



Environmental Management Advisory Board August 23, 2006

*Roy J. Schepens, Manager
Office of River Protection*



Office of River Protection



Bechtel National, Inc.





Safety is Office of River Protection's (ORP) Highest Priority

- ❑ Immediate Safety Risk Reduction
 - Interim Stabilized Tanks
 - Accelerated Tank Retrievals
- ❑ Vitrifying All Tank Waste
- ❑ Conservative Approach to Tank Vapors Issue
 - Tank Farm Workers Required to Use Supplied Air to Protect from Tank Vapors Until Hazard is Completely Characterized and Proved Safe
- ❑ Conservative Facility Design - Design Requires Defense in Depth
 - Elimination of Hazards Preferred
 - Engineered Safety Feature Preferred if Hazards cannot be Eliminated
 - Administrative Controls
 - Personnel Protective Equipment
- ❑ Highly Skilled, Trained and Experienced ORP and Contractor Staff
- ❑ Safety is Effectively Integrated into All Programs and Process through Integrated Safety Management



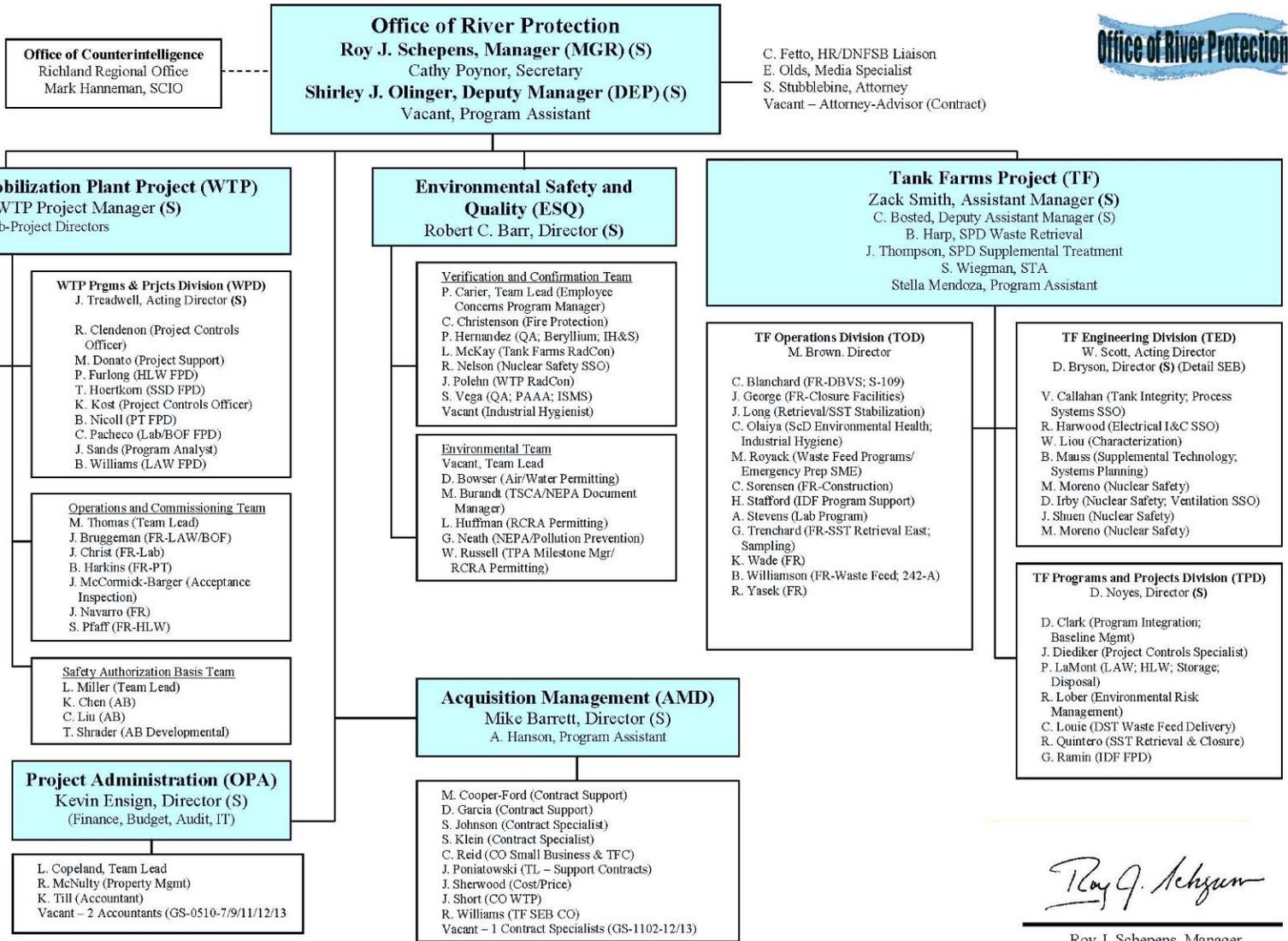


Chart Updated 8/10/06

Employee count = 102
 Approved 07 FTE = 115

Roy J. Schepens

Roy J. Schepens, Manager



Current Organization

Staff Changes to Strengthen ORP:

- ❑ **ORP Manager attended the EM Executive Leadership Program training workshops (Phase I & II)**
- ❑ **ORP Waste Treatment Plant (WTP) Federal Project Director attended Project Management Institute training**
- ❑ **ORP Acquisition Management Director**
 - **Hired a GS-15 Procurement Director that was advertised nationwide**
 - **Hired 2 GS-14 Contracting Officer positions that was advertised nationwide**
 - **Hired an experienced GS-13 Contract Specialist with strong analytical skills to backstop our WTP Contracting Officer (CO)**
 - **Recruited for an experienced GS-12/13 Contract Specialist to backstop our Tank Farm (TF) Contract CO**
 - **Hired a GS-13/14 level Organizational Property Management Officer**
 - **Hired a dedicated Procurement Attorney for ORP**
- ❑ **2 Federal Project Directors Selected/Promoted; 1 ex Facility Representative (FR) – Waste Retrieval; 1 Project Manager – Demonstration Bulk Vitrification System (DBVS)**
- ❑ **Recruiting 3 Federal Project Directors for WTP and filled 3 EVMS Project Control Specialists**
- ❑ **1 FR promoted to TF Operations Division Director**
- ❑ **2 FR Qualified/Promoted – WTP and TF**
- ❑ **4 Safety System Oversight (SSOs) Qualified (Process Systems; Electrical Instrument & Control; Ventilation)**

