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INTEGRATED MISSION ACCELERATION PLAN

Results-Oriented Technical, Regulatory, and Work Management Strategies that Reduce the Time and Cost to Close the Hanford Site Tank Farms

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REVISION 0

Submitted

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The Integrated Mission Acceleration Plan describes the technical, regulatory, and business management strategies and implementing actions needed to accelerate closure of the Hanford Site tank farms resulting, in an overall improvement in the River Protection Project life-cycle cost and schedule.

Approval indicates that the content of this document aligns the strategic level River Protection Project technical approach, schedule, cost, key decisions, and site integration points. The document defines the technical basis and execution actions required to implement the accelerated mission. It is not intended as a budget request, nor does it represent contractual commitments on behalf of either party.

The Integrated Mission Acceleration Plan (IMAP) describes technical, regulatory, and work management execution strategies and tactical implementing actions that will accelerate closure of the Hanford Site tank farms as compared to the Hanford Performance Management Plan. Accelerated closure strategies will be implemented within established funding levels with a corresponding reduction of life-cycle cost for the River Protection Project.

IMAP strategies and implementation plans are integrated within the overall River Protection Project system, including the Waste Treatment Plant. An Integrated Optimization Schedule which integrates waste feed delivery to the Waste Treatment Plant, tank waste retrieval/closure, and supplemental treatment technologies for transuranic waste, low-level waste, and low-activity waste is shown in Appendix D and discussed in Section 4.0.

IMAP execution strategies are success oriented and it is recognized that some elements will require revision to incorporate lessons learned, successes, and required improvements. The IMAP will be updated annually, more frequently if appropriate.

EXECUTIVE SUMMARY

Results-Oriented Execution Strategies

This Integrated Mission Acceleration Plan (IMAP) describes technical, regulatory, and management strategies and the associated action plans to accelerate closure of the Hanford Site tank farms. Successful execution of the IMAP will result in significant improvement in the River Protection Project (RPP) life-cycle cost and schedule. The IMAP integrates requirements and performance across all systems that are part of the RPP.

The Execution Strategies outlined below are described in detail in Sections 4.0 though 7.0. The near term and long term achievements from successful completion of these strategies are shown in Table ES-1.

1. **Retrieve and Close Single-Shell Tanks (SST), Double-Shell Tanks, and Tank Farms**

   Disposition waste from all 149 SSTs by 2018 within the established budget profile, reducing hazards to the workers, the public, and the environment while significantly reducing the program life-cycle costs.

2. **Provide Waste Feed Delivery to Satisfy Accelerated Waste Treatment Plant (WTP) Processing Rates**

   Deliver waste feed to the WTP and receive and disposition treated waste products per the WTP schedule and the System Plan to support the RPP mission completion.

3. **Process Waste via Supplemental/Alternate Treatment/Disposal**

   Implement environmentally responsible and cost effective non-WTP supplemental treatment and processing techniques that will reduce double-shell tank space usage and the planned loading on the WTP. The need and plan for implementation of supplemental low-activity waste processing for waste pretreated in the WTP will be established.

4. **Enhance Regulatory and Stakeholder Interactions**

   Work in a collaborative manner with the Washington State Department of Ecology, the U.S. Environmental Protection Agency, Washington State Department of Health, Tribal Nations, other U.S. Department of Energy sites, and stakeholder groups to develop and implement a responsible, progressive and efficient regulatory approach that meets established requirements while optimizing stakeholder involvement, regulatory reviews, approvals, and implementation.

5. **Improve Mission Support and Work Management Systems**

   Make fundamental business changes, including changing work processes to achieve operations and management efficiencies that will allow funding to be allocated for waste retrieval, tank closures, and supplemental waste treatment and disposal on an accelerated schedule. Work practices will be tailored to the hazards involved in compliance with established Integrated Safety Management Systems and environmental management principles.

Table ES-1. Integrated Mission Acceleration Plan Strategies Produce Results. (3 sheets)

IMAP STRATEGY	PLANNED ACHIEVEMENTS FY 2003 to FY 2006	PLANNED ACHIEVEMENTS FY 2007 to FY 2034
1. Retrieve And Close SSTs, DSTs, And Tank Farms (IMAP Section 4.2) ***(PBI – 1)*** ***(PBI – 3)***	➢ 40 tanks selected for early retrieval and closure ➢ Select/implement proven retrieval systems on the 40 tanks ➢ Up to 40 SSTs interim closed by 2006 (10 years ahead of the HPMP*) ➢ Two SST farms interim closed by 2006 (three years ahead of HPMP) – major step in overall footprint reduction for the tank farms ➢ 244-AR Vault interim stabilization completed in 2003 ➢ Interim stabilization of SSTs completed in FY2004 ➢ 9.4 million gallons of additional usable DST space gained ➢ Dry Retrieval/SST Waste Staging option evaluated and implemented if feasible ➢ Targeted SST waste retrieved directly to Supplemental Processing, avoiding DSTs and WTP	➢ Interim closure of West Area SST Farms by 2010 (20 years ahead of HPMP) ➢ All SST Farms closed by 2018 (13 years ahead of HPMP) ➢ DSTs, WTP, and River Protection Project facilities interim closed by 2033 (two years ahead of HPMP) ➢ Evaluate and improve performance of retrieval systems to optimize performance, safety, schedule, and cost. ➢ DST space managed efficiently based on WTP and supplemental processing performance
2. Provide Waste Feed Delivery To Satisfy Accelerated WTP Processing Rates (IMAP Section 4.3) ***(PBI – 2)***	➢ Integrated Optimization Schedule for feed delivery established and implemented ➢ Develop and implement an "Implementation Plan" that will form the contract basis for feed delivery to the WTP ➢ Construction of immobilized high-level waste storage facility completed in 2006 to store 880 canisters ➢ Projects completed in time to support feed delivery requirements to the WTP ➢ Alternatives evaluated and implemented as feasible to optimize meeting mission needs • Feed projects • Storage/disposal projects	➢ Evaluate project schedule and scope based on ongoing WTP progress and supplemental treatment progress ➢ Optimize the River Protection Project life cycle through optimal glass production ➢ Flexible and more efficient waste feed qualification improving life-cycle costs

Table ES-1. Integrated Mission Acceleration Plan Strategies Produce Results. (3 sheets)

IMAP STRATEGY	PLANNED ACHIEVEMENTS FY 2003 to FY 2006	PLANNED ACHIEVEMENTS FY 2007 to FY 2034
3. Process Waste via Supplemental/Alternate Treatment/Disposal (IMAP Section 4.4) ***(PBI – 4)***	➢ 750,000 gallons of transuranic waste retrieved from SSTs and processed using supplemental technology ➢ 250,000 gallons of low-activity waste/low-level waste retrieved and disposed using supplemental treatment technology ➢ Evaluate steam-reforming, bulk vitrification, containerized grout and other supplemental processing technologies that could be implemented to minimize quantity of waste sent to WTP ➢ Technologies selected for physical demonstration on real waste (To use in supplemental processing of waste pretreated in WTP.)	➢ Remote handled transuranic waste retrieved from DSTs and processed ➢ Implementation of cost effective supplemental processing optimized, reducing waste sent to WTP ➢ Alternate processing of waste pretreated in WTP implemented by 2010 ➢ Low-activity waste glass processing reduced by up to 80% from March 2002 Baseline
4. Enhance Regulatory And Stakeholder Interactions (IMAP Section 5.0) ***(All PBIs)***	➢ Tank Closure Environmental Impact Statement (EIS) completed by April 2004 ➢ Review and approval process of regulatory documents required for tank closure optimized, reducing the review cycle from 28 months to less than 12 months ➢ Permit review and approval for selected supplemental processing approach in less than 15 months after submission ➢ Templates for standardized functions and requirements documents and closure plans developed and implemented ➢ Risk-based closure criteria evaluated and implemented ➢ Timely and efficient Waste Incidental to Reprocessing (WIR) determination process developed and implemented ➢ Meet regulatory commitments consistently ➢ Agreements with the Waste Isolation Pilot Plant and Yucca Mountain for receipt of River Protection Project waste established	➢ Continued improvements in partnering among the ORP, the Tank Farm Contractor, and Regulators ➢ Trust and confidence in performance achieved

Table ES-1. Integrated Mission Acceleration Plan Strategies Produce Results. (3 sheets)

IMAP STRATEGY	PLANNED ACHIEVEMENTS FY 2003 to FY 2006	PLANNED ACHIEVEMENTS FY 2007 to FY 2034
5. Improve Mission Support And Work Management Systems (IMAP Section 6.0) ***(All PBIs)***	➢ Organization aligned to accelerated mission and tank closure focus from prior Management and Operations mission ➢ Authorization Basis documents restructured to hazards associated with tank closures for SSTs, eliminating unnecessary conservatism ➢ Work planning and work control process streamlined, optimizing the time period and costs associated with implementing field activities ➢ Integrated Mission Execution Schedule implemented and schedule accountability instilled at all levels ➢ CH2M HILL Hanford Group, Inc., contract modified, streamlining technical requirements, eliminating nonessential reporting and reviews, and establishing ORP oversight at Level 2 of the Work Breakdown Structure ➢ Internal/external review and approval processes optimized, eliminating serial reviews ➢ Infrastructure support consolidated and reduced as tank farm footprint reduces	➢ Lessons learned in near term work implemented, increasing efficiencies and accelerating accomplishments in this timeframe

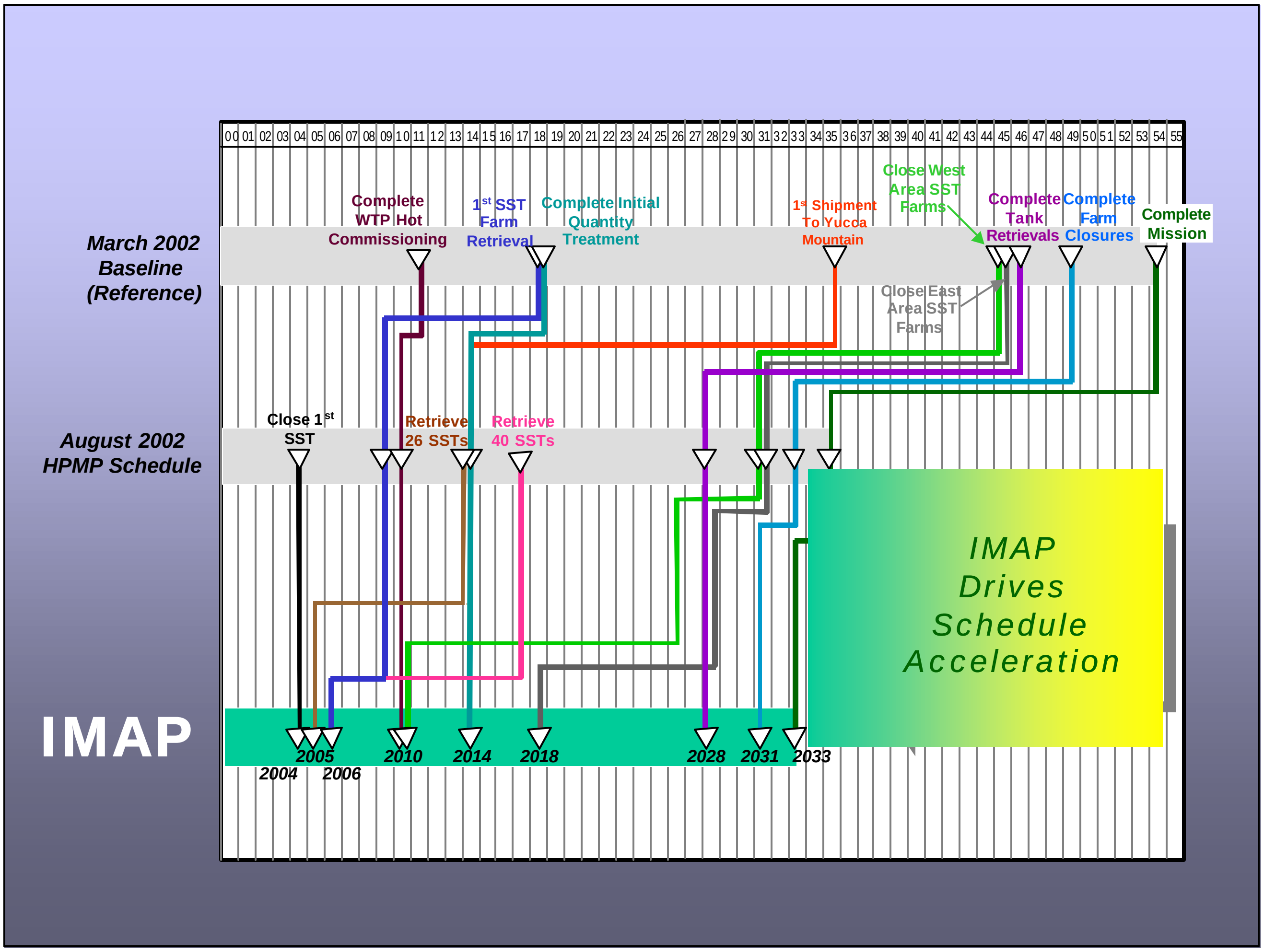
*DOE/RL-2002-47, 2002, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DST	=	double-shell tank.
HPMP	=	Hanford Performance Management Plan.
IMAP	=	Integrated Mission Acceleration Plan.
PBI	=	performance-based incentive.
SST	=	single-shell tank.
WTP	=	Waste Treatment Plant.

IMAP Accelerates the RPP Closure Schedule

As shown in Figure ES-1, implementation of the IMAP improves the schedule significantly from the recently established HPMP and even more significantly from the March 2002 Baseline. The IMAP actions drive acceleration of closure activities and mission completion.

Figure ES–1. Integrated Mission Acceleration Plan Schedule Accelerates Mission Completion.



As lessons learned over the next few years are incorporated and supplemental technologies are successfully deployed, additional schedule improvements will be realized.

Specific schedule improvements that result from the focus on closure are shown in Table ES-2. As shown in the table, the closure of 40 SSTs will be completed 10 years ahead of the HPMP schedule; the closure of the 200 West Area SST farms is completed 20 years ahead of the HPMP schedule; and the closure of all SST farms is completed 13 years ahead of the HPMP schedule.

Table ES–2. Integrated Mission Acceleration Plan Milestones Compared to the Hanford Performance Management Plan.

Accomplishment Milestone	HPMP Schedule	IMAP Schedule
Close first 26 SSTs	FY 2014	FY 2005
Close first 40 SSTs	FY 2016	FY 2006
Close 2 SST Farms	FY 2009	FY 2006
Demonstrate supplemental technology on real waste	FY 2008	FY 2004
Retrieve and treat 750K gallons of transuranic waste	FY 2012	FY 2006
Treat and dispose 250K gallons of low-level waste/low-activity waste	FY 2011	FY 2006
Close 200 West Area SST Farms	FY 2030	FY 2010
Close 200 East Area SST Farms	FY 2031	FY 2018
Complete mission	FY 2035	FY 2033

All activities to support IMAP are included in the Integrated Mission Execution Schedule, the primary tool for work execution and management of accountability for work planned.

The IMAP schedule is aggressive and results oriented while recognizing that some significant technical, regulatory, and management issues require resolution. These risks are recognized and accepted. Qualitatively, there is a significantly higher risk associated with pursuing the historically risk averse practice of producing studies, plans, and analysis. The benefit of aggressively pursuing SST closures is near term hazard reduction and generation of lessons learned to improve future retrievals and closures.

IMAP Reduces RPP Life-Cycle Cost by more than $7 Billion from the HPMP

Table ES-3 highlights the major improvements in the RPP life-cycle costs. The IMAP actions will reduce the life-cycle costs by approximately $7.4 billion from the HPMP. When compared to the March 2002 Baseline, total life-cycle costs are reduced by over $21 billion.

Table ES–3. Major Improvements in the River Protection Project Life-Cycle Costs.

Area of Life-Cycle Cost Improvement	Cost Reduction Compared to the HPMP
1. Optimized Processes and Procedures to Support Minimum Safe Operations	$1.2 Billion
2. SST Retrieval System Design and Construction	$5.0 Billion
3. Elimination of Proposed Waste Retrieval Facilities	$0.7 Billion
4. Elimination of Blending Facility	$0.2 Billion
5. Improved Logistical Coordination of SST Closures	$0.2 Billion
6. Use of Existing Retrieval Technologies Instead of Demonstration of New Technology	$0.1 Billion
Total Cost Reduction from August 2002 HPMP	$7.4 Billion

IMAP Defines Mission Acceleration Action Plans (MAAP) with Responsible and Accountable Managers.

IMAP identifies 30 MAAPs that must be performed on schedule to facilitate completion of IMAP closure schedule activities. The MAAPs are summarized in Section 7.0 and contained in detail in Appendix C.

The MAAPs each have several activities that must be completed on the schedule defined in the MAAPs to successfully support the five Execution Strategies. All MAAPs have individually assigned responsible managers and all actions within the MAAPs have identified personnel with responsibility for those individual actions. Assigned managers will be accountable for ensuring MAAP actions are completed as scheduled.

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FIGURES

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TERMS

AEA	*Atomic Energy Act*
AMS	articulating mast system
BCR	Baseline Change Request
BNI	Bechtel National, Inc.
C3T	Cleanup Constraints and Challenges Team
CERCLA	*Comprehensive Environmental Response, Compensation and Liability Act of 1980*
CH2M HILL	CH2M HILL Hanford Group, Inc.
CSB	Canister Storage Building
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy-Headquarters
DSA	Documented Safety Analysis
DST	double-shell tank
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ETF	Effluent Treatment Facility
F&R	functions and requirements
FFCAA	*Federal Facility Compliance Act Agreement*
FY	fiscal year
HLW	high-level waste
HPMP	Hanford Performance Management Plan
HWMA	*State Hazardous Waste Management Act*
HTWOS	Hanford Tank Waste Operations Simulator
ICD	interface control document
IDF	Integrated Disposal Facility
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
IMAP	Integrated Mission Acceleration Plan
IMES	Integrated Mission Execution Schedule
ISMS	Integrated Environment, Safety and Health Management System or Integrated Safety Management System (as used by the DOE)
LAW	low-activity waste
LDR	Land Disposal Restriction
LLW	low-level waste
MAAP	Mission Acceleration Action Plan
MLLW	mixed low-level waste
MRS	Mobile Retrieval System
NEPA	*National Environmental Policy Act of 1969*
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NRC	U.S. Nuclear Regulatory Commission
NWPA	*Nuclear Waste Policy Act of 1982*
OCRWM	Office of Civilian Radioactive Waste Management
ORP	U.S. Department of Energy, Office of River Protection

ORR	Operational Readiness Review
PMBS	Performance Measurement Baseline Schedule
RCRA	*Resource Conservation and Recovery Act of 1976*
RL	U.S. Department of Energy, Richland Operations Office
ROD	Record of Decision
RPP	River Protection Project
RSW	Radioactive Solid Waste
SEPA	*Washington State Environmental Policy Act of 1971*
SNF	Spent Nuclear Fuel
SpG	specific gravity
SST	single-shell tank
TEDF	Treated Effluent Disposal Facility
TIA	Technical Integration Activity
TFC	Tank Farm Contractor
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TRU	transuranic
TSCA	*Toxic Substance Control Act*
TSR	Technical Safety Requirement
WAC	*Washington Administrative Code*
WBS	Work Breakdown Structure
WDOH	Washington State Department of Health
WIPP	Waste Isolation Pilot Plant (Carlsbad, New Mexico)
WIR	Waste Incidental to Reprocessing
WMA	Waste Management Area (tank farm boundary)
WRF	Waste Receiver Facility
WTP	Waste Treatment Plant

DEFINITIONS

ALTERNATIVE TREATMENT – Implementation of processes that use a pre-treatment capability but do not require the Waste Treatment Plant vitrification capability to disposition low-activity waste. This may include disposition by bulk vitrification, grouting, steam reforming, and other technologies.

CLOSURE – Actions taken to reduce the human health and environmental threats posed by a hazardous waste treatment, storage, and/or disposal facility or unit (along with structures and contiguous land) after the facility or unit has received its final volume of hazardous waste. Closure must satisfy applicable requirements of 40 CFR 264, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Subpart G, and WAC 173-303-610, "Closure and Post-Closure." (*Hanford Federal Facility Agreement and Consent Order,* Appendix A, Definitions)

DISPOSAL – Emplacement of waste in a manner that ensures protection of the public, workers, and environment with no intent of retrieval and that requires deliberate action to regain access to the waste (DOE O 435.1, *Radioactive Waste Management*)

DISPOSITION – Activities that follow generation of a waste and which constitute completion of the life-cycle management of the waste including stabilization, disposal, or interim storage pending shipment to an approved waste repository.

GOVERNMENT FURNISHED SERVICES/ITEMS – Services or items that the U.S. Department of Energy commits to perform or provide to support the completion of activities and strategies associated with this plan.

HIGH-LEVEL WASTE – Highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that the commission, consistent with existing law, determines by rule to require permanent isolation. (Nuclear Waste Policy Act of 1982 (42 US: 10101 (12))

IMMOBILIZED HIGH-LEVEL WASTE – High-level waste (see High-Level Waste) that has been processed to reduce the environmental mobility of radioactive and/or hazardous constituents for storage or disposal.

IMMOBILIZED LOW-ACTIVITY WASTE – Low-activity waste (see Low-Activity Waste) that has been processed or treated to reduce the environmental mobility of radioactive and/or hazardous constituents.

INTEGRATED MISSION ACCELERATION PLAN (IMAP) – U.S. Department of Energy, Office of River Protection and CH2M HILL Hanford Group, Inc., implementation plan for an accelerated closure of Hanford Site's tank farms including accelerated closure of single-shell tanks, providing supplemental treatment for tank wastes, delivering feed to the Waste Treatment Plant, and closure of remaining tanks, ancillary systems, and facilities.

INTEGRATED MISSION EXECUTION SCHEDULE (IMES) – The executable integrated schedule developed to ensure implementation of contractually approved work contained in the IMAP.

INTERIM CLOSURE OR COMPONENT CLOSURE – Activities conducted after SST retrieval to implement the closure activities defined in the approved closure plan for the specific tank defined as an individual component of the tank system. The closure activities of the individual tanks will include characterization of the residual wastes remaining in the tanks, characterization of surrounding soil, submittal and approval of the component closure documents, residual risk assessment based on the tank specific characterization data, qualification of the ancillary equipments as a source term impacting risk assessment, implementation of approved *Hanford Federal Facility Agreement and Consent Order*, Appendix H process, placing a "heel stabilizing" layer at the bottom of the tank, tank fill, or other actions approved in the closure plan.

INTERIM STABILIZATION – Activities associated with the removal of pumpable supernatant and interstitial liquid from single-shell tank systems into double-shell tank systems. (*Hanford Federal Facility Agreement and Consent Order*, Appendix A, Definitions)

INTERSTITIAL LIQUID – Liquid in the waste matrix contained within the pore spaces of the salts and sludges, some of which is capable of gravity drainage while capillary forces hold the rest.

LOW-ACTIVITY WASTE (LAW) – Waste residuals from high-level waste pretreatment or waste that has been determined to be low-activity waste based on the Waste Incidental to Reprocessing process defined in DOE O 435.1, *Radioactive Waste Management*.

LOW-LEVEL WASTE (LLW) – Radioactive material that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, or by-product material as defined in Section 11e(2) of the *Atomic Energy Act of 1954*, as amended, or naturally occurring radioactive material. (DOE O 435.1-1)

MISSION ACCELERATION ACTION PLANS (MAAP) – Plans with defined actions, responsible parties and technical contacts, scheduled need dates, and required outcome to meet or exceed mission acceleration strategies defined in this plan.

SALTCAKE – Tank waste that consists primarily of sodium nitrate/nitrite crystals that resulted from removal of water from previously neutralized waste supernatant liquid.

SLUDGE – Tank waste that consists primarily of hydrated metal oxides that resulted from the neutralization of nitric acid waste streams.

SUPERNATANT – A freestanding liquid contained within tanks consisting primarily of alkaline salt solutions.

SUPPLEMENTAL TREATMENT – Implementation of processes or treatment of tank waste that does not require the Waste Treatment Plant. This may include retrieval directly to disposal containers, bulk vitrification, grouting, steam reforming, and other technologies.

TANK FARM – An installation of multiple adjacent tanks, usually interconnected, for storage of liquid waste, or substances used in the Hanford Site operations. Tank farms at the Hanford Site are underground.

TANK FARM CLOSURE – Actions taken to meet regulatory defined end-states associated with a tank farm as defined in approved closure plans (see Closure).

TRANSURANIC (TRU) WASTE – Radioactive waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator, does not need the degree of isolation required by disposal regulations; or (3) waste that the U.S. Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with Part 61 of Title 10, Code of Federal Regulations.

1.0 INTRODUCTION

1.1 PURPOSE

The Integrated Mission Acceleration Plan (IMAP) describes the regulatory, technical, and business management strategies and implementing actions needed to accelerate closure of the Hanford Site tank farms resulting in overall improvement in the River Protection Project (RPP) life-cycle cost and schedule. Successful execution of the identified strategies and actions will result in up to 40 single-shell tanks (SST) being closed and at least one million gallons of tank waste being dispositioned by processing that is supplemental to the Waste Treatment Plant (WTP) by the end of fiscal year (FY) 2006. Waste feed delivery requirements to the WTP will be met with the integrated optimization schedule delivery of projects required to transfer waste feed to the WTP. System integration activities will ensure that the needs of the overall RPP mission are met in the accelerated plan.

The U.S. Department of Energy, Office of River Protection (ORP) and CH2M HILL Hanford Group, Inc. (CH2M HILL) have created aggressive execution strategies and implementation plans to accelerate the closure of the Hanford Site tank farms. The strategies build upon the innovative approaches identified by the Cleanup Constraints and Challenges Team (C3T) and outlined in DOE/RL-2002-47*, the Performance Management Plan for the Accelerated Cleanup of the Hanford Site* (HPMP). In particular, the IMAP strategies and implementing actions meet and, in most cases, exceed the key elements of the HPMP Strategic Initiative 2 – Accelerate Tank Waste Treatment Completion by 20 Years, Accelerate Risk Reduction and Save Up to $20 Billion.

The IMAP focuses the attention of management and organizational resources on physical completion of work necessary to achieve tank farm closure and the elimination of unnecessary support functions, reviews, and documentation. This approach requires a partnership between ORP, CH2M HILL, the WTP Contractor, and the regulatory agencies to effectively realign resources; clarify roles and responsibilities; apply the U.S. Department of Energy (DOE) Orders tailored to the hazards; and identify and eliminate unnecessary activities.

The ORP and CH2M HILL will plan and perform all work described in the IMAP compliant with *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) requirements and Integrated Safety Management System (ISMS) principles.

1.2 OBJECTIVE

The objective of the IMAP is to define strategies and implementing actions to accelerate the closure of SST, double-shell tanks (DST), and Hanford Site tank farms while rapidly reducing risk to the worker and the environment. The accelerated closure also reduces the life-cycle costs of the RPP.

The IMAP accelerates tank farm closure while ensuring that all major RPP systems and interfaces are fully integrated and supported. CH2M HILL will perform the role of integrator for waste retrieval and tank closure, delivery of waste feed to satisfy WTP processing rates, storage and disposal of treated wastes, and processing tank waste via supplemental treatment/disposal technologies. This role will ensure that the requirements for the WTP are satisfied. For example, the IMAP supports the waste feed delivery to the WTP in accordance with the feed delivery schedule and capacity of the WTP. Appendix A lists the technical baseline assumptions that form the basis of the IMAP execution strategies.

The IMAP provides execution strategies that outline a successful transition from a focus on operations and maintenance to a focus on facility/site closure. These strategies provide for significant life-cycle cost savings through elimination of non-essential work, simplification of processes and procedures, and a significant reduction in the amount of time required to complete closure tasks.

1.3 EXECUTION STRATEGIES AND KEY U.S. DEPARTMENT OF ENERGY INITIATIVES

The IMAP defines the implementation of five execution strategies to accelerate the closure of Hanford Site tank farms. These five strategies are listed and briefly described below. The execution plans for these strategies are described in Sections 4.0, 5.0, and 6.0. Strategies one through three are the technical strategies designed to complete physical work within required timeframes. The key initiatives associated with ensuring the completion of these strategies are also listed. The fourth and fifth are enabling strategies that provide the regulatory and work management framework required to effectively execute the technical strategies.

1. **Retrieve and Close SSTs, DSTs, and Tank Farms**

   Disposition waste from all 149 SSTs by 2018 within the established budget profile, reducing hazards to the workers, the public, and the environment while significantly reducing the program life-cycle costs. All remaining RPP facilities will be closed by 2033.

   - Accelerate retrieval and closure activities for all SSTs and SST farms. The SST retrieval and closure activities will meet or exceed the requirements established in the Tri-Party Agreement M-45 Milestone series and the commitments in the HPMP. The IMAP defines actions to interim close up to 40 SSTs by the end of FY 2006 and interim close two SST farms in the same period.
   - Complete interim stabilization of the 16 SSTs requiring interim stabilization by the end of FY 2004.

2. **Provide Waste Feed Delivery to Satisfy Accelerated WTP Processing Rates**

   Deliver waste feed to the WTP and receive and disposition treated waste products per the WTP schedule and Revision 1 to the System Plan to support the RPP mission completion.

   - Ensure high-level waste (HLW) and low-activity waste (LAW) feed delivery and disposal systems are available to support the WTP with sufficient capacity. This initiative includes immobilized high-level waste (IHLW) storage capacity and immobilized low-activity waste (ILAW) disposal capacity.

3. **Process Waste via Supplemental/Alternate Treatment/Disposal**

   Implement environmentally responsible and cost effective non-WTP supplemental treatment, processing, and disposal techniques that will reduce DST space usage and the planned loading on the WTP. The need and plan for implementation of supplemental LAW processing for waste pretreated in the WTP will be established.

- Cost effectively retrieve, treat and disposition tank waste using supplemental treatment techniques. The IMAP defines actions to retrieve and disposition up to one million gallons of tank waste using supplemental techniques by the end of FY 2006.

4. **Enhance Regulatory and Stakeholder Interactions**

   Work in a collaborative manner with the Washington State Department of Ecology (Ecology), the U.S. Environmental Protection Agency (EPA), Washington State Department of Health (WDOH), Tribal Nations, other DOE sites and stakeholder groups to develop and implement a responsible, progressive and efficient regulatory approach that meets established requirements while optimizing stakeholder involvement, regulatory reviews, approvals, and implementation.

5. **Improve Mission Support and Work Management Systems**

   Make fundamental business changes, including changing work processes to achieve operations and management efficiencies that will allow funding to be allocated for waste retrieval, tank closures, and supplemental waste treatment and disposal on an accelerated schedule. Work practices will be tailored to the hazards involved in compliance with established ISMS and environmental management principles.

1.4 SCOPE

The IMAP provides overall strategies for the life cycle of the Tank Farm Contractor (TFC) work scope and provides specific Mission Acceleration Action Plans (MAAP) and an Integrated Mission Execution Schedule (IMES) for the FY 2003 through FY 2006 timeframe. The IMES contains specific execution details for the FY 2003 work package activities, and a lesser degree of execution details for the FY 2004 to FY 2006 period.

The IMAP will be updated annually (or more frequently if necessary) to implement improved strategies and execution plans for the following years that incorporate efficiencies, technologies, and lessons learned from the previous years. Tank interim closure sequencing will be revised as appropriate to reflect progress and innovations.

The IMAP is aggressive in work planning for the FY 2003 to FY 2006 timeframe in particular, and it is recognized that some specific elements of the execution plans and schedules might prove to be more effective or less effective than anticipated. ORP and CH2M HILL will update plans and schedules to reflect actual implementation experience.

Strategies and action plans are discussed only for work scope and activities that require changes from the current baseline to support the accelerated mission.

This IMAP and the corresponding IMES are aggressive and success oriented with no built-in contingencies, but the schedule and the initiatives are achievable with successful execution of the actions identified in this plan.

The most significant element that will affect progress, positively or negatively, is the willingness and desire of the project participants – the management team, individual employees, and stakeholders – to embrace change and champion mission success as the ultimate goal.

The remaining sections of the IMAP are organized as follows:

- The Work Breakdown Structure (WBS) and associated enabling assumptions for each primary scope of work are provided in Section 2.0.

- A description of the RPP Closure System, the associated Tank Farm Closure Systems, and RPP interfaces are provided in Section 3.0.
- The five execution strategies are discussed in detail in Sections 4.0 through 6.0 of this plan.
- MAAPs that define, assign, and schedule near term actions required to implement the five strategies are included in Section 7.0.
- Primary risks associated with the execution strategies are discussed in Section 8.0.
- IMAP cost, schedule, and configuration control are discussed in Sections 9.0 through 11.0.

1.5 CH2M HILL HANFORD GROUP, INC., ROLE AS RIVER PROTECTION PROJECT INTEGRATOR

CH2M HILL has been assigned the function and work scope for technical integration of RPP system requirements for ORP, the WTP Contractor, and CH2M HILL work activities. This function includes interface management, configuration control of the System Plan, maintenance of overall RPP system requirements, and production planning and control. As the RPP Integrator, CH2M HILL will ensure coordination of waste feed delivery from the tank farms to the WTP pretreatment processing and glass production and to IHLW and ILAW storage.

As the RPP Integrator, CH2M HILL will ensure that mission acceleration activities in the IMAP are coordinated with entire RPP system requirements.

1.6 INTEGRATED MISSION ACCELERATION PLAN IMPLEMENTATION

The IMAP execution strategies will be incorporated into the tank farm baseline through a Baseline Change Request (BCR), scheduled for submittal by CH2M HILL to ORP in conjunction with the finalization of this plan.

The life-cycle work scope will be identical for the IMAP and the BCR. The cost profile in the BCR and the IMAP will also be identical.

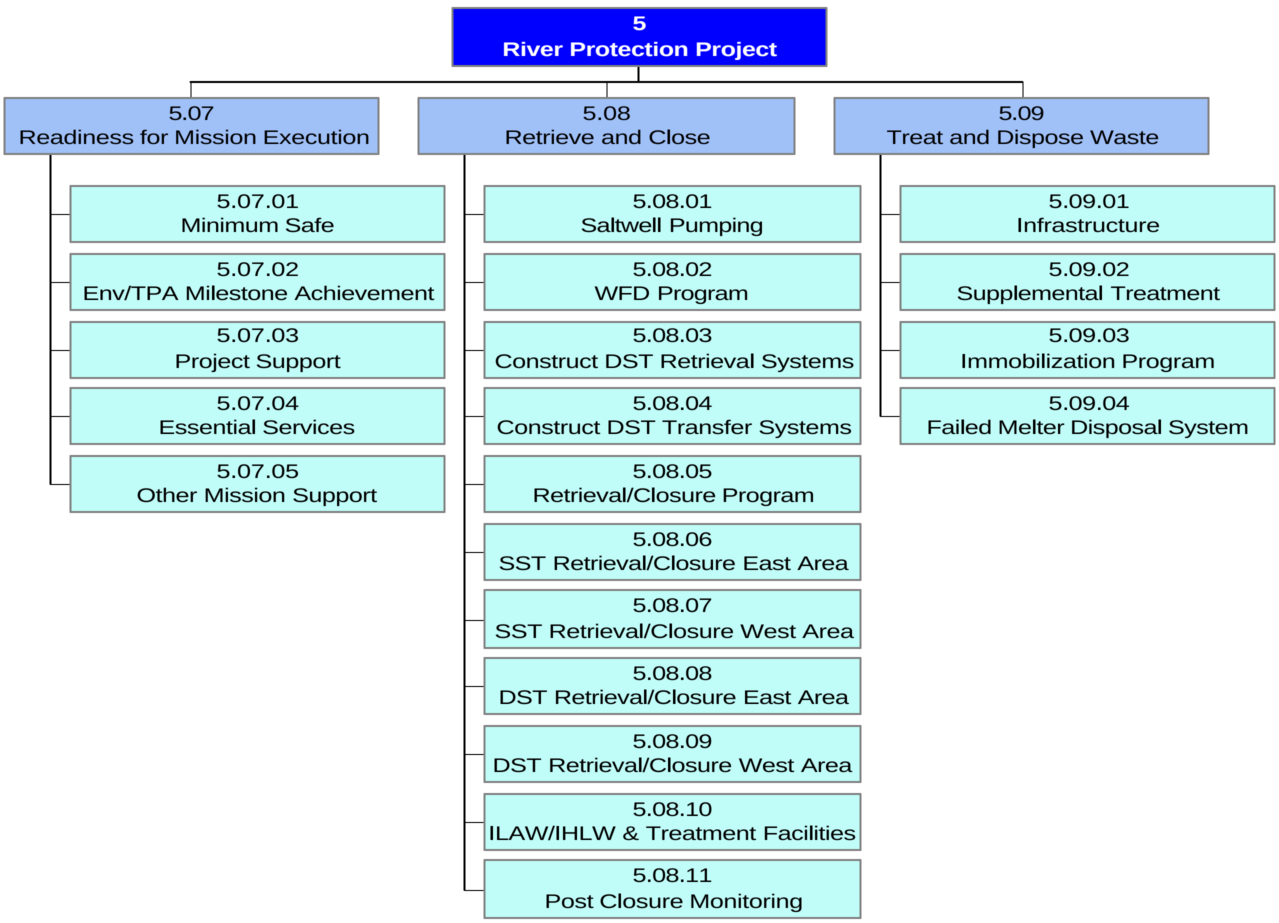
The primary difference between the IMAP and the BCR is that the IMAP provides strategies and actions to interim close up to 40 SSTs during the FY 2003 to FY 2006 timeframe while the BCR provides a baseline plan to interim close 26 SSTs. Resources and budget for retrieval and interim closure beyond the initial 26 tanks will be provided through efficiencies and experience gained during the initial tank closure activities. The additional 14 tanks represent a goal that must be achieved within the cost profile established for the 26 tanks in the BCR.

