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U.S. Department of Energy

Office of River Protection



10-TPD-148

OCT 28 2010

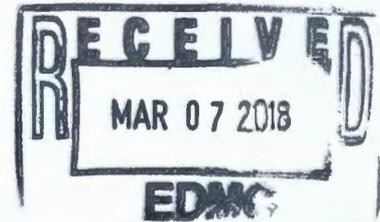
Mr. Dennis A. Faulk, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
Hanford Project Office
309 Bradley Blvd., Suite 115
Richland, Washington 99352

Dear Mr. Faulk:

PARTIAL COMPLETION OF HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (TRI-PARTY AGREEMENT) INTERIM MILESTONE M-062-40, TO SUBMIT A SYSTEM PLAN TO WASHINGTON STATE DEPARTMENT OF ECOLOGY (ECOLOGY) DESCRIBING THE DISPOSITION OF ALL TANK WASTE MANAGED BY THE U.S. DEPARTMENT OF ENERGY (DOE), OFFICE OF RIVER PROTECTION (ORP), INCLUDING RETRIEVAL OF ALL TANKS NOT ADDRESSED BY THE CONSENT DECREE IN *WASHINGTON v. DOE*, CASE NO. 08-5085-FVS, AND THE COMPLETION OF THE TREATMENT MISSION

The purpose of this letter is to confirm the outcome of discussions that occurred between July 28 and October 27, 2010, relative to the Ecology and DOE mutual obligations under interim milestone M-062-40 "starting October 31, 2010, and every three years thereafter . . . to select a minimum of three scenarios that will be analyzed in the System Plan." In satisfaction of these obligations, Ecology and DOE agreed on October 27, 2010, to model the five highest priority scenarios selected by each agency for System Plan 6. A discussion of the scenarios selected to be analyzed in the System Plan is presented in the attachment.

This letter and its attachment fulfill both agencies' obligations under interim milestone M-062-40 to select a minimum of three scenarios that will be analyzed in System Plan 6.



Office of River Protection
P.O. Box 450
Richland, Washington 99352

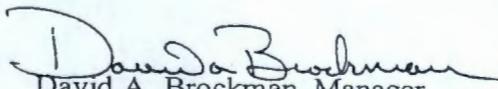
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504

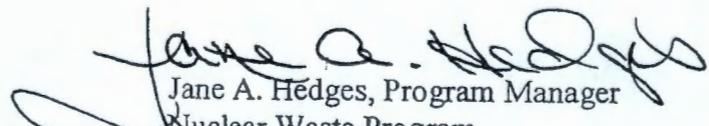
Mr. Dennis A. Faulk
10-TPD-148

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OCT 28 2010

If there are any questions, please contact us, or your staff may contact Stacy Charboneau, Assistant Manager for Tank Farms Project on (509) 373-3841.


David A. Brockman, Manager
Office of River Protection
U. S. Department of Energy


Jane A. Hedges, Program Manager
Nuclear Waste Program
Washington State Department of Ecology

Attachment

cc w/encl:

S. G. Harris, CTUIR

J. J. Lyon, Ecology

J.D. McDonald, Ecology

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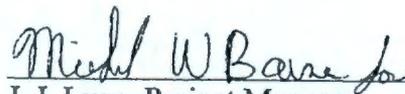
State of Washington
Department of Ecology
P.O. Box 47600
Olympia, Washington 98504

1.0 APPROVALS

By their signatures below, Ecology and ORP indicate concurrence with the selected scenarios and underlying and scenario-specific assumptions.



J. D. McDonald, Project Manager
Washington State Department of Ecology



J. J. Lyon, Project Manager
Washington State Department of Ecology



R. J. Koll, Program Manager
U. S. Department of Energy
Office of River Protection

2.0 INTRODUCTION

The purpose of this paper is to document the scenarios selected for inclusion in River Protection Project (RPP) System Plan Revision 6, hereinafter referred to as SP6. This revision to the System Plan is being prepared to meet milestone M-062-40, recently added to the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement):

“ . . . One year prior to the issuance of the System Plan, DOE and Ecology will each select the scenarios (including underlying and scenario-specific assumptions) that will be analyzed in the System Plan . . .

Starting October 31, 2010 and every three years thereafter, Ecology and DOE will each have the right to select a minimum of three scenarios that will be analyzed in the System Plan . . .

Beginning October 31, 2011 and every three years thereafter, issue the System Plan.”

A listing of the scenarios selected by each party is provided in Table 2-1. A summary description of the purpose and underlying common and scenario-specific assumptions are presented in Appendix A.

Some of the activities described herein may be subject to and/or undergoing the analysis required by the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, et seq. Additionally, some of the technologies described herein may be subject to and/or undergoing analysis under DOE O 413.3A Chg 1, *Program and Project Management for the Acquisition of Capital Assets*. They are included within this document for planning purposes only, not for decisional purposes, which will be conducted following the NEPA process.

Table 2-1. Final Selected Scenarios.