DOE Scholars Program

- ❑ **Current ORP Employee received *ScD in Environmental Health* with specialties in Toxic Substances and Hazardous Management, Industrial Hygiene, and Risk Assessment; supports Tank Farms**
- ❑ **Intern received *PhD in Civil Engineering*; Supports WTP**

4 Summer Interns (BS., MS., and PhD Candidates) supported WTP, TF, and Managers' Office summer of 2006

- ❑ ***Nuclear Engineering – WTP***
- ❑ ***Geophysics - WTP***
- ❑ ***Civil Engineering - TF***
- ❑ ***Human Resources – MGR/DEP***



Integrated Safety Management System (ISMS) Responsibilities

- ❑ **Manager and Deputy Manager** - Project vision and safety culture
- ❑ **Line Management** – Contractor safety expectations and performance oversight
- ❑ **ESQ** – Independent program and safety systems oversight
- ❑ **Staff** – Everyone is accountable for safety



Management Systems Aligned to ISMS Principles

ISMS Guiding Principles	Supplemental High-Reliability Principles	ORP Safety Culture	ORP Management Systems to Execute Principles
Line Management Responsibility	Highly-Reliable Operational Performance	<ul style="list-style-type: none"> • Leaders demonstrate commitment to safety 	<ul style="list-style-type: none"> • Project Management System/ORP FRAM • Assessment and Oversight Program • Management Walk-Through Program • ISMS
Clear Roles and Responsibilities	Individual Attitude and Responsibility	<ul style="list-style-type: none"> • Everyone is responsible for safety • Trust permeates the organization 	<ul style="list-style-type: none"> • ORP FRAM and ISMS • Human Resource Mgmt. • Workforce Management • Employee Relations
Competence to Perform Responsibilities		<ul style="list-style-type: none"> • Organizational learning is embraced • A questioning attitude is cultivated 	<ul style="list-style-type: none"> • Training and Qualifications Programs • Federal Technical Capability Program • HR Performance Recognition Program • Minority/Differing Profession. Opinion • Lessons Learned (LL)
Balanced Priorities	Performance Assurance	<ul style="list-style-type: none"> • Decision-making reflects safety first 	<ul style="list-style-type: none"> • Project Controls and Baseline Management and ISMS • Acquisition Management • Asset Management
<ul style="list-style-type: none"> • Identification of Safety Standards • Tailor Hazard Controls to Work 		<ul style="list-style-type: none"> • Nuclear operations are special and unique and required disciplined controls 	<ul style="list-style-type: none"> • Safety Basis Mgmt. System • Authorization Basis Management • Environmental Mgmt. System • ISMS Annual Declaration process
Operations Authorization		Organizational Performance Improvement	<ul style="list-style-type: none"> • Safety undergoes constant examination



Senior Management Integration Team (SMIT)

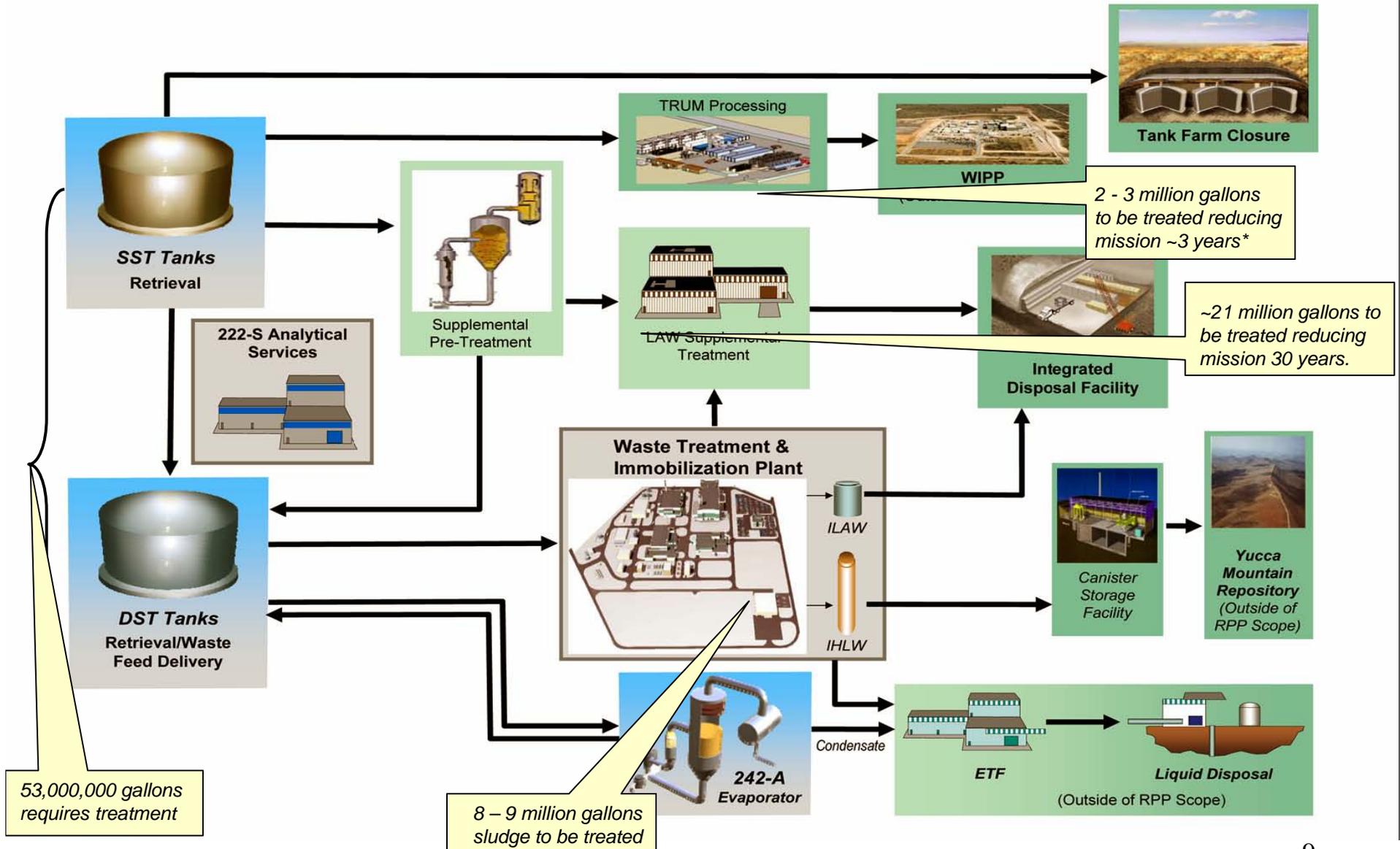
- ❑ Established in April 2006 to provide executive oversight and direction to integrate and optimize activities carried out by the TF Contractor and WTP Contractors and U.S. Department of Energy (DOE).
- ❑ Includes senior managers from ORP, WTP Contract, and the TF Contract.
- ❑ Meets on average twice a month to:
 - Ensure WTP Contractor and TF Contractor alignment,
 - Keep senior managements' interface perspectives and insights current,
 - Commission analyses, white papers, and other activities to enhance performance,
 - Identify technical and programmatic risks and risk management approaches,
 - Approve System Plan assumptions, key parameters, and scenarios and alternatives,
 - Advise EM of pending plans, issues, and performance enhancement opportunities,
 - Provide focused direction to River Protection Program (RPP) participants.



