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RPP-6118
Revision 0

Memorandum of Readiness to Proceed with Phase 1 Privatization for the Tank Farm Contractor

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

CH2MHILL
Hanford Group, Inc.
Richland, Washington

Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC06-99RL14047

Memorandum of Readiness To Proceed with Phase 1 Privatization for the Tank Farm Contractor

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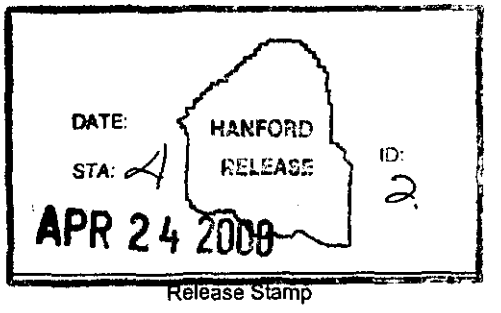
Abstract: This Readiness to Proceed Memorandum provides the CH2M HILL Hanford Group, Inc. formal certification of readiness to proceed with provision of the waste feed and infrastructure to handle the products from the privatization contractor's waste processing plant. Summary information is included from the integrated scope-cost-schedule baseline, the analyses of the baseline, management systems, and systems reviews.

4/24/00
Release Approval Date



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Approved For Public Release

RPP-6118
Revision 0

Memorandum of Readiness to Proceed with Phase 1 Privatization for the Tank Farm Contractor

Prepared by:

J. A. Voogd
J. O. Honeyman

Date Published
April 2000

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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Contractor for the U.S. Department of Energy
Office of River Protection under Contract DE-AC06-99RL14047

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Document Title: **Memorandum of Readiness to Proceed with Phase 1 Privatization for the Tank Farm Contractor**

Approved by: W T Dehn

W. T. Dehn, Acting President
and General Manager
CH2M HILL Hanford Group, Inc.

4/20/2000
Date

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EXECUTIVE SUMMARY

This Readiness to Proceed Memorandum provides the CH2M HILL Hanford Group, Inc. (CHG), formal certification of readiness to proceed to support Phase 1 with waste feed delivery, privatization site infrastructure, and facilities to handle immobilized product storage and disposal. The declaration of readiness is based on CHG's planning, analysis, management systems, and experience with the tank farm infrastructure and disposal systems.

This memorandum discusses the approach taken to provide evidence of the Tank Farm Contractor (TFC) readiness to proceed for the Phase 1 Part B-2 decision and serves as the executive summary of the overall effort. The memorandum includes:

a. Key Assumptions

b. Critical risk list and mitigation (handling) actions

c. A summary of the financial and schedule risk analysis

d. A manageable list of deficiencies and a corrective action plan for each, including a date for closure.

This memorandum states that CHG can accomplish the following:

- Provide waste feed to the Privatization Contractor in the specified amounts to the specified place at the required time
- Provide infrastructure to the Privatization Contractor as specified in the final privatization contract and the Interface Control Documents (ICD)
- Be prepared for receiving, storing and disposing of immobilized waste products
- Be prepared for receiving, managing, treating, and disposing of currently planned byproducts (secondary wastes) from the Privatization Contractor
- Support reasonable alternatives other than the current baseline
- Complete required administrative actions (e.g., permits, etc.) so that they will be in place at the required time.

The CHG mission elements have been planned with 80% confidence of meeting the schedule need dates, as requested.

CH2M HILL Hanford Group, Inc., is pleased to certify that the TFC is Ready to Proceed to support the Phase 1 B-2 decision with waste feed delivery, privatization site infrastructure, and facilities to handle immobilized product storage and disposal.

CONTENTS

APPENDICES

FIGURES

TABLES

TERMS

A/E	architect/engineer
BNFL	BNFL Inc.
BUG	Baseline Update Guidance
CHG	CH2M HILL Hanford Group, Inc.
CRAD	Criteria Requirements Analysis Document
DOE	U.S. Department of Energy
DST	double-shell tank
EIR	External Independent Review
FH	Fluor Hanford, Inc.
FY	fiscal year
HLW	high-level waste
HTWOS	Hanford Tank Waste Operations Simulator
ICD	Interface Control Document
IHLW	immobilized high-level waste
ILAW	immobilized low-activity waste
IPPD	Integrated Process and Product Development
ISMS	Integrated Safety Management System
LAW	low-activity waste
LDR	land disposal restrictions
LMHC	Lockheed Martin Hanford Corporation
LOI	Lines of Inquiry
MYWP	multi-year work plan
ORP	Office of River Protection
OUP	Operations and Utilization Plan
PIO	Project Integration Office
QAPD	quality assurance program description
RCRA	*Resource Conservation and Recovery Act of 1976*
RL	DOE, Richland Operations Office
RPP	River Protection Project
RTP	readiness to proceed
SEMP	Systems Engineering Management Plan
SST	single-shell tank
TBR	Technical Basis Review
TBSD	Technical Baseline Summary Description
TFC	Tank Farm Contractor
TPA	Tri-Party Agreement
WBS	work breakdown structure
WDOE	Washington State Department of Ecology

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1.0 INTRODUCTION

CH2M HILL Hanford Group, Inc. (CHG), is under contract to plan, manage, and execute the Tank Farm Contractor (TFC) projects and operations for the U.S. Department of Energy (DOE) Office of River Protection (ORP). In accordance with the contract, CHG is conducting business to meet the expected tank waste outcomes of the Hanford Strategic Plan. These actions include:

- Maintaining Tank Farms in a safe and stable configuration
- Delivering waste feed to the Privatization Contractor for treatment and immobilization
- Disposing of immobilized low-activity waste (ILAW) on Site in a 200 Area disposal system
- Storing the high-level immobilized waste until it can be shipped off Site for disposal (planned for the Yucca Mountain geologic repository).

In cooperation with ORP and BNFL Inc. (BNFL), CHG has assessed its readiness to proceed (RTP) with the detailed design and construction of facilities to retrieve, store, and dispose Hanford's tank waste. The River Protection Project (RPP) mission with the TFC and Privatization Contractor roles, is summarized in Figure 1-1. This Readiness to Proceed Memorandum, with the associated documents, is submitted for ORP's comprehensive review. The information describes that portion of CHG's scope necessary to support the waste feed delivery and immobilized waste disposal mission elements, while maintaining tank farms in a safe and stable configuration.