Both the IMAP and BCR provide for delivery of waste feed to the WTP on a risk-based, Integrated Optimization schedule.

2.0 WORK BREAKDOWN STRUCTURE SUMMARY AND ASSUMPTIONS

The WBS for the TFC scope has been realigned to the execution approach for Mission Acceleration (see Figure 2-1). The WBS has been organized around three major functions: Readiness for Mission Execution; Retrieve and Close Tanks; and Treat and Dispose Wastes. A summary description of these functions is provided in this section. This section also includes the key strategic assumptions on implementation approaches associated with these functions that have been incorporated into the planning basis. Section 7.0 provides the actions to be conducted that will implement these assumptions, including changes in requirements and/or method of performance required to attain the overall mission acceleration.

Figure 2-1. Tank Farm Contractor Work Breakdown Structure Elements of the River Protection Project.



2.1 READINESS FOR MISSION EXECUTION

This WBS includes work scope to safely and compliantly store the Hanford Site tank wastes until waste is retrieved for processing. This includes monitoring and maintaining the tanks and equipment in compliance with Technical Safety Requirements (TSR), Environmental, Safety, Health and Quality (ESH&Q) programmatic requirements, and the *Hanford Federal Facility Agreement and Consent Order*, commonly referred to as the Tri-Party Agreement. This work includes compliance efforts to meet the requirements of Tri-Party Agreement Milestones M-23, M-48, and M-46. It also includes necessary support activities such as project management, business services, and administrative functions as well as site infrastructure support provided by the U.S. Department of Energy, Richland Operations Office (RL) and its contractors.

Key strategic assumptions included in the baseline development of this function are:

1. Mission re-aligned organization and method of performance for meeting contract scope and requirements will result in substantial efficiencies. Implementing MAAPs: 5.1 through 5.9 (see Section 7.0).

2. The Documented Safety Analysis (DSA) will better align with actual safety risk and will result in reduced equipment safety designations and reduced number of TSRs. Cost reductions will be realized in the areas of equipment procurement, surveillance, and maintenance, as well as the upkeep of the Nuclear Safety Authorization Basis (AB). Implementing MAAP: 5.1.

3. Mission acceleration emphasis on tank closure and footprint reduction will result in lower costs to maintain, conduct surveillances for, and upgrade tank farm systems and facilities. Implementing MAAPs: 1.2, 1.3, 1.4, 1.5, 3.2, 3.3, 3.4, 5.2, 5.3, 5.4, and 5.5.

4. Mission acceleration performance and risk reduction associated with tank interim stabilization, retrieval, and closure will justify reductions in the full suite of upgrades and new installations of leak detection and monitoring equipment. Implementing MAAPs: 1.2, 1.3, 1.4, 4.1, 5.1, and 5.2.

5. As the Hanford Site shifts resources to accelerating the closure of facilities and systems, a proportional efficiency gain will be made in crosscutting infrastructure support cost. Implementing MAAPs: 5.8 and 5.9.

2.2 RETRIEVE AND CLOSE

This WBS includes all work scope to retrieve waste from the SSTs as space permits; transfer a portion of the low-level waste (LLW)/LAW) and transuranic (TRU) waste from SSTs for supplemental processing and treatment; and transfer LAW and HLW to the WTP through the DST system. Work in this WBS also removes pumpable liquids from SSTs to minimize the risk of leakage (referred to as “interim stabilization”) and meet Consent Decree commitments. This WBS also includes consolidation of some of the activities associated with interim isolation of tanks with retrieval and closure of SSTs. Work associated with closing tanks, inactive miscellaneous underground storage tanks, tank farms, and facilities includes completing the necessary cleanup actions on tanks, ancillary equipment, contaminated soils, treatment facilities, and storage/disposal facilities following the end of their service lives. This includes:

- Retrieve and close 149 SSTs and associated farms/support facilities.
- Deliver Tank Waste Feed to the WTP through the DSTs - Installation and startup of the AP-101 waste transfer pumping system; Project W-211, Initial Tank Retrieval Systems will install retrieval systems in 10 DSTs; Project W-521, Waste Feed Delivery Systems will install retrieval systems in eight DSTs; Project W-522 will install retrieval systems in three DSTs; and Project W-343 will install retrieval systems in six DSTs.

- Retrieve and Close 28 DSTs and associated farms/support facilities, as Waste Feed Delivery is completed.
- Close WTP following completion of waste processing.

Facilities will be closed in a *Resource Conservation and Recovery Act of 1976* (RCRA) compliant manner in accordance with the Tri-Party Agreement and Washington State's Dangerous Waste Regulations.

Key strategic assumptions included in the baseline development of this function are:

1. Mission re-aligned organization and method of performance for meeting contract scope and requirements will result in substantial efficiencies. Implementing MAAPs: 5.1 through 5.9.

2. Demonstrated performance in early SST retrieval will meet the requirements of the interim stabilization consent decree criteria. This allows for more effective, near-term risk reduction. Implementing MAAPs: 1.3, 4.1, and 4.3.

3. The DSA will result in reduced equipment safety designations and reduced number of TSR, better aligning with actual safety risk. This also reduces costs in the areas of equipment procurement. Implementing MAAP: 5.1.

4. Waste feed to the WTP will be available on an integrated optimization delivery schedule with required systems and equipment in place to meet WTF feed requirements. Implementing MAAPs: 2.1, 2.2, 2.3, and 2.4.

5. The Integrated Disposal Facility (IDF) will start design of an ILAW-specific trench at the 200 East Area. Alternative approaches to the IDF will be pursued in parallel with the design. Implementing MAAP: 2.5.

6. Regulator approval will be obtained to accomplish equipment/material procurement before issuing RCRA Part B permits. Regulator approval will be obtained to begin IDF and W-464 construction by March 2005. Implementing MAAPs: 1.5, 2.5, 2.7, 4.1, and 4.2.

7. ILAW package and IHLW canister specifications are unchanged. Impacts of potential changes are shown in Table 8-1. Implementing MAAPs: 2.5 and 2.6.

8. Waste retrieval will use the most cost and schedule effective means that meet requirements (e.g., modified sluicing, dry retrieval methods, etc). Implementing MAAPs: 1.1, 1.2, 1.3, and 1.4.

9. In accordance with DOE Order 425.1, a streamlined and tailored readiness review process will be implemented. Implementing MAAP: 5.7.

10. In process sampling during retrieval satisfies sampling requirement to support final retrieval and interim closure. Implementing MAAP: 1.6.

11. Waste receiver facilities will not be required to support early retrieval for supplemental treatment.

12. Evaporator services will continue at a rate that supports DST space management requirements. Operation of evaporator will be assumed by the TFC.
13. Environmental Impact Statement (EIS) Record of Decision (ROD) completed by April 2004 in a manner that supports IMAPs.
14. Timely closure approval process (RCRA/DOE).

2.3 TREAT AND DISPOSE

This WBS includes providing supplemental processing and treatment capabilities for LLW/LAW and TRU wastes. A critical element to achieving mission acceleration is the engineering development, design, construction, and operation of supplemental facilities that will augment the treatment capability provided by the WTP at the established operating rates. The WTP alone may not be capable of treating all the waste by 2028; therefore, facilities that provide alternative treatment approaches are needed to accelerate closure. Parallel processing of waste with the WTP and at supplemental facilities should reduce processing costs, shorten the schedule to retrieve, process, and dispose of the waste, and allow early completion of closure actions.

These alternate processing approaches include identifying TRU waste stored in the tanks and packaging the waste as TRU as opposed to treatment in the WTP; identifying waste incidental to reprocessing (WIR), or LAW, and implementing treatment technologies such as steam reforming, containerized grout or bulk vitrification in containers that can be retrieved and disposed at another location; and dispositioning of LLW tank waste.

This work scope does not include the WTP design, construction, and operations. However, the work includes activities necessary to provide the infrastructure for the WTP as well as other infrastructure for the supplemental waste treatment systems. This WBS includes construction of onsite storage, shipping, and disposal facilities to support the WTP, and supplemental treatment processes.

This WBS also includes disposing of LLWs at an LLW certified disposal site; processing and turning over TRU wastes for onsite storage and eventual shipment to the Waste Isolation Pilot Plant (WIPP); storage and preparation to ship IHLW canisters to Yucca Mountain. Wastes incidental to reprocessing, or LAW, will be treated and immobilized to meet onsite disposal requirements. Also included in this WBS are the following work activities:

- Process and dispose TRU waste currently held in SSTs.
- Provide supplemental treatment for a portion of the SST LLW/LAW.
- Dispose of ILLW/ILAW and failed WTP melters.
- Store and prepare IHLW for shipment to Yucca Mountain.
- Develop plans for processing LAW using alternate technologies as needed.

Key strategic assumptions included in the baseline development of this function are as follows:

1. Tri-Party Agreement Milestone M-62 will be renegotiated to allow for supplemental treatment. Implementing MAAPs: 3.2, 3.3, and 3.4.

2. Cesium and strontium capsules will be prepared for repository disposal by RL's site contractor, and are no longer within the scope of the RPP.

3. Canister Storage Building (CSB) operations to support the Spent Nuclear Fuel (SNF) Project will not affect CSB upgrades to support RPP.

4. IHLW will be shipped off-site to a national repository beginning as early as 2014; therefore, only one additional IHLW storage module will be required. Implementing MAAPs: 2.2, 2.6, and 2.7.

5. Waste in many of the tanks (at least 11 tanks) will be designated as TRU or LLW thereby allowing packaging and dispositioning with minimal treatment. Implementing MAAPs: 2.5, 3.2, and 3.3.

6. Testing results of alternate waste forms will demonstrate that the waste forms meet performance assessment criteria to allow disposal of the waste containers on site. Implementing MAAPs: 3.2, 3.3, and 3.4.

7. Packaged TRU waste will meet WIPP Waste Acceptance Criteria. Implementing MAAP: 3.3.

8. Regulatory permits for the supplemental process will be obtained in sufficient time to meet the accelerated schedule. Implementing MAAPs: 1.5, 1.6, 2.5, 3.2, 3.3, 4.1, 4.2, 4.3, and 4.4.

9. ILAW will be disposed of onsite. Implementing MAAP: 2.5.

10. The failed melter disposal will be in an onsite trench. Regulatory permits for disposal of failed melters onsite will be obtained. Implementing MAAPs: 1.6, 2.5, and 4.2.

11. The requirements for the failed melter disposal trench will be determined in time to support the completion of the IDF design and construction in support of acceleration of receipt of failed melters. Implementing MAAPs: 2.2, 2.5, and 4.1.

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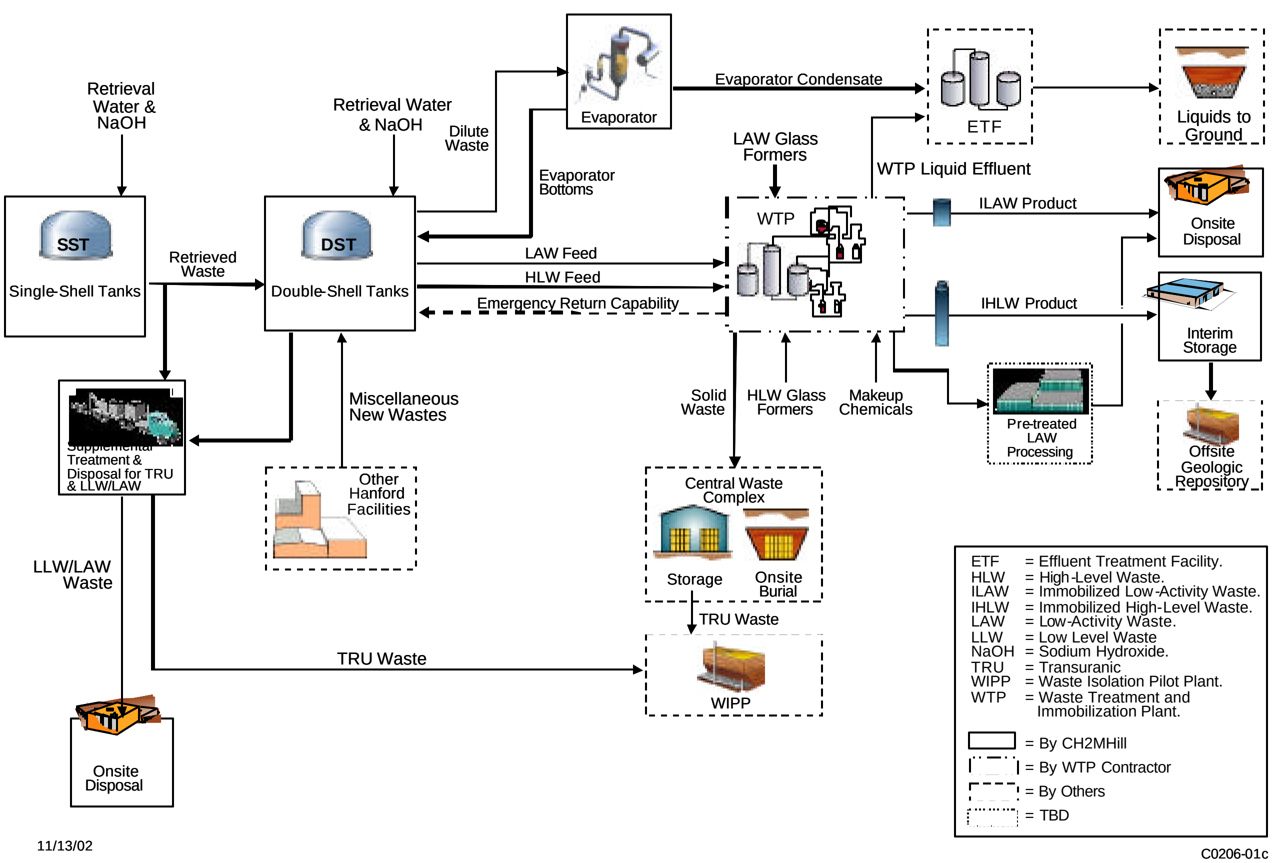
3.0 RIVER PROTECTION PROJECT AND TANK FARM CLOSURE SYSTEMS

ORP is responsible for the RPP, which will safely close the Hanford Site's tank farms. The tank farms consist of 149 older SSTs, and 28 newer DSTs. These tanks contain over 50 million gallons of radioactive and hazardous, mixed, TRU, low-level waste (LLW), and HLW solids, solutions and slurries. The RPP Closure System has been designed to retrieve, treat, and dispose of these wastes, while also closing the RPP tanks and the facilities required to perform these tasks. This section provides an overview of the RPP Closure System, the Tank Farm Closure Systems (defined within the context of the RPP), and a brief discussion of the interfaces that must be aggressively managed to ensure the integration and effective operation of these systems.

3.1 RIVER PROTECTION PROJECT CLOSURE SYSTEM

The RPP closure system starts with the retrieval of wastes stored within the tanks. In general, waste is retrieved from the SSTs into DSTs and from there waste is transferred to the WTP for pretreatment and HLW and LAW immobilization. The ILAW is slated for onsite disposal, while the IHLW will be stored on site until shipments to the HLW offsite geologic repository in Yucca Mountain begin. Figure 3-1 depicts the RPP Closure System.

Figure 3-1. River Protection Project Closure System.

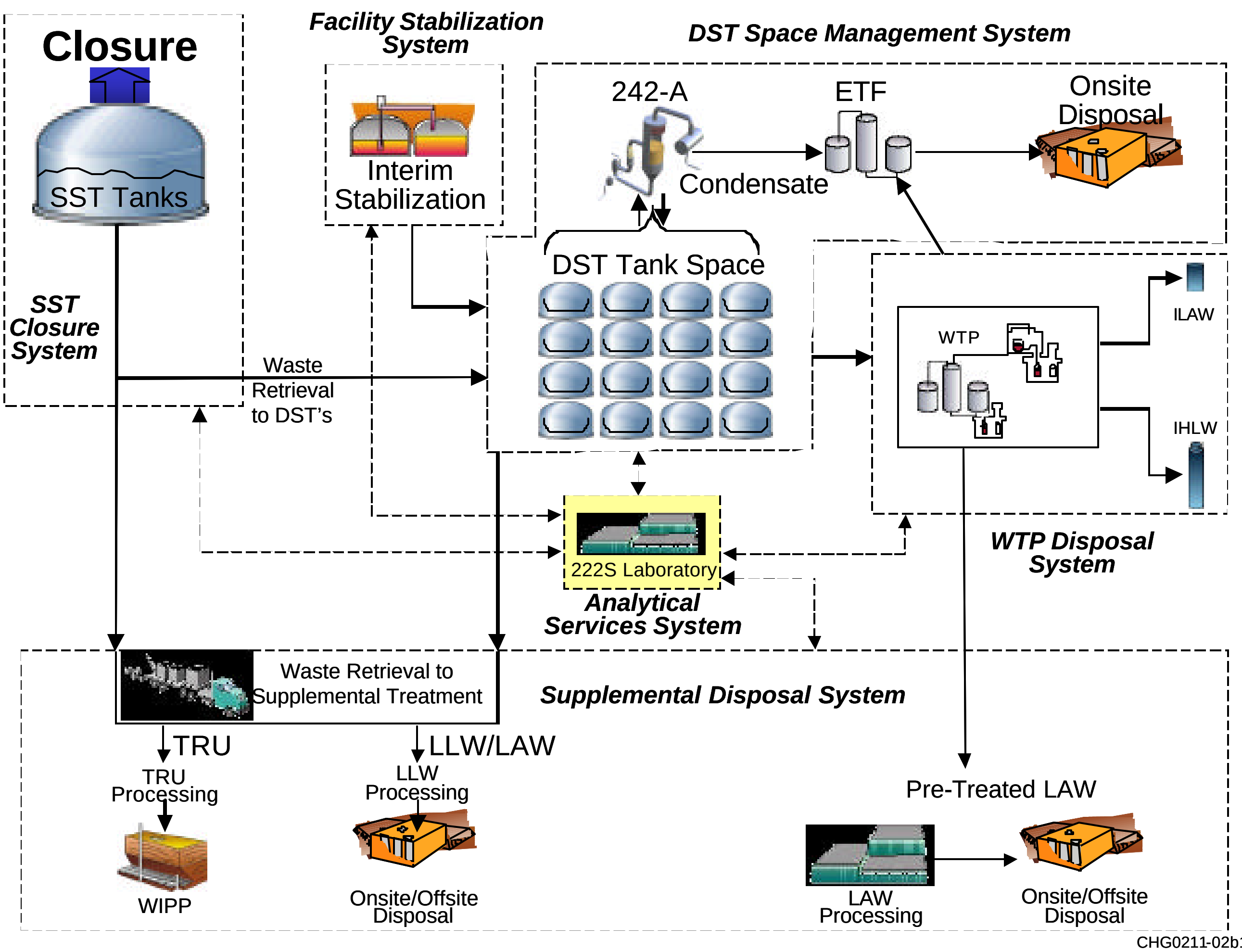


New to the RPP Closure System is the addition of supplemental and alternate treatment processes that will provide capabilities in addition to the WTP. This includes the processing and disposal on site of LLW, the processing of TRU waste for disposal at the WIPP facility, and the treatment of LAW for on site disposal either via supplemental treatment taking advantage of waste that requires little or no pre-treatment or via alternative treatment taking advantage of WTP pre-treatment capability. The addition of these supplemental process capabilities provides capacities required for ORP to be able to meet its regulatory commitment to complete treatment of tank wastes by 2028.

3.2 TANK FARM CLOSURE SYSTEMS

Six major Tank Farm Closure Systems have been defined as functional elements within the RPP Closure System. Figure 3-2 depicts these six systems and a brief explanation of these systems follows, including a description of the TFC's responsibilities within each system.

Figure 3-2. Tank Farm Closure Systems.



There is a strong dependency between each of these systems, such that the acceleration of work within any one of them requires matching accelerations within one or more of the others. Failure to maintain that balance ultimately results in an inability to sustain operations as a total system.

1. The SST Closure System contains the elements required to retrieve waste from and subsequently close SSTs. This system includes equipment, pumps, temporary transfer

lines, leak detection equipment, and controls. The rate of tank retrieval and interim closure is constrained by the ability of the overall system to store radioactive waste or treat it for disposal. The focus of this system is to retrieve SST waste and close SST Farms by 2018. The TFC is responsible for this system.

2. The DST Space Management System includes the DSTs, the inter-tank transfer systems, the 242-A Evaporator, and the Liquid Effluent Retention Facility. The DST system receives radioactive waste from SST interim stabilization and retrieval, analytical laboratory wastes, and very small amounts of facility stabilization wastes from other Hanford Site facilities. Wastes are staged for evaporator campaigns, which reduce the total volume of the waste, and for future waste feed deliveries to the WTP for treatment. Managing the total volume of tank wastes received and delivered, within the DST space available, is a primary factor in achieving the accelerated interim closure of the Hanford Site tanks. Once wastes are retrieved from SSTs, the process of DST closure can begin, as stored DST wastes continue to be delivered to the WTP and supplemental treatment facilities. Closure of DSTs and remaining ancillary facilities will be completed by 2033. The TFC is responsible for this system except for the Liquid Effluent Retention Facility, which is operated as support to this system through RL. The TFC will assume responsibility for the evaporator by June 2003.

3. The Facility Stabilization System includes completing the removal of liquid wastes from the SSTs to prevent leakage (know as interim stabilization), closure of the 244-AR Vault, and the closure of the remaining surplus facilities owned or constructed by ORP. The TFC is responsible for this system.

4. The Supplemental Disposal System provides capabilities to process and dispose of TRU, LLW, and LAW through means other than treatment by the WTP. The systems also provides for implementation of processes that use the pre-treatment capability of the WTP but do not require the WTP vitrification capability. The processes may include bulk vitrification, grouting, steam reforming, or other technologies. These supplemental capabilities will enable ORP to meet its regulatory commitment to complete tank waste treatment by 2028. If additional waste processing and disposal systems are required, other than those described in this plan, then additional capabilities could be developed as a new or expanded part of this system. The TFC is responsible for this system.

5. The WTP Disposal System includes capabilities to deliver tank waste feed from the DSTs to the WTP, to provide pretreatment and immobilization of LAW and HLW in the WTP, and to provide storage and disposal capabilities for the immobilized wastes. The treatment capability provided by this system is one of the primary tools that will be used to allow the removal of wastes from the DST Space Management System, and enable the SST Closure System to meet its functional and schedule requirements. The TFC is responsible for the development and operation of the waste feed delivery equipment, the IHLW interim storage facilities, as well as the development and operation of the ILAW disposal facilities as a part of this overall system. The WTP Contractor is responsible for the design, construction, startup, and operation of the WTP.

6. The Analytical Services System provides the radioactive analytical services that support waste characterization, waste transfers, and the waste feed delivery system. This system also prepares samples for process demonstration and evaluation of WTP pretreatment and vitrification flowsheets. The system has capability for HLW development tasks

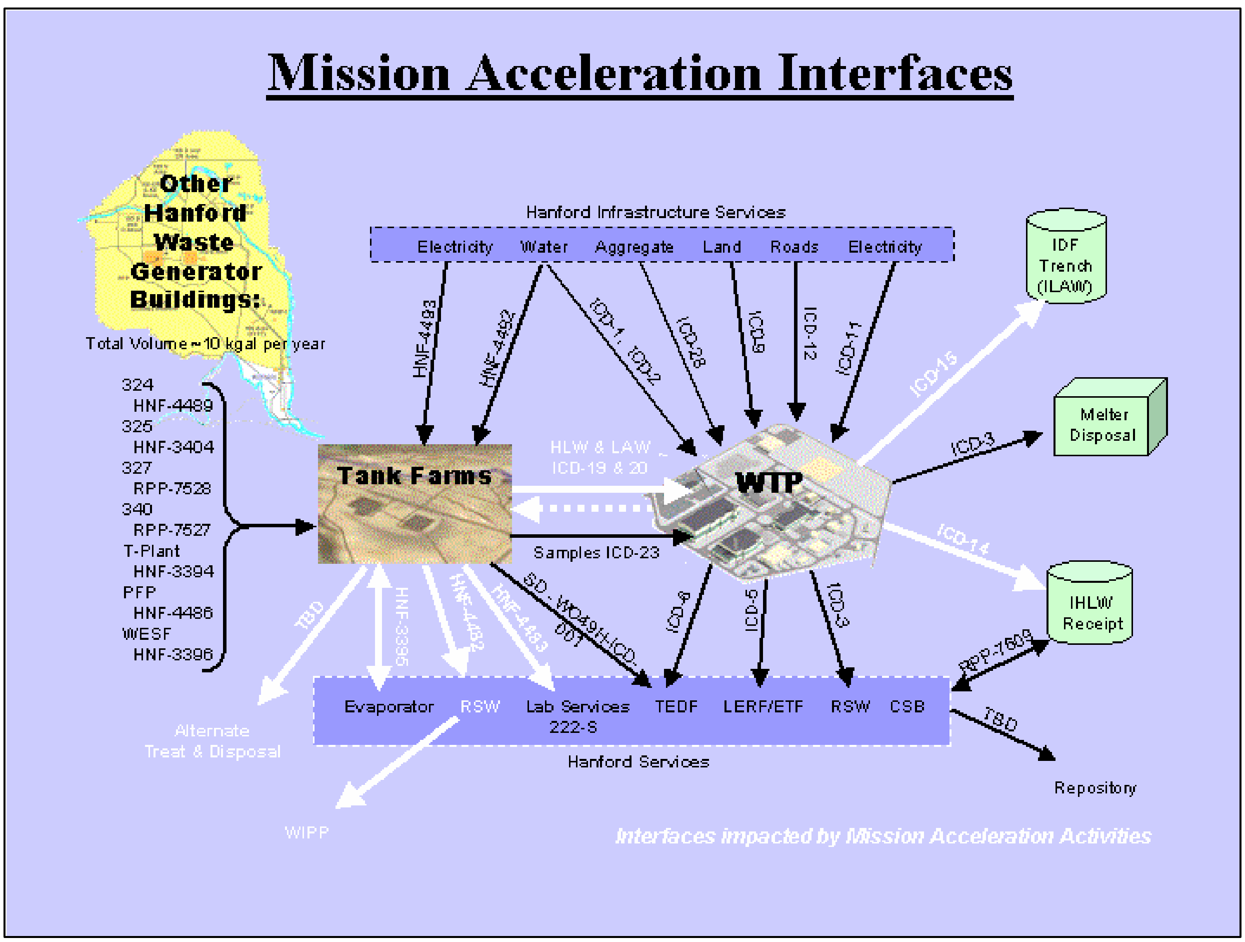
supporting supplemental and alternative waste process demonstration, as well as selective support to future WTP operations.

In addition, the RPP is dependent on significant site infrastructure support systems (e.g., electrical power distribution, transportation system, communication systems, etc.) and low-level onsite analytical services. At this time, these are provided by RL as specified in memoranda of understanding or interface control documents (ICD). The TFC will assume responsibility for the 222-S Laboratory by September 30, 2003.

3.3 INTERFACE MANAGEMENT

A complex set of interfaces must be successfully integrated to ensure the successful operation of the RPP and Tank Farm Closure Systems, and the completion of the accelerated mission. While most TFC interfaces involve other Hanford Site prime contractors, some include direct contact with the DOE or external regulating agencies. CH2M HILL's primary interfaces are with Project Hanford and the WTP Contractor. CH2M HILL is also responsible for coordinating the Project Hanford infrastructure and support services necessary for constructing and operating the WTP. Figure 3-3 summarizes the interconnections between tank farms, the WTP, and other Hanford Site and offsite facilities and services.

Figure 3-3. River Protection Project Interfaces.



Mission Acceleration Interface Impacts

Table 3-1 provides a summary of the interfaces that are associated with mission acceleration. These impacts range from fairly minor (e.g., access roads or aggregate supply) to potentially significant impacts (e.g., management of Radioactive Solid Waste sites to receive wastes that were not previously identified, such as TRU, LLW, etc.).

Table 3-1. Interfaces Impacted by Mission Acceleration.

CH2M HILL Hanford Group, Inc., Interfaces with Waste Treatment Plant		
Interface	**Document Number**	**Potential Mission Acceleration Impacts**
Low-Activity Waste Feed	ICD-19	Feed delivery sequence and schedule changes are anticipated throughout campaign. Evaluating potential changes to 270-day and 720-day sampling relative to retrieval parameters. Waste return space requirements defined as part of reserved emergency space
High-Level Waste Feed	ICD-20	
Immobilized High-Level Waste	ICD-14	Increased throughput must be accommodated; additional Canister Storage Building capacity may be needed significantly sooner.
Immobilized Low-Activity Waste	ICD-15	Increased throughput must be accommodated - larger trailer fleet or temporary building required to provide container-cooling capability.
Radioactive Solid Wastes	ICD-3	Additional waste generated due to increased throughput; no significant impact anticipated
Non-Radioactive, Non-Dangerous Liquid Effluents	ICD-5	
Radioactive, Dangerous Liquid Effluents	ICD-6	
CH2M HILL Interfaces with Project Hanford		
Water Services	HNF-4493 (DRAFT)	Potential for increase water use; no significant impact anticipated
Electricity	HNF-4492	Increased electrical usage likely due to additional projects and alternate treatment technologies
Radioactive Solid Wastes	HNF-4482	Significant impact anticipated - Additional waste generation based on multiple retrieval projects and increased tank operations. Additional ICDs may be warranted to accommodate waste generated from supplemental treatment technologies (e.g., transuranic retrieval).
Canister Storage Building	RPP-7609	Current Canister Storage Building modifications and new facility schedules will accommodate immobilized high-level waste canister production.
Evaporator and Laboratory Services	HNF-3395 & HNF-4483	The 242-A Evaporator facility and the 222-S Laboratory Services are being transferred from Project Hanford to CH2M HILL; consequently, the ICDs will be transitioned to internal procedures.

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4.0 TECHNICAL STRATEGIES

Section 1.0 described the five primary execution strategies to be implemented for mission acceleration. Three of these strategies are primarily technical:

- Retrieve and close SSTs, DSTs, and Tank Farms
- Waste feed delivery to satisfy accelerated WTP processing rates
- Process waste through supplemental or alternate treatment/disposal.

Section 3.0 describes the overall integrated systems that comprise the RPP, and defines the integrated tank farm systems that are integral to the Hanford Site tank closure mission. These systems are as follows:

- The SST Closure System
- The DST Space Management System
- The Facility Stabilization System
- The WTP Disposal System
- The Supplemental Disposal System
- The Analytical Services System.

CH2M HILL has a series of integrated production modeling tools that are used to estimate the technical performance of the integrated ORP closure systems. These tools are used to schedule tank retrievals and transfers necessary to support ongoing production of the WTP. They assist in balancing tank retrievals so the ILAW, Supplemental, and IHLW facilities operate to their maximum capacity, while integrating transfer logistics, cold chemical additions, retrieval and flush water, evaporator campaign scheduling and performance, and available DST space utilization.

The key elements of this integrated modeling capability are the tank waste inventory (best-basis inventory) and the Hanford Tank Waste Operations Simulator (HTWOS). Data generated by the HTWOS model are used to develop feed delivery schedules and need dates for new and expanded transfer systems and storage capacities. The data are also used to quantify the total ILAW product that must be disposed on site and the IHLW that must be stored before shipment to the repository. Figure A-1 (Appendix A) provides a graphic representation of the overall technical baseline development system. Together with Bechtel National, Inc. (BNI) detailed WTP models, these tools form the technical basis of the Hanford Tank Waste System Plan.

The accelerated plan described in this document has been modeled by the HTWOS. The key parameters of the current planning case is described in Appendix A. At this time, the aggressive goals outlined in this plan have only been partially achieved. However, the plan identifies additional technical and work planning efforts needed to further refine the technical baseline and continue to improve the overall predicted performance. Today, CH2M HILL's technical baseline predicts 25 SSTs to be retrieved by 2006 and the approved baseline achieves 26. As many of the identified activities in this plan are completed, CH2M HILL expects to continue to improve the schedule performance until the goals of this plan are achieved. The remainder of this technical section discusses CH2M HILL's current baseline approach, and identifies the opportunity areas to enable further accelerations.

For the near-term phase (FY 2003 to FY 2006) of the accelerated closure mission, significant performance accelerations are required from each of these systems:

- The SST Closure System will retrieve the seven SSTs currently identified by the Tri-Party Agreement; retrieve an additional 33 SSTs at a substantially reduced cost compared to the HPMP; and prepare up to 40 tanks for interim closure.
- The DST Space Management System will recover the identified 3 million gallons of DST space necessary to meet the M-45 milestones for waste retrieval from the seven identified tanks. The system must also make available approximately 6.4 million gallons of additional DST space to support additional retrievals for up to 40 interim tank closures. The amount of additional space required depends on the success of the transuranic (TRU), low-level waste (LLW), and LAW supplemental processing and disposal initiatives or on potential of dry retrieval to interim staging. This capability must be provided without the construction of new DSTs.
- The Facility Stabilization System will complete the removal of approximately 500,000 gallons of interstitial pumpable liquid remaining in SSTs and interim stabilize the 244-AR vault.
- The WTP Disposal System will design and construct the WTP complex (WTP Contractor's responsibility). Equipment and facilities to retrieve, stage, and transfer waste feed to the WTP must be constructed to support WTP processing schedules by the TFC. Interim storage systems for IHLW must be prepared, and an ILAW disposal system constructed by the TFC. The WTP system can effectively accomplish some or all of the necessary capability by further enhancements to LAW vitrification capacity, improved glass formulations, or other process and design changes that can increase the effective LAW vitrification capacity in a timely manner.
- The Supplemental Disposal System will process and prepare the contact-handled TRU waste contained in nine SST tanks for WIPP disposal and process the LLW contained in at least one SST for disposal. Processes will be developed and demonstrated for processing LAW independent of the WTP. Processes will be developed that use the pre-treatment capability but do not require the WTP vitrification capability to disposition LAW. Supplemental disposal may include disposal by bulk vitrification, grouting, steam reforming, and other technologies evaluated in the supplemental disposal.
- The Analytical Services System will provide timely and cost effective analytical services to support ongoing operations and design information to implement the efforts of the above systems.