SMIT Agenda Items To Date

- ❑ Systems Plan/Hanford Tank Waste Operations Simulator (HTWOS) Runs (4/14/06)
- ❑ RPP Baseline Schedule Status/Issues (4/21/06)
- ❑ RPP Baseline Cost Assumptions/Status (4/21/06)
- ❑ Interface Control Documents (ICDs) Status/Issues (4/28/06)
- ❑ High Level Waste (HLW) Glass Development (waste loading improvements) (5/5/06)
- ❑ HTWOS Sensitivity Case Analysis Status (5/5/06)
- ❑ TF Tri-Party Agreement (TPA) Discussion Objectives (5/26/06)
- ❑ WTP TPA Discussion Objectives (5/26/06)
- ❑ Integration of TF & WTP Strategies (5/26/06)
- ❑ Single-Shell Tank Performance Assessment (6/23/06)
- ❑ RPP Risk Management Approach (6/23/06)
- ❑ Technology Status Update (6/23/06)
- ❑ Status & Strategy for TPA Discussions (7/7/06)
- ❑ Start Low Activity Waste First (7/21/06)
- ❑ HTWOS Baseline Case Results and Sensitivity Case Assumptions (7/21/06)
- ❑ HLW Melter Bubbler Location Optimization (8/4/06)
- ❑ Savannah River Site and ORP Glass Waste Loading Assumptions/Calculation Approaches (8/4/06)
- ❑ Caustic Recycle Using Electrochemical Ceramic Membranes (8/4/06)
- ❑ ICD Issues Requiring ORP Resolution (8/4/06)