1.1 PURPOSE

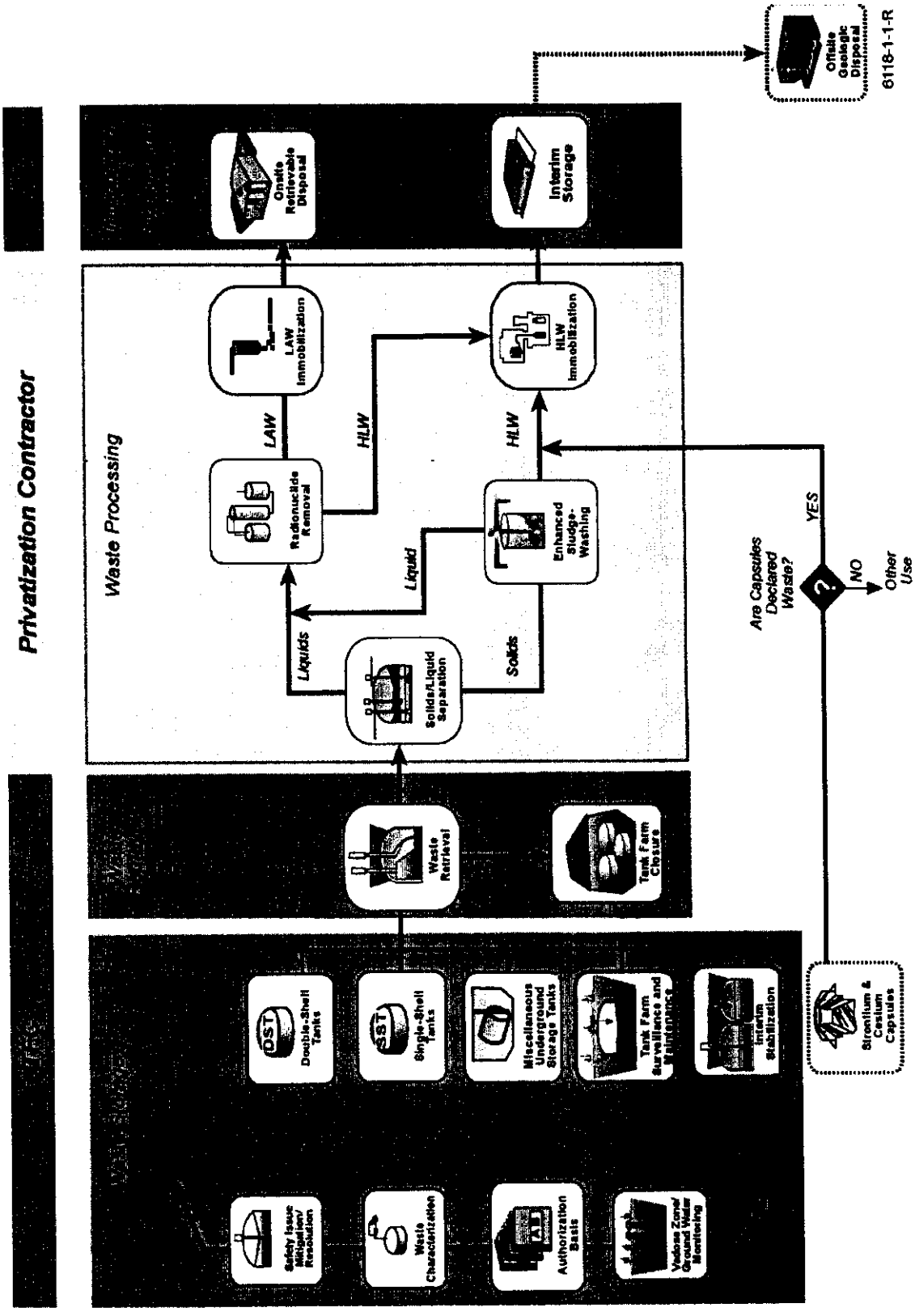
The purpose of this document is to formally "certify that CHG has the ability to provide the waste feed and infrastructure to handle the products from the BNFL waste processing plant." (ORP 1999, *CH2M HILL Hanford Group, Inc., Contract No. DE-AC06-99RL14047*, Performance Incentive 4.5.1 R1.) In this certification CHG provides, or references, the evidence that:

- The mission is understood
- Plans exist to execute the mission
- Management systems and organization are in place to execute the plans.

1.2 PREVIOUS DECLARATION OF READINESS

In January of 1998, the TFC submitted its statement of RTP with Phase 1B Privatization (Borneman 1998).

Figure 1-1. River Protection Project Mission Summary.



That memorandum, and the accompanying 1998 RTP evidence package, documented the results of planning and analysis leading to the conclusion;

> "... the systems and infrastructure required to support the mission are known. Required systems are either in place or plans have been developed to ensure they exist when needed. ... An analysis of programmatic, management, and technical activities necessary to declare RTP indicates that the system, personnel, and hardware will be on line and ready to support the private contractors."

The DOE concurred with the TFC's assessment (Taylor 1998). DOE also recognized eight "Major Recommendations on the RTP evidence package" that required action on the part of the TFC. CHG has proceeded with preparations to support the RPP mission. During this period, the eight DOE recommendations have been addressed (Wood 2000a).

1.3 CHANGES SINCE 1998 DECLARATION OF READINESS

The 1998 TFC's declaration of readiness was based on the 1996 DOE contract with two competing vendors to begin processing in 2002. In August 1998, the DOE signed a contract with one vendor, BNFL, to begin the design of pretreatment and low-activity waste (LAW) and high-level waste (HLW) treatment and immobilization facilities. Evolution of the program has continued and a number of technical and programmatic changes have occurred. This evaluation of RTP considers the following changes:

- Selected One Phase 1 Privatization Contractor instead of two
  - Waste feed delivery plans and infrastructure projects were replanned as a result
- Revised facility configurations
  - ORP is no longer providing a double-shell tank (DST) to the Privatization Contractor, for feed staging
  - The ILAW disposal system will use a remote trench rather than modified grout vaults
- Modified construction and operations schedules
  - LAW feed sequences have been reordered and facility ramp-up rates have been changed to meet the evolving requirements of the Privatization Contractor
  - The start up dates for feed delivery, vitrification and product disposal have been revised to fit new contract dates for 2006 waste treatment plant hot commissioning

- Adjusted scope between CHG and the Privatization Contractor
  - Sludge washing will be performed in the vitrification facility by the Privatization Contractor rather than in double-shell tanks (DST) by the TFC
- Added more single-shell tank waste to the feed sequence
  - The single-shell tank (SST) retrieval schedule is accelerated.

Other changes have influenced the execution of the baseline.

- The TFC became a prime contractor to DOE for execution of the RPP mission.
- CH2M HILL purchased the TFC and with the purchase obtained the tank farm contract.
- ORP established the Project Integration Office to coordinate the RPP mission and the multiple contractors.
- The RPP began using Integrated Process/Product Teams to work on interface agreements and issues.
- The TFC has demonstrated significant progress in operating the tank farms and resolving tank farm issues including: completion of the cross-site transfer line (W-058), removal of the high heat sludge from tank C-106, elimination of the flammable gas storage issue from tank SY-101, and implementation of a comprehensive tank farm safety Authorization Basis.

1.4 REQUIREMENTS FOR CERTIFICATION

The RTP evaluation objective includes demonstrating that the TFC can meet requirements to support the Privatization Contractor by providing the infrastructure and waste feed for immobilization and by receiving and managing the products and byproducts from the waste processing facilities. As part of the demonstration, ORP requested that CHG provide "Formal certification of the contractor's ability (Memorandum of Readiness to Proceed) to provide the waste feed and infrastructure to handle the products from the Privatization Contractor waste processing plant."

The specific documents that CHG is delivering in response to the ORP performance incentive are shown in Table 1-1.

Other specific elements that DOE requested as part of the formal certification, and their location in the RTP Deliverables, are shown in Table 1-2.

Table 1-1. Readiness To Proceed Document Deliverables.