A combination of some or all of these capabilities will enable ORP to meet its regulatory commitment to complete tank waste treatment by 2028. Responsibility for implementation of this system will be established at a later date.

For completion of the entire tank farm closure mission, the systems must meet the following performance requirements:

- The SST Closure System will build on the foundation of experience gained from retrieval and interim closure of the first 40 tanks. It must complete cost effective retrieval and interim closure of the remaining 109 SSTs by 2018.

- The DST Space Management System will receive waste retrieved from the SSTs and provide the source for waste feed to the WTP complex to support completion of processing by 2028.
- The Facility Stabilization System will complete closure of all ORP facilities by 2033.
- The WTP Disposal System will immobilize for disposal, all remaining tank waste by 2028. Facilities to interim store IHLW and dispose of ILAW must be constructed to support completion of the overall mission.
- The Supplemental Disposal System will deploy and operate systems to separately process and dispose of identified TRU wastes, LLW, and 60% to 70% of the remaining LAW including pre-treated LAW.

Appendix A lists the Baseline Technical Assumptions that form the basis of the IMAP execution strategies.

The following discussion describes the technical strategy and implementing initiatives for each major component of the ORP system as currently conceived, and how the overall system will evolve to meet the performance requirements.

4.1 TECHNICAL STRATEGIES

Successful implementation of the identified technical, regulatory and mission support strategies is required to accelerate completion of the closure mission. Table 4-1 illustrates the relationship between the technical strategies, the implementation initiatives both in the near-term and the long-term, and the implementing tank farm system that will achieve CH2M HILL's objective.

A description of each of the implementation initiatives is provided in the following subsections.

4.2 RETRIEVE AND CLOSE SINGLE-SHELL TANKS, DOUBLE-SHELL TANKS, AND TANK FARMS

The HPMP identifies the acceleration of SST retrieval and closure as two of the key elements supporting achievement of Strategic Initiative 2. Acceleration of SST retrieval reduces risk to the public and the environment, while acceleration of closure reduces ongoing mortgage costs, reduces ongoing exposures of field personnel, and represents completion of the tank cleanup mission.

Retrieval and closure of tanks and facilities will be accomplished using the Tank Closure System, relying on the DST Space Management System, and ultimately using the Facility Stabilization System.

The next section describes the definition of the tanks and facilities that will be retrieved, stabilized, and closed during the contract period. It discusses the planned activities and challenges that must be addressed to achieve the overall goals of the IMAP, and ultimately accelerate the overall completion of tank cleanup mission, as envisioned in the HPMP.

Table 4-1. Technical Strategies, Initiatives, and Implementing System. (2 sheets)

IMAP Strategy	Planned Achievements FY 2003 to FY 2006	Planned Achievements FY 2007 to FY 2034	Implementing RPP System
Retrieve and Close SSTs, DSTs, and Tank Farms (Section 4.2)	➢ Select 40 tanks for early retrieval and interim closure ➢ Complete interim stabilization of SSTs ➢ Complete 244-AR Vault interim stabilization ➢ Maximize available DST space ➢ Select/Implement retrieval systems ➢ Propose/Implement dry retrieval/SST waste staging option ➢ Close up to 40 SSTs and two SST farms	➢ Maintain risk-based approach of RPP-8554, *Single-Shell Tank Retrieval Sequences and Double-Shell Tank Space Evaluation*, after the first 40 tanks. Modify in future Integrated Mission Acceleration Plan (IMAP) revision to reflect 2010 interim closure of West Area SSTs. ➢ Evaluate and improve performance of retrieval systems to optimize performance, safety, schedule, and cost. ➢ Manage DST space based on WTP and supplemental processing performance. ➢ Focus on footprint reduction by interim closing West Area tanks by 2010 ➢ Interim close all SSTs by 2018. Close DSTs, WTP, and River Protection Project (RPP) facilities by 2034.	➢ Facility Stabilization System ➢ DST Space Management System ➢ SST Closure System ➢ Analytical Services System

Table 4-1. Technical Strategies, Initiatives, and Implementing System. (2 sheets)

IMAP Strategy	Planned Achievements FY 2003 to FY 2006	Planned Achievements FY 2007 to FY 2034	Implementing RPP System
Provide Waste Feed Delivery to Satisfy Accelerated WTP Processing Rates (Section 4.3)	➢ Establish and implement integrated and optimized project schedule for feed delivery ➢ Evaluate alternatives to meeting mission needs • Feed projects • Storage/disposal projects	➢ Evaluate project schedule and scope based on ongoing WTP progress and supplemental treatment progress ➢ Optimize the RPP life cycle	➢ WTP Disposal System ➢ Analytical Services System
Process Waste via Supplemental/Alternate Treatment/Disposal (Section 4.4)	➢ Process TRU (contact handled) (SSTs) ➢ Disposition LLW ➢ Demonstrate supplemental processing ➢ Perform technical studies of technologies ➢ Demonstrate technology (same as for supplemental processing) on real waste ➢ Down select process technologies	➢ Process TRU (remote handled) (DSTs) ➢ Maximize cost effective supplemental processing ➢ Target initiation of processing by 2010	➢ Supplemental Disposal System ➢ Alternative Disposal System ➢ Analytical Services System

4.2.1 Selection of the 40 Single-Shell Tanks for Early Retrieval and Interim Closure

This section discusses the selection of the initial SST retrieval and interim closure sequence designed to balance risk reduction, available DST space, tank closure, and feed delivery (Mission Acceleration Action Plan [MAAP] 1.1). This sequence achieves up to 40 tank retrievals and interim closures by 2006, exceeding Tri-Party Agreement commitments. The activities required to meet this aggressive goal are discussed in Section 4.2.4 and will establish the technical and operational experience and regulatory foundation to enable RPP to meet its regulatory commitment and close all SSTs by 2018.

This retrieval and interim closure sequence and schedule is greatly accelerated compared to the HPMP.

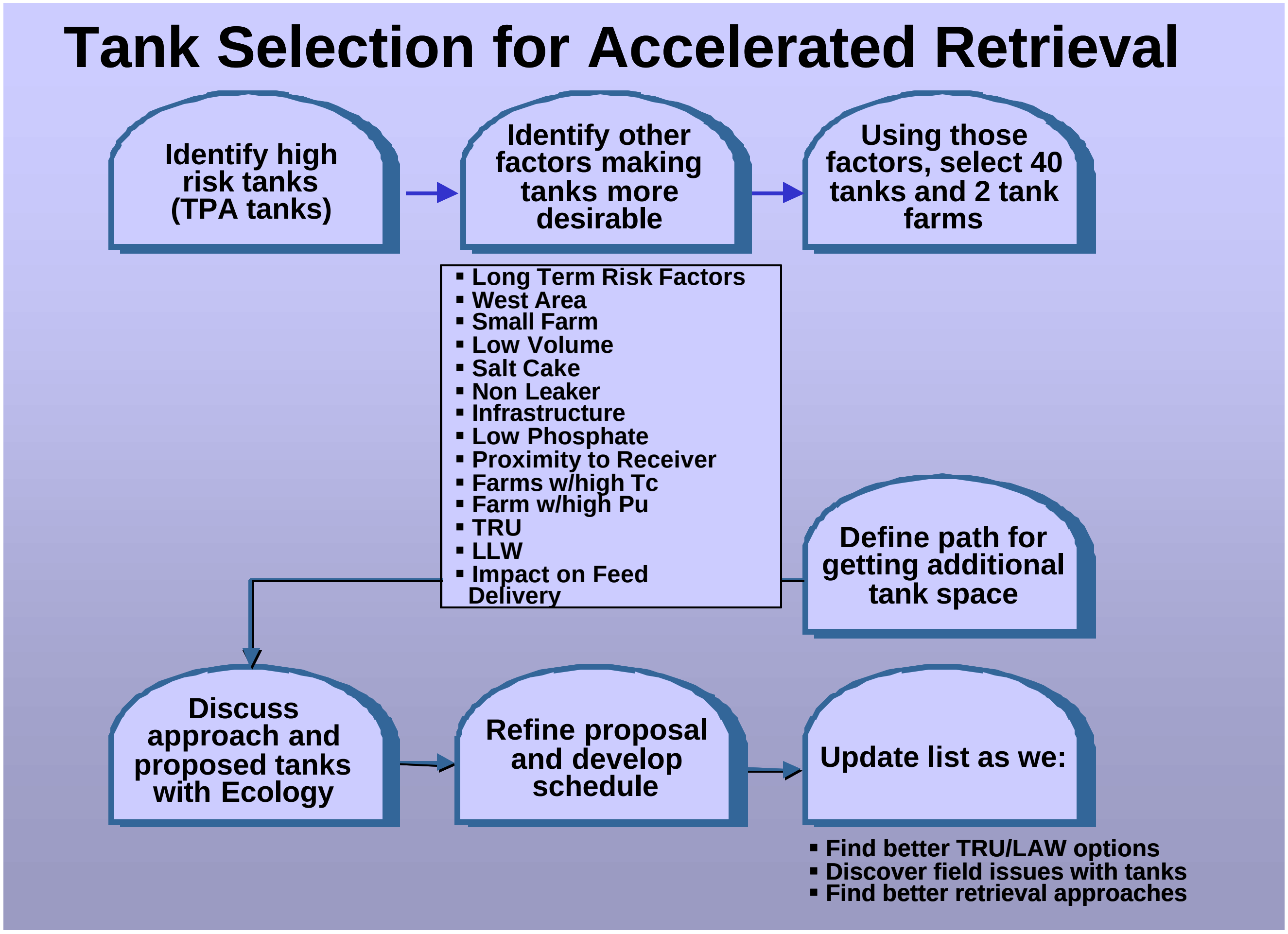
Implementation

SST tank retrieval sequences have generally been developed by ranking the tanks by groundwater and airborne risk factors, balanced with WTP waste feed delivery requirements. This risk ranking is primarily based on the estimated inventory of key radionuclides that drive risk assessment models. Key tanks with the highest projected groundwater risk were the subject of the negotiation of the M-45 series of milestones under the provision of the TPA. Seven tanks were identified for early retrieval (tanks C-106, S-112, S-102, C-104, S-103, S-105, and S-106); and milestones were agreed to between FY 2003 and FY 2009. All SSTs must be retrieved under current regulatory agreements, and remain in the retrieval que based on the characteristic risk factors discussed above.

This plan proposes to accelerate the retrieval of these identified high-risk tanks, and supplement their number with additional tanks that meet specific feasibility criteria to facilitate accelerated closure process for both sets of tanks. A complex balance between available tank space, specific tank locations, existing infrastructure, tank chemistry, and specific waste characteristics must be made to determine which tank retrievals could be accelerated to support the overall tank closure objectives.

A tank retrieval and closure sequence has been established that is responsive to the many needs that exist. Beginning with the current risk-based retrieval sequence, all 149 SSTs were assessed against a number of key criteria, then grouped and ranked to produce a viable retrieval and closure sequence that meets or exceeds Tri-Party Agreement compliance, and balances risk reduction, waste feed delivery and available DST space, supplemental processing, and tank closure. A brief discussion of how each of the parameters was assessed follows. The process for tank selection is illustrated in Figure 4-1.

Figure 4-1. Tank Selection Flow Chart.



All tanks with near term retrieval commitments in the Tri-Party Agreement are included for early retrieval. Beginning with the risk ranked SST retrieval sequence, additional factors were then considered to determine which farms and tanks were highest priority for early retrieval and closure:

- Tanks in West Area were given priority to accelerate closure of all West farms and reduce the tank farm footprint. (West Area farms are S, SX, T, TX, TY, and U.)

- Small tank farms were included, with a goal of closing complete farms and reducing the tank farm footprint. (The smallest SST farms are AX with four tanks and TY with six tanks.)

- Low volume tanks were included to minimize the requirements for DST space. Most SST tank waste will be retrieved into the DST system. Greater risk reduction may be achieved by retrieving several lower volume SSTs rather than retrieving a single high volume SST (radionuclide content, etc.).

- Tanks containing mainly saltcake were preferred over tanks containing sludge, due to ease of retrieval (assuming modified sluicing as the retrieval method). (BY, S, SX, TX, and U farms are predominantly saltcake.)

- Non-leaking tanks were preferred for early retrieval demonstrations, since near-term retrieval activities may involve sluicing or other methods that add liquid to a tank.

- Impact on waste feed delivery for WTP processing was evaluated and alternate feed batches identified.

- Tanks were selected from those farms that have infrastructure (power, water, etc.) to support retrieval systems (Farms A, AX, C, U, S).

- Phosphate content was considered, since high phosphate waste may cause line plugging and complicate retrieval.

- Physical location and proximity to a receiver tank were considered. In West Area, the S, SX, and U farms have existing transfer routes into the SY-farm receiver tank. T, TX, and TY farms are significantly removed from the DST receiver tank, and do not currently have transfer lines.

- Farms were ranked in order of projected long-term risk to the air and groundwater utilizing key radionuclide concentrations and content. The top tank farms projected to have the highest potential for risk to groundwater due to technetium (TX, S, BY) and to air due to plutonium (C, TX, SX) were considered high risk.

- Nine tanks containing TRU waste sludge were included in the retrieval planning to provide TRU waste processing feed (B-201, B-202, B-202, B-204, T-201, T-202, T-202, T-204, and T-111) independent of the DST space availability status and the WTP feed delivery.

- Tanks containing waste for supplemental LLW treatment methods were identified (T-110, U-201, U-202, U-202, U-204, and C-204).

Table 4-2 summarizes the initial selection of SSTs to be retrieved, the general schedule for retrieval, and the primary parameters that drove its selection.

The retrieval of the up to 40 tanks (either into the DST system or directly to TRU or LLW processing) was modeled and the model results identified the need for additional DST space. Proposed approaches to obtain the additional space are discussed in Section 4.2.3. A process is being developed to update or revise the tank retrieval list as new information becomes available.

Table 4-2. Initial Selection of Single-Shell Tanks to be Retrieved. (2 sheets)

Tank	Fiscal Year to Retrieve	Characteristics for Selection
C-106	2003	Tri-Party Agreement tank required in 2003, non-leaker
S-112	2003	Tri-Party Agreement tank, primarily saltcake, high risk farm, West area, infrastructure and receiver tank available, non-leaker
S-102	2004	Tri-Party Agreement tank, high risk farm, West area, infrastructure and receiver tank available, non-leaker
U-107	2004	Saltcake tank, West area, retrieval demonstration method can be readily converted into complete retrieval, non- leaker
C-201-C204	2004	Small, very low volume tanks (<5 kilogallons of waste in 55-kilogallon tanks
T-201-T204	2004	TRU waste in 55-kilogallon SST, West area, send waste directly to processing unit
B-201-B204	2004	TRU waste in 55-kilogallon SST, send waste directly to processing unit
U-201-U204	2005	Small, very low volume tanks (<5 kilogallons of waste in a 55-kilogallon tank), use vacuum retrieval, West area
S-103	2005	Tri-Party Agreement tank, saltcake, non-leaker, West area, transfer waste to DST system. Identified as target for steam reforming demonstration.
S-105	2005	Tri-Party Agreement tank, saltcake, non-leaker, West area, transfer waste to DST system
S-106	2005	Tri-Party Agreement tank, saltcake, non-leaker, West area, transfer waste to DST system
T-111	2005	TRU waste in SST, send waste directly to processing unit
C-104	2005	Tri-Party Agreement tank, non-leaker
T-110	2005	LLW in SST, send waste directly to processing unit
TY-101	2005	Small tank farm, West area, suspected leaker

Table 4-2. Initial Selection of Single-Shell Tanks to be Retrieved. (2 sheets)

Tank	Fiscal Year to Retrieve	Characteristics for Selection
TY-102	2005	Small tank farm, West area, non-leaker. Identified as target for steam reforming demonstration.
TY-104	2005	Small tank farm, West area, suspected leaker
TY-106	2005	Small tank farm, West area, suspected leaker
S-108	2006	West area, high risk farm, saltcake tank, priority may change depending on tank space and success of dry retrieval
S-109	2006	West area, high risk farm, saltcake tank, priority may change depending on tank space and success of dry retrieval
AX-101	2006	Small tank farm
AX-102	2006	Small tank farm
AX-103	2006	Small tank farm
AX-104	2006	Small tank farm
SX-101	2006	West area, high risk farm, saltcake tank, priority may change depending on tank space and success of dry retrieval
SX-106	2006	West area, high risk farm, saltcake tank, priority may change depending on tank space and success of dry retrieval
TY-103	2006	Small tank farm, West area, suspected leaker
TY-105	2006	Small tank farm, West area, suspected leaker

Additional Strategic Elements

The successful development and deployment of a dry retrieval and waste staging system could result in a significant restructuring of this sequence. Dry retrieval would preferentially accelerate retrieval of suspected leak tanks. Coupled with staging of waste in SSTs, a dry retrieval process would reduce DST space requirements. Section 4.2.4.1.2 provides a description of the dry retrieval process. (MAAP 1.4)

Risks to Implementation, Uncertainties, and Mitigating Actions

The retrieval tank sequence may be revised to take advantage of additional information on:

- The performance of the selected technologies
- Development efforts supporting dry retrieval and staging
- Supplemental disposal

- Differing physical parameters
- Emerging field conditions.

4.2.2 Facility Stabilization System Strategies

Along with the retrieval and closure of SSTs, ORP must stabilize existing liquids that pose a near-term risk to the environment, and stabilize and ultimately close all the facilities that it is responsible for. This is in support of Environmental Management's policy of accelerated risk reduction, and supports the overall Mission acceleration envisioned in HPMP Strategic Initiative 2.

Currently 16 SSTs remain to be stabilized, with approximately 500,000 gallons of pumpable liquid remaining to be removed. Approximately 350 inactive waste sites and facilities are currently under the responsibility of ORP. These include:

- Evaporators (242-T, 242-S)
- Vaults (e.g., 244-AR, 244-CR, 244-UR)
- Inactive miscellaneous underground tanks
- Miscellaneous inactive facilities (e.g., 213-W Compactor facility)
- Miscellaneous inactive waste sites (cribs, ponds, ditches, french drains, septic tanks, unplanned releases etc.).

Existing and future facilities owned and used by the RPP will be dispositioned and closed in the future. In cases where environmental risks exist due to removable liquid remaining in unacceptable storage configurations, interim actions to reduce environmental risk will be completed.

In the near term, RPP will complete interim stabilization of 244-AR Vault, and plan for future acceleration of remaining facilities by integration with 200 Area plateau closure.

4.2.2.1 Complete Interim Stabilization

CH2M HILL will complete interim stabilization of all the SSTs to reduce the risk of environmental releases resulting from residual interstitial liquids remaining in 16 SSTs by September 2004.

With regulator agreement, some of these tanks may proceed directly into retrieval operations.

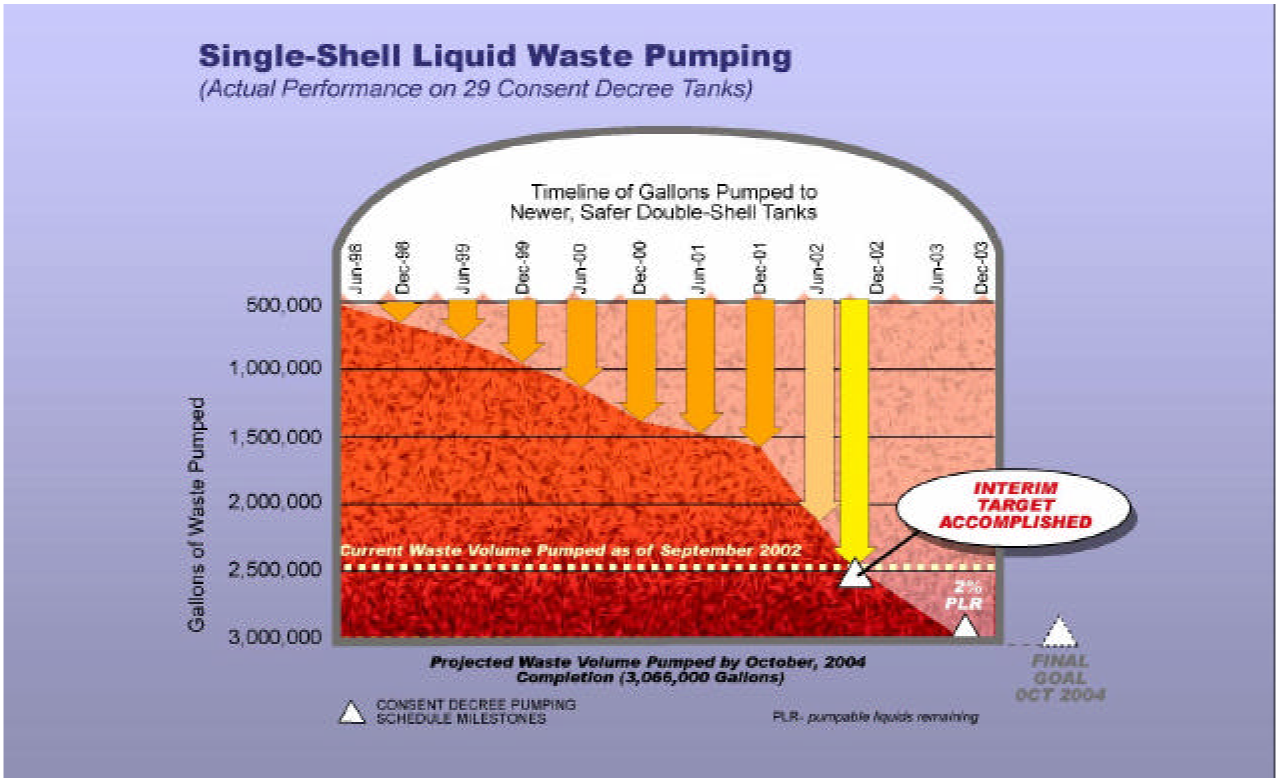
4.2.2.1.1 Implementation

Interim stabilization of these 16 remaining SSTs is being performed by saltwell pumping of liquids from these tanks into the DST system. The plan for interim stabilizing these tanks is covered in HNF-2358, *Single-Shell Tank Interim Stabilization Project Plan*. All Consent Decree interim stabilization activities will be completed by September 2004.

To date, a total of 133 SSTs have been determined to meet the interim stabilization criteria by previous waste removals or saltwell pumping. Sixteen tanks remaining to be stabilized consistent with achieving compliance with Consent Decree No. CT-99-5076-EFS. Tanks currently being pumped are A-101, AX-101, BY-106, S-101, S-102, S-107, S-111, S-112, SX-101, SX-102, U-107, U-108, U-111, and C-103. Tanks being evaluated as interim stabilized are BY-105 and SX-103.

Figure 4-2 shows the time-phased history of interim stabilization as defined by the Consent Decree, as well as the amount of waste remaining to be removed. As of October 1, 2002, approximately 500,000 gallons remains to be removed, and the program is on track to meet the FY 2003 volume removal milestones. The "Interim Milestone Accomplished" highlighted in Figure 4-2 represents completion of the FY 2002 volume removal target.

Figure 4-2. Single-Shell Liquid Waste Pumping.



Additional Strategy Elements

One of the accelerated retrieval approaches contemplates water additions to dissolve saltcake. Several of the target tanks for this retrieval technique are still in the interim stabilization process. In some cases, overall retrieval and interim closure of these tanks could be achieved by moving directly to saltcake retrieval rather than waiting to complete the interim stabilization process, which may take one to two years to complete. This accelerated retrieval approach will require modifications to the consent decree milestones for tank completion (MAAP 1.3). Two SSTs (S-112 and S-102) are likely candidates for retrieval to be initiated before saltwell pumping and evaluation are completed. This is discussed in Section 4.2.4.1.

Risks to Implementation, Uncertainties, and Mitigating Actions

None identified.

4.2.2.2 Complete 244-AR Vault Stabilization

Residual risk and ongoing mortgage costs for surplus facilities will be reduced by completing interim stabilization of 244-AR by the end of 2003.

4.2.2.2.1 Implementation Plan

The 244-AR Vault Facility is a “canyon” facility housing four waste processing tanks in three below-grade concrete cells. The 244-AR Vault Facility contains approximately 19,050 gallons of radioactive waste. The majority of the volume is contaminated water from intrusion of precipitation and snowmelt. Of the total volume, 16,050 gallons are contained in the four waste process tanks, and 3,000 gallons are in the concrete cells housing the tanks.

The primary objective of the 244-AR Vault Interim Stabilization Project is to remove any remaining pumpable liquids from the three sumps and the four tanks located within the canyon facility. Because of changes in the site infrastructure, lack of steam supply, and degradation of existing ventilation and pumping components, the use of existing infrastructure systems is not practical. Additional steps will be taken to isolate the facility, prevent further intrusions, provide periodic monitoring to detect any future intrusion, and retain the ability to pump accumulated liquids in the future if it is necessary.

Interim stabilization of 244-AR vault will be complete by September 30, 2003 under Tri-Party Agreement milestone M-45-11. The technical approach and planning for interim stabilization of 244-AR is covered in RPP-5635, *244-AR Vault Interim Stabilization Project Plan*.

4.2.2.3 Other Ancillary Facilities and Waste Sites

244-CR Vault – Similar in design to 244-AR. At this time interim stabilization and deactivation will be completed as part of final C-farm closure. Short-term actions pending final disposition will address *Washington Administrative Code* (WAC) and *Federal Facility Compliance Act Agreement* compliance with installation of leak detection, tank level monitoring, measures to prevent further water intrusion, and installation of a passive ventilation and isolation of the exhaust stack. These actions are anticipated to address current environmental issues.

242-T and 242-S Evaporators – Both of these facilities are currently planned to be deactivated and taken through decontamination and decommissioning post 2006.

Inactive Waste Sites – Near-term actions include continuing site surveillance, maintenance, and identification of integration opportunities for accelerated and cost effective disposition. CH2M HILL’s strategy is based on integration of these sites within farm closures or Central Plateau disposition initiatives based on geographical groupings and regional closures. Sites within, adjacent, or umbilical to a tank farm will be closed with their respective tank farm. Sites away from the footprint of a farm will be evaluated for potential integration within the Central Plateau Contractor’s disposition initiatives. Conversely some sites currently managed by the Project Hanford overlap or are close to some the tank farms (e.g., 216-T-32 Crib lies within the T Tank Farm; the 216-BY Cribs and 216-B Trenches lie close to the 241-BY and 241-BX Tank Farms). Disposition of these sites should be integrated with tank farm closures.

Inactive miscellaneous underground tanks and ancillary equipment will be closed as part of the overall farm closure planning.

DSTs and WTP facilities will require closure planning to be prepared as the overall life-cycle mission is completed.

Additional Strategic Elements

Links to 200 Area plateau closure acceleration activities need to be developed, and an integrated plan developed with RL.

Risks to Implementation, Uncertainties, and Mitigating Actions

None identified.

4.2.3 Double-Shell Tank Space Management System

The key capability that paces ORP's ability to accelerate the overall Tank Waste treatment mission is the availability of DST space. The available space in the existing 28 DSTs represents a limited resource which controls how many, when, and which SSTs can be retrieved and closed on an accelerated basis. This section discusses the key activities that will be necessary to maximize DST space availability, which in turn, allows acceleration of the SST retrieval and closure schedule.

4.2.3.1 Maximize Double-Shell Tank Space Availability

The ability to retrieve and close SSTs and deliver feed to the WTP is currently dependent on available DST space. DST space will be at a premium until the WTP begins to remove waste from the tank farms.

DST space management actions and techniques will be applied to make additional usable DST space available (MAAP 1.2). Based on the model run simulating retrieval of up to 40 tanks by 2006, the equivalent of approximately 9.4 million gallons of additional usable space is necessary to support the accelerated SST retrieval schedule through 2006. This quantity includes three million gallons previously identified as required to retrieve the seven tanks identified in the Tri-Party Agreement.

4.2.3.1.1 Implementation

The Tank Space Options Report identified a number of initiatives to make additional DST space available. Recent planning efforts have identified additional opportunities. Work is underway as described in MAAP 1.2 to evaluate and implement the following initiatives:

- Increase the DST fill height from 416 to 436 inches in 22 tanks to use the inherent physical capacity designed into the DST structures (potentially 1.4 million gallons of additional space).

- Reserve emergency space to reflect compliance with DOE O 435.1, *Radioactive Waste Management*, only. Currently 2.2 million gallons of space is kept in reserve, while the Order requires 1.1 million gallons (equivalent to one DST). Reducing the reserve space to respond to a single emergency less than 1.1 million gallons continues to meet DOE's order requirement, while making 1.1 million gallons of space available to support acceleration. This action will be incorporated into all future Waste Space evaluations, and will be incorporated formally into ICDs 19 and 20. (This will provide 1.1 million gallons of DST space.)

- Stage and concentrate dilute waste for evaporation to currently allowed storage concentration of specific gravity (SpG) 1.41. (This will provide up to 2.2 million gallons of additional space.)

- Direct retrieval of TRU tanks, currently stored in SSTs, to supplemental processing without utilizing DST space for staging and transfer. (This will provide 0.731 million gallons of DST space.)

- Implement tank-by-tank evaluations to allow greater concentration of wastes beyond current 1.41 SpG limit. Currently, tank waste concentration in the 242-A Evaporator is limited to a general 1.41 SpG limit to reduce the potential that flammable gas could be trapped in the stored waste, and result in periodic flammable gas release events. Tank-by-tank assessments may allow additional concentration (up to 1.6 SpG) while avoiding solids precipitation that influences flammable gas retention (may provide an additional three million gallons of effective DST space).

- Use space currently identified as "restricted" space in tanks that contain staged feed for WTP. This activity may affect existing characterization of the WTP. (This will provide up to 1.3 million gallons of DST space.)

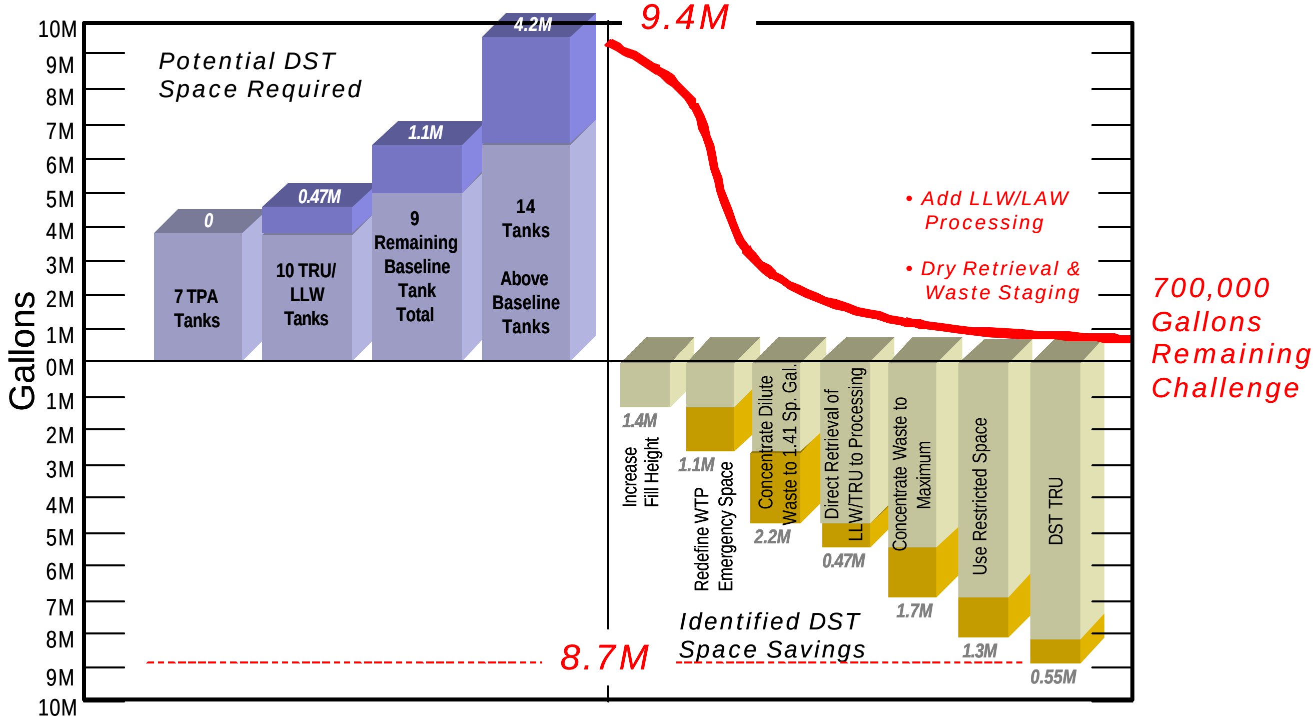
- Processing the TRU wastes currently stored in DSTs and separately disposing of the material before startup of the WTP. (This can save 0.55 million gallons of DST space.)

Once WTP begins immobilizing LAW and the supplemental LAW capability (post 2010) comes into effect, tank space management will be a much less significant concern.

Figure 4-3 shows the summary DST space volume management strategy for the near term. The left hand side of the chart shows the equivalent DST space storage requirements for the 7 Tri-Party Agreement tanks, 10 TRU/LLW tanks, the nine remaining tanks that equal the contract baseline of 26, and the 14 tanks that bring the total to 40, which is the basis of this plan. The total additional DST storage space required above the current level equals 9.4 million gallons.

The right hand side of the chart depicts the DST space volume initiatives discussed above. To date these initiatives total approximately 8.7 million gallons, leaving at least 700,000 gallons to be identified. Both the required waste volume and the space savings initiatives are estimates, and there is uncertainty inherent in both. In addition, logistical and scheduling issues may not allow efficient use of all identified space. Additional LLW/LAW processing, or some degree of implementation of dry retrieval and staging may be required to completely meet the IMAP objective of up to 40 tanks. It is believed that initiatives beyond the projected equivalent retrieved storage volume are feasible and prudent. For example, recently completed seismic evaluations indicate that fill heights up to 460 inches will be possible for many waste types (potentially 1.1 million gallons additional to that discussed above).

Figure 4-3. Double-Shell Tank Space Strategy for Retrieval of up to 40 Tanks.



Additional Strategic Elements

The amount of DST space required could be reduced dramatically by the successful deployment of dry SST waste retrieval and waste staging systems (MAAP 1.4). If additional SSTs can be directly retrieved to supplemental processing, it also will reduce the DST space required.

Risks to Implementation, Uncertainties, and Mitigating Actions

The primary risk in obtaining additional DST space comes from the efforts to increase waste concentration beyond 1.41 SpG. Historically, wastes have been concentrated to 1.6 SpG and sometimes greater; however, tanks with periodic flammable gas releases were formed, and costly mitigation actions were necessary. The ability to predict flammable gas storage as a function of waste feed characteristics, degree of concentration, and formation of undesirable solids is an important prerequisite to performing further concentration. If concentration can be performed safely, necessary authorization basis changes for the DST system and 242-A Evaporator will be completed.

The number and frequency of 242-A and Effluent Treatment Facility (ETF) evaporator campaigns will increase to maintain the waste volume in DSTs during the accelerated mission. The increased production must be integrated with planned maintenance and repair outages for these facilities. RL and ORP recently decided to transfer management and operation of the 242-A evaporator to CH2M HILL. This transition is planned to occur before June 2003. CH2M HILL is working directly with Project Hanford to develop the transition plan and define and integrate the needed remaining support operations.