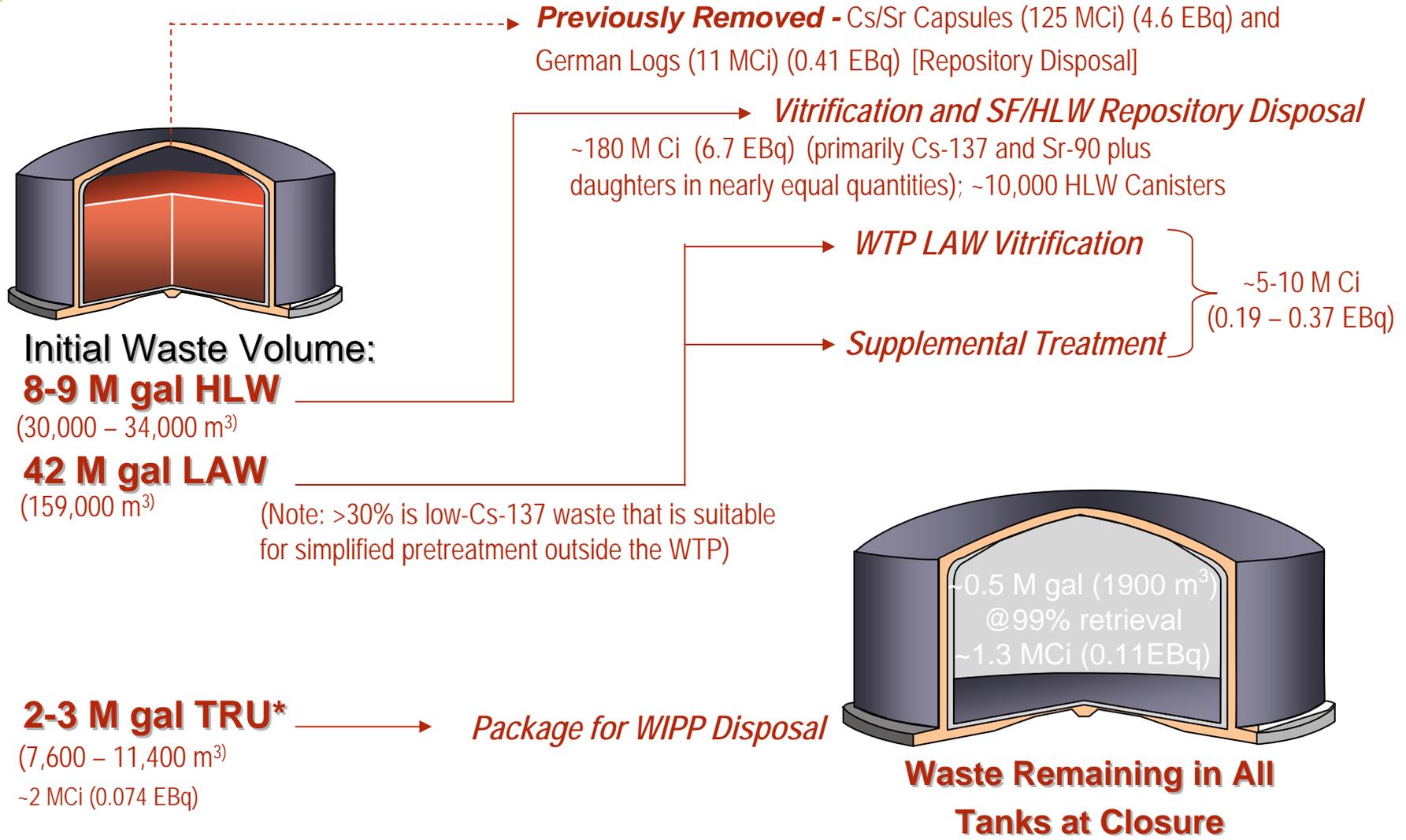
River Protection Project Mission



*A decision for disposal at the Waste Isolation Pilot Plant (WIPP) will not be made until (1) the waste meets the WIPP Waste Acceptance Criteria, with special emphasis on the waste determination as delineated in the WIPP recertification decision by the Environmental Protection Agency in March 2006; and (2) it meets the regulatory eligibility requirements for disposal as described in the WIPP Hazardous Waste Facility Permit.



Multiple Treatment and Disposition Pathways Result in ~97% of the Hanford Tank Radioactivity Being Disposed of Off-Site.



*Potential to eliminate 1500 HLW Canisters. A decision for disposal at the Waste Isolation Pilot Plant (WIPP) will not be made until (1) the waste meets the WIPP Waste Acceptance Criteria, with special emphasis on the waste determination as delineated in the WIPP recertification decision by the Environmental Protection Agency in March 2006; and (2) it meets the regulatory eligibility requirements for disposal as described in the WIPP Hazardous Waste Facility Permit.



Status of the River Protection Mission



Waste Treatment Plant Construction

- ❑ Construction 30% complete
- ❑ Design 70% complete



Tank Retrieval and Closure Activities

- ❑ Tanks retrieved to date: C-106, C-203, C-202 and C-201.
- ❑ Tanks in retrieval: S-112; S-102, C-103, and C-204
- ❑ Tank C-108 being outfitted for retrieval
- ❑ New retrieval technologies are working
- ❑ Discussing conducting a tank closure demonstration with State



Design and Testing of Supplemental Low-Activity Waste Treatment

- ❑ 58 lab-scale & engineering-scale tests completed including one each with actual waste and 7 large-scale runs with simulants
- ❑ CD-0/1 complete and CD-2 in preparation
- ❑ Facility design 100% complete
- ❑ Integrated dryer/large-scale test in Fiscal Year 2007



Integrated Disposal Facility

- ❑ Construction completed



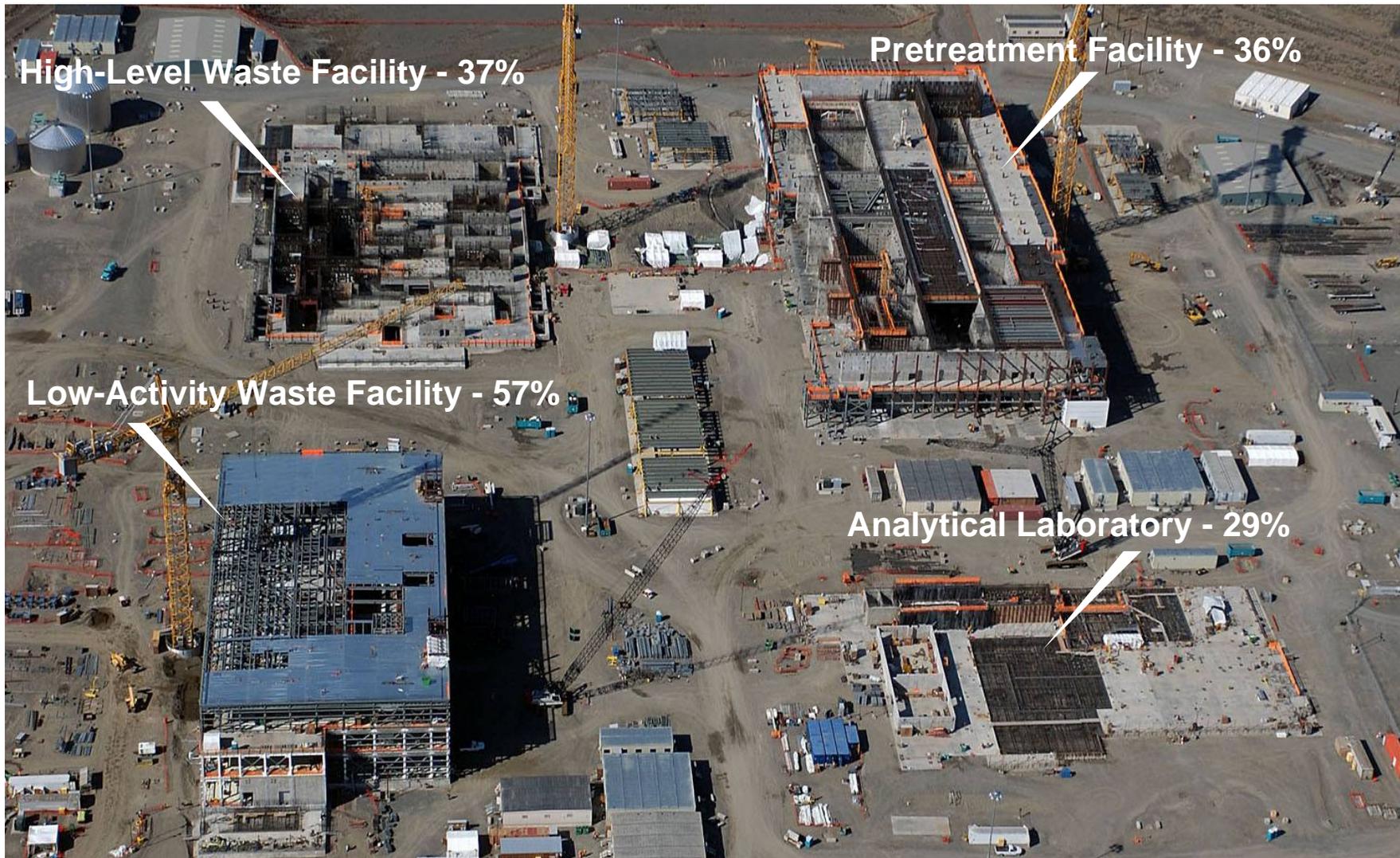
Waste Treatment Plant

- ❑ Continue construction of Low Activity Waste Facility, Balance of Facilities, Analytical Laboratory
- ❑ Suspended construction in Pretreatment and High-Level Waste facilities to focus on incorporation of revised seismic criteria and on advancing the design
- ❑ Recent Challenges
 - Cost growth/steel, labor and escalation
 - Solving technical problems
 - Seismic
 - Hydrogen gas
 - Mixing
 - Ultra-filtration/Concentration
 - Leaching for Chrome and Aluminum