Ecology's Selection	ORP's Selection
TRU to WTP	Baseline Case
WTP Delay with Increased Vitrification Capacity	FBSR for Supplemental Treatment
WTP Delay with New DST Farm	2020 Vision
Accelerated Retrieval	Enhanced Tank Waste Strategy
Slow SST Retrievals	Early U-Farm Closure

3.0 REFERENCES

Ecology et al. 1989, Hanford Federal Facility Agreement and Consent Order (HFFACO), [also known as the Tri-Party Agreement (TPA)], as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

APPENDIX A – SELECTED SCENARIOS

Short Title: Baseline Case

Purpose of Scenario: Establish the technical basis for the budget and schedule baseline documented in the Performance Measurement Baseline.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 5 Baseline Case:

- The Aluminum Removal Facility (ARF) has been eliminated.
- The WTP Equipment Option has been added. This option makes design, flowsheet, and operating mode changes to the WTP Pretreatment Facility, including processing at a higher temperature, to reduce the amount of sodium hydroxide added to keep aluminum from precipitating. These changes were needed to partially mitigate the sodium increases due to the removal of the ARF.
- Feed characterization / certification facility added for HLW feed to the WTP, comprising 6 tanks, each 500,000 gallons, equipped for solids mixing, sampling, and transfer.
- Model maintenance updates have been incorporated.
- Integrate with the next planned updates to:
 - The Integrated Waste Feed Delivery Plan, including use of a dedicated transfer line for LAW feed to WTP and changes in the planned usage of DSTs.
 - The SST Retrieval Plan and associated spreadsheet, including use of separate dedicated DST receivers for the A and AX farm retrievals, adjustment of the start dates for the remaining C-Farm retrievals to account for project logistics, and adjustments to some of the estimated minimum retrieval durations.
- Updated starting tank inventory.

Short Title: FBSR for Supplemental Treatment

Purpose of Scenario: Demonstrate the deployment of FBSR as an alternative to the Second LAW Vitrification Facility.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Use fluidized bed steam reformers (FBSR) for supplemental LAW treatment instead of the 2nd LAW Vitrification Facilities. Assume a monolithic waste form disposed at IDF. Feed will consist of a combination of excess pretreated LAW from the WTP PT Facility and pretreated LAW from supplemental pretreatment.
- WTP LAW Facility begins routine operation on 1/1/2020.
- Number of FBSRs will be estimated from the total required LAW treatment capacity (X MT Na/yr net), the WTP LAW Vitrification Capacity, and current estimate of the net capacity of a single FBSR (Q MT Na/yr net).
- The total required LAW treatment capacity (X MT Na/yr net) and feed configuration of the FBSRs will be selected to best support the schedule-based success criteria.
- Supplemental pretreatment will consist of at-tank small column IX and rotary micro-filters; the number of installations will be determined to match the total net FBSR capacity. Each supplemental pretreatment system will begin operations on the start date for their respective FBSR(s).
- The first FBSR will begin routine operation on 1/1/2018, at Q MT Na/yr net capacity.
- The startup of each of the remaining FBSRs will be spaced by 9-months, considering project logistics, each at Q MT Na/yr net capacity.

Short Title: 2020 Vision

Purpose of Scenario: Show the impacts and effects of phased turnover of the WTP facilities.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Early start up of the WTP LAW facility in 2016, operating at a nominal rate of one package of LAW glass per day.
- Use of supplemental pretreatment in the form of small column IX and rotary micro-filters to feed the WTP LAW facility until the WTP PT becomes available.
- Interim pretreatment system (IPTS), will be provided as follows:
 - Rotary micro-filters in AP-105 riser, with solids discharge to AP-105.
 - Small column ion-exchange in AP-107 riser, with high cesium eluate discharged to AP-107.
 - Pretreated LAW stream from the IPTS to be staged in three existing 15,000 gallon staging tanks.
 - Feed will be delivered to the WTP LAW Vitrification Facility using a hose-in-hose transfer line.
- Secondary liquid waste from the WTP LAW Vitrification Facility will be returned to the tank farms via a hose-in-hose transfer line and a modified valve pit in AP-Farm, until the ETF has been upgraded to accept such secondary waste.
- Additional detailed assumptions, including ramp-up rates for all facilities, will be established later as part of the Key Assumptions and Success Criteria.