ORP is considering further integration between the WTP and the ETF. (MAAP 5.8)

Three technical activities may also support DST space initiatives:

- Parallel development of dry SST waste retrieval and staging could reduce or eliminate dependence on DST space to support SST retrieval and interim closure. (MAAP 1.4)
- Supplemental processing and disposal of TRU wastes and LLW is planned in the baseline that will reduce the amount of waste to be retrieved into DSTs. (MAAPs 3.1, 3.2, and 3.3)
- A parallel supplemental LAW disposal technology development is also being evaluated and could eventually help alleviate DST space issues. However the primary goal of this effort is to enable completion of the overall mission by 2028, rather than to provide a near term tank space saver. (MAAPs 2.5 and 3.4)

4.2.4 Single-Shell Tank Closure System

Closure of SSTs directly supports achievement of HPMP Strategic Initiative 2. Accelerated retrieval of SSTs is Key Element 1, while acceleration of the tank farm closure process is Key Element 3. SST will be retrieved to prepare for tank farm closure.

4.2.4.1 Select/Implement Retrieval Systems

The strategy for accelerated retrieval of tank wastes is based on the following principles:

- Use of water-based retrieval (sluicing and water dissolution nozzles) for tanks that contain primarily soluble salts.
- Replicate standardized, state of the art technologies for mixed saltcake and sludge tanks – eliminating extended project cycles.
- Eliminate currently planned waste receiver facilities (WRF) and replace with transfer lines to DST systems for early retrievals. Planning for WRFs will be as required for bulk form retrievals.
- Initiation of retrievals under the existing *National Environmental Policy Act of 1969* (NEPA) ROD.
- Acceleration of the Tank Closure Environment Impact Statement (EIS) process, with a ROD issued by April 2004.
- Streamline work processes.
- Tailored approach to meet appropriate requirements; eliminating non-required features.

Successful application of the above principles will result in successful retrieval and interim closure of up to 40 tanks by the end of 2006, within the currently available funding.

A safe deployment approach will be driven by a "learn by doing" philosophy. Rather than expending extensive time and resources conducting research and development activities, CH2M HILL selected a technology suite based on the extensive development and design work done by DOE and others to date including DOE complex-wide site experiences in waste retrieval. The recently completed Cold Test Facility has already been put to use to adapt commercially available systems to Hanford Site tank waste retrieval. Commercial fabricated skid-mounted systems were integrated, started, and operated through a wide range of operating conditions. Developmental testing is nearing completion, and the setup will be used for operations training in preparation for field operations next year. The expectation is to resolve many design and operational issues by this cold testing approach, it is certain that many obstacles will be faced during the initial deployment and operations; and many will be resolved by the efforts of personnel in the field who find innovative ways to make things work.

By pursuing this deploy and learn approach, rather than the traditional approach which endeavors to eliminate all unknowns before proceeding; much more progress will be achieved, and key information and decisions will be made. This information will establish the basis for the disposition of SST waste and SST Farms closed by 2018 and will include the following:

- Retrieval technology performance and costs
- Realistic cost and schedule estimates for retrieval and closure of the tanks, and ultimately the 200 Area plateau
- Practical techniques for characterization and risk assessment
- Effective regulatory processes that support the accelerated schedule
- Decision making on the cost/risk/benefit that is inevitable in a landfill closure scenario

4.2.4.1.1 Implementation

This approach to retrieval of waste involves procurement of standard retrieval systems suitable for different groups of tanks. These systems will be modular, reusable, portable and involve simple control systems. Factors considered in developing the tank groupings for retrieval systems include size of tank, type of waste (e.g., saltcake or sludge), volume of waste, tank riser configuration, and classification with respect to leaks (e.g., sound, known leaker, suspected leaker). The retrieval and supporting systems will be designed, installed, and operated to meet the goals of the Tri-Party Agreement. Simplified leak detection, mitigation, and monitoring systems will be used. Upon completion of retrieval, the interim closure (final component closure) phase will begin with appropriate characterization and implementation of closure actions agreed upon with Ecology.

Table 4-3 describes the selected retrieval technology schedule for each of the initial 40 SSTs selected for retrieval and interim closure.

Table 4-3. Accelerated Retrieval and Interim Closure Schedule. (3 sheets)

	Tanks	Number Retrieved	Retrieval Technology	Number Interim Closed	Tanks Closed
FY 2003	C-106	1	Modified Sluicing	1	C-106
	S-112	1	Modified Sluicing		
FY 2004	S-102	1	Modified Sluicing		
	U-107	1	Modified Sluicing (Initial dissolution)		

Table 4-3. Accelerated Retrieval and Interim Closure Schedule. (3 sheets)

	Tanks	Number Retrieved	Retrieval Technology	Number Interim Closed	Tanks Closed
	C-200	4	Vacuum	4	C-200
	T-200	4	Vacuum	4	T-200
	B-200	4	Vacuum	4	B-200
				1	S-102
				1	S-112
FY 2005				1	U-107
	U-200	4	Vacuum	4	U-200
	S-103	1	Modified Sluicing	1	S-103
	S-105	1	Modified Sluicing	1	S-105
	S-106	1	Modified Sluicing	1	S-106
	T-111	1	MRS	1	T-111
	C-104	1	MRS	1	C-104
	T-110	1	MRS	1	T-110
	TY-101	1	MRS	1	TY-101
	TY-102	1	Modified Sluicing	1	TY-102
	TY-104	1	MRS	1	TY-104
	TY-106	1	MRS	1	TY-106
FY 2006	S-108	1	Modified Sluicing	1	S-108
	S-109	1	Modified Sluicing	1	S-109
	AX-101	1	Modified Sluicing	1	AX-101
	AX-102	1	MRS	1	AX-102
	AX-103	1	Modified Sluicing	1	AX-103
	AX-104	1	MRS	1	AX-104
	SX-101	1	Modified Sluicing	1	SX-101
	SX-106	1	Modified Sluicing	1	SX-106
	TY-103	1	MRS	1	TY-103
	TY-105	1	MRS	1	TY-105

Table 4-3. Accelerated Retrieval and Interim Closure Schedule. (3 sheets)

	Tanks	Number Retrieved	Retrieval Technology	Number Interim Closed	Tanks Closed
				**	AX-Farm Interim Closure
				**	TY-Farm Interim Closure
Total =>		40		40	

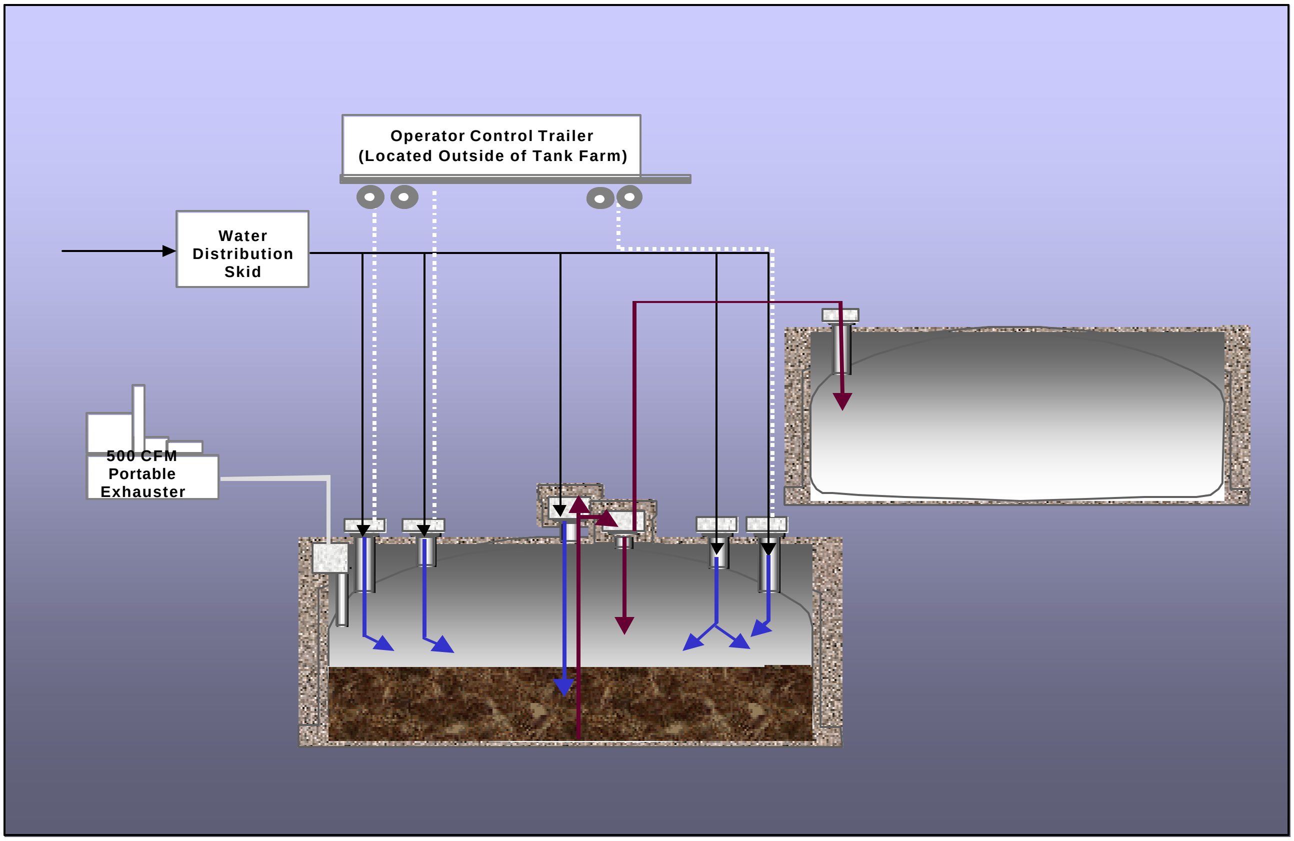
"Modified Sluicing" technology is based on past practice sluicing with modifications to reduce the working fluid inventory, and incorporation of lessons learned from previous waste retrieval operations at the Hanford Site and elsewhere. As appropriate, oxalic acid washes may be used in conjunction with Modified Sluicing. "Vacuum retrieval" uses a portion of the technology currently designed for retrieval of tank C-104 that is undergoing testing at the Hanford Site Cold Test Facility. It is planned for application to the smaller 200 series tanks. The Mobile Retrieval System (MRS) uses the vacuum retrieval system of the tank C-104 design and the mobile crawler in-tank-vehicle, and requires waste receiver and slurry transfer vessels. Most of the MRS will be reusable, thus spreading its cost over several tank retrieval efforts.

- **Saltcake Retrieval Strategy**

Saltcake dissolution will be used to retrieve water-soluble saltcake waste. The approach is to sprinkle the waste surface with raw water or to flood the surface of the waste with raw water. The added water must stay in contact with the saltcake for a long enough period for the brine to become saturated. Once the brine is saturated or near saturation, it is pumped from a saltwell to the receiver tank. This method retrieves the water-soluble portion of the waste only, resulting in very few of the solids (insoluble materials and low solubility salts) being pumped from the tank. This retrieval process is relatively slow due to the amount of time that must be allowed for the brine to reach equilibrium and the amount of time that the brine takes to drain to the saltwell through the remainder of the waste matrix. This method of liquid removal is very similar to the method used in interim stabilization saltwell pumping. This method is currently being applied by Savannah River Site and is the approach used to mitigate the SY-101 Surface Level Rise unreviewed safety question.

The system deployed in tank U-107 is shown graphically in Figure 4-4. Water is added to the tank using a variety of spray nozzles or "sprinklers." This system uses the existing saltwell pumping/transfer system to remove the brine from the tank and transfer it to SY-102.
A demonstration test has been completed showing the effectiveness and rates of retrieval of this simple approach. Data analysis is not yet complete. Because of plugged transfer lines, U-107 retrieval operations were suspended after completion of the process demonstration. Completion of retrieval will be planned after reliable transfer routes are established.

Figure 4-4. Saltcake Retrieval System.



This approach will be advantageous if selective dissolution is proven to be an effective means of separating radionuclides to support supplemental processing technologies, thereby reducing the burden on the DST system and the WTP. This approach is also advantageous for saltcake tanks that already contain operable saltwell pumping systems.

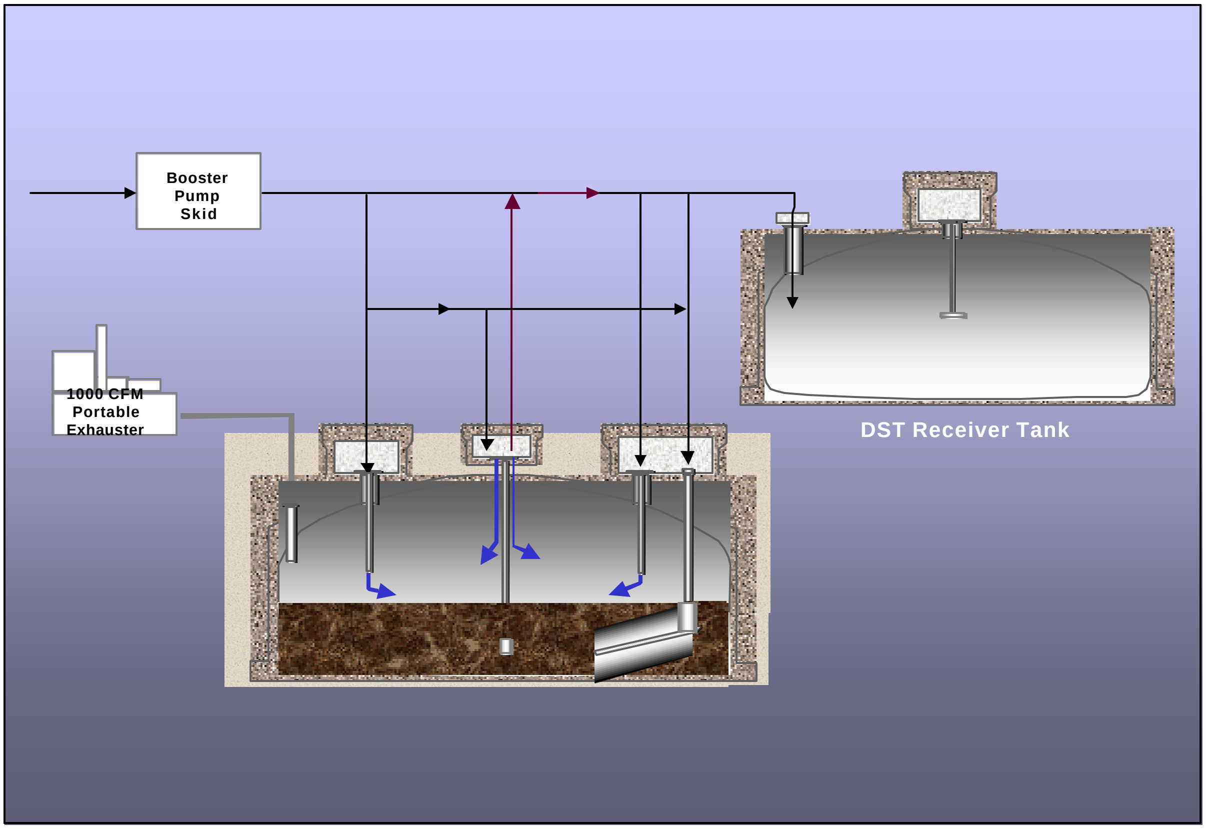
This approach is slow (~one-year retrieval duration) and most likely will not achieve the retrieval goal of <360 ft^3 residual. To meet the goal, a secondary retrieval method must be deployed. Options include modified sluicing and the MRS. These systems could be deployed at any time during the dissolution process.

- **Modified Sluicing**

For saltcake retrieval tanks subsequent to tank U-107, the following retrieval approach will be implemented. (See Figure 4-5.) Tanks S-102 and S-112 will be the initial tanks retrieved by this approach.

A progressive cavity pump (or vertical turbine pump) will be located near the center of the tank in a riser extension, or in the central pump pit (if the 42- or 12-inch riser in the central pump pit does not have a saltwell screen installed in it). Three remote directable water distributors will be located in the four-inch risers located 120-degrees apart, 6-feet from the tank wall. One additional central water distribution device will be located near the center of the tanks. This device will have an automatically indexing spray nozzle, to distribute water onto the saltcake waste. The three remote directable water distributors can be remotely operated. It is expected that 13 tanks (plus tank U-107) will be retrieved using this approach.

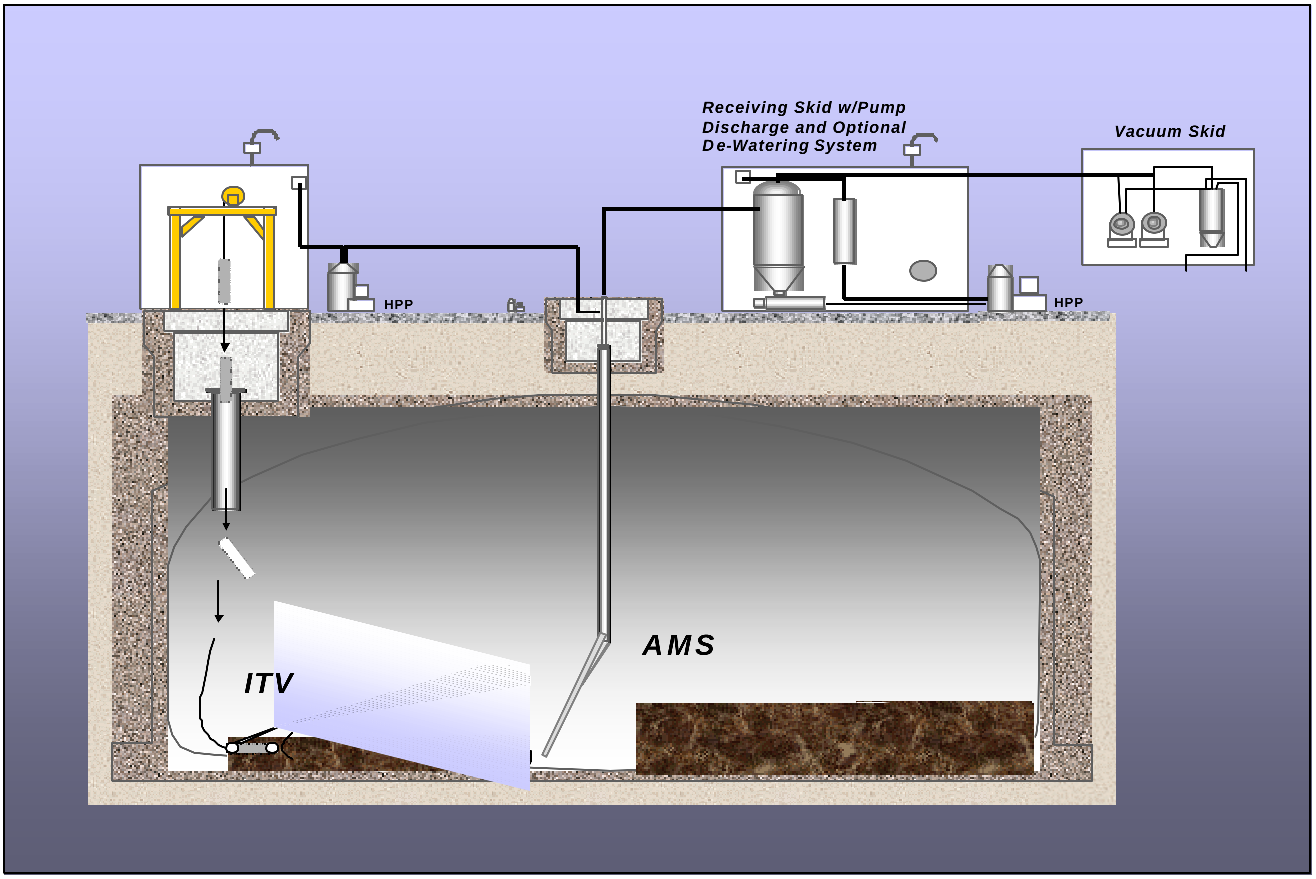
Figure 4-5. Modified Sluicing – Single-Shell Tank Sludge and Mixed Saltcake Retrieval.



- **MRS**

For the remainder of the tanks shown in Table 4-3, containing sludges or mixed saltcake and sludges, the MRS will be used (see Figure 4-6).

Figure 4-6. Mobile Retrieval System.



The MRS consists of two in-tank systems. An in-tank vehicle or crawler inserted through one riser works in conjunction with an articulating mast system (AMS) inserted through a second riser. These are supported by above grade skids including:

- Umbilical management system for the in-tank vehicle
- Vessel skid
- Vacuum skid (contains liquid ring vacuum pumps)
- Pump skid
- Hose-in-hose over ground transfer lines
- Decontamination and maintenance systems
- Hydraulic power packs, camera systems (both in-tank and ex-tank)
- Monitoring and control (including leak detection monitoring and mitigation)
- Services and utilities.

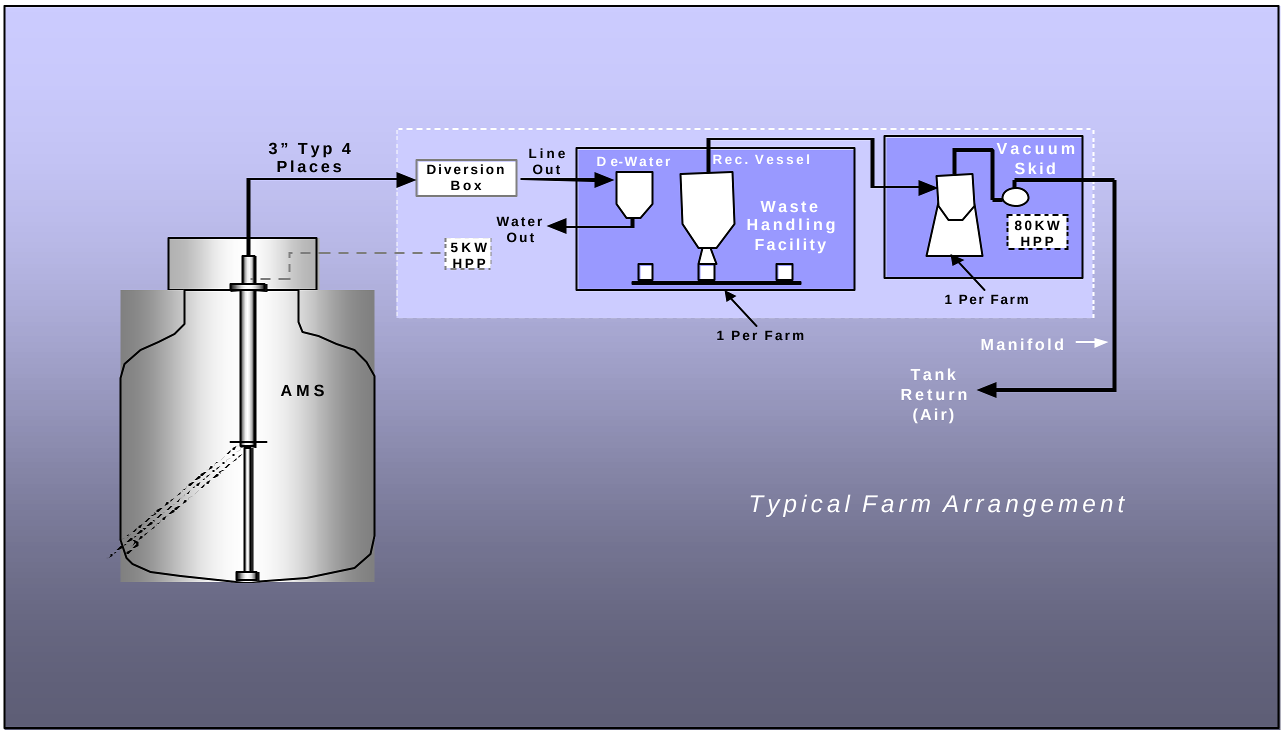
This design is based on the tank C-104 retrieval project design, vendor, and cold-testing experience. The system is undergoing testing in the Hanford Site's Cold Test Facility over the next several months.

Most of the necessary equipment and supporting systems will be used in subsequent tanks, spreading the equipment investment cost over several tank and farm closures.

- **Vacuum Retrieval Concept**

A vacuum system will be used as the waste retrieval approach for all of the 200 Series tanks (Figure 4-7). The vacuum is introduced to the tank waste by means of an articulating AMS that has a horizontal reach of 15 feet, and rotational capabilities of 360°. This system is identical to the AMS and vacuum system designed for tank C-104 and used in the MRS design.

Figure 4-7. Vacuum Retrieval System.



Air is mixed at the 3-inch suction port of the AMS enabling the required vertical lift of the waste to the topside receiver tank. The AMS is 33 feet in length in the retracted position, and can extend to greater than 40 feet in length. It will be deployed through and attached to standard 12-inch riser flanges that are available in all of the 200 Series tanks. In addition, 4-inch risers are available for in-tank camera viewing and control of the AMS.

Waste retrieval/processing will be accomplished by means of two different equipment configurations. For TRU waste retrieval/processing the waste will be fed from the receiver "hopper" tank directly into waste drums for preparation and shipment to WIPP. For the non-TRU waste retrieval/processing, the waste will be placed in drums (if LLW or LAW), transferred to the DST system, or stage it in an SST, depending upon process engineering, regulatory evaluation, and management decision.

Some water will be freed up as a result of mechanical retrieval of liquid bearing agglomerated waste. A de-watering system may also be needed for the TRU waste to package it "dry" to the extent possible. A hydro-cyclone with no moving parts is being considered for de-watering as necessary.

Additional Strategic Elements

- **Accelerated Retrieval of Saltcake Tanks**

There are 2 tanks currently under interim stabilization that contain primarily saltcake. Tanks S-102 and S-112 have, or soon will have, water addition systems to support saltcake retrieval. It is proposed to accelerate the start of saltcake retrieval before the completion of interim stabilization. Some changes to the Interim Stabilization Consent Decree will be required; however, the retrieval action will be completed before September 2004, the current mandated completion date of interim stabilization. A retrieved tank can be shown to meet the interim stabilization criteria, but some adjustment to the method of calculating pumpable liquid remaining will be needed. Applicable tanks will be identified and plans of this early transition will be developed. This approach will be reviewed with the regulatory agencies during January 2003. If accepted, a proposed revision to the consent decree incorporating regulatory inputs will be completed by March 2003. (MAAP 1.3)

Risks to Implementation, Uncertainties, and Mitigating Actions

The primary risk for the accelerated retrieval strategy is the acceptance by the regulators using water-based retrieval methods, with simplified control and leak detection systems. The schedule acceleration and significant budget limitations will limit the number and sophistication of the ancillary support systems for these retrieval systems.

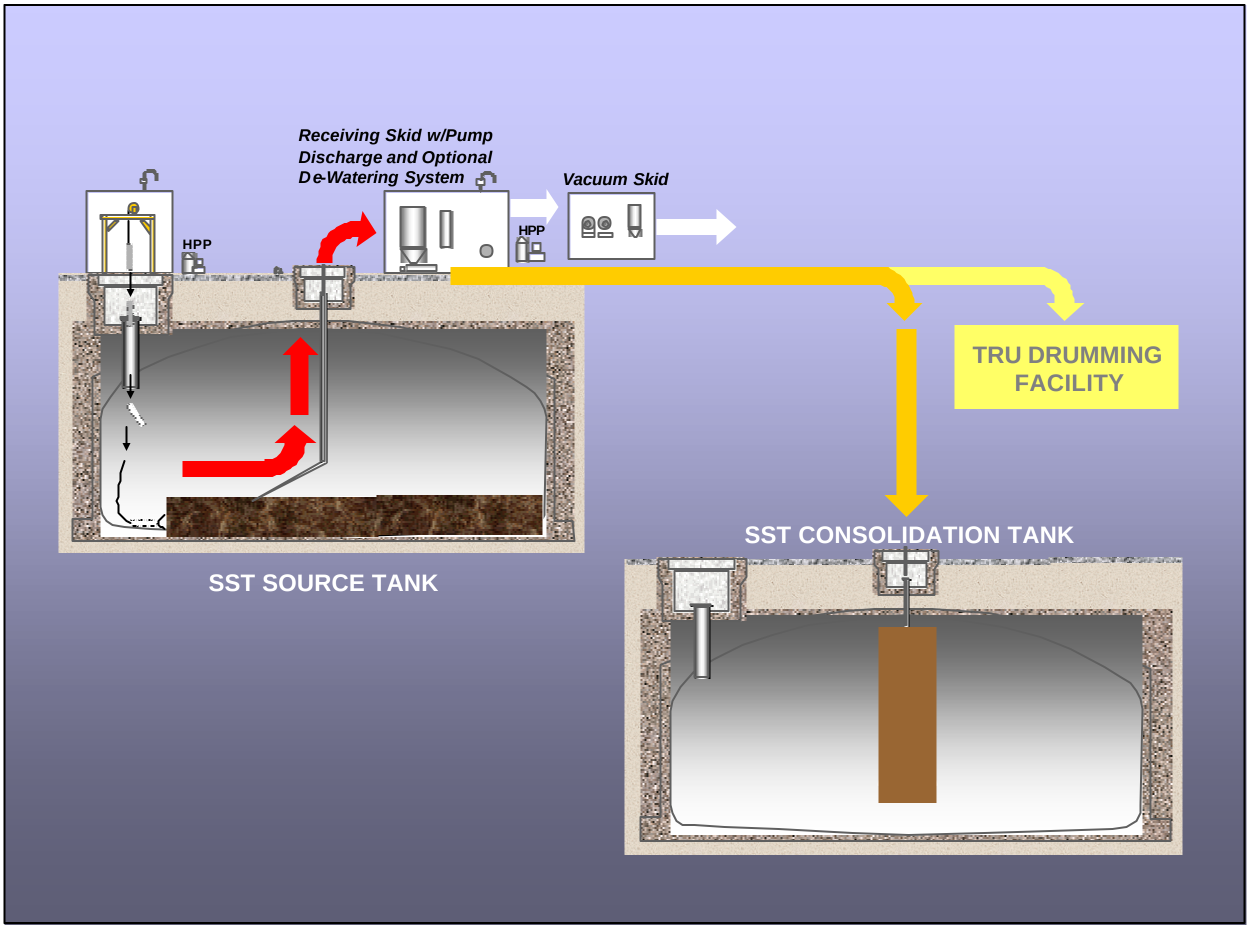
The performance of the selected retrieval technologies will remain an unresolved risk until significant retrieval experience has been obtained on a variety of SST wastes. Analysis and cold testing will not completely mitigate this risk. This risk underscores the need to move forward with actual waste retrieval in a safe manner to gain the necessary experience.

To achieve the retrieval schedule acceleration described in this plan, alternative retrieval and slurry transfer strategies supporting tank waste sluicing are required for early retrievals.

4.2.4.1.2 Propose/Implement Dry Retrieval/Single-Shell Tank Waste Staging Options

A dry retrieval concept is being evaluated that uses key components of the MRS (refer to MAAP 1.4). Waste would be retrieved by the vacuum system, supported by the in-tank vehicle to move waste to the articulated vacuum wand. The waste would then be transported short distances to a sound receiver tank for consolidated staging. The maximum transfer distance is approximately 200 feet, so tanks would be selected based on their proximity to a sound receiver. Interstitial liquid could be separated and collected for transport to the DST system. The mostly dry solid waste would be consolidated into a single sound SST (or more in the very large farms). A schematic of the approach is shown in Figure 4-8. There are many farms in which the waste from most of the tanks could be consolidated into one or two sound tanks.

Figure 4-8. 100 Series Single-Shell Tank Retrieval and Consolidation Approach.



If demonstrated to be feasible and permitted by the regulators, this approach could have a dramatic positive impact on the overall retrieval and interim closure strategy. It could largely decouple SST retrieval from the DST system, and allow optimization of future feed delivery to the WTP or supplemental processing technologies. It would also accelerate tank closure of most tanks within a farm. The approach would simplify the retrieval from tanks with questionable integrity, for which no effective retrieval system has been agreed upon with regulators.

Implementation of dry retrieval/waste staging would result in a revision to the tank retrieval schedule and the list of selected tanks. Targeted tanks would have to consider proximity to sound receivers in addition to the tank selection criteria cited in Section 4.2.1.

Design, cold testing, and initial feasibility assessment of the dry retrieval system and waste staging concepts will be completed by April 2003. If cold testing and deployment studies support feasibility, approval will be pursued from regulatory agencies by June 2003 to proceed with the deployment.

4.2.4.2 Close Single-Shell Tanks

In concert with the regulators, the time frame to interim close SSTs will be significantly shortened. (MAAPs 1.5, 1.6, 4.1, 4.2, and 4.3)

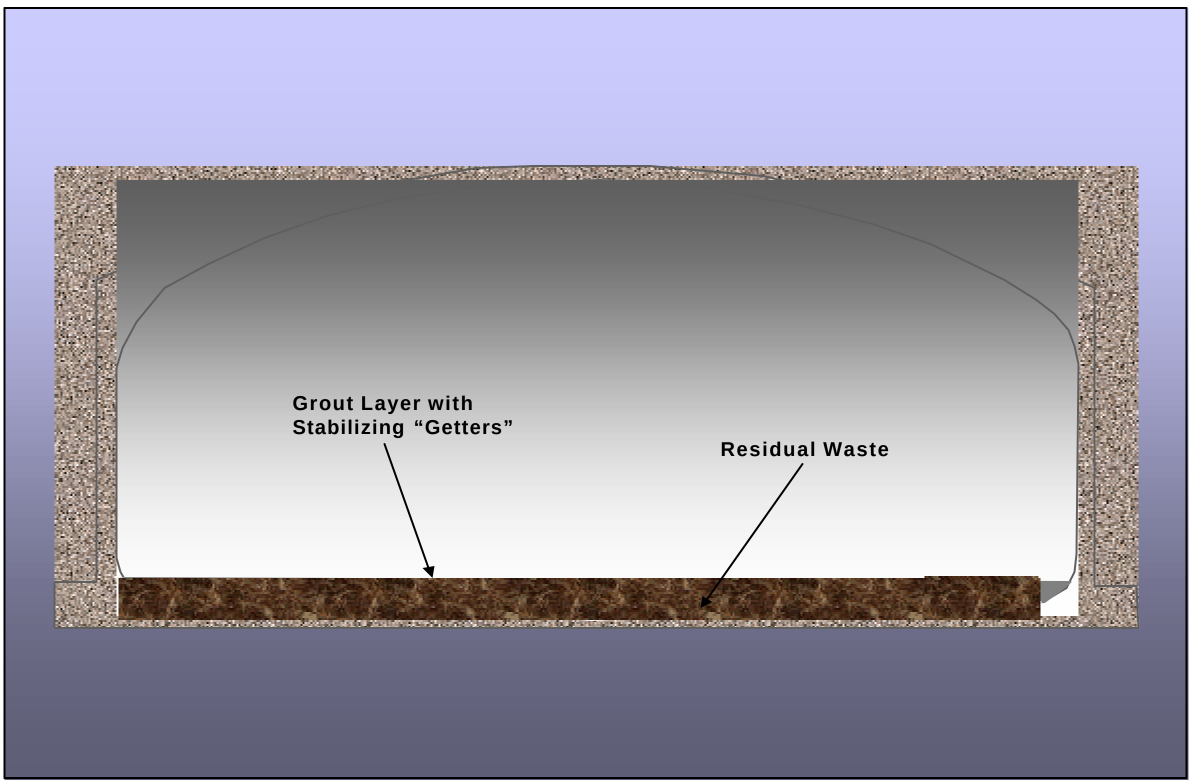
4.2.4.2.1 Implementation

Retrieval and interim closure will be accelerated to begin in FY 2003, and a closure EIS and ROD will be completed by April 2004. The closure schedule is provided in Table 4-3. Innovative technical activities in support of the accelerated closure activities must be accomplished to enable the accelerated schedule to be met. These innovations have been identified in characterization, closure system design engineering and authorization basis approaches for closure system design.

A general description of the interim closure concept is illustrated in Figure 4-9. Interim closure is more accurately described as component closure and has these primary characteristics:

- Waste removed to extent required
- Heel Stabilizing Layer (getters as needed)
- Isolation of attached piping and ancillary equipment per the closure plan
- Tank equipped for final fill.

Figure 4-9. Typical Single-Shell Tank Interim Closure Concept.