Percent Complete as FY '07 Begins



% Complete reflects overall engineering, procurement and construction*

13

**May 2006 EAC; percentages exclude Project Contingency, Late Adjustments & do not include allocation of Plant Wide and Shared Services*



Waste Treatment Plant Work Continues, But Challenges Remain

- What Has Worked:
 - Right-sized plant – more capable – that can complete the mission
 - Building a well qualified and experienced staff
- What could have been done better:
 - Earlier use of industry experts
 - Engineering and construction too closely coupled
 - Very large projects contingency calculation methodology underestimated impacts of Programmatic risks, world economics, under-appreciation of escalation/inflation rates, and technical risks
- What's Next:
 - Establish credible Project cost and schedule baseline
 - Addressing recommendations from industry experts
 - U.S. Army Corps of Engineers completing validation of review of the May 2006 Project Estimate at Completion (EAC)
 - Plan to have new project baseline by late summer 2006
 - Develop an Interim Project Baseline
 - Certify the contractor's Earned Value Management System in November 2006



Restoring Confidence and Credibility

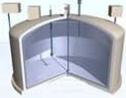
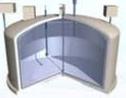
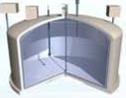
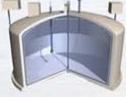
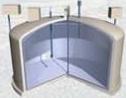
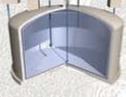
- ❑ Secretary's Direction
- ❑ Bottom's up EAC
- ❑ More rigorous reporting
- ❑ Comprehensive validation review
- ❑ EM Office of Project Recovery established
- ❑ After Action Fact Finding Review
- ❑ Industry Expert Reviews



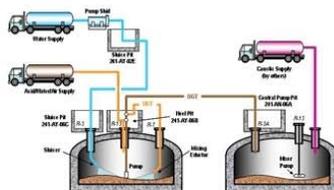
Hanford Tank Cleanup Status



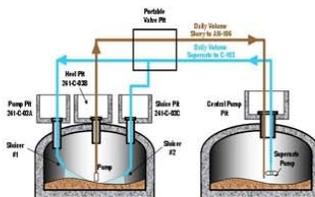
Retrieval Summary Updated through August 4, 2006

RETRIEVED	IN PROGRESS	NEXT IN LINE
 <p>C-201</p> <ul style="list-style-type: none"> Capacity of tank: 55,000 gallons Completion date: March 23, 2006 Volume removed: 717 gallons Curies removed: 961 Technology used: Vacuum retrieval 	 <p>C-204</p> <ul style="list-style-type: none"> Capacity of tank: 55,000 gallons Retrieval started: July 23, 2006 Volume of waste to be removed: 1,486 gallons Volume of waste removed to date: 202 gallons Curies removed to date: 66 of 486 Technology in use: Vacuum retrieval 	 <p>C-108</p> <ul style="list-style-type: none"> Capacity of tank: 530,000 gallons Volume of waste to be removed: 66,000 gallons Curies to be removed: 167,198 When retrieval to begin: FY 2007 Technology to be used: Modified sluicing
 <p>C-202</p> <ul style="list-style-type: none"> Capacity of tank: 55,000 gallons Completion date: August 11, 2005 Volume removed: 1,183 gallons Curies removed: 2,560 Technology used: Vacuum retrieval Lessons learned from first application reduced retrieval time from nine months to just six weeks. 	 <p>C-103</p> <ul style="list-style-type: none"> Capacity of tank: 530,000 gallons Retrieval started: November 6, 2005 Volume of waste to be removed: 72,000 gallons Volume of waste removed to date: 68,294 gallons Curies removed to date: 2,675,901 of 2,700,091 Technology in use: Modified sluicing 	 <p>S-109</p> <ul style="list-style-type: none"> Capacity of tank: 758,000 gallons Volume of waste to be removed: 400,000 gallons Curies to be removed: 35,214* When retrieval to begin: 2010 Technology to be used: Selective Saltcake Dissolution Up to 200,000 gallons are to be used in the Demonstration Bulk Vitrification System to demonstrate a new technology with potential to supplement the Hanford Vitrification Plant for treatment of low activity waste. * The 35,214 number of curies is based on assumption that 80% of the Cs-137 and Tc-99 will be retrieved.
 <p>C-203</p> <ul style="list-style-type: none"> Capacity of tank: 55,000 gallons Completion date: March 24, 2005 Volume removed: 2,441 gallons Curies removed: 1,095 Technology used: Vacuum Retrieval First application of this innovative retrieval technology 	 <p>S-102</p> <ul style="list-style-type: none"> Capacity of tank: 758,000 gallons Retrieval started: December 17, 2004 Volume of waste to be removed: 464,000 gallons Volume removed to date: 253,000 gallons Curies removed to date: 335,199 of 704,283 Technology in use: Saltcake Dissolution Engineers developed unique variable height pump to prevent clogging that occurred using conventional pump assembly. 	
 <p>C-106</p> <ul style="list-style-type: none"> Capacity of tank: 530,000 gallons Completion date: December 31, 2003 Volume removed: 194,229 gallons Curies removed: 8,885,700 Technology used: Sluicing/Acid dissolution C-106 was a high heat tank and was placed on a safety "watch list." Retrieval of the waste solved this safety issue. 	 <p>S-112</p> <ul style="list-style-type: none"> Capacity of tank: 758,000 gallons Retrieval started: September 28, 2003 Volume of waste to be removed: 614,000 gallons Volume removed to date: 609,343 gallons Curies removed to date: 590,105 of 628,068 Technology in use: Remote Water Lance/ Modified Sluicing Demonstration project under way to determine effectiveness of remote water lance to break up and mobilize hardened waste at bottom of tank. 	