Requested Documents	Document Title	Document #
Readiness to Proceed Memorandum	*Memorandum of Readiness to Proceed with Phase 1 Privatization for the Tank Farm Contractor*	RPP-6118 (Honeyman and Voogd 2000)
Integrated Resource Loaded Schedule	*Programmatic Baseline Summary for Phase I Privatization for the Tank Farm Contractor*	HNF-1946 (Diediker 2000)
Tank Farm Contractor Operation and Utilization Plan	*Tank Farm Contractor Operation and Utilization Plan*	HNF-SD-WM-SP-012 (Kirkbride 2000)
Staffing Plan	*Human Resources Staffing Plan for the Tank Farm Contractor*	RPP-6114 (Bosley 2000)
Configuration Management Plan	*Configuration Management Plan for the Tank Farm Contractor*	HNF-1900 (Weir 2000)
Quality Assurance Program Plan	*Quality Assurance Program Description for the Tank Farm Contractor*	RPP-MP-600 (Hebdon 2000)
Safety Program Plan	*Integrated Environment, Safety and Health Management System Description for the Tank Farm Contractor* *RPP Administration*, "Health and Safety Program Description"	HNF-MP-003 (CHG 2000b) HNF-IP-0842, Vol. IX, Section 1.1 (CHG 2000d)
Environmental Program Plan	*Environmental Program Description for the Tank Farm Contractor*	HNF-1773 (Powell 2000)
Technical Baseline Summary	*Technical Baseline Summary Description for the Tank Farm Contractor*	HNF-1901 (Tedeschi 2000)
Draft Project Execution Plan	*Draft Project Execution Plan for the Tank Farm Contractor*	RPP-6017 (Halverson 2000)
Letter Report on resolution of the eight "Major Recommendations on the RTP evidence package" from previous RTP	"Contract No. DE-AC06-99RL14047, River Protection Project Fiscal Year 2000 Performance Incentive ORP 4.5.1, Revision 1," "Phase 1 Part B-2 Readiness to Proceed, Section 3, Standard 3, and Section 4, Standard 2	CHG-0002228 (Wood 2000b)

ORP = Office of River Protection.
RTP = Readiness to Proceed.

Table 1-2. Readiness To Proceed Certification Elements.

Certification Elements	Location
CHG Key Assumptions	RPP-6118, Appendix A
CHG Critical Risks	RPP-6118, Appendix B
Financial and Schedule Risk Analysis	RPP-6118, Section 3.0
Manageable List of Deficiencies, Corrective Action Plan for each, including date for closure	RPP-6118, Section 5.0
Criteria Review Assessment Document Crosswalk	RPP-6118, Section 4.0

The DOE also requested that the memorandum state that the TFC can:

- Provide waste feed to the Privatization Contractor in the specified amounts to the specified place at the required time
- Provide infrastructure to the Privatization Contractor as specified in the final privatization contract and the Interface Control Documents (ICD)
- Ensure that it will be prepared for receiving, storing, and disposing of immobilized waste products
- Ensure that it will be prepared for receiving, managing, treating, and disposing of byproducts from private contractors
- Ensure that the contractor can support alternatives other than the current baseline
- Ensure required administrative actions (e.g., permits, etc.) are in place.

This memorandum provides the statements and evidence that CHG can accomplish these mission activities.

1.5 READINESS ASSESSMENT PROCESS

CHG used a systematic approach to determine RTP with the next phase of this mission. That process included:

- Evaluation of the ORP criteria requirements analysis documents (CRAD)
- Evaluation of the External Independent Review (EIR) Lines of Inquiry (LOI)
- Review of existing systems with internal and external review groups
- Update of the baseline to address planning changes
- Analysis of the planning change impacts
- Updates to the management systems needed to support the mission.

These steps lead to preparation of the information provided to ORP for this RTP.

Section 3.0 presents the results of the mission planning, development of an updated cost and schedule baseline, and analysis of that updated baseline.

Section 4.0 provides a discussion of the management systems needed to execute the mission plans. It discusses the management system documents that were updated for submittal and reviews to verify that management systems were working. Section 4.0 also addresses enabling assumptions and critical risks.

Section 5.0 addresses issues identified by management assessments with the follow on actions to assure the success of the Phase 1 mission.

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2.0 CERTIFICATION OF READINESS

CHG declares it is ready to proceed to support the RPP Phase 1 mission as required by contract and further defined in the ORP fiscal year (FY) 2000 multi-year work plan (MYWP) and corresponding performance incentive (ORP 1999). CHG will be ready to deliver waste feed to the Waste Treatment Plant, within specification, February 2006.

CHG has evaluated the TFC baseline, management systems, existing and planned hardware relative to the mission requirements, funding and field operations. The TFC portion of the Phase 1 mission is largely an extension of current operations for the TFC. An updated resource-loaded schedule has been established, and the required systems, staff, and documentation either are in place or plans have been developed to ensure that they will be in place when needed. Plans confirm that the TFC will be able to sustain feed delivery, infrastructure support, and receipt and eventual disposal of immobilized and other waste products for the duration of Phase 1 (i.e., through FY 2018). CHG confirms that the support and services (e.g., secondary waste treatment) needed for the tank waste retrieval and disposal mission and those that will be provided by members outside the TFC, are planned consistent with the scope, schedule, and cost in the RPP baseline, and that clear lines of communication and interface controls exist, or are being developed.

The planning assumptions required to construct HNF-1946, *Programmatic Baseline Summary for Phase 1 Privatization for the Tank Farm Contractor* (Diediker 2000) were derived from "Contract No. DE-AC06-99RL14047 – The U.S. Department of Energy, Office of River Protection (ORP) Mission Planning Guidance for Fiscal Year (FY) 2002 – Revision 1" (Short 2000) and *CH2M HILL Hanford Group, Inc., Contract No. DE-AC06-99RL14047* (ORP 1999). The CHG Key Assumptions are provided in Appendix A. A comparison of the updated ORP planning assumptions (Barrett 2000) and the updated RTP baseline was completed. No significant discrepancies were discovered.

Budget and resource requirements, including staffing, have been estimated for Phase 1 of the tank waste retrieval and disposal mission. A financial analysis indicated that there is a high degree of confidence that the work required to meet key retrieval and disposal startup dates in 2006 can be carried out per the planned schedule with an 80% confidence of meeting a baseline estimate of $4,146M (escalated) through the Phase 1 period analyzed (FY 2000 through FY 2018).

Management, management systems, and Integrated Safety Management Systems exist to support the tank waste retrieval and disposal mission. CHG has demonstrated the ability to manage large, complex projects and has brought their corporate expertise to bear on this mission. The CHG contract is definitive and provides the vehicle to clearly communicate and control the scope.

Risk associated with the tank waste retrieval and disposal mission scope is manageable. Risks associated with technical, environmental, safety, health, cost, schedule, and management aspects of the updated baseline were evaluated at the working level of the work breakdown structure (WBS) and rolled up to the major mission-element level. Cross-cutting risks and technical risks of a programmatic nature also were considered. Mitigation measures were incorporated into the

updated baseline to provide an acceptable probability of achieving technical, schedule, and cost expectations. Critical risks and the planned mitigation are provided in Appendix B.

CHG's confidence and credibility in planning and executing complex field tasks, has matured significantly during the last three years. These tasks involved the full range of activities necessary to upgrade tank farms, mix and retrieve waste, characterize feed, and transfer it.

Highlights of our success include:

Safety Issue Resolution

1. Closure of organic, high heat, criticality safety issues, and Unreviewed Safety Questions
2. Implementation of the Final Safety Analysis Report
3. Closure of the Flammable Gas Unreviewed Safety Question
4. Integrated Safety Management System Phase II verification.

Significant Field Execution (Operations)

1. Characterizing 134 of 177 tanks
2. Retrieving the wastes from high-heat tank 241-C-106
3. Resolving the crust growth safety issue with 241-SY-101 by installing transfer system and then retrieving and transferring waste and then back diluting 241-SY-101
4. Removing pumpable liquids from single-shell tanks ahead of schedule defined in the consent decree
5. Installing a *Resource Conservation and Recovery Act of 1976* (RCRA) compliant cross-site transfer system and completing several large volume transfers from 200 West to 200 East areas.

TFC Project Management

1. The TFC successfully managed over $300M of work per year in FY 1998 and FY 1999. This work was performed $37.1M (6%) under budget and with only a minor schedule variance ($8.4M, 1.3%).

These accomplishments represent a strong base of performance achieved by the TFC. The ability to plan, schedule, and execute complex operational evolutions is one of the key elements of success for the ORP.