Primary Initiatives for Schedule Acceleration

- **Characterization for Closure**

Extensive tank characterization has been done to address safety issues and establish the initial waste processing facility design and waste form qualification for the WTP operations. However, sampling and analysis supporting closure decisions have not been done. During previous characterization, standard methods were developed and applied successfully. These will be used as follows:

- A common sample specification template – data quality objective
- A common tank residual sampling tool fabricator (one contractor to support overall program)
- Two proven methods to retrieve residual samples, including more than one sampling tool design
- Common analytical procedures and processes (222-S Laboratory)
- A common analysis data report template (222-S Laboratory)
- A common sample tank sample analysis plan template
- A common quality assurance plan template
- A common tank characterization report template.

Standardization results in minimum sampling and sample analysis periods, with plans and documentation largely standardized to the point of preparation by automation with tank specific changes clearly identified.

- **Closure System Design**

The closure system design will be streamlined as follows:

- Consistent core functions and requirements (F&R) (or equivalent) for each farm/tank will be established (MAAP 1.6).
- Common Level 2 specifications and drawings will be used (farm/tank).
- Engineering closure design for each tank will be standardized – tank-specific geometry, flange location, riser location, ancillary equipment and location for each tank are attached as an appendix to the standard design. Closure design will address any use of a heel stabilizing agent (getter) and any tank filler material.
- Ancillary equipment will be removed, capped, or administratively removed from service.

CH2M HILL will streamline its engineering and work control processes to accelerate the overall design and work control processes (MAAP 5.5).

- **Authorization Basis**

A common Preliminary Documented Safety Analysis and DSA report template will be developed and applied to each farm/tank. Streamlined review and approval processes in accordance with the contract must be achieved to meet the aggressive interim closure schedule contemplated in this plan (30-day approvals). Safety Evaluation Reports will not place requirements or provisions above DOE Order requirements and will be tailored to the hazards involved.

Additional Strategic Elements

None identified.

Risks to Implementation, Uncertainties, and Mitigating Actions

As discussed in Section 5.0 regarding regulatory strategies, the principal issue is reaching a common definition of interim closure. CH2M HILL's closure planning is based on collaborative and timely policy development on this issue.

Timely review, comment resolution, and document approval will be a fundamental element to success in completion of the accelerated closure mission. (MAAPs 1.5 and 1.6)

Other significant risks to achieving the accelerated closure schedule include:

- Identification of WIR (DOE O 435.1). (See MAAPs 1.5 and 4.5.)

  The residual waste remaining in the SSTs (heels) after completion of the retrieval activities must be evaluated against DOE O 435.1 requirements. In going through the WIR process, the residual waste will be managed as either LLW or TRU (greater than 100 nanocuries per gram for TRU elements).

  On-going litigation regarding WIR could affect the schedule and overall WIR determination of residual waste. (CH2M HILL will evaluate use of available options under DOE O 435.1 including *Comprehensive Environmental Response, Compensation and Liability Act of 1980* [CERCLA] closure.)

- Enhanced WIR Determination Process Management:

  A WIR determination will need to be completed on an accelerated basis to support the aggressive tank closure plan. Timely coordination will be necessary to achieve this determination within a 60-day period.

- Path Forward to Deal with TRU and Greater Than Class C Residuals:

  Based on the present data from SSTs, it is anticipated that the waste residuals in a number of the SSTs will meet the TRU waste classification. It also is anticipated that the waste residuals in several of the SSTs may exceed the Class C waste classification. In both cases, a regulatory path forward will have to be developed in coordination with the DOE to allow such waste residuals to be left in place and close the tanks.

- Land Disposal Restriction (LDR) requirements:

  Methodology to demonstrate LDR compliance of in-tank residuals is not now known, and a process must be established. One approach is to use the debris rule requirements contained in 40 CFR 268, "Land Disposal Restrictions." After waste retrieval, the structure of C-106, for example, can be classified as debris (40 CFR 268.2, "Definitions Applicable in this Part;" WAC 173-303-040, "Definitions"). Applicable LDR treatment standards for debris are those at 40 CFR 268.45, "Treatment Standards for Hazardous Debris," Table 1, Alternative Treatment Standards for Hazardous Debris, and the corresponding regulations at WAC 173-303-140, "Land Disposal Restrictions."

However, because of the unique circumstances associated with the residual configuration in a radioactive underground tank, Table 1 treatment standards may not be achievable. Therefore, in accordance with 40 CFR 269.44(h), a site-specific variance to these treatment standards will probably be requested. This variance request will be included in the tank specific closure plan.

4.3 SUPPLY WASTE FEED DELIVERY TO SATISFY ACCELERATED WTP PROCESSING RATES (WTP DISPOSAL SYSTEM)

Waste Feed Delivery at accelerated WTP production rates will be necessary to complete treatment of tank wastes by 2028 (Key Element 2 of the HPMP). Significant construction of waste retrieval and transfer systems will be required. An optimized, integrated project schedule has been developed to efficiently conduct the work in the near term, complete the necessary design and procurement activities at the time required; and install equipment at the appropriate time to meet accelerated WTP production rates.

An accelerated feed delivery schedule results from the DOE decision to configure the WTP with two HLW melters, along with the planned increases in ILAW and IHLW melter capacity and productivity. Wastes must be retrieved from DSTs at higher rates than the HPMP project schedules to be staged, and ultimately transferred to the WTP for treatment into disposable waste forms. Mixer pumps, transfer pumps, interconnecting pipelines, and other essential support systems must be provided in time to allow waste feed to be delivered in concert with these accelerated WTP commissioning and operational plans.

For the IMAP, CH2M HILL has optimized the feed delivery system by acceleration of needed mixer pumps and transfer systems, trading some planned LAW feeds requiring dissolution with dilute LAW solutions of similar compositions. CH2M HILL also has eliminated schedule float for feed delivery projects and developed an integrated, optimized project completion and turnover schedule. This approach will provide adequate feed capacity while maintaining an affordable cost profile. Actions are ongoing to maximize the efficiency of the waste feed delivery systems (MAAP 2.1) and to integrate the impacts of increased WTP production rates into the RPP technical basis (MAAP 2.2)

CH2M HILL will evaluate alternative approaches for ILAW disposal and select the most cost effective method. The approaches under consideration include the current ILAW disposal concept, onsite mixed waste trenches, and use of the Environmental Restoration Disposal Facility (ERDF) megatrench facility or sister concept. The ERDF megatrench concept was identified in the HPMP as a possible opportunity. ORP has issued formal direction to use an IDF as the design baseline and the project is proceeding on that basis. (MAAP 2.5)

Finally, CH2M HILL will aggressively pursue IHLW shipping schedules with the DOE Office of Civilian Radioactive Waste Management (OCRWM) to begin shipments of Hanford Site IHLW to the Yucca Mountain Repository as early as possible. Early and frequent shipments will limit the need for additional storage modules. (MAAPs 2.7 and 2.8)

4.3.1 Implementation

Optimized Integrated Feed Delivery

Previously, WTP waste feeds were staged at least 270 days before the need date to allow for WTP waste qualification processes to be completed. In addition, project and operations schedules were developed to allow 6 months of schedule float on each side of the 270-day waste qualification window. This resulted in lags of 18 to 26 months between project turnover and first use of the tank waste feed. The project schedules have been revised to eliminate most of this float. HTWOS runs modeled were performed without the schedule lag.

The results of these HTWOS models runs were evaluated against the current project schedules. Where ongoing work was underway in conjunction with other project upgrades, that work was continued. Design and procurement activities were optimized as appropriate. The equipment removal and installation schedules were reviewed and work was staggered with ongoing field activities. It is important to install the in-tank equipment only when it is needed. The corrosive tank environment results in equipment degradation immediately upon installation, and expensive ongoing maintenance is required to keep the in tank equipment operable. Instead, CH2M HILL's optimized schedule does the surface and field work on an efficient schedule, and installs the in-tank equipment as it is needed to support the feed delivery schedule. The Mission Summary Schedule for the modifications is shown in Section 10.0. (MAAP 2.1)

Scope Adjustments to Support Mission Acceleration

Projects W-314 and E-525 are developing strategies for working with the regulators to gain concurrence for eliminating unnecessary scope from each project, with potential savings of $20 million to $30 million. Project W-314 is exploring deferral or possible elimination of planned ventilation and pit upgrades to AP Tank Farm. Project E-525 is investigating elimination of SY Tank Farm pipeline replacement from the project's scope. By January 2003, Project E-525 will have completed preliminary design of the planned SY pipe replacement and developed a construction cost estimate that will provide the basis for a cost-benefit analysis to support a decision on the SY pipe replacement. (MAAPs 2.3 and 2.4)

- **ILAW Disposal**

CH2M HILL has completed an evaluation of ILAW disposal alternatives, and has made recommendations as requested. ORP has provided formal direction to proceed on a parallel path to provide disposal capability for ILAW. CH2M HILL is proceeding with design of an IDF in cooperation with Fluor Hanford, using corporate affiliates. Evaluation will continue on using the existing ERDF in lieu of this new facility. The ILAW disposal capability project is not considered a capital line item project.

The IDF will provide site disposal capability for ILAW, mixed low-level waste (MLLW), and LLW in a common facility, with savings accrued for the overall site program. If use of the ERDF is approved, these materials would be disposed along with the CERCLA cleanup wastes currently disposed there. (MAAP 2.5)

The ILAW packages will be placed in the near-surface trench with remote handling equipment, radiation shielding, and a surface protective barrier. As the packages are placed, the trench will be backfilled with soil, sand, or gravel to eliminate void space and limit subsidence to ensure compliance with regulatory limits.

The construction of immobilized waste storage facilities will meet Tri-Party Agreement requirements. The accelerated schedule is also supportive of the WTP hot commissioning start in 2007.

Additional Strategic Elements

None Identified.

Risks to Implementation, Uncertainties, and Mitigating Actions

IMAP accelerated project schedules increase three of the Project W-211 Risk Events: Project Integration, Concurrent Construction, and Schedule Changes. After completion of the Implementation Plan in 2003, the Baseline Uncertainty/Risk Analysis for Project W-211 will be revisited to incorporate the potential impacts from the accelerated construction schedule. For Project W-464, the WTP production scenarios (570 canisters per year) exceed current planning production allowances for the CSB of 480 canisters per year.

Structural analysis of the HLW canister design is currently on-going. A WTP optimization proposal for thinner-walled IHLW canisters is also being analyzed. The potential impact of the thin-wall proposal would be the need to increase the impact limiter dimensions in the CSB. Because the CSB tubes have limited height restrictions, this could result in a single-stack configuration instead of the current double-stack, thus reducing the total storage capacity to half its current design capacity. If this occurs, the CSB will reach maximum capacity within 1.5 to 2 years and the already accelerated schedule for the design and construction of an additional IHLW facility could be accelerated by another 12-15 months (MAAP 2.6). Potential mitigation could be to defer the 570-canister rate until after the CSB reaches capacity and the first module is available for IHLW storage.

4.3.2 Optimize the River Protection Project Life Cycle

ORP, CH2M HILL, and the WTP Contractor will work together to identify opportunities for optimizing the life-cycle glass production.

4.3.2.1 Implementation

The waste feed delivery sequence has continued to evolve with the WTP contract and design schedule, and CH2M HILL's understanding about the waste characteristics has improved. A series of short duration, ad hoc efforts has been conducted to develop and propose enhanced feed sequences and simple blending approaches to improve the overall ORP flowsheet. Minor changes in the feed delivery requirements can have significant impacts on the facilities necessary to retrieve and stage the feed for processing in WTP. CH2M HILL will submit an Implementation Plan for waste feed delivery systems to ORP in the spring of 2003 that will establish schedule milestones for the primary project elements.

A Technical Integration Activity (TIA) group has been established between ORP, CH2M HILL, and BNI (the WTP Contractor), and the TIA has developed an Integrated Systems Plan that supported DOE decision-making on start of construction. The Systems Plan is a summary level, mission duration planning and evaluation tool that draws on the technical resources of ORP, CH2M HILL, and the WTP Contractor to produce a projection of the integrated systems performance over the life cycle of the RPP.

Some limitations on current key data inputs have been identified. Efforts are underway to resolve these issues, and outputs of these ongoing efforts have been tagged for evaluation in subsequent issues of the Systems Plan.

Small changes in key assumptions, or improvements to projected processing performance can have large impacts on the overall mission completion schedule, the quantity of high-level and low-activity glass product produced, and the necessary supplemental or alternative treatment capacity. Technical management of the process performance data is important, and opportunities evaluated could result in contract changes for either WTP or CH2M HILL if implemented.

The TIA has developed a protocol that will be implemented under the existing ICD management process that will identify technical issues that require integration, and provide recommendations to ORP to resolve the issues. See MAAP 2.2 for the path forward in this area.

Additional Strategic Elements

None Identified.

Risks to Implementation, Uncertainties, and Mitigating Actions

None Identified

4.4 PROCESS WASTE VIA SUPPLEMENTAL TREATMENT/DISPOSAL

The HPMP establishes an overall processing strategy to accelerate tank waste treatment to achieve the Tri-Party Agreement commitment of treating all tank wastes for disposal by 2028. A key element of the overall strategy is treatment of wastes retrieved from Hanford Site tanks using one or more of the supplemental technologies described in Section 4.4.2. Implementing supplemental processing will reduce the burden on the WTP and improve the rate of environmental risk reduction (retrieval) by freeing up DST space or by processing waste without involving the DST system. Ultimately, supplemental treatment technologies may be required to process 60 to 70 percent of wastes previously scheduled for ILAW vitrification in the WTP.

The supplemental technologies being considered include: TRU/LLW packaging, bulk vitrification, containerized grout, and steam reforming. These supplemental technologies were selected by screening potential technologies that could be used for supplemental tank waste processing (RPP-11261, *Recommendation for Supplemental Technologies for Potential Mission Acceleration*). Screening evaluated the technical feasibility and probable performance of the technologies. The selected technologies will be tailored to the characteristics of waste to be treated. In all cases, the focus is on the timely deployment of applied technologies tailored to tank waste characteristics. Selection of technologies will be completed in calendar year 2003 for deployment to support accelerated tank closure.

4.4.1 Implementation

Not all Hanford Site tank wastes are HLW. The Hanford Site tanks also contain TRU, LLW, and LAW (HLW). The definitions listed in this IMAP describe the differences among these waste types. The radioactivity content and dose rate vary widely. Some tank wastes produce exposure levels requiring remote operations and shielding, while others can be handled more directly with contact handling techniques.

The implementation plan applies tailored treatment technologies to specifically selected tanks and waste streams to increase overall treatment efficiency and reduce life-cycle cost. The plan will ensure that all supplemental treated waste will be managed and disposed of in compliance with all regulations. Specifically: TRU and LLW waste will be disposed as TRU and LLW waste, and LAW will be treated and packaged for disposal onsite in ILAW disposal facilities. The selection of supplemental technology waste feeds and application of the specific supplemental treatment technologies is discussed below.

4.4.1.1 Waste Selection

Tank wastes suitable for supplemental treatment are described below.

4.4.1.1.1 Transuranic Wastes

Currently, twelve tanks (nine SSTs, and three DSTs) are identified as TRU tanks. Reviews of process history and tank inventory indicate the SSTs may be processed as contact handled TRU waste and the DSTs will likely be processed as remote handled TRU waste. Table 4-4 provides a list of the tanks currently identified as TRU, their handling categorization for planning, and waste volumes in each tank.

Table 4-4. Tanks Potentially Containing Transuranic Waste.

Tank	Handling	Volume (kgal)	Handling Type Total Volume (kgal)
T-201	Contact	29	731
T-202	Contact	21	
T-203	Contact	37	
T-204	Contact	37	
B-201	Contact	30	
B-202	Contact	29	
B-203	Contact	51	
B-204	Contact	50	
T-111	Contact	447	
SY-102	Remote	71	617
AW-103	Remote	273	
AW-105	Remote	263	

4.4.1.1.2 Low-Level Wastes

Six tanks containing LLW sludge wastes have been selected for supplemental processing, as listed in Table 4-5.

Table 4-5. Tanks Potentially Containing Low-Level Waste.

Tank	Waste Type	Combined Volume (kgal)
T-110	LLW sludge	385
C-204	LLW sludge	
U-201	LLW sludge	
U-202	LLW sludge	
U-203	LLW sludge	
U-204	LLW sludge	

Characterization of the waste in tank T-110 has not yet been completed, but is expected to be either TRU waste or LLW. If the waste is characterized as TRU, it will be treated, packaged, stored on an interim basis, and then sent to WIPP for disposal. If the waste is characterized as LLW, it will be treated, packaged, potentially stored on an interim basis, and then disposed of in a licensed facility. T-110 treatment will be complete by the end of FY 2006.

4.4.1.1.3 Low-Activity Wastes

LAW feed to supplemental treatment will come from two sources: tanks that were previously pretreated to remove Cs, Sr, and U; and pretreated waste from the WTP pretreatment plant. These wastes contain relatively low amounts of radioactive materials (<0.05 Ci), and will require little or no additional separation of Cs to allow supplemental treatment and ILAW disposal under the existing WIR determination by the U.S. Nuclear Regulatory Commission (NRC) and the DOE.

Previously pretreated tank waste is contained in the tanks are shown in Table 4-6.

Table 4-6. Potentially Low Curie Low-Activity Waste Tanks. (2 sheets)

Tank	Cs-137 Ci/L for 5m Na Solution
TX-106	0.050
BY-110	0.049
TX-103	0.049
TX-108	0.046
TX-105	0.046
TX-115	0.045
TX-112	0.043
TX-110	0.043
S-110	0.042

Table 4-6. Potentially Low Curie Low-Activity Waste Tanks. (2 sheets)

Tank	Cs-137 Ci/L for 5m Na Solution
TX-111	0.042
B-104	0.042
BY-103	0.041
TX-114	0.040
BY-109	0.036
BX-111	0.036
BY-111	0.033
BY-102	0.033
BX-110	0.031
BY-105	0.030
TX-117	0.027
BY-112	0.027
TX-118	0.027
S-112	0.026
BY-108	0.025
B-107	0.018
B-106	0.017
TX-116	0.017
TY-102	0.015
B-109	0.011
B-105	0.011
B-103	0.011
B-101	0.011
S-109	0.007
TX-113	0.004
T-109	0.003

4.4.1.2 Supplemental Treatment Process Description

TRU and LLW waste will be packaged for disposal as described below. In addition to processing and packaging of TRU waste, other supplemental treatment technologies will be evaluated for processing LAW. These include Bulk Vitrification, Containerized Grout, and Steam Reforming.

4.4.1.2.1 Transuranic/Low-Level Waste

The waste form in TRU/LLW SSTs enables relatively simple processing steps to be used to prepare the sludge for packaging and subsequent shipment to WIPP. The waste in the SSTs will be dewatered and packaged into WIPP compliant containers using contact-maintained commercial sludge packaging equipment. The preliminary schedule for processing includes process definition and procurement by March 2003 and construction and startup by September 2004 in conjunction with tank waste retrieval operations. Operations will start in October 2004 and continue into 2006. At least 750,000 gallons of TRU waste will be treated by the end of FY 2006.

TRU waste from the DSTs is expected to be remote handled. Handling of remote handled waste is more complicated than handling of contact handled waste. A solid/liquid separation-processing step or solidification step is expected to prepare remote handled TRU for packaging and subsequent shipment to WIPP. Liquids resulting from a solid/liquid separation step will be returned to the DSTs pending WTP treatment.

4.4.1.2.2 Supplemental Treatment Strategy.

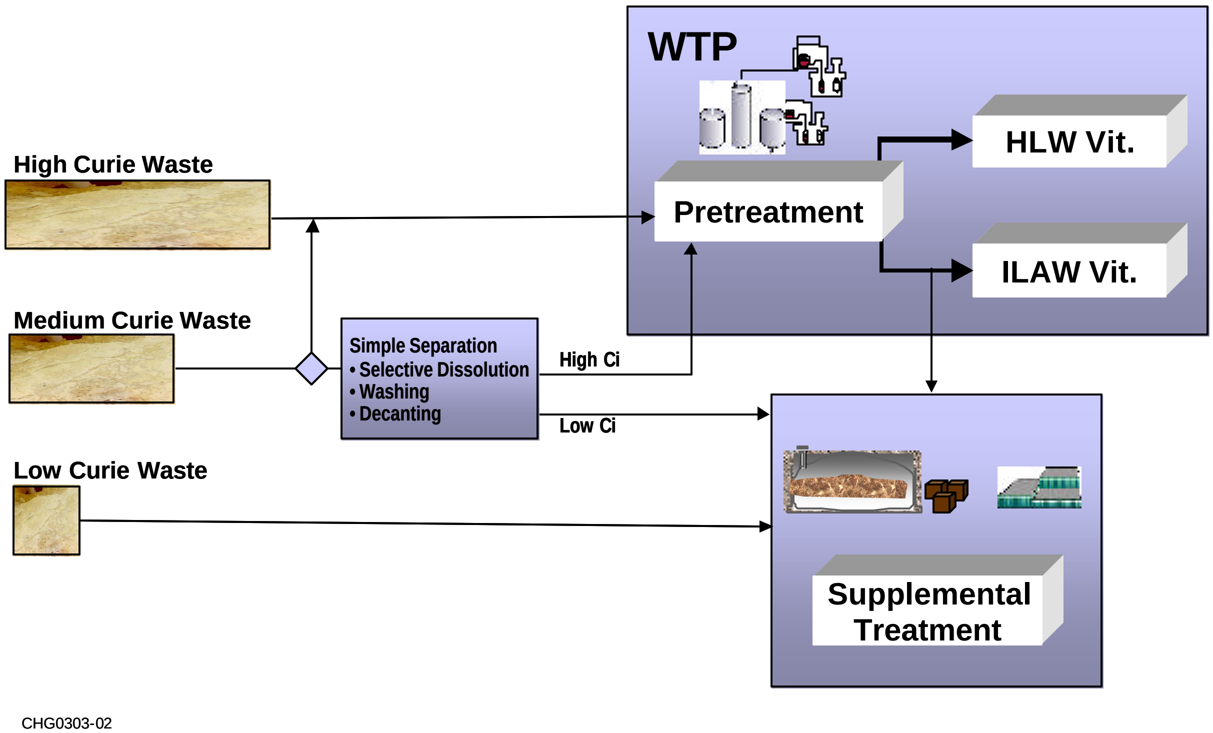
Beginning in 2006, the initial LAW supplemental treatment will be fed from tanks previously treated to remove cesium. For example, some tanks were pretreated in B Plant in support of previous Cs and Sr removal and encapsulation campaigns. As appropriate, additional simple separation processes such as selective dissolution will be used to further reduce cesium content in the waste feed stream. When WTP comes on line, approximately 2010, supplemental treatment facilities will begin to process waste from the WTP pretreatment plant in addition to waste feed received from previously pretreated tanks. Figure 4-10 depicts the overall processing strategy.

4.4.1.2.3 Candidate Low-Activity Waste Supplemental Treatment Technologies

The following technologies may be used to treat LAW. Development and testing of these technologies is being performed in calendar year 2003. Following testing and development a selection process, described below, will select the supplemental treatment technologies that will be used to treat the LAW feed stream.

Bulk Vitrification. Bulk vitrification is a flexible technology that is currently being used domestically and internationally for radioactive, hazardous, and mixed waste treatment. This technology would be deployed to treat waste in a relatively localized area. Secondary containment and off gas treatment facilities are provided as part of the mobile system.

Figure 4-10. Overall Supplemental Treatment Strategy.



Bulk vitrification is performed by mixing the waste with soils containing glass forming materials (e.g., high silica clays or sands) in the process vessel, inserting electrodes into the process vessel and applying electrical power. Bulk vitrification can be conducted in large containers (e.g., 20 to 30 m^3) resulting in waste forms with small surface area to volume ratios. The relatively small surface area minimizes the potential for waste form leaching. The melter used to vitrify the waste becomes the waste container, and is disposed with the waste upon completion of treatment. The glass form produced by this technology (i.e., aluminosilicate) is less sensitive to sulfate concentration than the borosilicate glass produced by the WTP process. This process is capable of higher waste loadings due to higher processing temperatures.

Containerized Grout. Grouts are routinely used throughout the world to immobilize radioactive and hazardous wastes because of their flexibility. They can be applied in conjunction with other treatment approaches (e.g., sulfate removal, steam reforming) to tailor the waste form. Grouting can be performed at ambient temperatures and pressures. It involves mixing the waste with grout formers (e.g., Portland cement, fly ash, and slag) and conditioners to produce a waste form exhibiting the required physical and chemical characteristics. While grouting results in an increase in immobilized LAW volume relative to the WTP Contract Planning Case, the grouting process also offers operational safety and permitting advantages over more complex technologies because of its technical simplicity (e.g., few unit operations conducted at ambient conditions) and maturity. Grouting can be designed to produce a final waste form with no secondary waste streams.

The preliminary schedule for containerized grout processing includes process and qualification testing by July 2003, and LAW treatment down selection in August 2003. If containerized grout is selected, design will be completed by September 2004, permitting by September 2005, construction and startup by September 2006, and operations following.

Steam Reforming. Steam reforming is also being considered as a supplemental treatment immobilization technology. Steam reforming is a well-established petrochemical processing technology that has been used effectively over the past several years to treat some radioactive wastes from commercial nuclear power plants. The process under consideration has the capability to destroy organics, convert alkali and other metals to stable minerals, gasify carbon, and reduce nitrates and nitrites to nitrogen gas. The apparent ability to treat sulfate wastes is particularly desirable.

Steam reforming processes waste in a high-temperature fluidized bed under a slight vacuum. Superheated steam and additives are injected into the bed creating reducing and oxidizing zones. The process destroys organics, nitrates and nitrites, and, with the help of additives, incorporates radionuclides together with sodium, sulfate, chlorine, and fluorine into a mineral-like, granular waste form.

Steam reforming produces a mineral-like granular waste form. The waste form may be combined with a binding agent to produce a monolith, or encased in a high integrity container

for disposal. The steam reforming process produces one secondary waste stream that may require further treatment: the dried salt solids resulting from the off gas scrubber operation.

Technology Selection for LAW Immobilization. The application of at least one technology to supplement the WTP LAW immobilization capacity, thereby taking full advantage of the WTP pre-treatment capability is critical to achieving completion of tank waste processing by 2028. The initial technology selection will be performed by October 2003.

The objective of the supplemental technology selection process is “to select a suite of technologies and processes that, when combined into a system for treatment of selected Hanford Site tank wastes, supplements the enhanced WTP and provides the highest level of confidence of safely and efficiently completing tank wastes by 2028 (CEES-0012). Table 4-7 lists selection goals and criteria for supplemental technologies.

Table 4-7. Goals and Criteria for Supplemental Technology Demonstration. (2 sheets)

Goal	Criteria
Ensure worker and public safety	Levels of safety control mitigation
Provide environmental protection comparable to current vitrified waste disposal plan, considering the nature of waste, pretreatment, and performance of the immobilized waste form and/or disposal units.	Waste form and disposal site performance
	Immobilized waste volume
	Secondary wastes
	Difficulty of obtaining facility permits
	Waste Incidental to Reprocessing determination

Table 4-7. Goals and Criteria for Supplemental Technology Demonstration. (2 sheets)

Goal	Criteria
Maximize schedule acceleration	Confidence in meeting Performance Management Plan commitment dates
	Technology maturity
	Contribution to increased processing capacity
Maximize cost-effectiveness	Life-cycle cost
	Capital cost
	Cost profile
	Return on investment
Maximize operability	Operability
Minimize overall system interface impacts	Impact on Waste Treatment Plant
	Impact on tank farm and River Protection Project disposal

Source: RPP-12287

The preliminary scheduled date for initial LAW treatment down selection is October 2003.

4.4.2 Regulatory Strategy

Regulatory issues include environmental assessments, environmental impact statements and the permitting of the waste process activities. Close coordination with the regulatory community will be needed to develop a pathway to complete the required assessments. (MAAPs 1.6 and 4.4) Regulatory issues are discussed in detail in Section 5.0, Regulatory Strategies.

4.4.3 Risks to Implementation, Uncertainties, and Mitigating Actions

Risks and uncertainties for supplemental technologies exist in two broad categories, product performance and operational concerns, and are summarized below. Mitigating actions that have been identified are described together with the risks and uncertainties to which they apply.

- **Product Performance**

An initial product performance uncertainty is the leaching and contaminant stabilization performance of grout and steam reforming as compared to WTP ILAW glassification. Both supplemental technologies will perform differently than the WTP glass base case; steam reforming has a potential advantage in its capability to chemically convert contaminants.

There is uncertainty in the details of long-term performance analysis protocols. Hanford Site methods for calculating performance assessments have differed from approaches used in other parts of the DOE complex. A current investigation to ensure the defensibility of projections may reduce the uncertainty.

Performance comparisons among the candidate supplemental technologies is a complex matter due to the differences in constructing and operating the respective facilities and differences in the resultant waste forms. To accomplish its downselect for supplemental technologies, a value-based weighting system for comparison of the waste performance results from the different technologies must be developed.

- **Operational concerns**

Integration of the supplemental treatment operation with WTP treatment strategy poses certain risks. For example, WTP pretreatment strategies may limit tank farm sources or require additional tank farm pretreatment to address ALARA and long-term performance issues.

4.4.4 Life-Cycle Decision-Making for Required Supplemental Treatment

Procurement activities are currently underway to obtain private sector proposals on supplemental waste treatment alternatives. Process performance and waste form performance data will be obtained from vendors as part of the phased evaluation and technology downselect activities, currently scheduled for October 2003. Projected treatment costs and schedules will be obtained for the vendors to supply capability to treat some or all of the necessary supplemental treatment needed by ORP to meet the 2028 waste treatment completion milestones.

Part of that decision process will determine the overall acquisition strategy that CH2M HILL will recommend to ORP. Options of building one or more treatment module systems will be considered. While CH2M HILL's current baseline assumes that one treatment system will be selected and come into operation in 2006 for the near-term treatment of previously separated or simple separation feed tanks, a number of deployment alternatives will exist and will be evaluated for overall life-cycle cost benefit.

It is possible that a small modular deployment approach like bulk vitrification can be simply replicated to provide adequate capacity; or that some combination of a modular approach, plus a simple treatment facility (such as containerized grout) would be deployed to meet the overall mission. Current decision and deployment timeline is as follows.

- Initial technology downselect – October 2003
- Deployment decision for initial treatment system – FY2004
- Authorize vendor to provide initial treatment system – FY2004
- Life-cycle recommendation for overall acquisition Strategy – FY2005
- Initiate design and procurement of any balance of mission capability (if required) – FY2007
- Startup of balance of mission capability (if required) – FY2013.

4.5 INTEGRATION WITH REVISED RPP SYSTEM PRODUCTION RATES

ORP has negotiated substantial increases in the average production capacity to be achieved in the WTP. ORP expects to achieve pretreatment rates equivalent to 2930 MT waste sodium per year;

an average HLW glass production rate of 6MT HLW glass per day; and an average LAW glass production rate of 30 MT ILAW glass per day. These production rates are significantly higher than previously planned and have further accelerated waste retrieval, waste transfer, and immobilized waste storage and disposal projects to support the RPP system.

HTWOS modeling to support the higher production rates has been completed to establish the technical basis for this increased capacity scenario.

The Mission Summary Schedule (Appendix D) displays the summary project schedules that meet these accelerated Waste feed delivery requirements. This sequence of retrieval and transfer systems supports a WTP with a pretreatment capacity 2930 MT waste sodium/year; HLW glass production averaging 6 MT/day; and LAW glass production averaging 30 MT/day.
CH2M HILL will submit a detailed Implementation Plan to ORP in the spring of 2003 for project activities that will support the revised RPP system production rates.

An assessment of the cost and schedule impacts of the increased production rates has been performed using the revised Mission Summary Schedule developed from the updated modeling of the new production case.

5.0 REGULATORY APPROACH

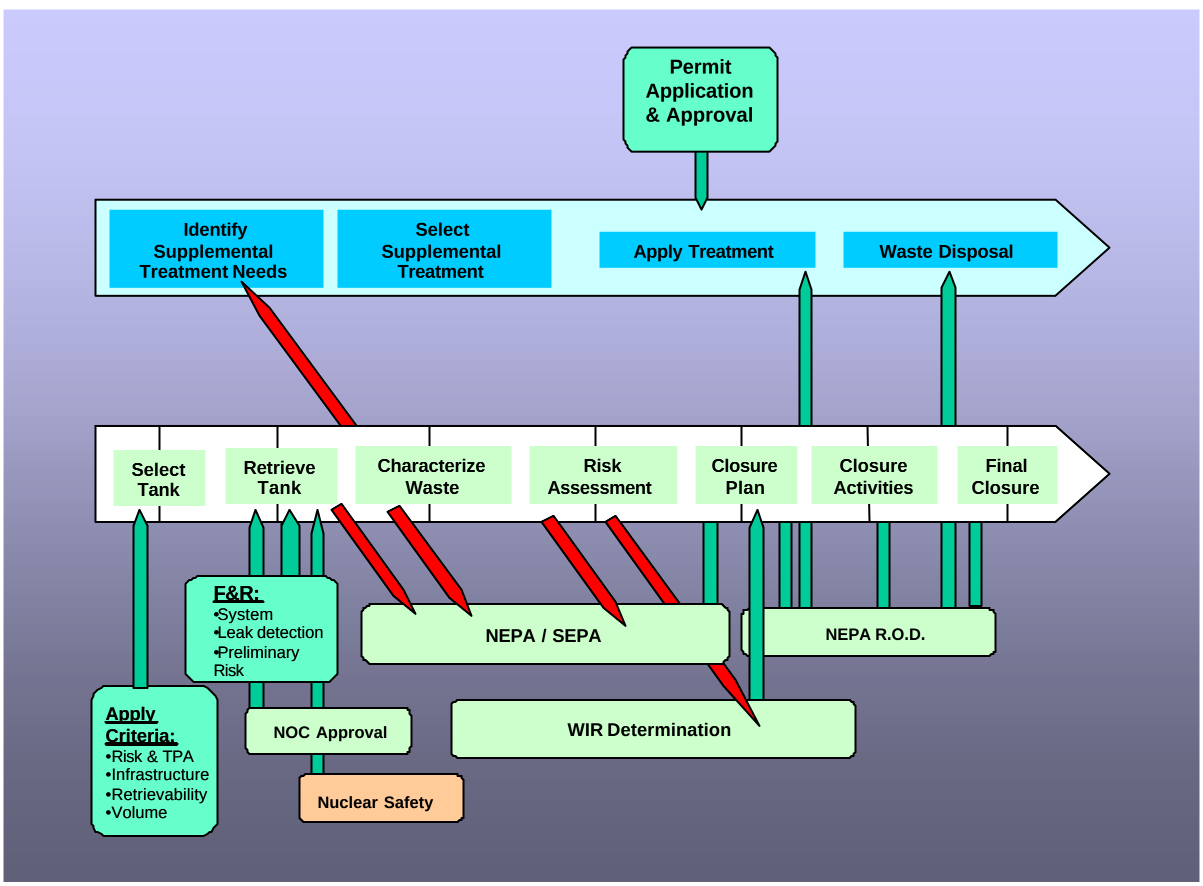
Development and execution of efficient regulatory processes will be required to achieve the retrieval and interim closure of up to 40 SSTs by 2006, and disposition of SST waste and closure of SST Farms by 2018.

To meet these dates, SSTs require closure at an average rate of 10 tanks per year. The complexity of the physical system to be closed (tanks, ancillary systems, contaminated soils, etc.) and the nature of the waste to be managed during this mission make this a daunting task. In addition to the technical challenges, there are similar challenges in accomplishing the major regulatory requirements that guide the establishment of controls to protect human health and the environment. Innovative approaches must be identified and implemented to address regulatory requirements and build momentum toward closing the Hanford Site tanks, while not diminishing the quality of closure.

Appendix B lists the primary environmental regulations and requirements that affect the accelerated mission.