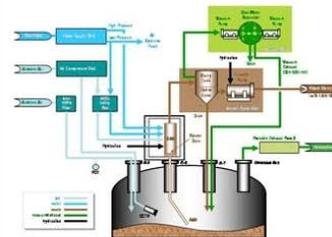
● Acid Dissolution



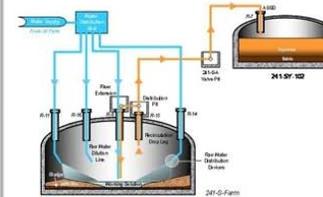
● Modified Sluicing



● Vacuum Retrieval



● Saltcake Dissolution



Remote Water Lance (Salt Mantis)

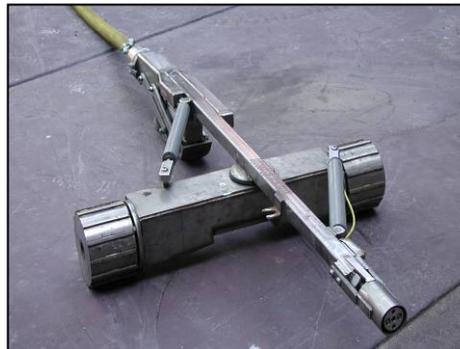




New Innovative Tank Waste Retrieval

Technologies

- ❑ Technologies based on waste characteristics and each tank's physical condition
- ❑ Demonstrating achievability of 99% waste retrieval
- ❑ Working with State of Washington and Nuclear Regulatory Commission on retrieval effectiveness
- ❑ Managing available Double-Shell tank space

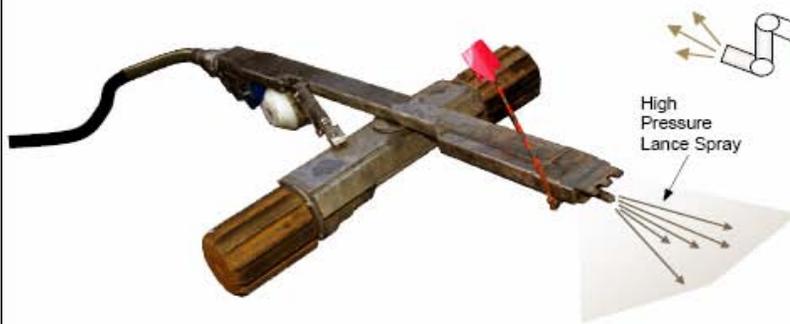




New Innovative Tank Waste Retrieval

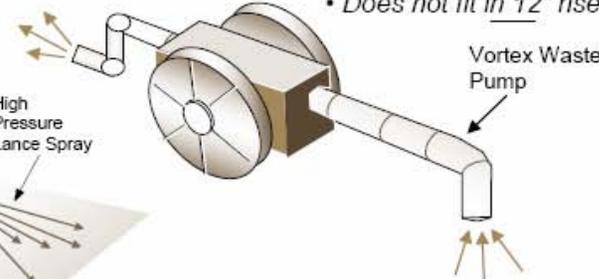
Salt Mantis: Waste Breakup and Mixing Tool

- High pressure spray breaks up and mixes waste
- Augments other retrieval systems



Aardvark: Waste Breakup and Transfer Tool

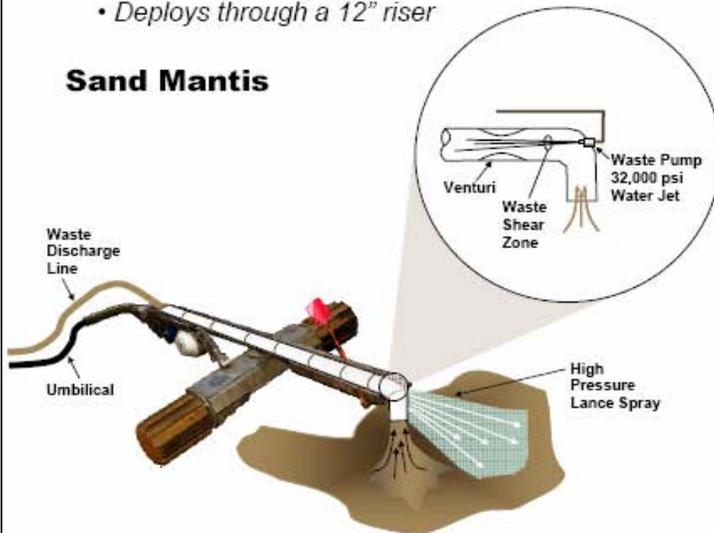
- Developed for mining industry
- Pumps material with Vortex Pump
- Does not fit in 12" riser