In addition, substantial capital facility construction will be necessary to meet the feed delivery requirements, provide infrastructure, and store and dispose of the immobilized products. Between FY 2000 and waste treatment plant hot commissioning in FY 2006 approximately $1 B

of construction and project integration work must be successfully completed to support ORP's overall objectives.

Strong operational performance was one of the reasons that CH2M HILL decided to purchase the Lockheed Martin Hanford Corporation (LMHC) in December 1999. CH2M HILL is a world-class Project Delivery company, with world-wide experience and success in innovating, planning, constructing, and completing complex environmental projects for a wide variety of clients. The skills brought by CH2M HILL are complementary to the talent and skill already apparent in the TFC's efforts over the last 3 years.

CH2M HILL Hanford Group, Inc., is ready to proceed with Phase 1 of the River of Protection Project mission.

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3.0 MISSION PLANNING

The RPP consists of five major functional components as illustrated in Figure 3-1. Waste Storage, Waste Retrieval, Immobilized Waste Disposition, and Immobilization Support, are performed by CHG. The Waste Immobilization function is performed by the Privatization Contractor. Shown in Figure 3-1 are internal and external interfaces, with reference numbers to the ICDs. The Offsite HLW Repository, Site Support Services, and the Groundwater/Vadose Zone Project are also identified.

The mission has been identified in logic diagrams that are based on schedules for accomplishing the scope. The *RPP Mission Logic* diagram, TWR-2086, Figure 3-2 is a tool for translating the RPP mission requirements identified in the *River Protection Project Mission Analysis Report* (ORP 2000a) into a sequence of activities necessary to achieve the mission objectives. Figure 3-2 illustrates the major work that the RPP must perform to accomplish its mission, including safe storage, waste immobilization (Phase 1), waste immobilization and disposal completion (Phase 2), and closure. The logic also illustrates how the Privatization Contractor activities integrate with the other contractor activities by way of the linkages to the Privatization Contractor in Phase 1.

The RPP work breakdown structure has been organized programmatically into ten elements as a common framework for work planning and integration of the project baseline. The work breakdown structure is shown in Figure 3-3. This RTP assessment focuses on the subset of activities within the WBS needed to support the Privatization Contractor. This subset is the Phase 1 tank waste retrieval and disposal mission, which includes the following WBS elements and portions of:

- TW-01 Characterization in Support of Retrieval, within Tank Waste Characterization
- TW-03 Project W-314, within Tank Farm Operations
- TW-04 Waste Retrieval
- TW-05 Interface Management, within Process Waste Support
- TW-08 Infrastructure
- TW-09 Immobilized Waste.

The entire Phase 1 RPP budget estimate is also reported here for comparison.

3.1 PLANNING GUIDANCE

ORP established the feed sequence and the associated dates for delivery of the initial LAW and HLW feed (French 2000). ORP then supplemented this information in the FY 2002 planning guidance (Short 2000). This guidance provided additional information necessary for tank waste

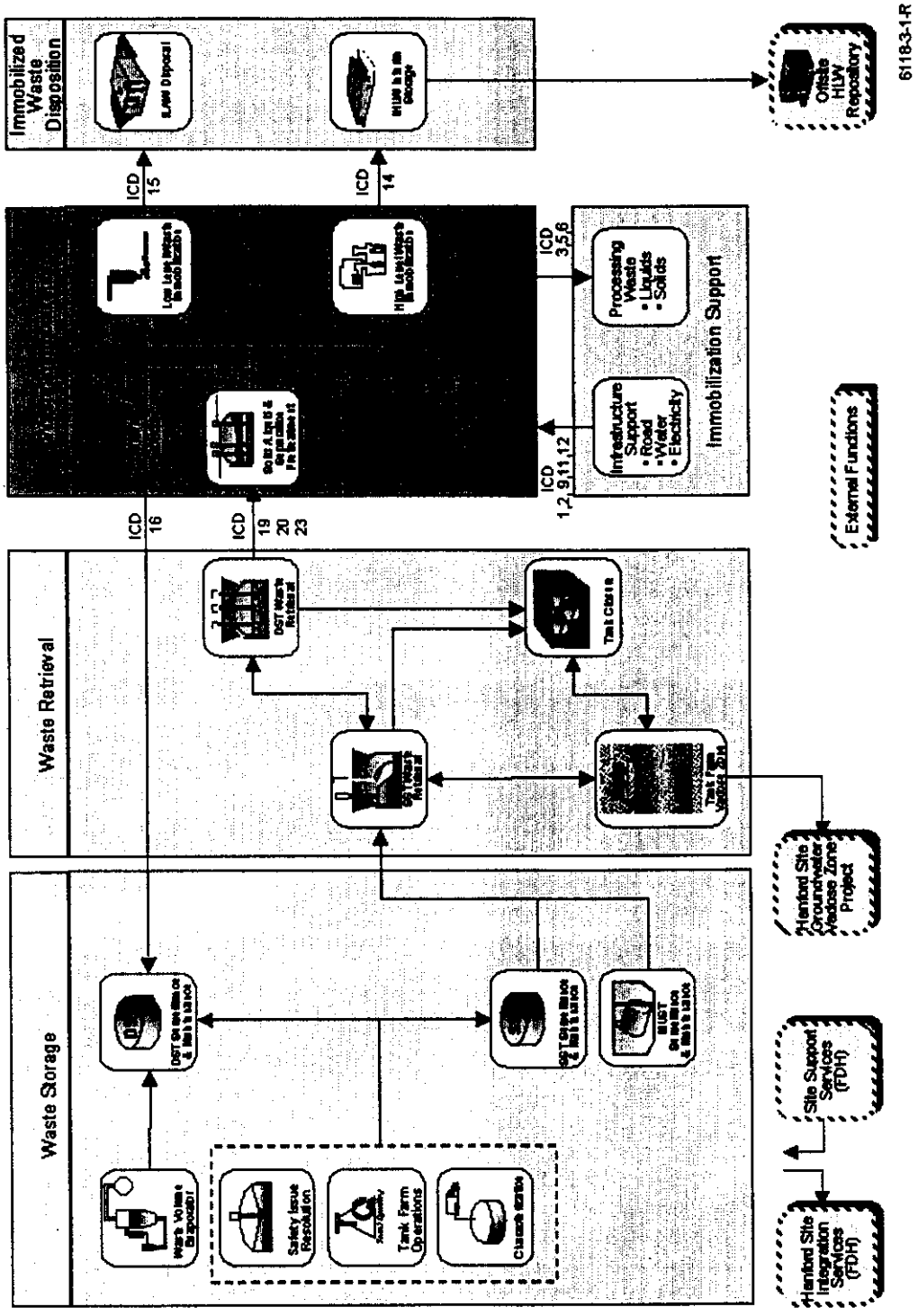


Figure 3-1. Functional Components of the River Protection Project.