The areas of regulatory overlap governing the process of closing tanks and managing the generated waste are depicted in Figure 5-1. The accelerated mission will require innovative integration of the requirements set by the regulatory systems needed to achieve tank closure.

Figure 5-1. Regulatory Integration for the Closure of Tanks.



An overarching regulatory process is the NEPA, which requires the DOE to consider environmental impacts in major decision-making. At the State level, the *Washington State Environmental Policy Act of 1971* (SEPA) requires state agencies to consider environmental impacts before issuing permits and approvals, such as RCRA permits and closure plans.

The DOE previously completed an Environmental Impact Statement (DOE/EIS-0189, *Tank Waste Remediation System, Hanford Site, Richland, WA, Final Environmental Impact Statement*) that addressed retrieving tank waste and vitrifying the waste in the WTP. Tank closure and waste treatment technologies supplemental to vitrification are not adequately addressed in existing NEPA/SEPA documents. Therefore, a Tank Closure EIS will address the closure of the SSTs and the connected activities.

The *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) was signed by DOE, Ecology, and EPA in 1989. The Tri-Party Agreement ensures environmental impacts associated with the Hanford Site are investigated, and appropriate action taken to protect public health, welfare, and the environment. The Tri-Party Agreement established a procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions in accordance with the various regulations of RCRA, the *State Hazardous Waste Management Act* (HWMA), and CERCLA. Tank waste is regulated under RCRA and HWMA, and must be integrated with CERCLA activities onsite. A major milestone of the Tri-Party Agreement is Closure of the Hanford Site SSTs and final disposal of tank wastes by 2028.

The strategy for closure of the SSTs began with removal of pumpable liquids to reduce short-term hazards of further leaks. This activity is addressed in the SST Interim Stabilization Consent Decree and will be complete in 2004. Retrieval of as much remaining waste as technically possible comes next, followed by interim closure. The retrieved waste will be placed into stable, safe forms for long-term dry storage or disposal.

The Tri-Party Agreement requires that DSTs be made compliant with RCRA and HWMA because they will be operating through 2028. The waste in DSTs will be retrieved, treated, stored, and disposed to ensure long-term protection. For new facilities, the Tri-Party Agreement requires full compliance with RCRA and HWMA.

The Tri-Party Agreement also lays out the process for submittal, review, and approval of RCRA permit applications and closure plans, to deal with the wastes and contamination. The Tri-Party Agreement requires that any changes to Tri-Party Agreement commitments be submitted and approved via change requests before ORP issues work direction that is inconsistent with the Tri-Party Agreement.

5.1 REGULATORY PROCESSES AND STRATEGIES

Implementation of the following strategies supports the mission acceleration system elements.

5.1.1 Tank Closure Environment Impact Statement

A Tank Closure EIS is being prepared (MAAP 4.4). The following information is required to support the EIS:

- Retrievability of tank heels
- Risk assessment parameters and standards

- Applicability of points of compliance
- Implementation of the RCRA process to close tanks
- Dispositioning of the Greater Than Class C waste
- Dispositioning of the TRU waste
- Supplemental Treatment Technology.

Some of this information can only be obtained through a retrieval and closure demonstration. Tank 241-C-106 has been selected for this demonstration. Activities associated with collection of data on this tank will be covered by an Environmental Assessment.

The following Data Packages will be developed to support the analysis of the EIS alternative:

- Assessment Guidance
- Worker Health and Public Safety
- Inventory
- No Action – Baseline
- Retrieval and Storage
- Waste Disposal
- Closure and decontamination and decommissioning
- Supplemental Treatment.

The schedule for the Tank Closure EIS is:

- Issue Notice of Intent for public comment (December 2002)
- Issue the Draft EIS for public comment (September 2003)
- Issue the ROD (April 2004).

5.1.2 Regulatory Reviews and Approvals Planning

To meet the aggressive schedule required by this IMAP, CH2M HILL will:

1. Perform comprehensive planning for regulatory reviews and approvals.

   A comprehensive plan and schedule for the submittal and approval of needed regulatory reviews and approvals will be developed and regularly updated. This plan will enable regulatory agencies (Ecology and WDOH) to coordinate public and stakeholder involvement events and effectively plan regulatory participation, review, and approval.

2. Develop an Annual Closure/Permitting Plan (MAAP 4.2):

   CH2M HILL will submit to the regulatory agencies an annual permitting plan that describes the required closure plans and permits scheduled for approval in the following year. This plan will delineate the roles and responsibilities of all parties in support of all tank retrieval and closure activities. The purpose of this plan is to obtain consensus among all of the involved parties on the plans, activities, and resources required by all to achieve the planned tank retrievals and closures.

3. Implement the regulatory processes using the lessons learned of the Tri-Party Agreement processes and working with CH2M HILL's regulators. These goals will be achieved by adopting the following actions:

   - Establish more extensive regulatory and stakeholder interfaces to allow early resolution of regulatory and technical issues (MAAP 4.1).
   - Use standardized applications and parallel reviews by ORP, CH2M HILL, and regulators to optimize the review cycles of regulatory documents (MAAPs 1.5 and 1.6).
   - Work with DOE-HQ and NRC on parallel review cycles of DOE O 435.1 documents.

5.1.3 Tank Retrieval and Closure Approach

Retrieval and closure of the SST and DST farms will be achieved by phases, (See Figure 5-2). The first phase retrieves and closes an individual tank (component). The second phase interim closes a tank farm, and the final phase concludes when all SST farms are closed in coordination with the Hanford Site Central Plateau and the final NPL delisting of the Central Plateau.

Phase 1: Tank Retrieval and Component Closure

<u>Strategic Objective:</u> Tank Interim Stabilization and Retrieval: (Figure 5-2, Steps 2 and 4)

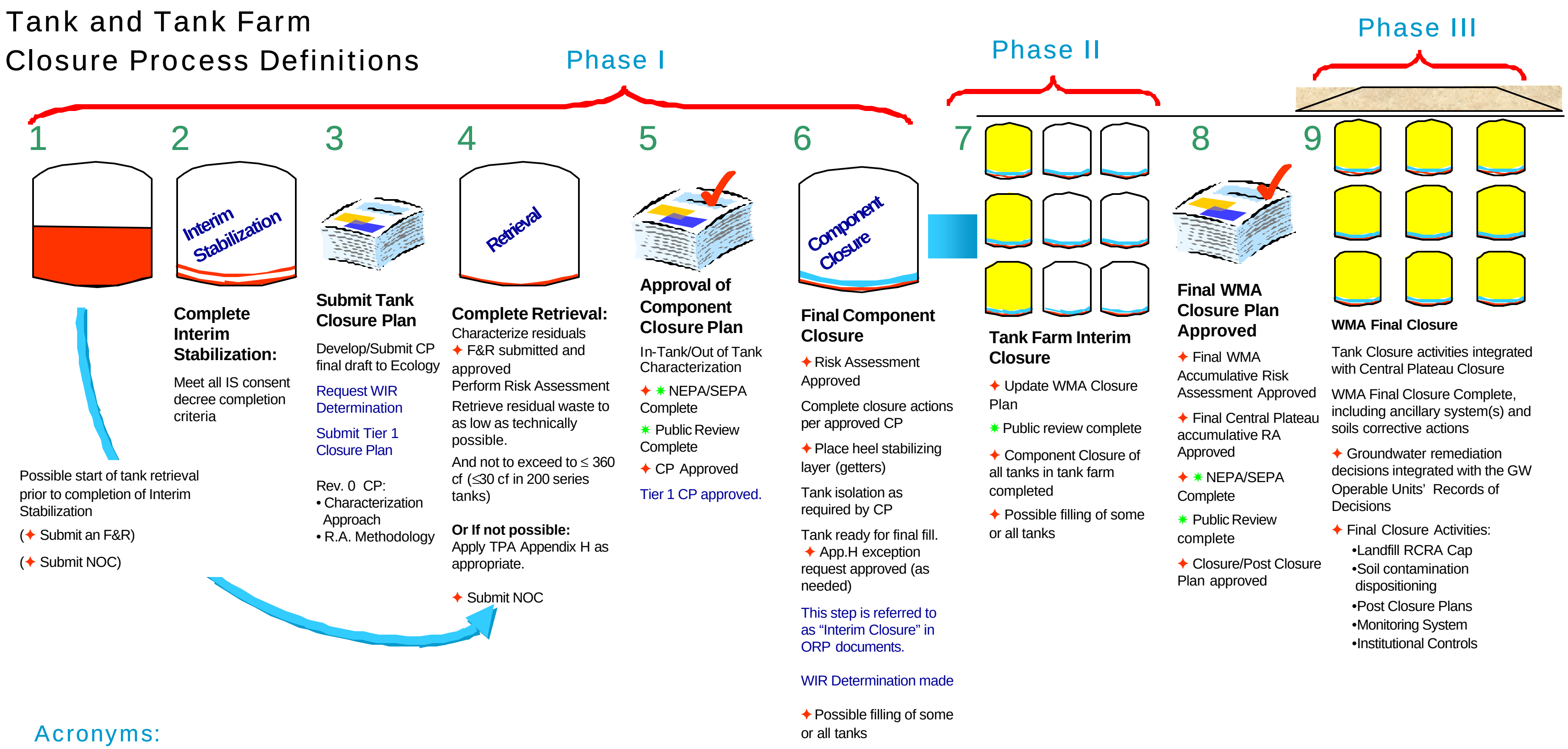
Efficiently and effectively meet the Tri-Party Agreement retrieval goals (retrieve as much waste as technically possible, maximum volume of residuals after tank retrieval not to exceed 360 ft^3 in the 100 series tanks, and 30 ft^3 in the 200 series tanks) and DOE O 435.1 requirements. If retrieval to these levels is not possible, a detailed explanation will be submitted. Tri-Party Agreement Appendix H procedures will be used to modify the retrieval criteria or to process a waiver request.

Implementation:

The SST interim stabilization (removal of pumpable liquid) activities are underway and will be completed consistent with the consent order. SST retrieval to remove solids from the tanks will then be conducted. However, in certain cases, such as tanks S-102 and S-112, it is expected that initiation of retrieval activities before completing the prescribed interim stabilization process will accelerate SST closure and overall risk reduction activities.

Pursuit of this approach for the 2 tanks is expected to require a change to the Consent Decree and perhaps the Tri-Party Agreement (see MAAP 1.3).

Figure 5-2. Tank Closure Definitions.



Acronyms:

App. H:	Tri-Party Agreement Appendix H
Cf	Cubic Feet
CP	Closure Plan
Component:	Specific Tank
F&R:	Retrieval Functions and Requirements
IS:	Interim Stabilization
NOC	Notice of Construction
RA	Risk Assessment
TPA	Tri-Party Agreement
WIR	Waste Incidental to Reprocessing
WMA	Waste Management Area

✦ Requires Regulator Approval

✷ Public Involvement

CHG0211-04A

Before commencing tank retrieval and in consultation with Ecology, CH2M HILL will incorporate lessons learned from previous F&Rs and develop a standardized F&R template to be used for future tank retrievals (MAAP 1.6). For example, the F&R documents have historically contained details not required for an effective Ecology review. CH2M HILL will work with Ecology to focus on documentation/submittals. It is anticipated that the initial F&Rs generated for the above tanks will not include the retrieval system's complete design, but subsequent F&Rs will reference the completed standardized designs of the retrieval technologies to be deployed at the Hanford Site. It is expected the presentation material will be streamlined and the content will be limited to the following elements:

- The retrieval systems to be used in a tank or group of tanks
- A preliminary Risk Assessment based on the available data
- Leak loss detection and mitigation measures
- Retrieval F&Rs.

<u>Strategic Objective:</u> Tank Component Closure: (Figure 5-2, Steps 3, 5, and 6)

When tank retrieval has been completed the SSTs will be interim closed as individual components of the tank system. The closure activities of the individual tanks or groups of tanks will include the following:

- Characterize the residual wastes remaining in the tanks after retrieval
- Characterize soil contamination due to past leaks
- Submit the closure documents (Draft Closure Plan, WIR determination request for the WMA, and a DOE O 435.1 "Tier 1 Closure Plan")
- Perform a risk assessment based on the tank specific characterization data
- Quantify the ancillary equipments source term impacting risk assessment and Appendix H implementation
- Approve the Closure Plans after public review and comment and the WIR determination
- Approve Appendix H implementation
- Implement interim closure activities specified in the approved closure plan, including placing a heel-stabilizing layer at the bottom of the tank.

Implementation:

- **Regulatory Closure Plan Development and Review Processes:**

  The Tri-Party Agreement recognized uncertainties in the closure process anticipating that the SST closure plan would evolve. Working with Ecology, tank component closure will be accomplished through a tiered approach (see Figures 5-3 and 5-4) to be formalized in the Sitewide RCRA Permit (the Permit) modification process. The tiered approach will minimize duplication of information and reviews and allow phased review and approvals. The three tiers include:

  1. An SST system-wide closure plan (the SST Framework Closure Plan) will provide an overall framework for closure. Figure 5-3 describes the contents.

2. Eight Waste Management Area closure plans for individual or grouped SST farms will be appendices to the SST Framework Closure Plan.
3. Component closure plans will be developed for one or a group of components within the SST system (e.g., one or more tanks, one or more pieces of ancillary equipment). Refer to Figures 5-3 and 5-4 for further details.

Figure 5-3. Resource Conservation and Recovery Act of 1976 Tank Closure Tiers.

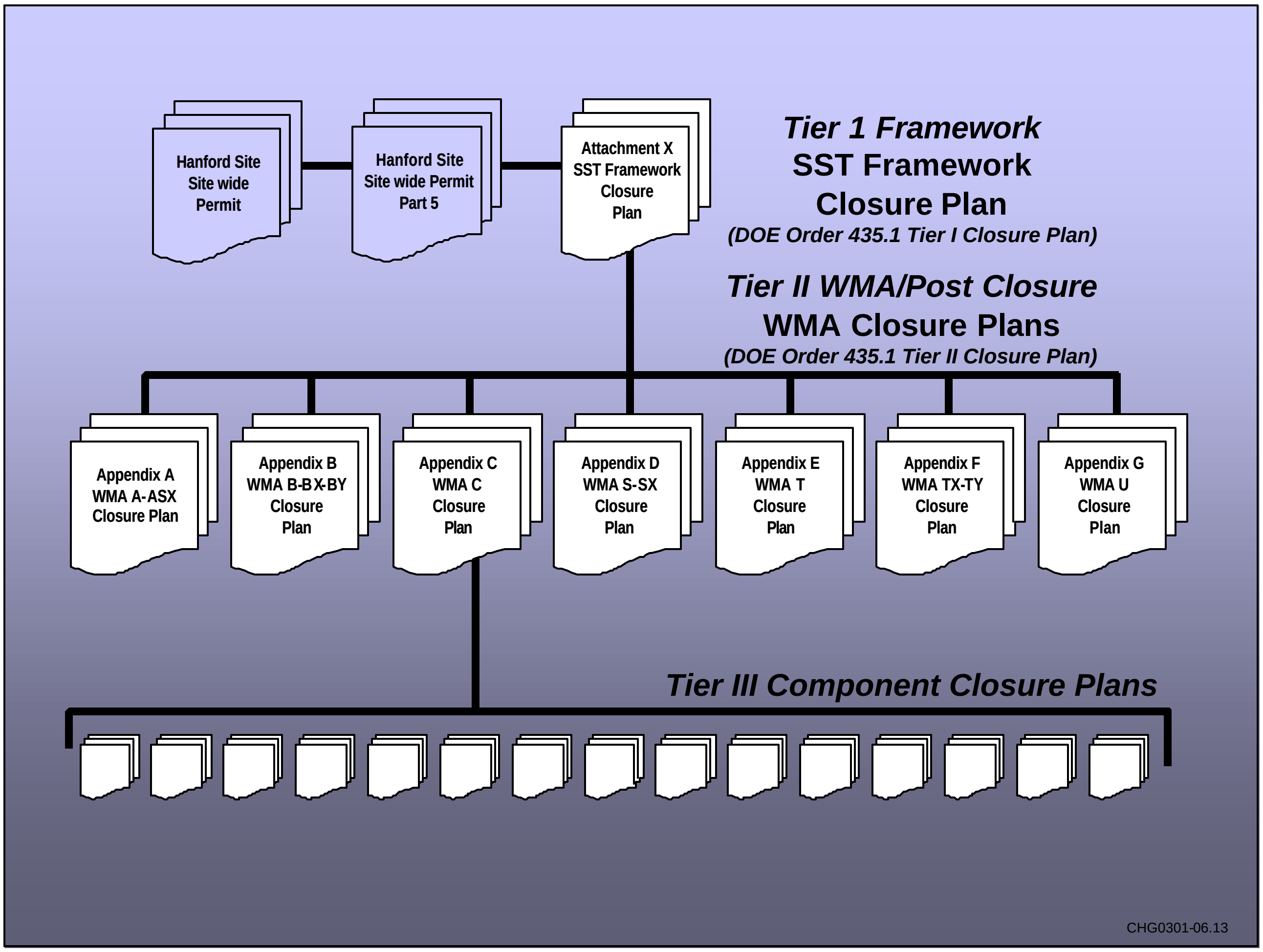
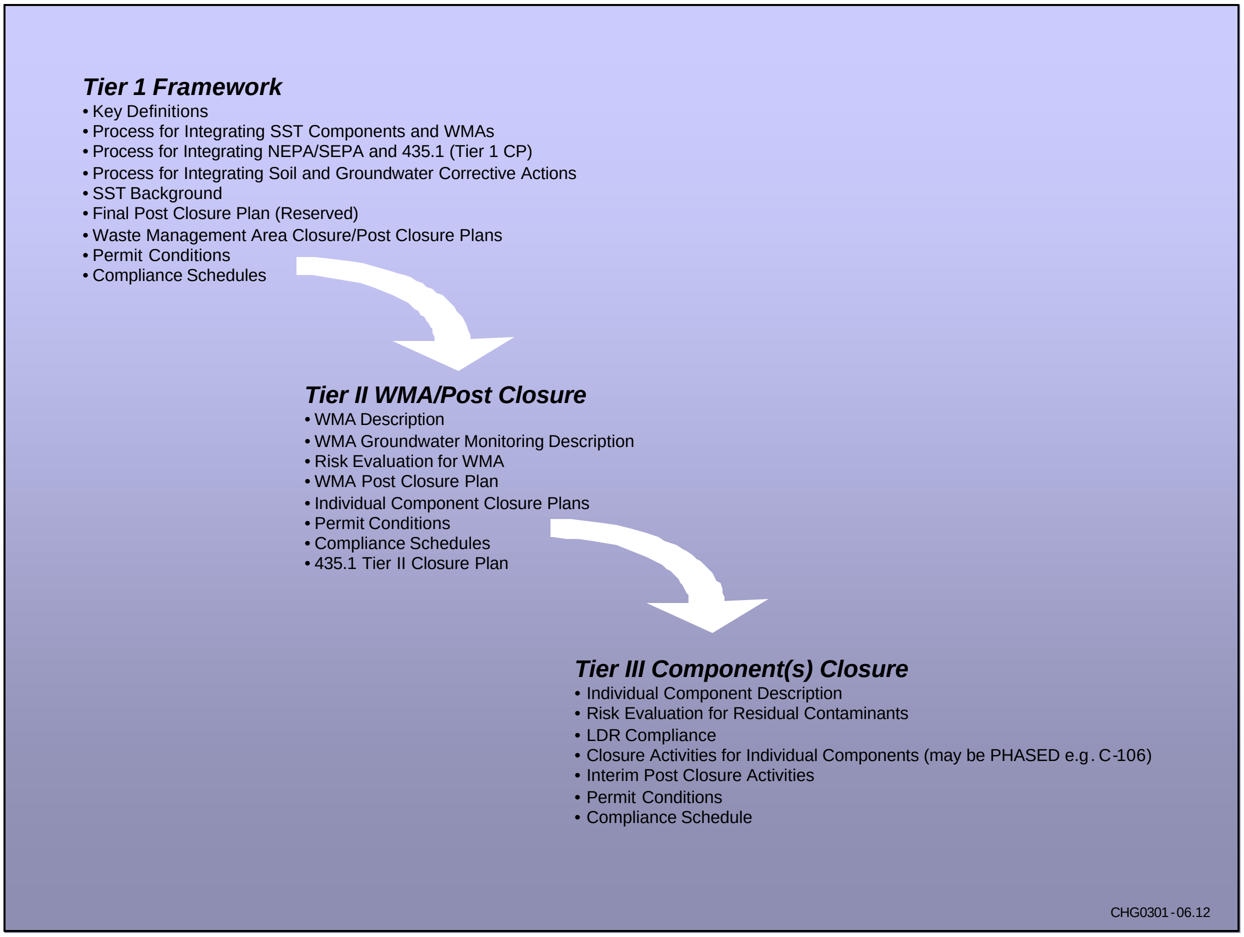


Figure 5-4. Resource Conservation and Recovery Act of 1976 Closure Plan Tiers Contents.



- **Tank and Waste Management Area Final Closure:**

  Closure paths will ensure protection of human health and the environment while dealing with the complex system of the tank farms. Component (one or more tanks or ancillary equipment) closure plans will be submitted either as a clean closure plan, a contingent landfill closure or a post closure plan. Where appropriate, modified closure and post closure actions will also be addressed. For closure as a land disposal unit, a post closure permit is required that addresses maintenance and inspection activities, groundwater monitoring requirements, and final corrective actions implemented under the closure plan. The final closure will be coordinated with the CERCLA decisions regarding the WMA.

  Removal or decontamination of all contaminated soils is expected to be prohibitively expensive because of the extent and depth of the contamination. DOE does not expect to be able to clean close all components within the SST system and may not be able to clean close SST and DST components. Therefore, landfill closure of these systems may be appropriate with waste residues controlled by water intrusion control methods. All such end-states will be addressed in the Tank Closure EIS.

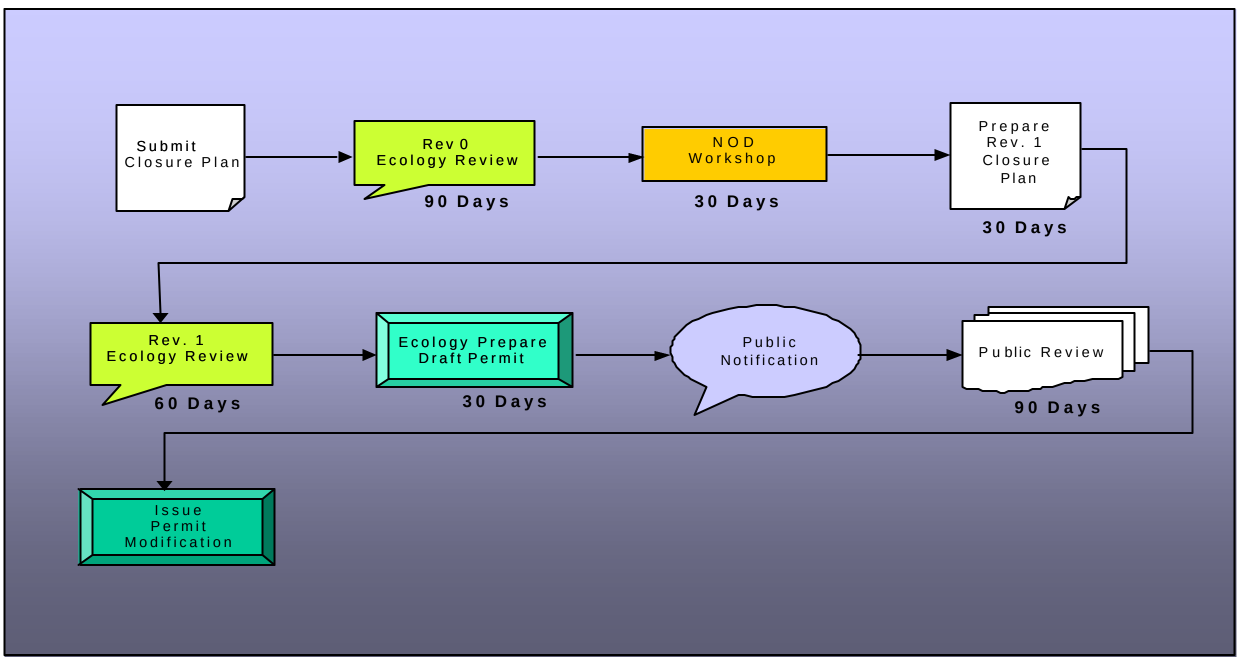
- **Modify the Closure Plan Review and Approval Cycle: (See Figure 5-4)**

The existing Closure Plan review cycle was designed to review and approve closure plans of the Hanford Site RCRA facilities undergoing final closure. The tiered approach to closure using component or partial closures lends itself to modification of the review and approval cycle. Lessons learned show that critical elements revolve around extensive and early involvement of the regulators and stakeholders. Particularly important tasks are Ecology's review of the plan, issue resolution workshops, drafting of the Permit conditions, and public review and comment.

It is CH2M HILL's intention to maintain the critical review cycle elements described in the Tri-Party Agreement, Section 9.0. CH2M HILL will work with Ecology to design an effective and efficient review and approval cycle that is commensurate with the Phase I tank component closure (MAAPs 1.5 and 1.6). The public involvement element of the review cycle will be maintained as originally designed in Section 9.0, in compliance with the regulatory requirements.

Figure 5-5 shows the flow of the review and approval cycle elements and the proposed duration (in days) for each element.

Figure 5-5. Proposed Closure Plan Review and Approval Cycle.



The current review cycle has multiple formal comment and resolution steps due to the anticipated size and complex nature of the documents. Development of the tiered and phased approach to closure and standardization of the closure documents reduces the size and complexity of the documents. Partnership with the regulator during development of the closure plan(s) and before the first formal regulatory review will optimize their input, ensure completeness, and enable the resolution of issues. Additionally, lessons learned and resolution of any issues during the demonstration for tank C-106 will be incorporated into future closures. Taking this approach, the review cycle can be reduced from 28 months to 8 to 12 months while maintaining regulatory and stakeholder participation.

The following are steps to be developed, in partnership with Ecology, to optimize the review and approval cycle, while maintaining the quality of the process:

- Maintain Ecology's initial review period (90 days).
- Maintain the Public Comment period per the regulatory requirements (45 days). This is included in the 90-day Public Review shown in Figure 5-5.
- Optimize the issue resolution period (30 days, compared to the 90 days in the existing cycle). This is based on resolving the major regulatory issues that are common to tank closure within the review and approval process of the C-106 tank closure plan and working more closely with Ecology earlier in the process.
- Maintain the Permit condition-drafting period (60 days).
- Adopt parallel review cycles for ORP and Ecology.
- Group the component closure plans of a number of tanks in one WMA.
- Develop a resource plan for Ecology to support such a schedule.
- Use common Public Review and Comment for more than one closure plan.

A standardized Closure Plan document will be generated in coordination with CH2M HILL's regulators to be used for the closure of the 149 SSTs. The Component Closure Plan (CCP) will include the information required in a RCRA closure plan and the tank-specific information to be reviewed among the information "common" to the rest of the SSTs. This will facilitate a more focused document review.

Strategic Objective: Conduct Component and Cumulative Risk Assessment

Risk Assessment is a key element required to support regulatory decisions for the tank component closure. CH2M HILL's assessments will be conducted consistent with other assessments being used for the eventual closure of the Hanford Site Central Plateau.

Lessons learned have shown that successful risk assessments have followed a common path:

- Define Performance Objectives
- Define the Conceptual Exposure Model
- Define the Site Physical Conceptual Model
- Identify and Catalog the Input Values for Fate and Transport Simulations
- Identify Relevant Closure Management Alternatives and Decisions
- Implement the Risk Assessment Simulations
- Develop credibility in tools and simulation
- Stakeholder involvement.

Implementation:

- **Conduct Risk Assessments Consistent with the Central Plateau Closure Projects:**

  The Central Plateau Risk Framework lays out the basic risk parameters to be used in generating a Risk Assessment for the closure and/or cleanup of waste sites in the Central Plateau of the Hanford Site. CH2M HILL will work with Ecology to determine how this framework will be implemented for the closure of the SSTs and Waste Management Areas (MAAP 4.3). Risk assessment exposure scenarios for tank closure will be based on an industrial use for the foreseeable future (estimated at 150 - 300 years), and an intruder scenario to be developed and agreed to for the long-term risk. ORP and RL are working with the Tribal Nations to establish a Native American scenario to be used consistently in risk assessment efforts on the central plateau. The initial analysis will evaluate impacts based on a variety of scenarios such as residential farmer to support making an informed decision.

The Central Plateau Risk Framework also deals with Groundwater Protection and remediation. CH2M HILL will establish a strategy with the regulators for setting groundwater standards as they pertain to the RCRA corrective actions required at WMA(s) where releases have been identified. This process will integrate the effort done under the RCRA Closure and Corrective Action with the groundwater remedial work to be done under CERCLA for the groundwater operable units in the Central Plateau (MAAP 4.6).

CH2M HILL will actively participate with the Sitewide Risk Assessment Coordination Board. Through this participation CH2M HILL will establish consistent risk assessment tools, common risk assumptions, consistent points of compliance and points of risk calculations, and guide the inclusion of the SST farms in the Hanford Site Composite Analysis that is to be completed in 2004-2005.

- **Use an Iteratively Refined Risk Assessment Approach: (See Figure 5-6)**

  A risk assessment will be performed for each tank/tank farm using the following phased approach. At each subsequent stage, information collected during the preceding stage will be incorporated to reduce uncertainty and refine the predictions.

  - Retrieval F&R (Per Tank or Tank Group Basis)

    CH2M HILL will use historical documents and data to provide an initial estimate of chemical and radiological risk from tank residuals and possible leaks.

  - Post-Retrieval (Per Tank or Tank Group Basis)

    CH2M HILL will conduct a risk assessment using measured retrieval loses, residual volumes, and inventories to provide an improved estimate of chemical and radiological risk from tank residuals and possible leaks

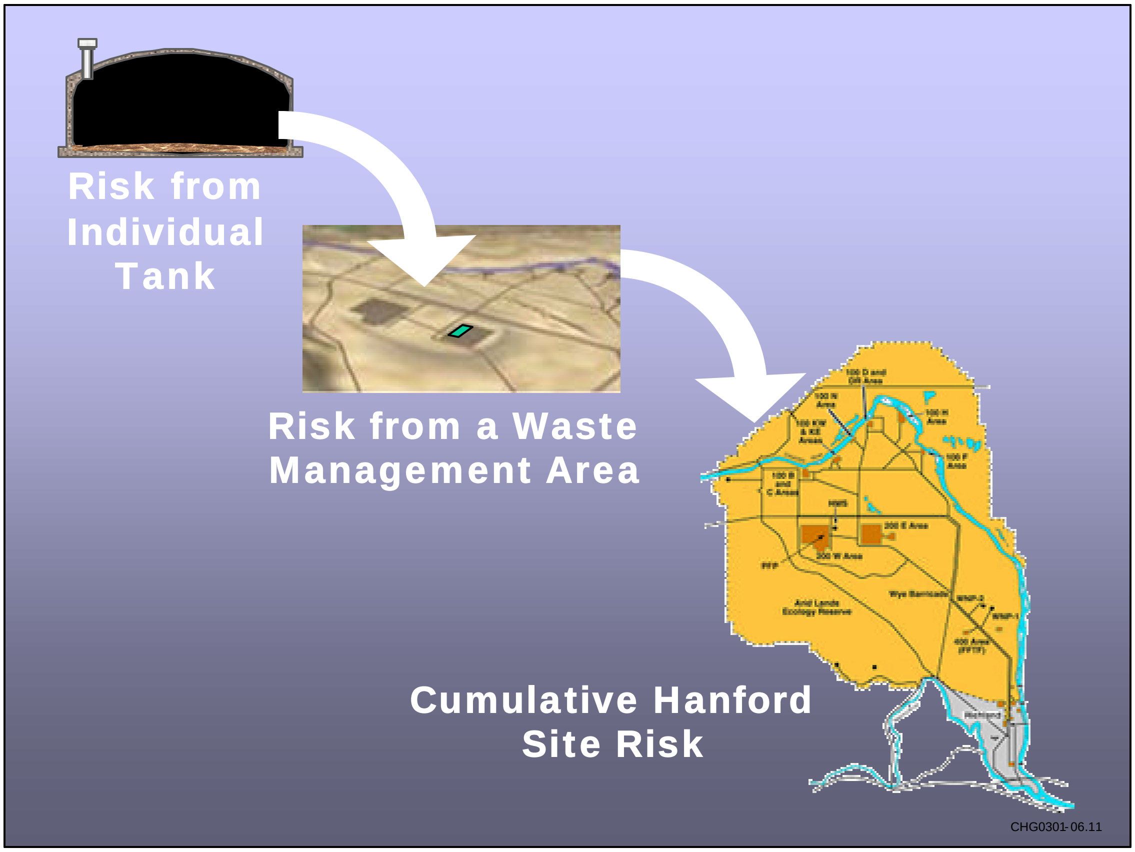
  - Pre-Closure (Per Tank or Tank Group Basis)

    CH2M HILL will perform risk assessment with information developed previously and include tank fill or other tank specific closure options

  - Closure (Tank Farm Basis)

    CH2M HILL will perform a risk assessment for the entire farm simulating the agreed upon closed conditions. CH2M HILL will use all information and data attained during component closure and soil characterization.

Figure 5-6. Risk Assessment Approach.



Each individual tank risk assessment will include up to four risk-affecting components:

- Remaining tank inventory
- Past leak inventory (historical vadose contamination)
- Contamination remaining as part of tank farm infrastructure
- Retrieval leak estimates.

Once completed for each individual tank (or tank group), the results of the risk assessments will be totaled for all tanks within the tank farm to produce a composite risk assessment for the entire tank farm. The composite risk assessment for the tank farm will be provided to the System Assessment Capability (a larger Hanford Site scale model) to place the tank farm risk in perspective of the other risk producing facilities on the central plateau (burial grounds, cribs and ditches). This approach will allow us to proceed with the closure of the components of the SST system using the data obtained for the component characterization, and refine the overall risk assessment as more data are obtained from new tanks being characterized for closure.

- **Coordination with the Central Plateau Closure Integrated Planning**:

The Hanford Site is developing an integrated Strategy for Central Plateau Closure. The major elements of this integrated strategy are:

- Disposition of TRU Wastes.
- Integrated "Area/Regional Cleanup"
- Integrated Groundwater Remediation
- Tank Farm Area Closure
- Scheduling and Prioritization.

ORP and CH2M HILL will support and participate in the development of this integrated strategy for the closure of the Central Plateau. This participation will cover all aspects of this strategy; area closure, TRU waste disposition, groundwater remediation, scheduling and prioritization, in addition to the development of consistent cumulative risk assessment processes. It is essential that all decisions regarding the Central Plateau (RCRA/CERCLA) are fully integrated.

- **Modify and Use the System Assessment Capability to Conduct Cumulative Central Plateau Risk Assessments.**

  The System Assessment Capability will be updated to perform the Hanford Site Composite Analysis. CH2M HILL will work with RL to enhance the System Assessment Capability model to run timely cumulative risk assessments to analyze the impacts of tank closure on the Central Plateau and the Columbia River.

<u>Strategic Objective:</u> Disposition of Tank Waste Residuals.

Waste that may be left in the tank after achieving the retrieval goals will be managed in a manner that is protective of worker and public health and safety, and the environment. DOE O 435.1 and the EPA LDRs provide regulatory guidance in determining the requirement for managing the residuals.

<u>Implementation:</u>

- **WIR Determinations (DOE O 435.1)**

  Per DOE O 435.1, closure of HLW tanks shall be completed in accordance with the requirement for a closure plan. The residual waste remaining in the SSTs (heels) after completion of the retrieval activities must meet WIR criteria. The WIR process will be used to determine if the residual waste will be dispositioned as either LLW or transuranic waste (TRU), (greater than 100 nanocuries per gram) (MAAP 4.5).