Sand Mantis: Waste Breakup, Mixing, and Transfer Tool

- Waste transfer capability added to "Salt Mantis"
- Deploys through a 12" riser

Sand Mantis



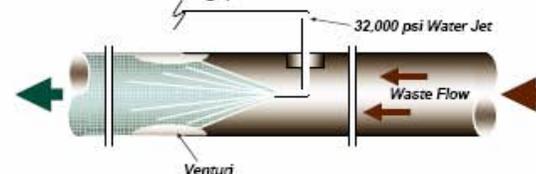
Rotary Viper: Waste Mixing Tool

- Sluicer
- Mixes Waste
- Fits down 4" Riser



Squid Pump: In-Line Waste Transfer Tool

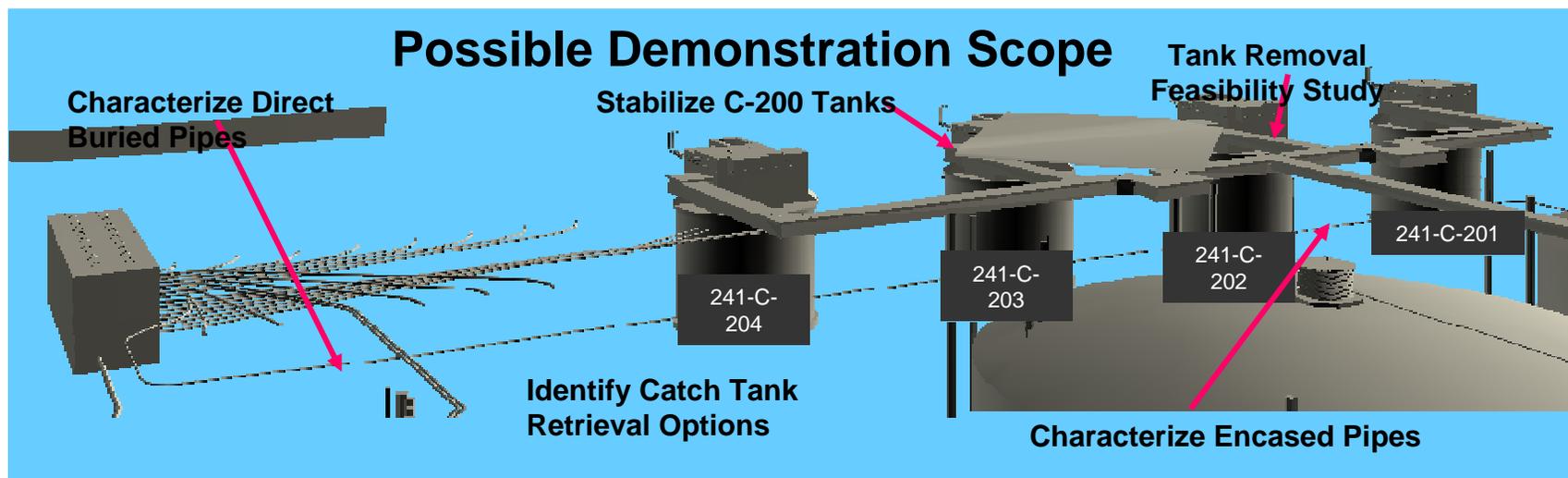
- Small size allows installation of Transfer Lines and in existing pits





Demonstrate Field and Regulatory Processes to Close SST System Components

- ❑ General project scope discussed with Ecology
 - Pipeline characterization (visual & sampling)
 - Tank stabilization and sampling (coring)
 - Catch tank retrieval and disposition
 - RCRA/CERCLA closure process
 - Waste Determinations for tank and equipment residuals
- ❑ Project Plan under development
- ❑ Supporting “White Papers” under development
 - Closure Strategy and Options
 - RCRA/Integration venues
- ❑ Draft Waste Determinations under development
- ❑ Pre-requisites
 - RD&D Permit
 - NEPA coverage
- ❑ Major Gains
 - Dispositioning of “structures” under the CERCLA process
 - General acceptance of landfill closure assumption





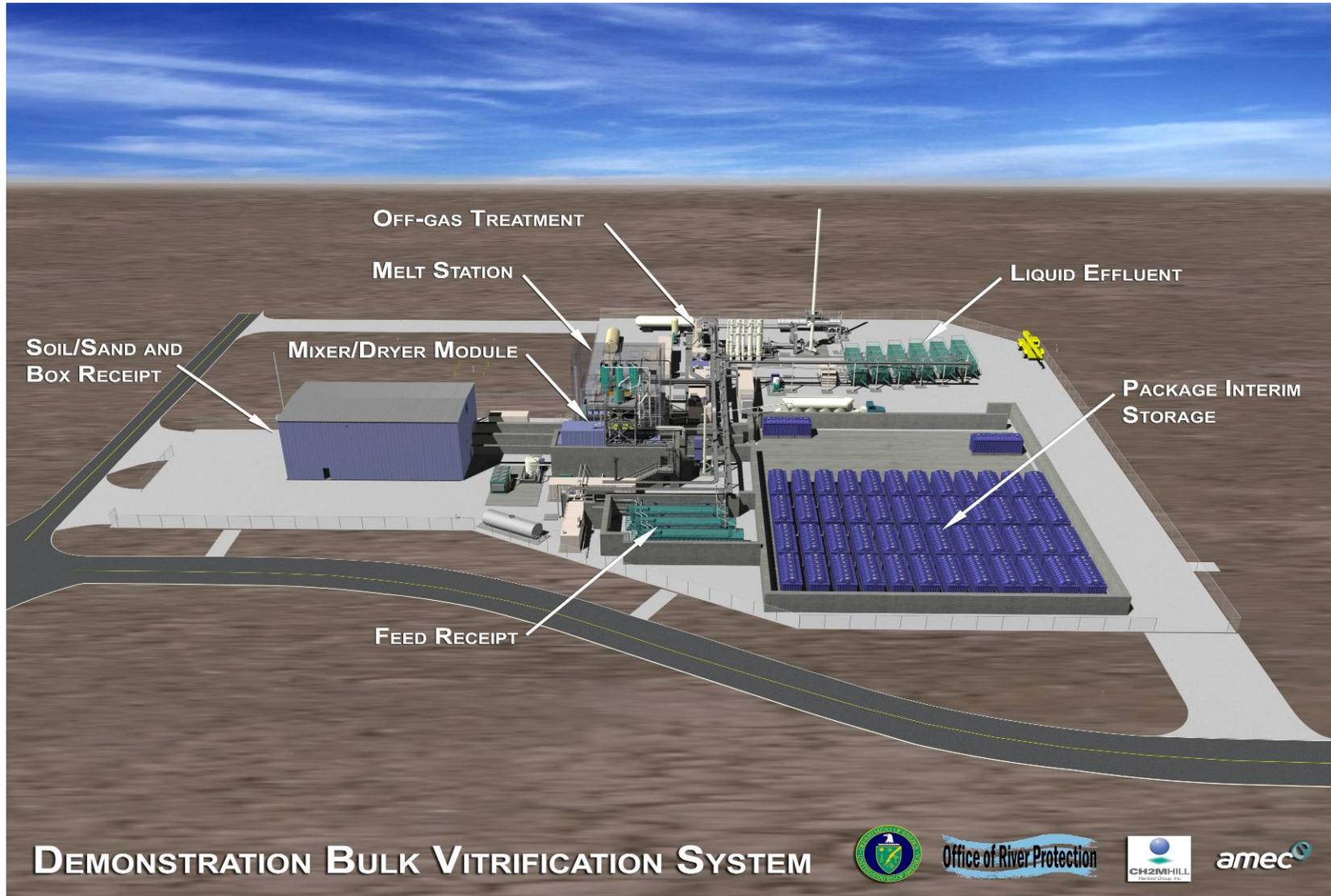
Bulk Vitrification (BV) Technology Demonstration Program