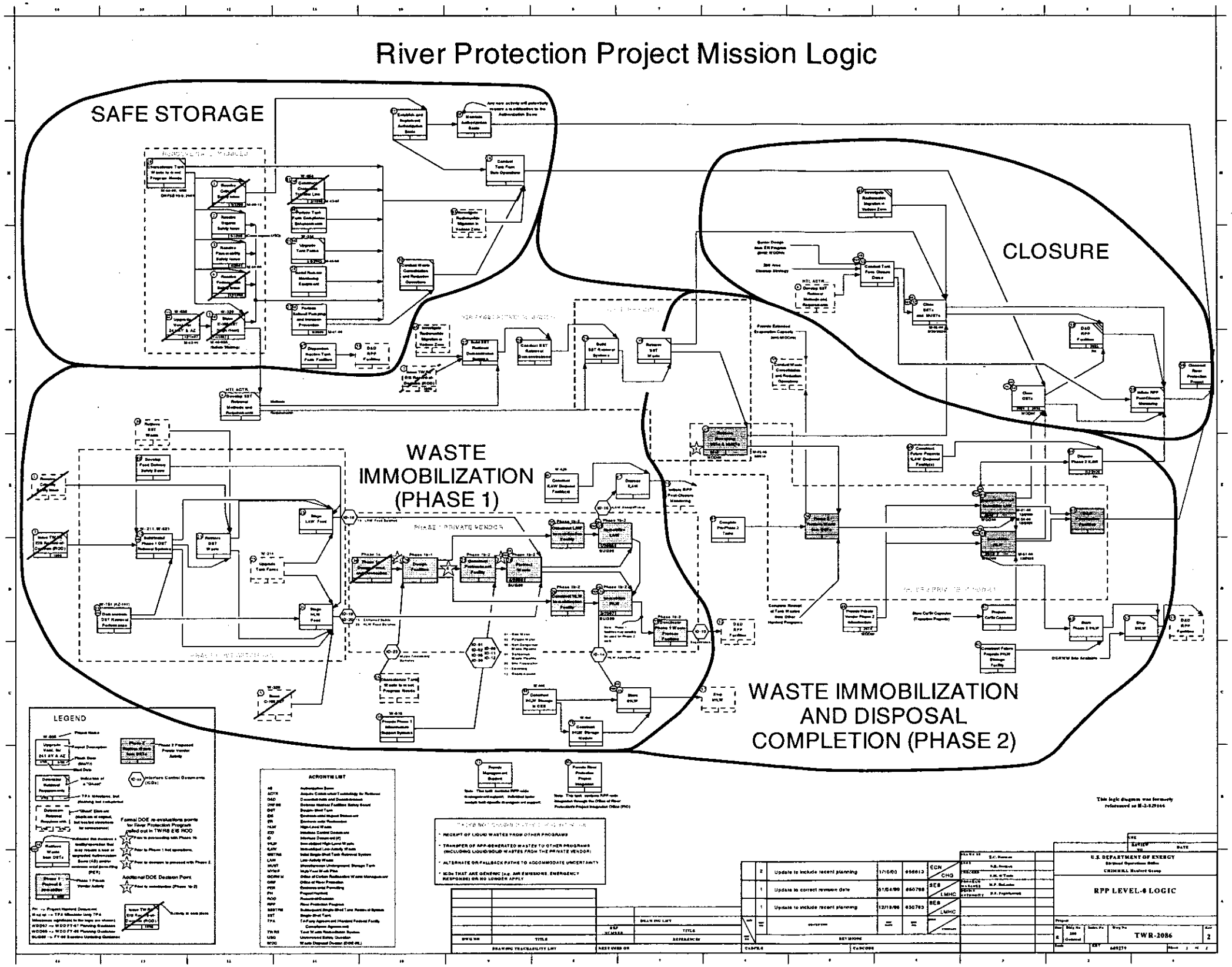
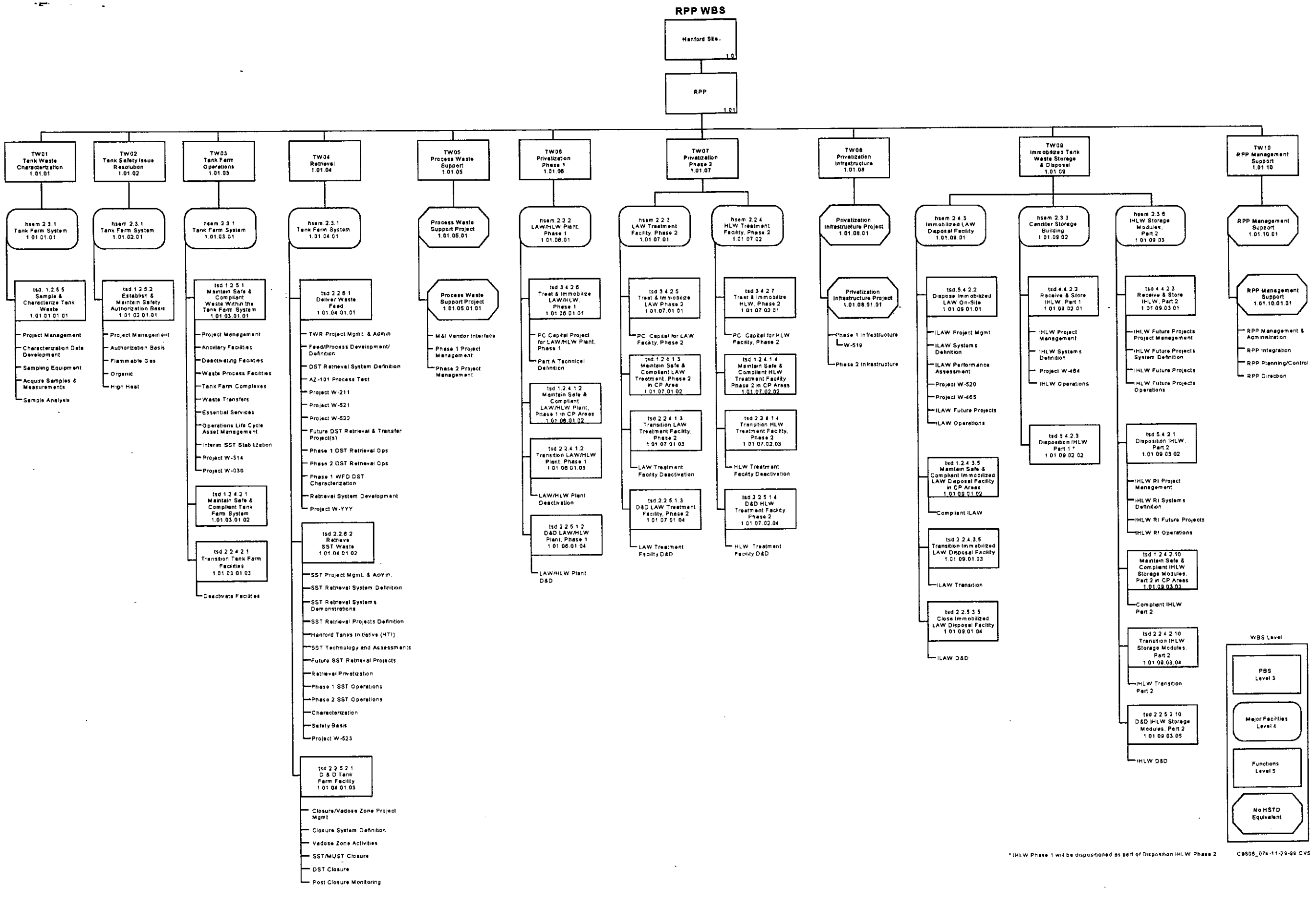


Figure 3-2. River Protection Project Mission Logic (River Protection Project Level 0 Logic).

Figure 3-3. River Protection Project Work Breakdown Structure



* IHLW Phase 1 will be dispositioned as part of Disposition IHLW Phase 2

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retrieval and disposal planning with emphasis on priorities for the full RPP mission. CHG's plan for the Phase 1 retrieval and disposal mission was developed based on this guidance. Subsequently, ORP provided additional assumptions that have been used to support the RTP analysis (Barrett 2000).

Critical items from this set of key planning assumptions are:

- FY 2001 funds are constrained to $382.1M. Budget/fund levels are unconstrained from FY 2002 through the end of the mission and are tied to full compliance requirements.
- Planning bases for feed delivery sequence and rates for both LAW and HLW minimum order are specified.
- Key startup dates were provided by ORP. These are listed in Table 3-1.

Table 3-1. Office of River Protection Baseline Guidance Schedules.