- **Enhanced WIR Determination Process Management:**

  ORP will coordinate this determination closely with the DOE-Headquarters (HQ) and NRC to ensure timely review and concurrence will occur within 60 days. The department will actively participate during the preparation of the data packages and risk assessment documentation to ensure completeness for ORP to review and use to process the WIR determinations (MAAP 1.5):

  - Residual waste volume and characterization

  - Risk Assessment, and Performance Assessment
  - Engineering and technical information on waste stabilization and fill layers.

- **Develop Path Forward to Deal with TRU and Greater than Class C Residuals:**

  Based on the present data from SSTs, it anticipated that the waste residuals in a number of the SSTs will meet the TRU waste classification. It is also anticipated that the waste residuals in a number of the SSTs may exceed the Class C waste classification. In both cases, a regulatory path forward will be developed to allow such waste residuals to be left in place and close the tanks. Regulatory options and pathways will need to be evaluated for the dispositioning of this waste. Some of the pathways being considered are:

  - Site-specific determinations
  - Risk based analysis (Alternate Waste Classification Limits)
  - Superfund processes
  - DOE and EPA determinations.

- **Development of DOE O 435.1 Tier I and Tier II Closure Plans:**

  In compliance with DOE O 435.1, closure of the tanks containing radioactive waste must be conducted in accordance to approved closure plans. These documents will be based on the closure plans developed to satisfy the RCRA closure of Waste Management Areas (tank farms) and components (tanks). The requirements for the development of these two sets of documents where analyzed through a cross walk of contents and found to be equivalent with minor differences that can be developed separately to comply with all the DOE O 435.1 requirements.

  This approach will streamline the process of developing such documents, eliminate redundancy, and ensure consistency among all the regulatory closure documents.

  - Tier I Closure Plans are submitted to DOE-HQ for approval within 60 days. The review process of these documents is conducted by the High-Level Waste Steering Committee and a review team representing various sites of the DOE Complex. A Tier I plan will be developed to delineate the overall strategy for the closure of the tank farms on the Hanford Site.

  - Tier II Closure Plans will be reviewed and approved by ORP within 60 days. These plans will be based on the RCRA (Tier II) Closure Plans developed for the closure of Waste Management Areas, supplemented by Performance Assessments and Composite Analysis as required by DOE O 435.1.

  ORP and CH2M HILL will be working closely on conducting effective and streamlined reviews of these documents to be completed in support of the accelerated mission.

- **Early and Effective Coordination with NRC:**

  Although the WIR determinations at the Hanford Site will be made by ORP, the NRC technical support is needed to ensure that coordination and consistency are maintained between the two agencies in making such determinations, and to gain support from NRC for CH2M HILL's determinations. The NRC technical staff will be provided all the information being developed for the making of this determination. Technical workshops with NRC technical staff will be conducted early in this process. A memorandum of understanding/agreement between DOE and NRC will be developed and signed to guide this cooperative relationship for the development and review of the WIR supporting packages (MAAP 4.5).

- **Comply with LDR requirements:**

  CH2M HILL will work with its regulators to finalize the path forward regarding the LDR requirements. While such efforts are still on going, CH2M HILL will have identified the following path as the most viable.

  LDR compliance will be achieved through compliance with the debris rule requirements contained in 40 CFR 268. After waste retrieval, the structure of C-106, for example, can be classified as debris (40 CFR 268.2, WAC 173-303-040). Applicable LDR treatment standards for debris are those at 40 CFR 268.45, Table 1, Alternative Treatment Standards for Hazardous Debris, and the corresponding regulations at WAC 173-303-140. However, because of the unique circumstances associated with the residual configuration in a radioactive underground tank, Table 1 treatment standards may not be met. Therefore, and in accordance with 40 CFR 269.44(h), a site-specific variance to these treatment standards will probably be requested. This variance request will be included in the tank specific closure plan.

5.1.4 Supplemental Disposal System

<u>Strategic Objective:</u> A number of supplemental treatment technologies will be considered and evaluated. The selected technology(s) will be deployed in support of the closure mission by calendar year 2004.

<u>Implementation:</u>

Based on the technology selected, a permitting schedule will be developed in coordination with CH2M HILL regulators that supports the supplemental processing schedule. This will require an expedited permitting schedule to be completed in approximately 18 months, compared to the cycle described in the Tri-Party Agreement of approximately 33 months (MAAP 1.6).

The technologies being evaluated may require Research and Development activities to test their performance on a field scale in the treatment of the Hanford Site Tank wastes. This may require submitting Research, Development, and Demonstration Permit Applications to Ecology to allow the demonstration of the technologies using tank waste in adequate and representative volumes.

Packaging and transferring the TRU waste from at least nine SSTs to the Waste Isolation Pilot Plant also will be evaluated. If shipping the TRU waste to WIPP is feasible, the waste will be sampled and characterized to ensure that it meets the WIPP waste acceptance criteria. In preparing and packaging this waste for transportation, a treatment process may also need to be applied. Such a process would require a permitting strategy.

- **ILAW and IHLW Disposition Decisions to Minimize Life-Cycle Costs:**

  Disposal of ILAW at an existing alternate disposal facility such as ERDF has the potential for significant savings. Evaluation of this opportunity will be pursued in the C3T process; however, during the 3-6 month evaluation of this option, the ILAW design activities will continue. A framework agreement and process for obtaining regulatory equivalency, and/or other necessary agreements to dispose waste in the alternate facility will be developed. If this option appears viable, the ILAW trench Tri-Party Agreement/RCRA Part B Permit milestone would be modified consistent with the Tri-Party Agreement process. A revision to the DOE Disposal Authorization Statement and Performance Assessment might also be required.

The IHLW product must be delisted and an LDR treatability variance approved for the treated waste product to be disposed in Yucca Mountain.

5.1.5 Operations and Waste Feed Delivery

No new regulatory strategies are required for operations of the DST system. A RCRA DST Part B permit application has been in development and will be submitted to Ecology in August 2003. Once a final status DST Part B Permit is issued, the process will be in place to ensure compliant operations and waste feed delivery for the duration of waste treatment.

Multiple projects have been planned to ensure a RCRA-compliant and reliable waste transfer system is in place by June 30, 2005, consistent with the Tri-Party Agreement. These projects are either in design or are already in the construction phase. A project is currently in the planning stages to interim isolate those components of the existing transfer system that will not be used post June 30, 2005.

6.0 MISSION SUPPORT/WORK MANAGEMENT STRATEGIES

To meet the challenges of the accelerated mission, ORP, CH2M HILL, and the Regulators will make fundamental changes in the management and execution of the tank farm scope of work. These changes will:

- Safely increase operational productivity.
- Align people and resources to the mission.
- Clarify contractual commitments and requirements.

This section outlines the IMAP strategies and action plans required to accomplish these improvements as they apply to each party involved and within the context of the CH2M HILL contract period and the life cycle of the TFC scope of work. Further explanation and more detailed listings of actions required are provided in Section 7.0.

6.1 SAFELY INCREASE OPERATIONAL PRODUCTIVITY

Maintaining and improving integrated safety management are key elements in accomplishing the significant productivity gains required for mission acceleration.

CH2M HILL will not subject its workers to increased health and safety risks and will strive for continuous improvement in its worker safety record – already one of the best in the DOE complex.

It is true that performing fieldwork on an accelerated schedule will increase the potential for workers encountering more hazards than when less fieldwork is performed. However, CH2M HILL's workforce has shown great competence in identifying and controlling health and safety hazards during fieldwork. CH2M HILL will continue to perform hazard analysis and maintain worker involvement to identify and apply controls. CH2M HILL will focus the field activities on clearly defined mission goals. Well-defined goals translate into well-defined scope for the workers, and allow the workers to concentrate on their tasks, which improves safety and performance.

MAAP 5.2 describes CH2M HILL's approach to define minimum safe operations. The approach ensures that requirements are met for maintaining safety of workers, the public, and the environment, but eliminates activities that add little value.

The identification of work required to meet acceleration goals was accomplished through a detailed review of the TFC Baseline. As the required work was identified, Project Managers also identified new or modified methods of performance to gain efficiencies, work scopes that could be deferred until required (just-in-time delivery), and work scopes that are no longer required and should be deleted.

Reducing the operating life cycle of the waste tanks provides a unique opportunity to define the scope required to safely maintain, operate, upgrade, and ensure the integrity of the waste tanks. In particular, it eliminates activities associated with maintaining tank farm facilities for a much longer mission. For example, the tank farm facilities maintenance organization will approach SST facilities fundamentally different than DST facilities that are still required to complete the mission. Rather than expending resources on labeling updates for SST equipment, temporary labels will be employed as required. Unlike the DST facilities, there will be no major spare parts inventory for SST facilities. Instead, a program to cannibalize parts from SSTs that have been through retrieval will be instituted. This will meet the minimum requirements for spare parts over the next few years as increasingly more SSTs are retrieved and closed.

This approach is coordinated with MAAP 5.7, and will ensure contractual requirements are true requirements, and not assumed requirements.

CH2M HILL also will increase productivity through the reduction of safety analysis and work control requirements for facilities that no longer require nuclear facility controls, i.e., SSTs (after a defined stage in the waste retrieval process) and support/inactive facilities. This will allow the elimination of non-risk reducing work currently required by the conservative application of controls on these facilities. The new DSA differentiates active DSTs required for waste feed delivery from SSTs awaiting retrieval and closure, and will apply appropriate controls (MAAP 5.1). As waste is retrieved from SSTs, the SSTs will transition into a state requiring only controls associated with site management, and post-closure controls imposed under the closure plan.

Additional actions to increase operational productivity while maintaining operational safety include:

- Develop and implement a detailed field IMES. This schedule addresses all field activities and support activities required to perform the mission in detail. In combination with increased tracking and accountability, it significantly enhances the ability to plan and manage the right work on schedule. All work to be performed will be on the schedule (MAAP 5.3).

- Increase accountability for safe completion of work through use of regular schedule accountability meetings. These meetings provide the opportunity to identify and prevent potential problems, and re-emphasize the importance of working as a team and meeting commitments. Personal responsibility will be identified on the schedule (MAAP 5.4).

- Streamline and apply a graded approach to the work control process. For example, development of complex packages of engineering documents and as-built drawings is not appropriate for retrieval and closure activities that are effectively decontamination and decommissioning tasks in a tank that will have no future function. The work control documents will in the future only include those things required to complete the specific task. This approach will result in significant improvement in effective release and execution fieldwork. Actual work packages will be issued in the field on a much-improved schedule with elimination of inappropriate requirements (MAAP 5.5).

6.2 ALIGNMENT OF PEOPLE AND RESOURCES

ORP is accelerating the waste retrieval, waste processing, and tank closure mission to reduce the hazards posed by the tank wastes. Organizational realignments will focus attention to completion of physical work to retrieve and close tanks and provide feed to the WTP.

Aligning CH2M HILL's people and resources to perform the accelerated scope of work is critical to success. This alignment will encompass the goals, vision, and structure of the mission with a particular focus on meeting priority objectives. These alignments must occur in the government and contractor organizations to minimize organizational interface requirements and the inherent volume of decision processes associated with them.

CH2M HILL's mission has been refocused from maintenance and operation of the tank farms to a waste feed operation and closure mission. A mission alignment process is currently underway to ensure that all levels of the contractor organization support the new mission. This process involves defining the organizational structure and positions required in the organization to complete the work scope, identifying potential candidates for those positions, and evaluating and selecting the candidate for each position. The realignment process will be completed in April 2003.

There are three important aspects to the organizational alignment:

- Focus CH2M HILL's organizations at all levels to accomplish common goals.
- Align the CH2M HILL organizational structure on the mission objectives (i.e., waste feed operations and close tanks), to eliminate the propensity to do unnecessary work.
- Provide a flexible organizational structure within CH2M HILL to allow rapid, cost-effective completion of a project, and rapid reassignment of resources to the next project. Ensure the right mix of technical, administrative, craft, and other skilled labor personnel is available to staff the projects.

6.2.1 Organizational Focus

ORP and CH2M HILL will advance the strategies outlined above by performing the following actions:

- Clearly communicate overall mission objectives and goals to employees.
- Align the organizational structure and skill mix to priority objectives.
- Involve employees in developing and implementing solutions.
- Recognize employees for their contributions to mission completion.

The role of ORP is to implement the DOE's mission with regard to the Hanford Site tanks, with the final responsibility for safe management and cleanup of the tank farms. ORP manages the CH2M HILL contract and establishes policy and top-tier priorities. ORP administers the contractual requirements, interfaces with DOE-HQ, and provides budget for the mission work scope.

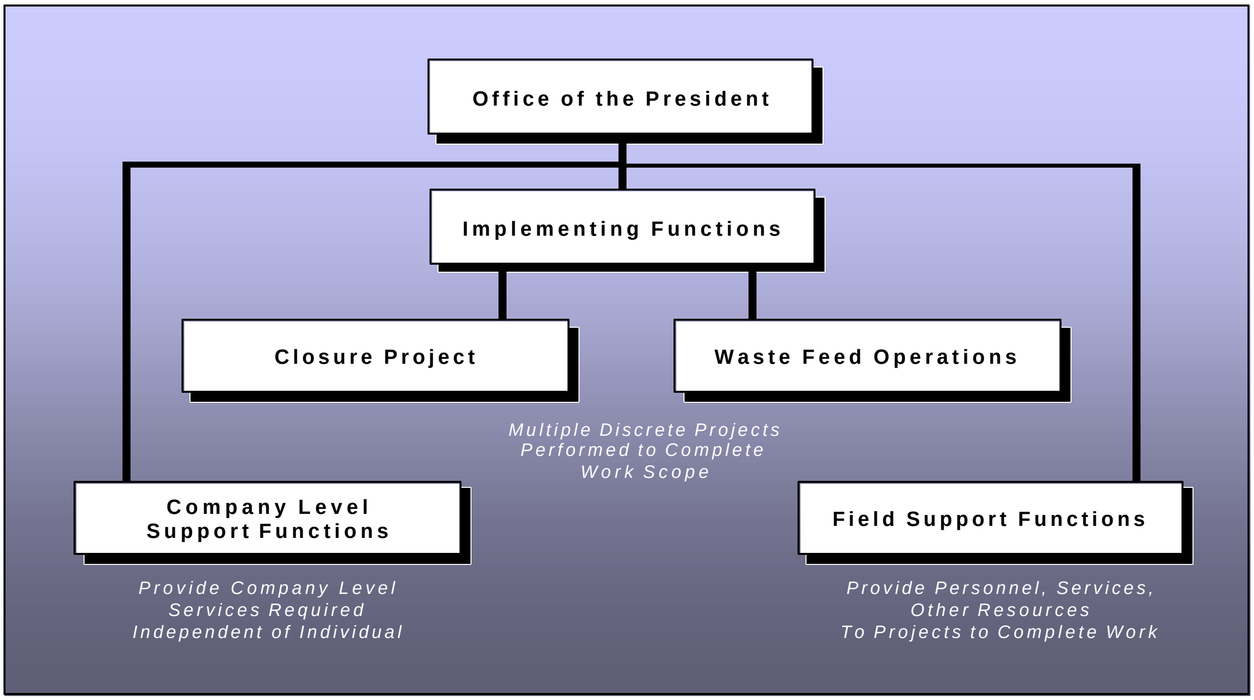
ORP provides input and review on required information in a timely manner to support completion of work in the IMES, and evaluates performance of the work. ORP partners with CH2M HILL in interactions with regulators to reach consensus on the approaches required to meet regulatory requirements.

CH2M HILL is responsible for planning, executing, and completing the work scope associated with the accelerated mission to close tanks. This includes definition of the discrete activities to be accomplished and the methods to accomplish them. CH2M HILL ensures ORP is informed of the methods and schedules associated with completing the contracted scope of work. CH2M HILL works directly with ORP and regulators to reach consensus on the approaches necessary to meet regulatory requirements.

6.2.2 Organizational Alignment to the Mission

The CH2M HILL organization realignment will employ two key implementing functions that reflect the mission focus: Closure Project and Waste Feed Operations. Support functions will provide the programs, qualified personnel, procured resources, and services to the implementing functions to perform the work scope. Work scope will be divided into projects supporting the mission objectives. Organizations and positions that do not contribute to completion of the mission objectives will be eliminated. Figure 6-1 shows the proposed functional breakdown.

Figure 6-1. CH2M HILL Hanford Group, Inc., Functional Breakdown Structure.



The first step in the mission alignment process involves defining each level in the organization, as driven by the mission need. Then the positions required in the organization to complete the scope will be defined. Finally, potential candidates for those positions will be identified, evaluated, and selected. During this process, tasks that do not support the accelerated mission will be identified and eliminated. The final scope mapped onto the organization will align with the mission, and the organization will be appropriately sized and structured to execute the mission.

Alignment of CH2M HILL's goals, visions, and organizational structures to complete the accelerated mission also involves resource management. Personnel whose roles are clearly associated with a well-defined mission goal are more effective than those whose roles are ill defined. The process of selecting and assigning personnel based on mission need, and then involving the personnel in the development and implementation of the solutions leads to effective mission completion.

6.2.3 Organizational Flexibility

The new CH2M HILL organizational structure is designed to be flexible and project completion oriented rather than operations oriented. Within the Closure Project and Waste Feed Operations implementing functions, project teams will be formed to execute well-defined work scopes. Project teams will be assigned to discrete focused activities, aligned with the key mission objectives. The teams will include the required mix of technical and administrative personnel, operators, craft and other skilled labor to complete the project.

As discreet work scopes are completed, the flexible project team approach will allow CH2M HILL to quickly deploy to the next work activity or respond quickly to new work scope. The majority of personnel required to execute the projects will reside in a resource pool (organized by functional area of expertise) rather than in permanent project organizations. Personnel will be assigned to a project scope on an as-needed basis.

Project managers and support organization managers will use the IMES (MAAP 5.3) to plan resource needs and effectively manage resources. Project managers will select the most appropriate approach to deploy the required resources, including matrixing of the support personnel from within the company, subcontracting offsite resources to perform a discrete work scope, buying a service, using CH2M HILL affiliates for specific expertise, and obtaining services from other site contractors. This approach will reduce the need to hire permanent staff for discrete projects and tasks of limited duration. The use of outsourcing and subcontracting also reduces the need for adding permanent staff for specialized expertise, and ensures that resources are applied only as needed to complete a project.

This approach is important for maintaining flexibility in managing resources because resource requirements will change as the mission progresses and tanks are closed. Operations and maintenance resource requirements will gradually decrease as tanks and facilities are closed and the active tank farm footprint is reduced. Resource needs for retrieval and interim closure activities will increase in the near term and then remain essentially level for several years. Construction will continue for a number of years to complete waste feed support projects and resources will be provided most often through competitively bid fixed price subcontracts. Supplemental waste processing activities will start in FY 2004. The types of expertise required for each of these mission areas is specific, and several interrelated strategies for obtaining the optimal resources (direct staff, matrix support, purchased services, subcontracted work, out-sourced work, etc.) will be implemented to complete the work effectively.

As the organizational realignment process proceeds, mismatches between available resources and resource needs will become evident. The process will allow CH2M HILL to identify opportunities to retrain personnel for new activities, cross train personnel for multiple activities, or eliminate certain positions depending on the projected mission needs.

6.3 CONTRACTUAL COMMITMENTS AND REQUIREMENTS

ORP and CH2M HILL will establish and maintain a clear understanding of contract commitments and requirements to provide the foundation for the successful execution of the accelerated mission. A contract modification is being developed (MAAP 5.7), and it will address the following actions:

- Contractual requirements will be reviewed, and the contract will invoke only those requirements specific to the work scope in a specific area, eliminating unnecessary constraints and costs.

- ORP and CH2M HILL will work to create a process for the development of required deliverable documents, to enable ORP to complete review and approval within 30 days of submittal, reducing the time required to complete projects. The number of approvals will be optimized at the minimal level.

- The number and type of routine reports will be minimized, consistent with the revised requirements, eliminating non-value-added paperwork, and allowing focus of resources on mission completion.

- Government furnished services and items will be defined in the contract, allowing focus on delivering mission critical decisions and products on time, and allowing subsequent work to proceed on or ahead of schedule at reduced costs.

Mission acceleration requires extensive use of the 242-A Evaporator and the ETF. Accelerated retrieval and efforts to increase available DST space increase the demand on these facilities. Responsibility for these facilities will be transferred to CH2M HILL to ensure effective integration (MAAP 5.8).

In addition, work is underway to reduce the cost of Sitewide/shared services to more accurately reflect the share of those services required by CH2M HILL to complete the mission (MAAP 5.9).

7.0 ACTION PLANS FOR IMPLEMENTING STRATEGIES

ORP, CH2M HILL, and the Regulators must make substantial improvements in the management and execution of the TFC scope of work to safely meet the challenges of the accelerated mission. This requires a transition to a number of new or adjusted technical, regulatory, and work practices. This section focuses on the actions being executed to accomplish this transition.

The transition to an accelerated mission drives a number of significant and critical changes that must be accomplished in FY 2003. As such, they have been defined and are being implemented as Mission Acceleration Action Plans. Each of these Action Plans is listed in Table 7-1, as they relate to each of the five IMAP Implementation Strategies. These Action Plans define and assign the critical near-term actions that execute the tank farm contract strategy. These actions will be integrated into the IMES, which will be the management tool that ensures completion to support acceleration. A brief description of each of these Action Plans is discussed in this section, with more detailed description provided in Appendix C.

Table 7-1. Mission Acceleration Action Plans.

Mission Acceleration Action Plans	ORP Lead	CH2M HILL Lead	Completion Date
1 SST Retrieval and Closure			
1.1 Initial Tank Selection Process - Retrieval Sequence (40)	Stevens	Ni	Mar-03
1.2 Define and Implement Tank Waste Storage Options	Louie	Ni	Sep-03
1.3 Early Transition from Interim Stabilization to Retrieval	Stevens	Sams	Apr-03
1.4 Implement Dry Retrieval and Waste Staging in SSTs	Stevens	Sams	Jun-03
1.5 Simplify WIR/Tier 1 Closure Plan Review & Approval Process	Stevens	Jarayssi	Apr-03
1.6 Standardize Retrieval/Closure/Permitting Documents and Review Cycles	Stevens	Jarayssi	Apr-03
2 Waste Feed Delivery and Disposal			
2.1 Risk Based Schedule for Waste Feed Delivery	Louie	Popielarczyk	Jul-03
2.2 Align Waste Feed vs Glass Production Basis	Clark	Popielarczyk	Jul-03
2.3 SY Farm Transfer Line Options	B. Williams	Van Beek	Feb-04
2.4 AP Farm HVAC and Pit Upgrade Options	B. Williams	Biagini	Sep-03
2.5 Integrate LAW / LLW / MLLW Disposal Options	LaMont	Kristofzski	Aug-03
2.6 IHLW Storage Facility Options	LaMont	Kristofzski	Sep-03
2.7 Coordinate w/ Yucca Mountain to Optimize IHLW Shipping	LaMont	Kristofzski	Oct-03
3 Supplemental Treatment and Disposal System			
3.1 Alternate LAW Processing	Clark	Raymond	Sep-04
3.2 Supplemental LLW Processing	Mauss	Kristofzski	Jun-03
3.3 Supplemental TRU Processing	Mauss	Kristofzski	May-03
3.4 Supplemental LAW Treatment	Mauss	Raymond	Sep-04
4 Regulatory Approach			
4.1 Enhance Regulatory Interactions	Erickson	Allen	Apr-03
4.2 Permits, Closure Plan Schedule, and TPA Update	Rasmussen	Jarayssi	Jun-03
4.3 Risk Assessment Approach	Lober	Jarayssi	Apr-03
4.4 EIS / ROD to Support Acceleration	Rasmussen	Jarayssi	Apr-04
5 Mission Support/Work Management			
5.1 Simplify the Safety Basis	Irby	Leach	Dec-03
5.2 Minimum Safe Operations	Noyes	Leach	Mar-03
5.3 Develop Integrated Mission Execution Schedule	Noyes	Pettigrew	Complete
5.4 Implement Schedule Accountability Meetings	Bryson	Pettigrew	Complete
5.5 Streamline the Work Control Process	Royack	Pettigrew	Complete
5.6 Align ORP and CH2M HILL Organizations and Resources	Noyes	Ross	May-03
5.7 Modify the Contract and Streamline Requirements	O'Connor	Cartmell	Apr-03
5.8 Transfer RPP Support Operations from RL to ORP	Royack	Allen	Sep-03
5.9 Reduce the Cost of Site Wide / Shared Services	Ensign	Cartmell	Sep-03

7.1 SINGLE-SHELL TANK RETRIEVAL AND CLOSURE

Improving methods, accelerating schedules, and reducing costs for retrieving wastes and closing 177 tanks and numerous associated facilities is a critical element of the accelerated mission. Decision processes and execution methods must change significantly to accomplish accelerated closure. An example of this is the recent agreement to use a graded approach in the readiness assessment process for the C-106 demonstration project. The primary acceleration actions being executed, related to retrieval and closure are:

MAAP 1.1 – Initial Tank Selection Process – Retrieval Sequence (First 40 Tanks)

Managing the accelerated retrieval and interim closure of up to 40 SSTs by 2006 requires a tanks selection and sequencing process that balances important selection criteria, such as risk reduction, retrievability, staging or treatment space availability and feed delivery to the WTP. This process will produce the priority listing of tanks that will be used for retrieval and interim closure execution. A process to perform updates to the sequence will be used to provide control and flexibility as CH2M HILL progresses and applies lessons learned to the mission. Actions are currently underway to establish the list of 40 tanks, the sequence they will be retrieved and closed in, and a process to manage this list, **by March 2003**.

MAAP 1.2 – Define and Implement Tank Waste Storage Options

Storage space in the DSTs is a primary limitation to the accelerated retrieval of tank wastes. Capacity within these tanks is managed through a specific set of performance standards, i.e., height of operating limits, specific gravity of the waste, emergency storage capacity, etc. Actions are currently underway to implement reasonable adjustments to these standards that allow incremental additions to storage capacity, **by September 2003.**

MAAP 1.3 – Early Transition from Interim Stabilization to Retrieval

Acceleration provides opportunities to accomplish multiple objectives through a single or consolidated action. One such example is the potential to move directly into retrieval on SSTs that are in the process of interim stabilization. As such, interim stabilization will be accomplished in parallel with a single retrieval action. Using this method will require approval of a Consent Decree Change Request in parallel with the retrieval F&R process. Actions are underway to gain approval of this change request, **by April 2003.**

MAAP 1.4 – Implement Dry Retrieval and Waste Staging within SSTs

To accomplish the commitments established in this plan, new processes and technologies that will significantly change the pace of retrieval and interim closure must be used. One such potential is the use of dry retrieval methods and the staging of these retrieved wastes in a select few SSTs. The use of this method could provide significant improvements in DST space management, as these wastes would not have to be staged within the DST system. Actions are currently being taken to gain approvals for this method, **by June 2003.**

MAAP 1.5 – Simplify the WIR/Tier 1 Closure Plan Review and Approval Process

Timely decision making on WIR determinations and Tier 1 Closure Plans is a critical element of acceleration. These decisions commonly constitute critical path activities that can provide day-for-day accelerations as process times are reduced. Actions are currently underway to reduce process times for Tier 1 Closure Plan reviews from an estimated 24 months it currently takes, to an 8-month review and approval timeframe. CH2M HILL and ORP are collaborating on developing a strategy to optimize the WIR determination process time. Additional activities will result from these two initiatives and both strategic items will be addressed **by June 2003**.

MAAP 1.6 – Standardize Retrieval/Closure/ Permitting Documents and Review Cycles

The current process of developing, reviewing, and approving F&Rs, Closure Plans, permits, and related documentation requires extensive time and resources to complete. Actions are currently underway to establish a standard, and simplified, set of documents to accomplish these same approvals in less time, using fewer resources. Agreement on this simplified and standardized set of documents is planned, **by April 2003**.

7.2 WASTE FEED DELIVERY AND DISPOSAL

Developing transfer systems and delivering tank waste feed to the Waste Vitrification Plant, in conjunction with the development of storage and disposal systems for processed and treated wastes, are critical elements in the disposition of Hanford Site tank wastes. Each of these systems is a significant and costly element of the RPP. The integration of technical approaches and schedules to deliver and operate these systems can produce significant cost and schedule efficiencies. The primary acceleration actions being executed, related to waste feed delivery and disposal are:

MAAP 2.1 – Develop Integrated Optimization Schedule for Waste Feed Delivery

The existing waste feed delivery system construction schedules install retrieval pumps in a series of DSTs at least one year ahead of the need date for each of these pumps. Significant schedule improvements can be realized by adjusting the design, procurement, and certification of these installations to meet WTP processing requirements as shown in the Integrated Optimization Schedule. Actions are currently under way to reschedule these activities and include an assessment of the acceptability of any impacts to the WTP **by July 2003.**

MAAP 2.2 – Align Waste Feed versus Glass Production Basis

As design and throughput modeling progresses for the WTP, technical uncertainties will be resolved regarding waste feed volumes versus IHLW and ILAW glass production over the life cycle of the RPP. Actions are currently underway to assess modeling output and make recommendations regarding system strategies, technologies, and performance improvements to optimize the technical and cost effectiveness of waste treatment and disposal, **by July 2003.**

MAAP 2.3 – SY Farm Transfer Line Options

Six SY tank farm transfer lines will remain in service after 2005, but do not have secondary containment through the pit wall as required by RCRA specification. Use of periodic compensatory inspections and testing in lieu of the replacement of these lines could provide adequate protection while saving significant operational time and construction dollars. Actions are currently underway to gain approval to assess these options and select the appropriate path forward, **by June 2003.**

MAAP 2.4 – AP Farm Heating, Ventilation, and Air Conditioning and Pit Upgrade Options

The currently scheduled upgrade of the AP Farm heating, ventilation, and air conditioning systems occurs well in advance of the scheduled operation of the AP Farm mixer pumps. In addition, it is suspected that the existing pit coatings, drain seals, and leak detectors are adequate to meet AP Farm operating requirements. Actions are currently underway to: (1) gain approval to defer the scheduled heating, ventilation, and air conditioning upgrades to "just in time" meet the schedule for mixer pump operations, and (2) inspect pit coatings and drain seals to determine the need for replacement, **by February 2004.**

MAAP 2.5 – Integrate LAW/LLW/MLLW/CERCLA Waste Disposal Options

Currently the Hanford Site's ILAW, LLW, MLLW, WTP failed melters, and CERCLA wastes are all planned for disposal in separate on site trenches. The potential exists to gain agreements and implement the disposal of these wastes within the existing, or modified, Environmental Restoration Disposal Facility (ERDF). Combining the disposal of these wastes within this single facility could save significant land area committed to disposal, as well as enabling schedule accelerations and cost savings. Actions are underway to assess and decide on the viability of this option, **by August 2003**.

MAAP 2.6 – IHLW Storage Facility Options

IHLW will be stored on site until it is shipped to Yucca Mountain for disposal. Current acceleration plans propose to accelerate the date for and increase the production volume of IHLW, i.e., canisters of glass, as well as accelerating the date proposed for initiating shipments of IHLW canisters to Yucca Mountain. The combination of production level increases versus initial shipping dates requires an assessment of the scope and schedule of the planned IHLW storage facilities. Actions are currently underway to provide this assessment, **by September 2003.**

MAAP 2.7 – Coordinate with Yucca Mountain to Optimize the IHLW Shipping Schedule

The HPMP schedules initial shipments of HLW from the Hanford Site to Yucca Mountain in 2012. To confirm and further define this plan, coordination and definition of shipping volumes and schedules needs to occur between ORP, HQ, and Yucca Mountain. Actions are currently underway to develop and integrate this shipping schedule, **by October 2003.**

7.3 SUPPLEMENTAL TREATMENT AND DISPOSAL

To process or treat the Hanford Site's tank wastes by 2028, treatment capabilities in addition to the Waste Vitrification Plant will be required. Focusing these supplemental and alternate treatments on characteristics of the selected waste streams will accelerate risk reduction and improve schedule and cost. The primary acceleration actions being executed, related to Supplemental Treatment and Disposal are:

MAAP 3.1 – Alternate LAW Processing

Several treatment and processing options are being pursued for the LAW stream. Assessments of these options will provide a decision basis for volumes to be processed through the WTP versus supplemental capabilities. Actions are currently underway under the supplemental treatment technology development aspects of this plan to develop the information necessary to determine the optimal path forward, **by September 2004.**

MAAP 3.2 – Supplemental LLW Processing

Experience at other sites (e.g., Rocky Flats) provides a basis for the option of processing and disposal of LLW through capabilities supplemental to the WTP. Once it is determined which tank(s) hold LLW, the technical, regulatory, and design/construction of such a process can proceed. Actions are currently underway to evaluate and determine tank(s) holding LLW, **by June 2003.**

MAAP 3.3 – Supplemental TRU Processing

Experience at other sites (e.g., Rocky Flats) provides a basis for the option of processing and disposing of TRU wastes through capabilities supplemental to the WTP. Once it is determined which tank(s) hold TRU waste and the regulatory path for WIPP certification has been established, the development of such a process can proceed. Actions are currently underway to determine which tanks holding TRU waste and establish a regulatory path for WIPP certification, **by May 2003.**

MAAP 3.4 – Supplemental LAW Treatment

The treatment of up to 30 percent of the LAW tank wastes through capabilities supplemental to the WTP requires the identification of tailored treatment applications for selected tank waste types. A number of technologies are being considered to meet this need. Actions are currently underway to evaluate and select appropriate technologies for the supplemental treatment of LAW, **by September 2004.**

7.4 REGULATORY APPROACH

Gaining regulatory approvals, within the context of the accelerated mission, requires significant change in the methods and timeframes currently being used. In most cases, these activities constitute a portion of the critical path for required projects. Reducing required documentation, process times, and costs will create direct work accelerations. The primary acceleration actions being executed, related to Supplemental Treatment and Disposal are:

MAAP 4.1 – Enhance Regulatory Interactions

The C3T process began the regulatory partnering process required for acceleration. Empowering CH2M HILL to plan and lead regulatory discussions and interactions, rather than following the sequential processes of the past, will create additional momentum towards a partnering arrangement amongst ORP, Ecology, EPA, WDOH, and CH2M HILL. Actions are currently underway to assess resources required and implement this type of relationship, **by April 2003.**

MAAP 4.2 – Permits, Closure Plan Schedule, and Tri-Party Agreement Update

Acceleration of tank farm closures places a number of regulatory permits and approvals on the critical path for successful completion. Developing a consolidated listing and schedule for permits and closure plans will provide a tool for assigning resources and tracking progress. Actions are currently underway to create this list and schedule and integrate them with the Tri-Party Agreement **by June 2003.**

MAAP 4.3 – Risk Assessment Approach

The Central Plateau Risk Framework lays out the basic risk parameters for closure and/or cleanup of waste sites in the Central Plateau. Working closely between ORP, RL, the Regulators, and CH2M HILL the process and steps for implementing this framework will be developed and ultimately will lead to the inclusion of the SST farms in the Hanford Site Composite Analysis and the Central Plateau Risk Framework and Ground Water Strategy. Actions are currently underway to define and implement this process, **by April 2003.**

MAAP 4.4 –EIS/ROD to Support Acceleration

A Tank Closure Environmental Impact Statement and ROD are required by April 2004 to support the acceleration of tank closure. Defining the scope and data requirements, as well as the accelerated schedule for the analysis, public review, and approval cycles are critical to scheduled completion. Actions are currently underway to develop, review, approve, and issue the ROD for this EIS **by April 2004.**

7.5 MISSION SUPPORT/WORK MANAGEMENT

MAAP 5.1 – Simplify the Safety Basis

The current Authorization Basis and TSRs are based upon a conservative analysis and application of required controls for all tank farm facilities. This drives extensive non-risk reducing work that could clearly be refocused on activities that accelerate closure. Actions are currently being implemented to review the DSA and incorporate a graded approach and realistic work controls for the retrieval, treatment, and closure of SSTs and wastes, **by October 2003.**

MAAP 5.2 – Minimum Safe Operations

Actions are underway to review operational practices and define minimum activities required to maintain safe operations. In doing so, integrated safety management will continue to be CH2M HILL's priority and the integrity of the tank farm systems will not be compromised. The outcome of these reviews will be to redefine methods of performance, deferral of activities until necessary, or the deletion of work that is no longer required, **by March 2003.**

MAAP 5.3 – Develop IMES

Successful implementation of the accelerated work outlined in this plan requires an execution schedule that provides the ability to sequence activities, resource load, and resolve logistic issues with a much finer level of detail, over longer periods of time. Actions are currently underway to implement the IMES, **by January 2003. [Completed]**

MAAP 5.4 – Implement Schedule Accountability Meetings

Using the finer level of detail provided in the IMES, CH2M HILL will focus its leadership on execution on a daily, weekly, and monthly basis. Critical path scheduling and management focus will accelerate productivity and performance. Actions are currently underway to implement Schedule Accountability Meetings, **by December 2002. [Completed]**

MAAP 5.5 – Streamline the Work Control Process

More efficient and timely development of work packages will significantly improve productivity and performance levels. Establishing Fix-It-Now Teams and removing existing barriers to produce effective work packages or other mechanisms will result in more work getting done for less money. Actions are currently underway to streamline the work control process, **by January 2003. [Completed]**

MAAP 5.6 – Align DOE and CH2M HILL Organizations and Resources

Arguably the most critical element to mission acceleration is the alignment of people to the work. Shifting the site culture from an operational mentality to one of closure requires that ORP and CH2M HILL personnel be directly aligned to value added tasks related to safe retrieval, treatment, and closure. Focusing people on specific project and goal-oriented tasks raises productivity. Conversely, as success on project- and task-oriented work is rewarded, the mentality of maintenance and status quo will be eliminated. Actions are currently underway to initiate this transition with realignment of the organizations completed, **by May 2003.**

MAAP 5.7 – Modify the Contract and Streamline Requirements

Aligning requirements and resources to the accelerated mission requires significant changes in contractual conditions. Clear definition of processes, thresholds, deliverables, roles, and responsibilities is required to provide essential support and coordination. As such, ORP has restructured the CH2M HILL contract. In addition, many requirements are being evaluated and other modifications are being evaluated to minimize reporting, provide flexibility in procurements, and shorten review and approval timeframes, **by April 2003.**

MAAP 5.8 – Transfer RPP Support Operations from RL to ORP

Operation of the evaporator and analytical services are critical element of managing DST space availability. Direct operational efficiencies could be gained through the transfer of these facilities from RL to ORP. The RPP will also become the primary user of the 222-S Laboratory and the CSB as the analytical requirements for the Plutonium Finishing Plant and the transfer of fuel from the SNF facility to the CSB are completed. Actions are currently underway to evaluate the transfer of these facilities from RL to ORP. The Evaporator will be transferred to ORP **by June 2003** and the 222-S Laboratory will be transferred to ORP by **September 2003**.