Short Title: Enhanced Tank Waste Strategy

Purpose of Scenario: The judicious use of transformational technologies may shorten the treatment mission and reduce the lifecycle cost by approximately \$16B and schedule by seven years.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Use fluidized bed steam reformers (FBSR) for all LAW treatment instead of the WTP LAW Vitrification and 2nd LAW Vitrification Facilities. Assume a monolithic waste form disposed at IDF. Feed will consist of a combination of pretreated LAW from the WTP PT Facility and pretreated LAW from supplemental pretreatment.
- Number of FBSRs will be estimated from the total required LAW treatment capacity (X MT Na/yr net) and current estimate of the net capacity of a single FBSR (Q MT Na/yr net).
- The total required LAW treatment capacity (X MT Na/yr net) and feed configuration of the FBSRs will be selected to best support a waste treatment end date 7-years earlier than the baseline.
- Supplemental pretreatment will consist of at-tank small column IX and rotary micro-filters; the number of installations will be determined to match the total net FBSR capacity. Each supplemental pretreatment system will begin operations on the start date for their respective FBSR(s).
- The first FBSR will begin routine operation on 1/1/2018, at Q MT Na/yr net capacity.
- The startup of each of the remaining FBSRs will be spaced by 9-months, considering project logistics, each at Q MT Na/yr net capacity.
- Formulate HLW glass using the enhanced HLW glass model described in PNNL-19372.
- If increased HLW Vitrification capacity is required to meet the treatment end date objective, assume that the necessary design changes to the HLW Vitrification Facility have already been made to support next generation melters, not to exceed 1.5 times the SP6 Baseline Case capacity, starting at first melter change-out.

Short Title: TRU to WTP

Purpose of Scenario: Assess the impact of treating all of the potential “TRU” tank waste at the WTP.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Assume that all potential “TRU” tank waste will be treated at the WTP as HLW.

Short Title: Early U-Farm closure

Purpose of Scenario: Show the impacts of beginning U-Farm retrievals instead of the A-farm retrievals for the 9 retrievals after C-Farm.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Retrieve the 4 AX-Farm tanks and 5 U-Farm tanks (U-101, U-104, U-110, U-112, U-106) as the 9 additional retrievals after C-Farm.
- Adjust retrieval sequence to accelerate the remaining U-Farm retrievals to enable early closure, if possible.
- Assume that necessary infrastructure upgrades are made in time to support the U-Farm retrievals.
- Adjust closure sequence to begin U-Farm closure activities once U-Farm retrievals are completed.

Short Title: Accelerated Retrievals

Purpose of Scenario: Demonstrate the effect on mission duration of using an alternative SST retrieval approach that decouples near-term SST retrievals from DST tank space limitations in order to 1) mitigate SST retrieval delays for any reason, 2) level load SST retrievals throughout the mission, and accelerate closure of T-Farm separate from TX-Farm and TY-Farm.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Allow for consolidation (staging) of T-Farm waste into sound TX-Farm tanks.
- Start T-complex WRF construction and operation 2 years earlier than Baseline.
- Receive waste into TX-101, TX-102, TX-103, TX-104; TX-118, TX-108, TX-106, and if needed TX-111, in the order specified.
- Retrieve T-Farm into TX farm tanks (listed above) using existing planned technologies and constraints, with additional monitoring as needed.
- Receivers must meet Interim Stabilization (IS) criteria when full or when finished receiving waste.
- Liquid waste management strategy:
 - Retrieve Salt Cake first.
 - Use dissolved Salt Cake for sluicing the sludge.
 - Use SP5 baseline date for availability of transfer line to SY-Farm.
 - Use one or more wipe film evaporators (WFE) connected to WRF:
 - Assume same specific gravity end-point as 242-A, but do not apply 242-A specific source term and waste volume reduction restrictions to the WFEs.
 - Number of WFEs should be estimated to keep up with the retrievals.
 - Stage dilute supernate and store concentrated supernate in the WRF.
 - Transfer concentrated supernate to the DST system as space permits.

Short Title: WTP Delay with Increased Vitrification Capacity

Purpose of Scenario: Evaluate the how well a 10% increase in overall vitrification capacity can offset all or part of the impacts from a uniform four year delay in the startup of the WTP.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Assume a uniform 4-year delay in the start of hot commissioning for all WTP processing facilities.
- Increase the HLW vitrification capacity by 10% relative to the WTP Delay case.
- Increase the WTP LAW treatment capacity by 10% relative to the WTP Delay case.
- Increase the Second LAW treatment capacity by 10% relative to the WTP Delay case.

Short Title: WTP Delay with New DST Farm

Purpose of Scenario: Evaluate how well a new DST farm can offset all or part of the impacts from a uniform four year delay in the startup of the WTP?

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Assume a uniform 4-year delay in the start of hot commissioning for all WTP processing facilities.
- New DST Farm is operational on 9/30/2020.
- Farm is located in 200E, with full integration with rest of DST transfer system.
- Chose the number of DSTs in the farm to allow SST retrievals to remain on schedule, but no more than 8 tanks; use nominal 1-Mgal tanks.
- Tanks will be equipped with dual mixer pumps without incremental insertion capability, slurry pumps, and decant pumps; and supporting infrastructure upgrades as needed.

Short Title: Slow SST Retrievals

Purpose of Scenario: Show the impacts on the baseline of increasing the minimum retrieval durations for the SSTs.

Distinguishing Features – List each assumption that is being changed, added to, or deleted from the System Plan Revision 6 Baseline Case:

- Increase the minimum retrieval durations of each SSTs by 25%, for all retrievals which start between 1/1/2011 and 1/1/2021, due to unspecified near-term retrieval difficulties.
- Assume that the unspecified retrieval difficulties have been overcome for all retrievals which start after 1/1/2021.
- No change to selected retrieval technologies from Rev 6 Baseline Case.