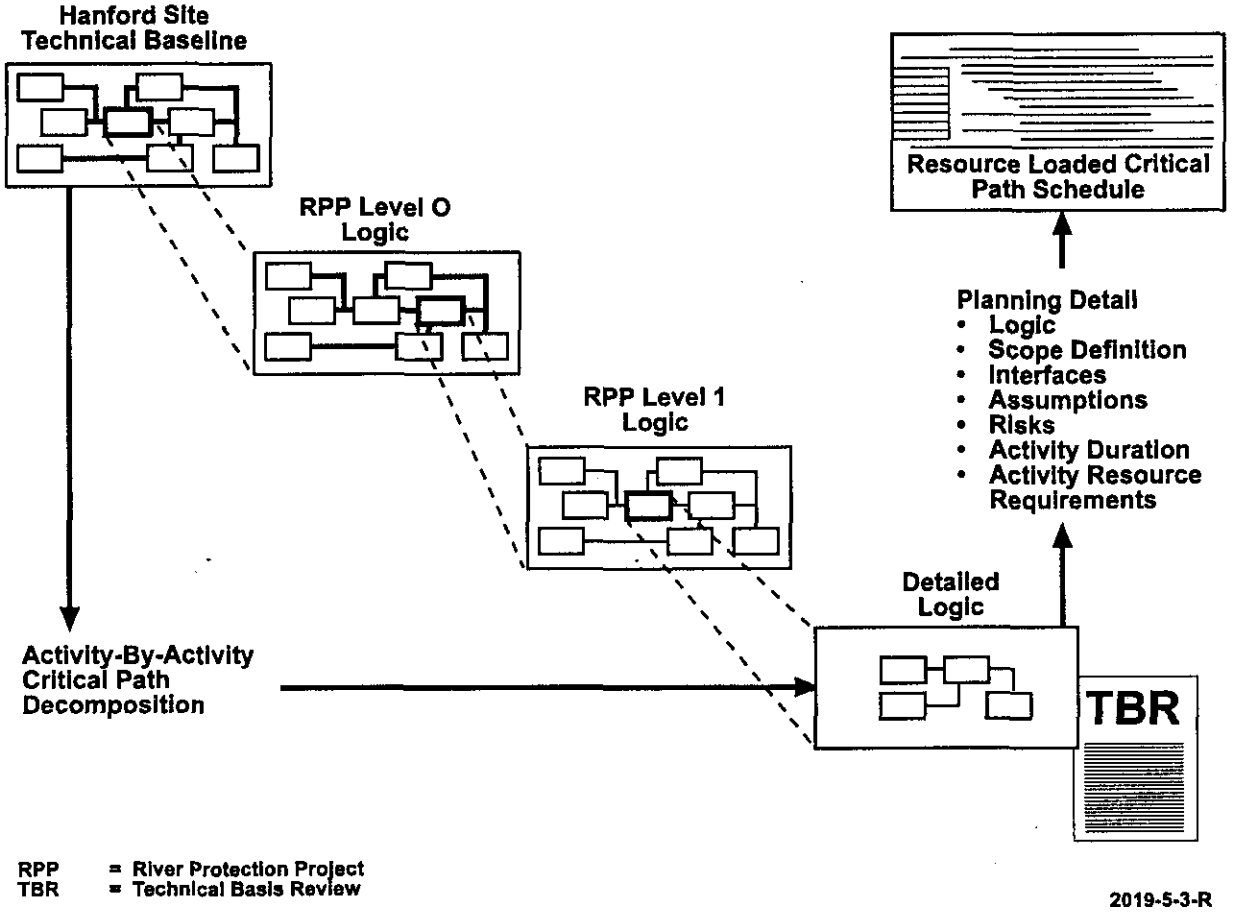
Key Startup Dates	
a. Delivery of first LAW batch initiated	February 28, 2006
b. First batch of LAW delivered	April 30, 2006
c. Delivery of first HLW batch initiated	August 31, 2006
d. First batch of HLW delivered	October 31, 2006
e. Delivery of first batch from second HLW staging tank initiated	January 31, 2008
f. First batch from second HLW staging tank delivered	March 31, 2008
g. Earliest date delivery of first AN-102 batch is initiated	December 31, 2008
h. Earliest date first AN-102 batch is delivered	February 28, 2009
i. Start LAW facility hot commissioning	November 30, 2006
j. Start HLW facility hot commissioning	May 31, 2007
k. Start LAW hot vitrification services	March 1, 2008
l. Start HLW hot vitrification services	September 1, 2008

FY = fiscal year.
HLW = high-level waste.
LAW = low-activity waste.

3.2 INTEGRATED BASELINE

CHG maintains a life-cycle integrated baseline of the technical, workscope, schedule, and cost requirements supporting the Phase 1 mission. The integrated baseline planning is a process that guides the project in the development of a consistent, efficient, and effective means for successful project performance and delivery. This integrated baseline planning process is depicted in Figure 3-4.

Figure 3-4. Integrated Baseline Development.



As noted in Section 3.0, overall workflow and sequence for the RPP is depicted in the RPP Mission Level 0 Logic (Figure 3-2). This logic identifies approximately 100 sequentially linked, broadly scheduled activities necessary to achieve the technical requirements of the mission. The RPP Mission Logic is the top-level basis for the RTP planning. CHG key assumptions were developed to bound scope and establish a basis for planning. The key assumptions were derived from DOE reference documents and are included in Appendix A.

The TFC used activity-based planning to define work scope and developed Level 1 Logics, which depict unique activities, logical interdependencies, and sequence of the technical scope necessary to achieve the tank waste retrieval and disposal mission. The diagrams identify logic, interface, scope, and support the detailed Technical Basis Review (TBR) packages generated for each activity identified on the Level 1 Logics. The updated logics are provided in HNF-1946, *Programmatic Baseline Summary for Phase 1 Privatization for the Tank Farm Contractor* (Diediker 2000).

The TBRs provide the lower levels of the schedule logic. The TBRs document the definition of work to be performed, interface requirements, assumptions, risks, skills and resources required to perform the work, organizational responsibilities for work performance, and defines how and when the work will be executed. Activity-based cost estimates are prepared at the lowest practical level of detail and include estimate basis, assumptions, and exclusions for each TBR.

The formal documentation captured in the TBR packages is used to produce a task-oriented, logic-driven, resource-loaded, critical path schedule. The integrated resource-loaded schedule provides a time-phased plan with a logical sequence of interdependent activities, milestones, and constraints. More than 12,000 schedule and cost-estimated activities are included in the proposed baseline schedule. This level of detail substantiates feed delivery, storage, and disposal, the rigor and depth of CHG's planning for waste feed delivery. Financial information is presented in the Baseline Summary (Diediker, 2000).

The Mission Summary Diagram provides a graphical summary of the detailed schedules for the Retrieval, Projects, and Operations mission and reflects the operating scenario and sequence of waste retrieval and delivery to the Privatization Contractor. Detailed planning assumptions and information on tank waste composition, existing or planned equipment, and operational capabilities are defined in HNF-SD-WM-SP-012, *Tank Farm Contractor System Operation and Utilization Plan* (Kirkbride 2000). The Mission Summary Diagram is shown in Figures 3-5 and 3-6.

The integrated baseline schedule and TBR documentation is key to conducting the financial and risk analyses. Risks were derived from detailed planning and linked to the RPP mission analysis, program logics, and critical path schedule assessment. The TFC project management team utilizes risk management strategy throughout the project life cycle. Mitigating actions and plans exist, with identified responsible parties, to manage each identified risk event. Detailed risk management process and results are documented in the *Financial Analysis for Phase 1 Privatization for the Tank Farm Contractor*, HNF-2017, Rev 2 (Basche 2000). Critical risks are further discussed in Section 4.2.