MAAP 5.9 – Reduce the Cost of Sitewide/Shared Services

Diligence is required to ensure that essential services to the tank farms are provided in cost-effective ways. As the methods of performance change and the footprint of the tank farms shrinks, opportunities to reduce costs will occur. Actions are currently underway to improve the cost of shared services, **by September 2003.**

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8.0 RISKS AND MITIGATIONS

8.1 MISSION ACCERATION RISK OVERVIEW

This section describes the plan for accelerating the retrieval and processing of waste and the interim closure of tanks. Accelerating any project increases the inherent risk associated with fluctuating budgets, technical uncertainties, resource availability, schedule conflicts, etc. However, by accelerating tank and tank farm closures, significant environmental risks will be eliminated and as acceleration activities are completed, new knowledge will be forthcoming that could clarify some key technical, environmental, and regulatory questions, such as:

- How well a technology will perform?
- Is it a regulator-accepted approach? (e.g., Tri-Party Agreement agreeable or permitable)
- How successful will retrieval systems need to be?
- How are closure goals to be met?
- How effectively can a stable waste form be created?
- How quickly can any of these things be completed?

Through Modification 064 of the contract, CH2M HILL has been directed to move from studies that result in paper answers (which are still fraught with uncertainty) and take the first big step in risk reduction by executing mission acceleration. In the process, new knowledge will be gained at every step. Technologies will be identified that empty tanks more effectively; new knowledge will be gained on the reasonableness of supplemental waste treatment. The ability to make wise, longer-term decisions on treating the remaining LAW and closing tanks will be greatly enhanced by using data gained during field execution of projects.

This IMAP has substantial uncertainty in that it indicates what CH2M HILL must do to accomplish the retrieval and processing of waste and interim closure of tanks much faster than has been planned in the past. The RPP will accept some programmatic and technical risks and, in the process, may also experience some failures. In doing so, it is envisioned much more progress will be made, environmental hazards will be reduced or eliminated, and more will be learned to support future cleanup actions.

Mission acceleration and the increase in fieldwork activity may potentially expose CH2M HILL's workers to hazards (radioactive, chemical, industrial, and environmental). CH2M HILL will use the ISMS to carefully define the work, identify potential hazards, install necessary hazard controls, perform work safely and provide feedback and safety improvements. The challenge of performing more fieldwork on an accelerated schedule will be met by rigorously applying hazard analyses and keeping workers involved in identifying and applying controls. One expected outcome of this accelerated work is the focus that can be brought to field activities when the work groups have clearly defined goals, and are visibly making progress towards those goals. Well-defined goals translate into well-defined scope for the workers, and allow the workers to concentrate on their tasks, which improves safety and performance.

Throughout the previous sections of this plan, uncertainties and challenges (risks) are identified, along with recommended approaches to reducing the risk impacts, reducing the likelihood of occurrence, or managing through the uncertainties. Many of the Mission Acceleration Action Plans are in themselves mitigation actions for some of the identified uncertainties.

8.2 PROGRAMMATIC AND TECHNICAL RISKS

Programmatic risk management is an integral part of the tank farm operations and project management functions. This risk type includes those events that could impede the successful progression or completion of planned activities. Programmatic risks are managed in accordance with the Risk Management Plan (RPP-MP-607) and the tank farm Risk Management procedure (TFC-PRJ-PC-C-13), which includes the identification and prioritization of risk events, implementation of mitigation actions, and monitoring and responding to changing conditions.

Technical risk is managed in the same manner as programmatic risk. Technical risks are defined as those risks that the physical system will not perform as designed or planned, and/or that the waste will not behave as predicted. Identifying and managing technical risks is a key ingredient to mission acceleration as new technologies and techniques will be introduced to the Hanford Site tank farms. Risk-based technology deployment is discussed throughout this document and supports the insertion of proven technology in selected mission areas to reduce identified risks.

To ensure effective management, both programmatic and technical risk mitigation actions are placed in the IMES and will be tracked to completion with the same rigor as other baseline activities. After a Summary Life-Cycle Schedule is constructed as a roll-up from the IMES, a risk analysis will be conducted on the critical and near-critical path fragnets. The results of this analysis and other risk analyses performed on selected project areas will support a process of iterative risk reviews where areas of higher uncertainty will be highlighted for senior management review and action.

Table 8-1 summarizes some of the more significant risks relative to mission acceleration. This listing is a small sampling of the risks that are maintained, tracked, and monitored through a central risk database and by individual project and task managers. The central risk database directly supports the Hanford Programmatic Risk Summary, which is a listing of the higher priority risks that may be encountered by RL or ORP and their contractors.

Table 8-1. Mission Acceleration Risk Events and Handling Actions. (5 sheets)

Item No.	Related Mission Acceleration Strategy	Risk Event and Potential Handling Actions
1	Mission acceleration requires resolution of regulatory issues, permitting requirements, and NEPA scope before implementation of closure plans and supplemental technologies.	If regulatory approvals (CAA, RCRA, NEPA, WIR) are not obtained in a timely manner to support acceleration activities, then life-cycle cost and schedule savings relative to the current baseline may not be realized. **Mitigation:** (1) Permit requirements and associated regulatory issues, including performance requirements and waste acceptance criteria, should be evaluated during the identification and selection of acceptable treatment technologies. (2) Align on scope required for the EIS and proceed with executing to the approved EIS/ROD development schedule

Table 8-1. Mission Acceleration Risk Events and Handling Actions. (5 sheets)

Item No.	Related Mission Acceleration Strategy	Risk Event and Potential Handling Actions
2	An existing risk that would be exacerbated by accelerating closure actions is related to the completion criteria for an interim closed tank or tank farm and a closed tank or tank farm.	If tank farm closure criteria are more restrictive than assumed in the HPMP or in the IMAP, then life-cycle cost and schedule savings relative to the current baseline may not be realized. This risk, which has been identified in previous documents, is exacerbated by the acceleration required for SST retrieval demonstrations and closure demonstrations and the reduced time available to switch to alternate technologies if the primary technologies prove to be inadequate.
3	Mission Acceleration includes the optimization of design, construction, or operation throughout the RPP. Key to optimization is to avoid suboptimizing one area while optimizing another. Consequently, each improvement must be evaluated from an overall RPP and life-cycle perspective. The following represents changes that increase risk to the TFC while reducing WTP risk: The increase from one to two HLW melters enables increased HLW production rates through the WTP. However, with the increased production rates, the need for an additional IHLW storage facility will be accelerated.	**Mitigation:** Interface management process will continue to be used with senior management being contacted when potential optimization – suboptimization situations are identified. With two HLW melters, increased production may cause the need for additional transport carriers and earlier storage tube availability through the life-cycle plan. FH has also indicated that operations in the CSB will handle a maximum of 480 canisters per year; well below the projected 570 with the two HLW Melters. **Mitigation**: Use latest System Plan to support early start and shipping dates for products. The risk impact could be the design and construction of a larger "CSB-type" facility sooner. One mitigation option to be evaluated may be accelerating shipments to Yucca Mountain, thus reducing on-site storage needs.
4	The CSB will be used to store immobilized HLW (IHLW). Presently, the Spent Nuclear Fuel Program is moving K-Basin spent fuel to the CSB for interim storage until the material can be shipped to the repository. There are additional spent fuel materials stored onsite that could be transferred to and stored at the CSB.	If spent nuclear fuel movements extend beyond current schedule, then these transfers could interfere with construction and operation of the CSB's IHLW facilities. **Mitigation:** Formalize ICD agreement to include late finish dates for spent nuclear fuel transfers so they will not interfere with construction and operation plans.
5	Mission acceleration requires the successful reclassification of certain wastes to TRU or LAW in accordance with DOE O 435.1. This allows certain wastes to be shipped off-site for disposal without processing through the WTP.	If the Waste Incidental To Reprocessing (WIR) classification is not approved, then tank waste may require treatment at the WTP before disposal. **Mitigation:** WIR determination strategy and process is being developed for DOE review and approval.
6	The Supplemental Treatment schedules for the design, development, and implementation of waste treatment technologies are aggressive and the supplemental treatment technologies must be ready or capable of achieving the throughputs required to meet the accelerated processing goals.	If vendors are unable to meet these technology deployment schedules, then completion of supplemental treatment may extend beyond FY 2006. Also, it may not be possible to meet the accelerated tank closure schedule if supplemental treatment is inadequate. Since minimum research and technology has been applied directly to the tank farm area, considerable uncertainty remains to be resolved. **Mitigation:** Timely decision of treatment technology and early communication of procurement strategy to prospective vendors, and continue the use of technology identification workshops with world experts and implement aggressive contracting of proven technology applications to the tank farm.

Table 8-1. Mission Acceleration Risk Events and Handling Actions. (5 sheets)

Item No.	Related Mission Acceleration Strategy	Risk Event and Potential Handling Actions
7	Currently Leak Detection Monitoring and Mitigation (LDMM) is required during SST retrieval. This adds considerable cost at minimal improvement to operational and environmental risk reduction.	If extensive LDMM technologies are required, then projected cost efficiencies for SST retrievals will not be attained and will directly impact the number of SST retrievals and closures to be completed on an accelerated basis. **Mitigation:** Work with regulators, establish simplified approaches to the LDMM requirement.
8	Mission acceleration requires a change to the current 28-month Closure Plan review and approval cycle to a 8-12 month cycle.	**Mitigation:** Accelerating or streamlining processes in the Tri-Party Agreement Closure Plan review cycle. The streamlined approach will be presented and collaboratively evaluated with WDOE.
9	DST space initiatives are needed to provide sufficient storage space for SST retrievals and closure commitments.	If DST space is not available, then retrievals will stop until space becomes available (except for supplemental treatment of SSTs). **Mitigation:** (1) Request adjustments to contingency capacity requirements, (2) Evaluate retrieval technologies, which avoid DST storage (e.g., dry retrieval and other supplemental processes), (3) Use HTWOS modeling to optimize planned DST storage space requirements.
10	The Mission Acceleration strategy includes using the same technology that is deployed for SST retrieval on TRU waste retrieval.	If using SST retrieval technology is not possible, then significant cost and schedule increases will occur. **Mitigation:** SST retrieval technology selection must also consider use by the TRU project.
11	The physical capability of the 242-A Evaporator has been cited as a potential issue in meeting the RPP needs. Mission Acceleration increases the need for this facility and adds to the need for its longevity.	If the 242-A evaporator is not capable of meeting increased mission needs, then other alternatives will have to be deployed to meet mission acceleration targets. **Mitigation:** Complete the current study that considers facility condition and ability to meet increased use requirements.
12	Mission Acceleration necessitates the establishment of realistic Authorization Basis related requirements.	Activities are currently on going to finalize the Documented Safety Analysis (DSA) and submit to DOE for approval. Implementation is scheduled for April 04. The new DSA will reduce conservatism currently in the Authorization Basis and allow work to be performed more quickly, under appropriate controls, while maintaining a safe working envelope. **Mitigation:** Finalize and submit DSA to ORP by March 24, 2003. Implement DSA by October 31, 2003.
13	Mission Acceleration requires increased resources for the WTP, River Corridor, and tank farm work activities, at approximately the same time. This need applies to craft workers as well as key professional engineers.	If resources are not available when needed, then significant scheduling delays may occur. **Mitigation:** Current RPP actions include establishing a vibrant resource planning process that covers the tank farm and WTP, realigning the tank farm work force to the new mission focus areas, and communicating projected staffing needs throughout RPP to maximize RPP-wide use.

Table 8-1. Mission Acceleration Risk Events and Handling Actions. (5 sheets)

Item No.	Related Mission Acceleration Strategy	Risk Event and Potential Handling Actions
14	Mission acceleration activities are founded on the premise that level funding through FY 2006 will be available for accomplishing specified work scope.	If funding or resources are diverted from RPP to accomplish other accelerated Site cleanup initiatives, then life-cycle cost and schedule savings relative to the accelerated mission will not be realized. Impacts are both near-term (affects SST retrieval and closure, and construction of and Waste Feed Delivery systems and the WTP) and long-term (impacts to construction of supplemental waste treatment systems). Mission acceleration exacerbates this risk further by allowing minimum schedule float and applying contingency to only capital line-item construction projects. **Mitigation:** ORP will ensure levelized funding is available to the RPP during the acceleration period.
15	Mission acceleration strategies include significant levels of uncertainty whereby cost and schedule impacts have not been quantified.	**Mitigation:** (1) By December 31, 2003, a detailed risk analysis will be conducted to indicate areas of greatest uncertainty and risk as well as measuring the probabilities of achieving success. (2) Subsequent insertion of necessary mitigating actions will be completed to improve probability indicators.
16	Off-site transportation and disposition paths currently do not exist, and may not exist on the schedule required for TRU waste disposition in a timely manner.	Currently, indicators show that Hanford Remote Handled TRU system capacity will not support the accelerated closure (Tank Closure Acceleration) and process constraints would be imposed on TRU retrieval and storage. Commitments for TRU shipments to WIPP cannot be met without mobile TRU processing systems from the Carlsbad Field Office. **Mitigation:** Continue discussions with WIPP and development of data in support of need and continue to monitor WIPP's progress on RH-TRU permitting.
17	Predictable timely funding is needed to accurately plan for accelerated cleanup.	The cumulative impact of annual Continuing Resolutions may result in extension of mission schedule and loss of public/stakeholder confidence, trust, and support. **Mitigation:** Continue to set contingency actions if continuing resolutions occur.
18	Risk based end states have not been established or are being delayed. This is evident in the Central Plateau (CP) where closure processes may not be universally applied to ensure consistent risk-based decision-making.	Having variations in end state definitions could result in less than optimal cleanup, delays, and cost increases. **Mitigation:** Acceptable decision processes with "logistical" consideration of "regional" closure will be pursued. The use and coordination of risk assessments to support collective decisions (e.g., regional closure, tank farm closure) in lieu of individual waste site decisions forms the basic foundation of this action.
19	The site infrastructure is aging and may be unable to support critical path activities in a timely manner.	Frequent breakdowns and unpredictable performance may result in costly upgrades or new construction to support the long-term operability of site infrastructure and project facilities. Breakdown of site services could also contribute to an event with negative consequences or site logistics could be impacted. **Mitigation:** Maintain an up-to-date Major Equipment List/Safety Equipment List MEL/SEL and conduct reliability assessments on key equipment and facilities. Maintain an effective standby inventory of safety significant equipment and parts.

Table 8-1. Mission Acceleration Risk Events and Handling Actions. (5 sheets)

Item No.	Related Mission Acceleration Strategy	Risk Event and Potential Handling Actions
20	Mission acceleration activities require all parties to do work differently so that newer, more efficient products and processes result.	Delays in DOE and Regulator decision-making and approval processes could lead to increased cost and schedule delays in start-up, testing, and full-scale operation of various facilities and operations. Examples of areas needing a reduction in processing time include: - Contract Selections - Regulatory Authorizations - Delegations of Authority - Critical Decisions - NEPA Reviews. **Mitigation:** Continue to collaboratively streamline the associated processes to minimize delays.

9.0 COST (LIFE-CYCLE) IMPROVEMENTS AND CHALLENGES COMPARED TO THE HANFORD PERFORMANCE MANAGEMENT PLAN

Table 9-1 represents the funding profile planned for CH2M HILL to perform all defined work scope including integrated Mission Acceleration activities for the FY 2003 through FY 2006 timeframe. The only difference in the funding profile when compared to the HPMP is the addition of $5 million in FY 2003 for awarding a subcontract to evaluate steam-reforming technology. In addition, CH2M HILL has approximately $20 million in carryover funding from FY 2002.

Table 9-1. Integrated Mission Acceleration Plan Funding Profile for Fiscal Year 2003 Through Fiscal Year 2006 (in Millions of Dollars).

Work Activity	FY 2003	FY 2004	FY 2005	FY 2006
Interim Stabilization *(PBI 1)*	12	2	-	-
Waste Feed Delivery Alignment *(PBI 2)*	100	100	100	100
Tank Closure *(PBI 3)*	66	88	90	80
Supplemental Treatment TRU/Low Activity Waste *(PBI 4)*	60	10	10	20
Readiness for Mission Execution	177	160	160	160
Total for Each FY	**415**	**360**	**360**	**360**
Total for FY 2003 – FY 2006				**1,495**

Successful implementation of the strategies contained in this IMAP are expected to result in a total life-cycle savings of approximately $7.4 billion when compared to the August 2002 HPMP. A total project life-cycle savings of approximately $20 billion is expected compared to the March 2002 Baseline.

Significant funding challenges are anticipated for FY 2004 and FY 2005. These challenges will be met through effective implementation of the Work Management Strategies identified in Section 6.0 and the MAAPs identified in Section 7.0; incorporation of lessons learned from initial tank retrievals; incorporation of emerging technology; and enhanced SST retrieval system design and construction.

Specific examples of life-cycle cost improvements that will be implemented to meet the funding challenges are discussed in the following paragraphs. The anticipated life-cycle savings compared to the HPMP are also identified.

Minimum Safe Operations – The HPMP includes minimum safe operations activities and costs from the existing TFC baseline. These costs are approximately $120 million per year until facilities are closed and operations and maintenance costs are reduced and begin to rapidly ramp down beginning in FY 2024. This IMAP proposes to reduce the minimum safe operations activities necessary and sufficient for safe storage operations. Activities that are not needed are not included in this plan. The life-cycle savings resulting from elimination of these types of activities is approximately $1.2 billion.

SST Retrieval System Design and Construction – The HPMP assumed that costs for the SST retrieval systems used higher cost and more complicated technologies than the previous baseline. The systems included the MRS for sludge tanks at $78 million per tank, fluidic system for mixed saltcake and sludge tanks at $41 million per tank, and saltcake dissolution at $17 million per tank. The total retrieval system cost for the 149 SSTs in the HPMP is approximately $6.5 billion over the project life cycle.

For this IMAP, less expensive SST retrieval systems are proposed. Three standardized retrieval systems will be used: modified sluicing, the MRS, and vacuum-based retrieval for low volume 200 series tanks. The costs for these systems will be reduced by standardizing the retrieval system designs, reusing retrieval equipment over multiple tank retrievals, sequencing the retrievals to allow all tanks in the farm to be retrieved over a shorter time period, and upgrading the farm infrastructure once for each farm instead of upgrading the farm infrastructure systems for each waste retrieval. This revised approach is estimated to cost approximately $1.4 billion. The anticipated life-cycle savings of this approach is approximately $5 billion compared to the HPMP.

WRF – WRFs were included in the HPMP to transfer SST waste following retrieval and to deliver it to the DST system. The WRFs were scoped to include a series of receiving tanks, pumps, and transfer piping. The WRFs provide retrieval solution recirculation to minimize the potential waste volume generated during retrieval and to provide temporary solids storage during retrieval. Three WRFs were included in the HPMP. The costs for these WRFs include approximately $419 million for design, construction, startup and operation, and eventual closure of the facilities estimated at $300 million.

The IMAP proposes to minimize the number of WRFs by managing the available DST space, providing integrated and optimized retrieval of the SSTs and DSTs, waste volume reduction using the 242-A evaporator, waste retrieval without solution recirculation, retrieving SST waste and temporarily storing it in sound SSTs, and just-in-time waste transfers from the DSTs to the treatment facilities. This strategy could result in cost savings of approximately $719 million over the life cycle.

Blending Facility – The HPMP included a waste blending facility to prepare a more consistent feed composition before delivery to the WTP. The facility was envisioned to receive waste from several tanks, and blend it to reduce the process and throughput impacts on the vitrification process from waste constituents such as sulfate, chromium, and zirconium, thereby reducing the glass volume produced. The costs included in the HPMP for the blending facility is $250 million.

The IMAP eliminates the blending facility. The treatment will be accomplished by inclusion of supplemental treatment technologies and TRU and LLW waste packaging in lieu of design, construction, and operation of the blending facility. The life-cycle cost savings are approximately $250 million.

Tank Interim Closure – For the HPMP, SSTs will be interim closed awaiting closure of the entire tank farm. The DSTs will be interim closed after their last use following retrieval. Interim closure includes preparing and obtaining approval of the Tier 1 Closure Plan, preparation of risk assessment and risk analyses, and designing and constructing the interim closure. The HPMP included costs of $8 million for each tank for a total cost of $1.416 billion for all 177 Hanford Site tanks.

Through improved sequencing, alignment of tasks, and minimizing interim actions on individual tanks, the IMAP approach to interim closure reduces costs by approximately $1 million per tank. This results in a life-cycle cost reduction of approximately $177 million.

SST Retrieval Technology Development – The HPMP assumed that SST retrieval technologies would be developed and tested. The systems under development included leak detection, mitigation, and monitoring technologies, dry retrieval technologies, and waste specific retrieval technologies that use diminished volumes of liquid during retrieval.

The IMAP assumes that existing technologies can be used to retrieve the waste from the SSTs using three existing technologies; modified sluicing, MRS, and a vacuum-based retrieval system. Technology development of alternative retrieval methods is not required. Technology testing is limited to cold testing of the C-104 MRS and limited testing of leak detection monitoring and mitigation technologies. The life-cycle cost reduction is estimated at approximately $100 million.

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10.0 SCHEDULE IMPROVEMENTS COMPARED TO THE HANFORD PERFORMANCE MANAGEMENT PLAN

Implementation of the strategies defined in this IMAP will enable the life-cycle schedule improvements projected in the HPMP of over 20 years when compared to the March 2002 baseline to be realized. Additionally, 40 SSTs will have waste retrieved and be interim closed by the end of FY 2006 compared to the 7 planned in the HPMP. The IMAP strategies project a mission complete date that is two years ahead of the HPMP schedule.

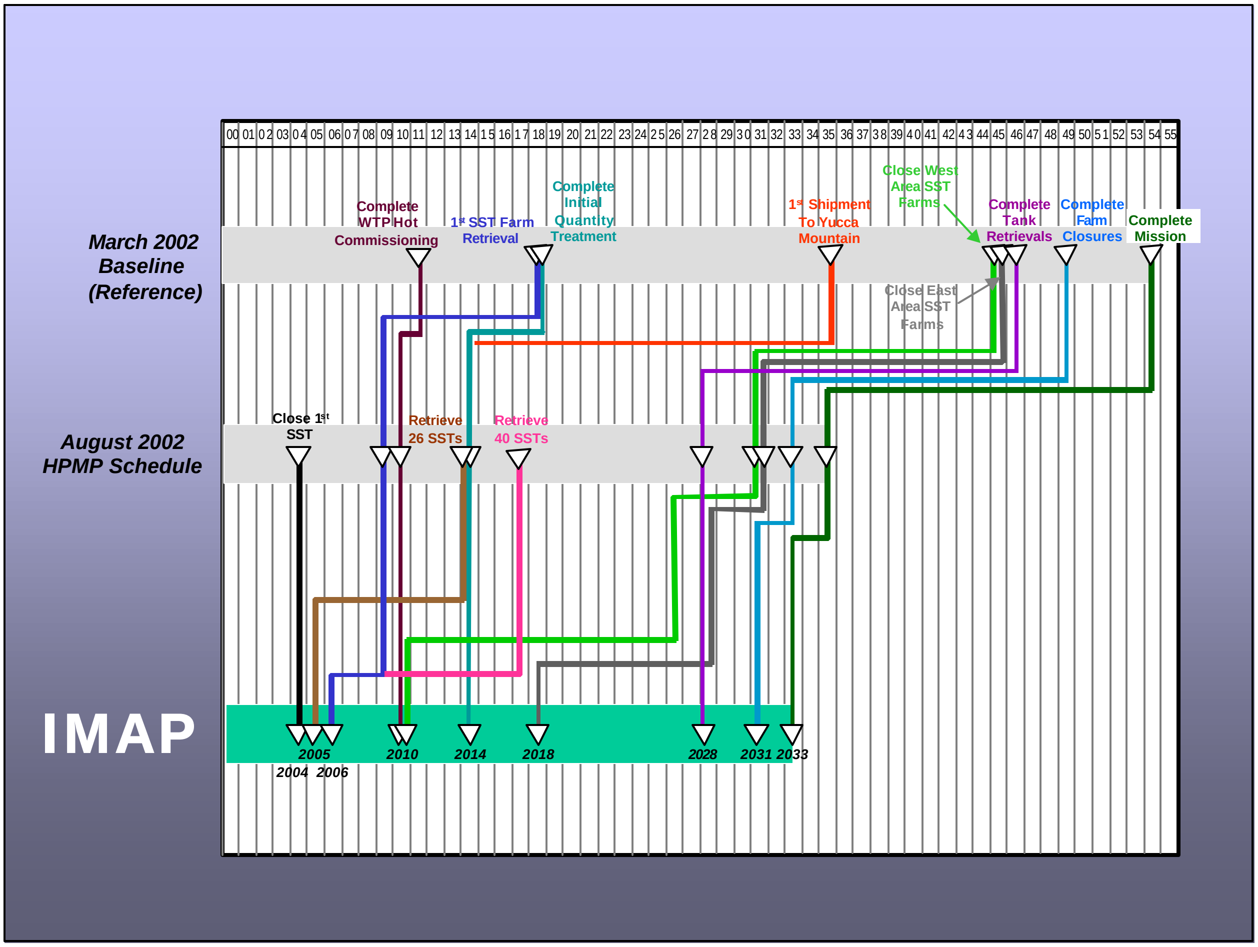
Table 10-1 displays the IMAP acceleration of several key milestones when compared to the HPMP.

Table 10-1. Integrated Mission Acceleration Plan Schedule Improvements Compared to the Hanford Performance Management Plan.

Accomplishment Milestone	HPMP Schedule	IMAP
Close first 26 SSTs	FY 2014	FY 2005
Close first 40 SSTs	FY 2016	FY 2006
Close 2 SST Farms	FY 2009	FY 2006
Demonstrate supplemental technology on real waste	FY 2008	FY 2004
Retrieve and treat of 750,000 gallons of TRU	FY 2012	FY 2006
Treat and dispose of 250,000 gallons of LLW/LAW	FY 2011	FY 2006
Close 200 West Area SST Farms	FY 2030	FY 2010
Close 200 East Area SST Farms	FY 2031	FY 2018
Complete mission	FY 2035	FY 2033

As shown in Figure 10-1, the HPMP (Reference Case) projected overall mission completion in 2035 versus the IMAP projected completion in 2033. All other significant milestones are accelerated in the IMAP when compared against the March 2002 baseline.

Figure 10-1. Integrated Mission Acceleration Plan Schedule Acceleration.



Appendix D contains a project summary schedule for all TFC activities based on the HTWOS computer run of January 30,2003. This schedule indicates that as a result of CH2M HILL's integrated planning to-date (including DST space management, waste transfers, SST retrieval systems, etc.), CH2M HILL could effectively retrieve waste from at least 25 SSTs by the end of FY 2006. The schedule also indicates TRU removal and processing from 9 SSTs.

Since the January 30, 2003, HTWOS run, CH2M HILL has already been able to schedule another SST for retrieval by the end of FY 2006.

The HTWOS run (with the 26 SST retrievals) approximates the BCR schedule that will be approved in March 2003.

CH2M HILL's challenge over the next several months is to increase the scheduled SST retrievals to 40 by FY 2006 (as shown in Section 4.0 of this plan). The planning activities for increased retrievals will incorporate lessons learned in CH2M HILL's initial retrievals, efficiencies in DST space management, implementation of supplemental technologies, and other successes the overall RPP systems. Updates to the IMAP will incorporate the latest versions of the project summary schedules based on the HTWOS modeling.

11.0 CONFIGURATION MANAGEMENT AND CHANGE CONTROL

The IMAP strategies, decision points, mitigating actions, and enabling assumptions have been built into the IMAP performance baseline. The performance baseline, in support of the IMAP, includes the detailed schedule (Performance Measurement Baseline Schedule), project scope (as defined in the WBS Dictionaries), and the detailed resource estimates (included in the PMBS resource loaded schedule). CH2M HILL will execute work scope defined in the performance baseline as presented in the IMAP and agreed to in the TFC contract and ORP guidance within budgetary and schedule commitments. Configuration control of the IMAP data within the performance baseline will be managed as defined in established Change Control Processes.

The change control and configuration management of the IMAP and associated performance baseline will be documented and approved within defined change control thresholds to ensure that actual performance, changes in program direction, technical requirements, ORP guidance or other changed conditions affecting the contract baseline are thoroughly analyzed for impacts, and that they are documented and communicated to management for expeditious resolution. Therefore, the IMAP baseline will be updated as required to maintain a current document that emphasizes strategic review, implementation, and performance.

Impacts presented by baseline changes will be thoroughly analyzed and defined to include an evaluation of, and where required, inclusion of necessary actions to preserve or improve life-cycle total project cost and project estimated completion date (critical path). Resources and/or schedule considerations will be identified that will minimize or evaluate potential adverse consequences from changed conditions. CH2M HILL also will identify and implement mitigating actions and/or changes that can be used to offset the impact of changed conditions or emergent work scope.

In summary, the IMAP and the performance baseline will be rigorously controlled to provide for meaningful performance measurement, control of baseline scope and schedule, and as a tool for project execution.

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12.0 REFERENCES

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*, as amended.

40 CFR 268.2, "Definitions Applicable in this Part," *Code of Federal Regulations*, as amended.

40 CFR 268.45, "Treatment Standards for Hazardous Debris," *Code of Federal Regulations*, as amended.

89-10, *Hanford Federal Facility Agreement and Consent Order*, 1989, as amended, 2 vols., Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

24590-WTP-ICD-MG-01-003, 2002, *ICD 03 – Interface Control Document for Radioactive Solid Waste*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-005, 2002, *ICD 05 – Interface Control Documents for Nonradioactive, Nondangerous Liquid Effluents*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-006, 2002, *ICD 06 – Interface Control Document for Radioactive, Dangerous Liquid Effluents*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-014, 2002, *ICD 14 – Interface Control Document for Immobilized High-Level Waste*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-015, 2002, *ICD 15 – Interface Control Document for Immobilized Low-Activity Waste*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-019, 2002, *ICD 19 – Interface Control Document for Low-Activity Waste Feed*, U.S Department of Energy, Office of River Protection, Richland, Washington.

24590-WTP-ICD-MG-01-020, 2002, *ICD 20 – Interface Control Document for High-Level Waste Feed*, U.S Department of Energy, Office of River Protection, Richland, Washington.

Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 USC 9601 et seq.

DOE O 435.1, *Radioactive Waste Management*, U.S. Department of Energy, Washington, D.C.

DOE/EIS-0189, 1996, *Tank Waste Remediation System, Hanford Site, Richland, WA, Final Environmental Impact Statement*, U.S. Department of Energy, Washington, D.C.

DOE/RL-2002-47, 2002, *Performance Management Plan for the Accelerated Cleanup of the Hanford Site*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

HNF-2358, 2002, *Single-Shell Tank Interim Stabilization Project Plan*, Rev. 5, CH2M HILL Hanford Group, Inc., Richland, Washington.

HNF-3995, 2002, *Interface Control Document between the Double-Shell Tank System and the 242-A Evaporator Facility*, Rev. 1, Numatec Hanford Corporation, Richland, Washington.

HNF-4482, 2002, *Interface Control Document for the Tank Farm System and Fluor Hanford Treatment Storage Disposal Facilities*, Rev. 1, Numatec Hanford Corporation, Richland, Washington.

HNF-4483, 1999, *Interface Control Document between the Tank Farm System and 222-S Laboratory*, Rev. 0, Numatec Hanford Corporation, Richland, Washington.

HNF-4492, 2002, *Interface Control Document between the Tank Farm System and the Fluor Hanford Electrical Distribution System*, Rev. 1, Numatec Hanford Corporation, Richland, Washington.

National Environmental Policy Act of 1969, as amended, 42 USC 4321, et seq.

RPP-5635, 200, *244-AR Vault Interim Stabilization Project Plan*, Rev.0, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-7609, 2001, *Interface Control Document for the Spent Nuclear Fuels Program and Immobilized High-Level Waste Interim Storage at the Canister Storage Building*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-7702, 2001, *Tank Space Options Report*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-8554, 2002, *Single-Shell Tank Retrieval Sequence and Double-Shell Tank Space Evaluation*, Rev. 1, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-11261, 2002, *Recommendation for Supplemental Technologies for Potential Mission Acceleration*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-11306, 2002, *Evaluation of Low-Activity Waste Feed Supplemental Treatment Options by the C3T Mission Acceleration Initiative Team for the Office of River Protection*, Rev. 0, CH2M HILL Hanford Group, Inc., Richland, Washington.

RPP-MP-607, 2002, *Risk Management Plan*, Rev. 1, CH2M HILL Hanford Group, Inc., Richland, Washington.

State of Washington Hazardous Waste Management Act, RCW 70.105A.

TFC-PRJ-PC-C-13, 2002, *Risk Management*, CH2M HILL Hanford Group, Inc., Richland, Washington.

WAC 173-303-040, "Definitions," *Washington Administrative Code*, as amended.

WAC 173-303-140, "Land Disposal Restrictions," *Washington Administrative Code*, as amended.

Washington State Environmental Policy Act of 1971, RCW 43.21C.010, et seq.