- ❑ Results to date indicate that BV glass comparable to WTP ILAW
- ❑ Allows treatment flexibility in treating difficult waste streams
- ❑ Secondary waste is minimized and recycled within the process or sent to Effluent Treatment Facility (no orphan waste streams)
- ❑ Results from BV testing have application to WTP operations (i.e. off-gas system technology/performance and waste form qualification)
- ❑ Best & Brightest Demonstration Bulk Vitrification System review underway – no fatal flaws at mid-way debrief
- ❑ May allow interim LAW treatment prior to WTP startup



Demonstration Bulk Vitrification System





Integrated Disposal Facility

- ❑ Constructed under a temporary authorization in cooperation with State of Washington
- ❑ Will be operated under State issued Resource Conservation and Recovery Act (RCRA) permit for mixed waste cell
- ❑ Construction [complete]
- ❑ Will be operationally ready and permitted for vitrified low activity waste initially



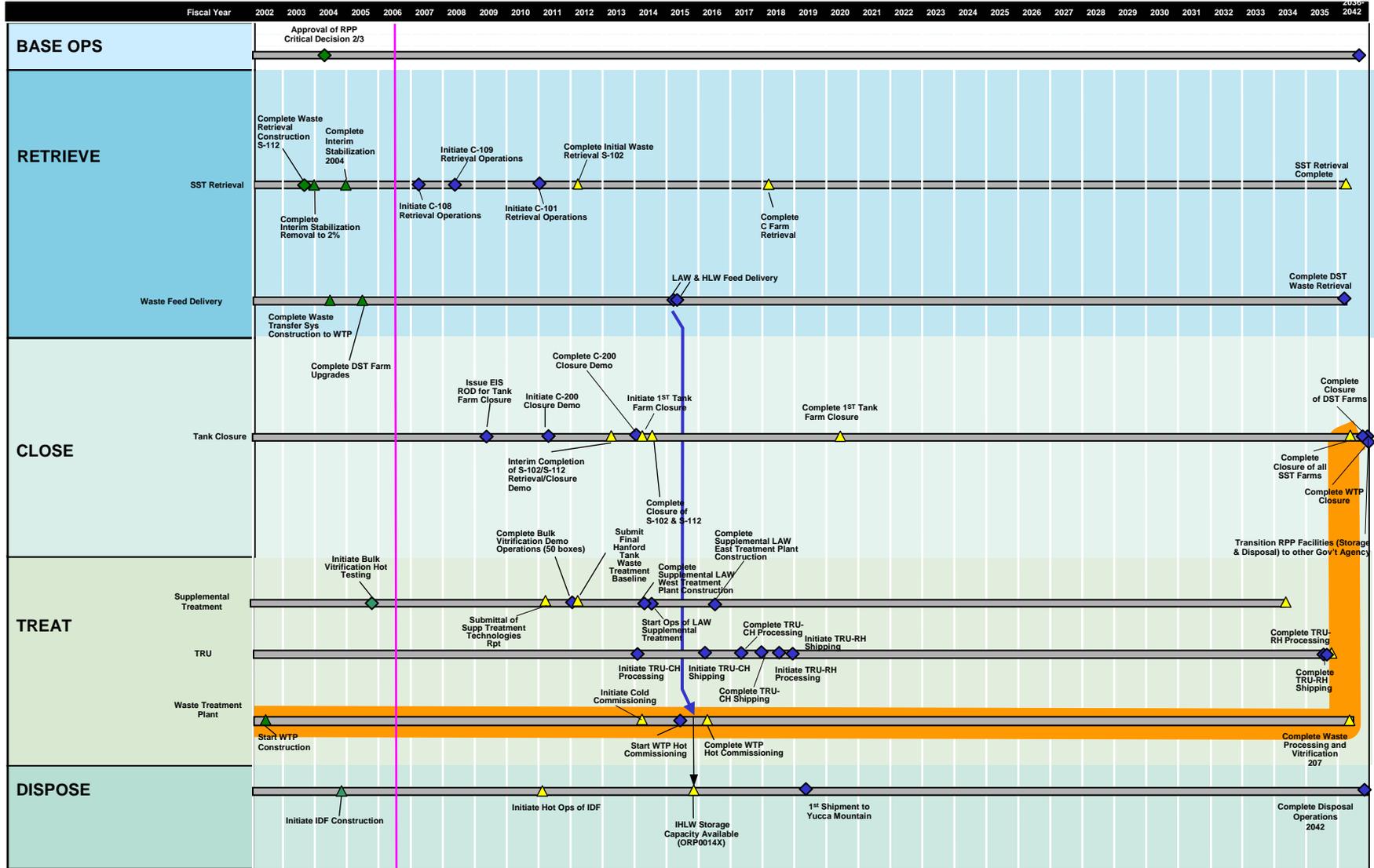
Integrated Disposal Facility





DRAFT – NOT APPROVED BASELINE

RPP Management Summary Schedule



- ▲ Planned Selected TPA Milestones
- ▲ Completed Selected TPA Milestones
- ▲ Missed TPA Milestones
- ◆ Planned Other Targets
- ◆ Completed Other Targets

Note: The Lifecycle Cost and Schedule Baseline is being updated



Conclusions

- ❑ Safety is our top priority – Our workers are our greatest asset
- ❑ The Waste Treatment Plant is the cornerstone of Hanford Tank Waste cleanup
- ❑ Supplemental Technologies are yielding promising results progressing
- ❑ New innovative tank waste retrieval technologies are working
- ❑ Participation of regulators, stakeholders and tribal nations is key to our success