3.3 ANALYSIS

The updated RTP baseline was evaluated for technical conformance with guidance, financial risk (cost and schedule), and ability to manage staffing mission requirements.

3.3.1 Technical Analysis

In March, 2000 ORP modified its planning assumptions to eliminate sulfate removal from the vitrification flowsheet. This resulted in a decrease in the assumed sodium oxide loading of envelope B waste from 19.5% to 7.5% in the ILAW. These assumptions were formally transmitted to CHG on April 10, 2000, (Barrett 2000). CHG has performed a comparative analysis of the proposed updated Baseline Summary (Diediker 2000) with this ORP guidance using the Hanford Tank Waste Operations Simulator (HTWOS). A summary of the technical findings is included in Appendix C. These findings show that the need dates can be met for feed delivery and product storage and disposal. A more detailed discussion of this comparison can be found in the *Tank Farm Contractor Operations and Utilization Plan* (Kirkbride 2000).

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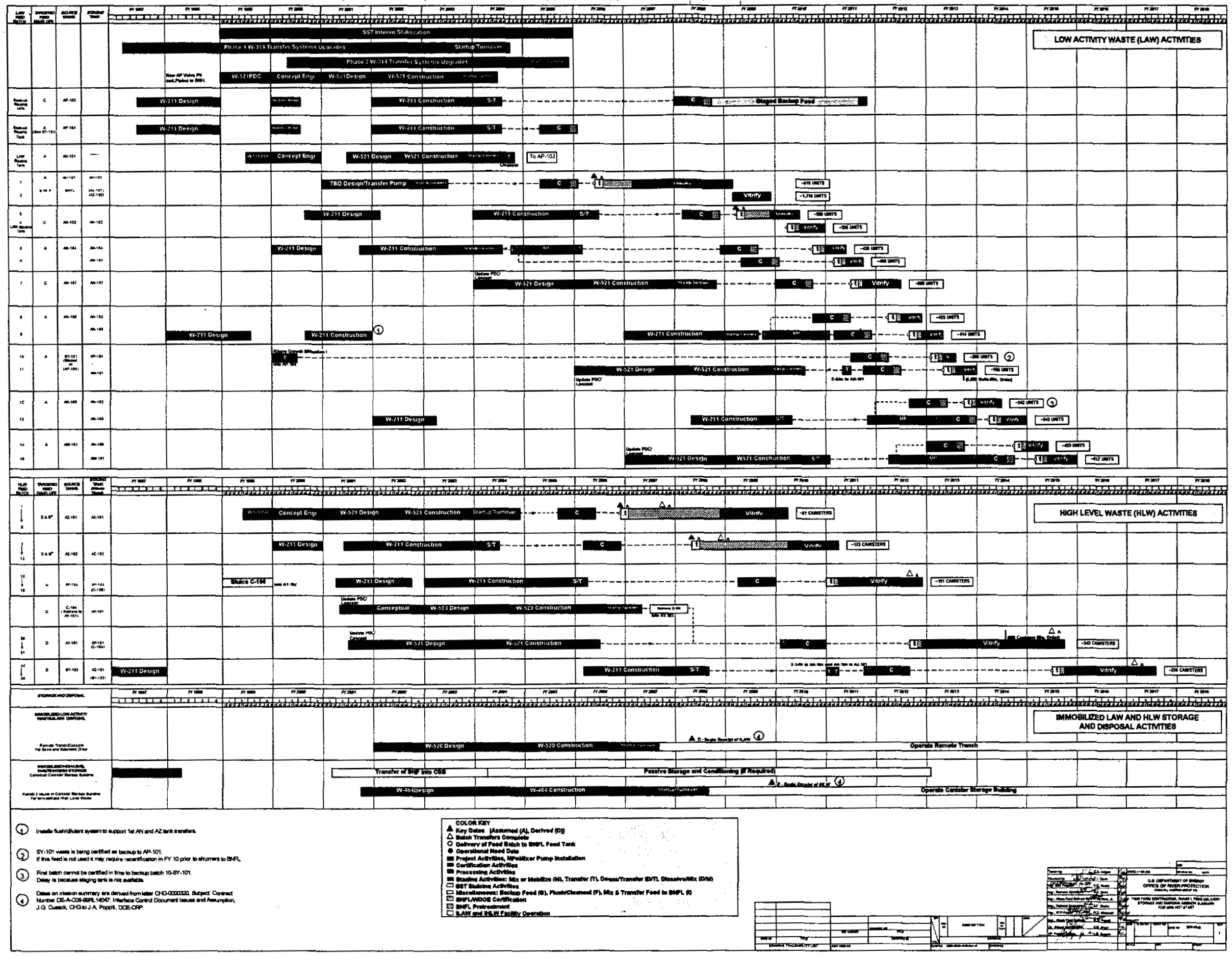
Figure 3-5. Feed Delivery, Storage, and Disposal Mission Summary for 2006 Hot Start.

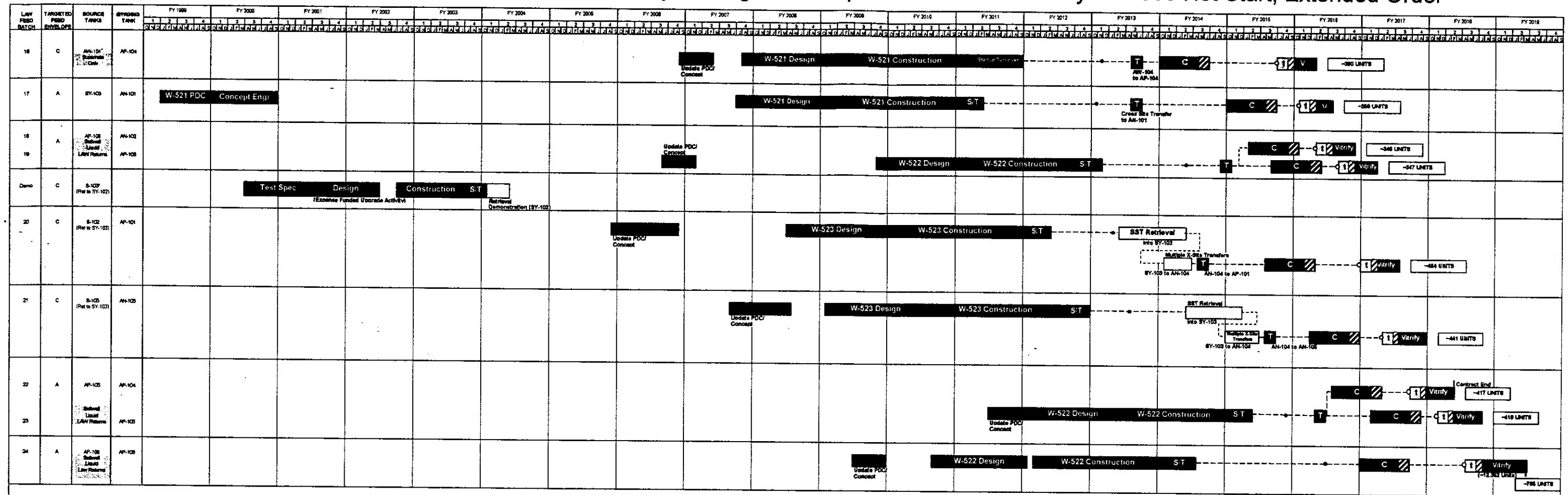
Tank Farm Contractor, Phase 1, Feed Delivery, Storage and Disposal Mission Summary for 2006 Hot Start



1. Installs fluxi/diluent system to support 1st AN and AZ tank transfers.
2. SY-101 waste is being certified as backup to AP-101. If this feed is not used it may require recertificaton in FY 10 prior to shipment to BNFL.
3. First batch cannot be certified in time to backup batch 10-SY-101. Delay is because staging tank is not available.
4. Dates on mission summary are derived from letter CHG-0000320, Subject: Contract Number DE-AC06-96RL14047, Interface Control Document Issues and Assumption, J.G. Cusack, CHG to J.A. Poppiti, DOE-ORP.

