	October 1, 2021	<b>October 1, 2022</b>
Potential TRU Tank Waste Packaging	October 1, 2013	<b>BC: April 2018</b> SC-A: None

# Interim HLW Storage

Item	SP4 BC	SP5 BC and SC-A
Facility name	Hanford Shipping Facility (HSF)	Interim Hanford Storage Facility (IHSF)
Storage capacity and module size increment	2,000 – 12,000 Δ 2,000	4,000 – 16,000 Δ 2,000
Start shipping at:	1,000	3,000 June 2022 – decision to build additional modules or a shipping facility. Expandable for canisters remain in interim storage until final disposal alternative established.
Final disposition	Planned offsite geologic repository	TBD
Facility Ready	—	Oct 2017
First canister	May 2018	May 2018

# LERF / ETF

Item	SP4 BC	SP5 BC Proposed
Assume ETF upgraded as needed to support waste treatment mission	✓	✓
LERF basins allocated for RPP	2 of 3	2 of 3
ETF flowsheet model	Black-box based on HNF-4573. Splits only, no chemicals tracked for bulking or stabilization of solid waste form.	

# Integrated Disposal Facility (IDF)

Item	SP4 BC	SP5 BC and SC-A
<u>Will receive and dispose:</u>		
ILAW Packages from WTP and 2 <sup>nd</sup> LAW Facility	✓	✓
Spent and failed LAW melters from WTP and 2 <sup>nd</sup> LAW Facility.	✓	✓
Spent HLW melters	✓	✓
Other solids waste from WTP and 2 <sup>nd</sup> LAW Facility	✓	✓
Solid waste from ETF	✓	✓
Lithium hydrotalcite by-product from ARF	✓	✓

# Miscellaneous Assumptions

Item	SP4 BC	SP5 BC	SP5 SC-A
Potential TRU tank waste	WIPP	Retrieve, package and stage for future disposition	Process through WTP
Cs/Sr Capsules	RL disposition		
FFTF Na	Not addressed		
K-basin sludge	Not addressed		
Spent HLW Melters	To IDF pending determination of disposal pathway		
Li hydrotalcite disposition	To IDF		
IMUSTs/MUSTs	To WTP		
HLW Glass Disposition	Hanford Shipping Facility: Ship to repository via	Storage at Interim Hanford Storage Facility until final disposal alternative decision made by June 2022. Plans include both shipping in 2022 via Hanford Shipping Facility and potential continued storage.	