Figure 3-6. Feed Delivery, Storage, and Disposal Mission Summary for 2006 Hot Start Extended Order.

Tank Farm Contractor, Phase 1, Feed Delivery, Storage and Disposal Mission Summary for 2006 Hot Start, Extended Order



(1) Percentages of waste from AW-103 transferred AY-102 and AW-104 are to maximize the oxide loading in the blended feed from C-107 and AW-104. 40% remaining will be retrieved in Phase 2

COLOR KEY
- ▲ Key Dates (Assumed (A), Derived (D))
- △ Batch Transfers Complete
- ○ Delivery of Feed Batch to BNFL Feed Tank
- ● Operational Need Date
- Project Activities, MP=Mixer Pump Installation
- Certification Activities
- Processing Activities
- Staging Activities: Mix or Mobilize (M), Transfer (T), Degas/Transfer (D/T), Dissolve/Mix (D/M)
- SST Sluicing Activities
- Miscellaneous: Backup Feed (B), Flush/Cleanout (F), Mix & Transfer Feed to BNFL (t)
- BNFL/WDOE Certification
- BNFL Pretreatment
- ILAW and IHLW Facility Operation

U.S. DEPARTMENT OF ENERGY
OFFICE OF RIVER PROTECTION
CH2M HILL HANFORD GROUP, INC.
TANK FARM CONTRACTOR, PHASE I, FEED DELIVERY, STORAGE AND DISPOSAL MISSION SUMMARY FOR 2006 HOT START - EXTENDED ORDER

Table 3-2 compares the dates that were provided in the ORP guidance (Barrett 2000) with the corresponding dates included in the proposed updated baseline schedule as shown on the Mission Summary Diagram (Figures 3-5 and 3-6). In all cases the proposed updated baseline completes construction and the necessary operational evolutions in advance of the guidance dates.

Table 3-2. Comparison of Readiness-to-Proceed Baseline Schedule with Office of River Protection Planning Guidance.

Status	ORP April Guidance Need Date	RTP Baseline Schedule (Diediker, 2000) Available Date
Delivery of first LAW batch initiated	02/2006	1/2005
Delivery of first HLW batch initiated	08/2006	8/2005
ILAW Storage Available	12/2007	6/2007
IHLW Storage Available	9/2009	6/2008

HLW = high-level waste.
IHLW = immobilized high-level waste.
ILAW = immobilized low-activity waste.
LAW = low-activity waste.
ORP = Office of River Protection.
RTP = River Protection Project.

The analysis shows the feed, storage, and disposal systems will be available as required. The issue associated with feed envelopes is discussed in Section 5.1. The quantity delivered in accordance with the Feed Staging Strategy meets the minimum and extended order quantities for LAW and HLW.

Infrastructure is being put into place to support the RPP by Project W-519, TWRS Privatization Phase 1 Infrastructure Support. Project specifications and schedule progress provide confidence that the necessary infrastructure (water, electricity and roads) will be in place in time and consistent with the privatization contract and associated infrastructure ICDs. The analysis also considered the quantities, schedule and compositions of byproducts received from the Privatization Contractor as defined by the contract and ICDs. Related cases were analyzed by the simulator models.

3.3.2 Financial Analysis

A financial analysis was performed to document the results of the risk-based analysis (Basche 2000). The analysis addressed the executability of the proposed baseline cost and schedule and recommended program additions to meet the 80% probability of success target required by (Short 2000) and (Barrett 2000).

The tank waste retrieval and disposal total unescalated budget requirements are $3,528M including other adjustments of $288M and $66M risk adjustment (see HNF-2017 [Basche 2000]) for detailed explanation of cost adjustments). The risk-based cost analysis suggests an allowance of $66M above the baseline to achieve the desired 80% probability of success. With escalation, this total budget is $4,146M. The costs for Phase 1 and the balance of the mission are presented

in Table 3-3. The updated escalated total RPP budget requirement excluding the Privatization Contractor portion over the Phase 1 life (FY 2000 through FY 2018) is approximately $17 B.

Table 3-3. Tank Farm Contractor Budget Analysis Summary FY 2000 through FY 2018.

	Retrieval and Disposal Phase 1 FY00 – FY18	**CHG Total Program FY00 – FY18**
Updated Baseline Budget	$ 3,174	$ 12,987
Additional Risk Allowance (not previously included)	$ 66	$ 66
Budget Adjustments	$ 288	$ 697
Subtotal	$ 3,528	$ 13,750
Escalation	$ 618	$ 3,387
Total	$ 4,146	$ 17,137

CHG = CH2M HILL Hanford Group, Inc.
FY = fiscal year.

The risk-based schedule analysis provided confirmation that the required schedule could be met with an acceptable probability of success. Table 3-4 contains the predicted 80% confidence completion dates of selected key events. Note that the dates determined by the probabilistic analysis at 80% confidence level are different than the baseline schedule dates shown in Table 3-2. However, the 80% confidence dates are all earlier than the need dates. Thus the risked-based analysis demonstrates the acceptability of the proposed schedule. Capital project portions of the program already have contingency incorporated in their baselines so no additional cost and schedule risk analysis was completed on this portion of the Phase 1 lifecycle budget. Management systems costs also were not evaluated because they are essentially level-of-effort activities and do not contain significant technical or programmatic risks.

Table 3-4. Schedule Analysis Summary.

	ORP April Guidance Need Date	**Target Date in Proposed Baseline at 80% Probability (Basche 2000)**
Delivery of first LAW batch initiated	2/2006	7/2005
Delivery of first HLW batch initiated	8/2006	5/2006
ILAW storage available	12/2007	10/2007
IHLW storage available	9/2009	9/2008

HLW = high-level waste
IHLW = immobilized high-level waste.
ILAW = immobilized low-activity waste.
LAW = low-activity waste.
ORP = Office of River Protection.

3.3.3 Staffing Plan and Analysis

The *Human Resources Staffing Plan for the Tank Farm Contractor*, RPP-6114 (Bosley 2000), evaluates the staffing needs for CHG and its subcontractors as well as listing the staffing needs of Fluor Hanford, Inc. (FH), and BNFL. A summary of the baseline staffing need for the first nine years is shown in Table 3-5 to address construction and operating staff needs through the construction and hot commissioning of the RPP Phase 1 Mission.

Table 3-5. CH2M HILL Hanford Group, Inc.; Fluor Hanford, Inc.; and Privatization Contractor Staffing Profile Summary.

Description	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08
CHG non-project staff – including FH and NHC support to RPP	1,634	1,599	1,660	1,559	1,402	1,215	1,177	1,282	1,405
CHG subcontractor support	466	458	496	453	413	479	493	580	413
CHG feed delivery/storage A/E and construction staff	98	288	613	421	464	408	278	171	135
CHG operations staff for feed delivery/storage construction projects	59	79	79	139	159	159	139	95	139
CHG Subtotal	2,257	2,424	2,848	2,572	2,438	2,261	2,087	2,128	2,092
FH projects staff	2,164	2,292	2,244	2,160	1,757	1,625	1,625	1,625	1,625
Operator, craft, and operating engineer support for the Privatization Contractor	0	0	0	0	0	270	0	0	0
Privatization Contractor operations and maintenance staff	0	50	110	239	551	823	798	692	526
Privatization Contractor construction staff	932	2,463	3,058	3,477	1,968	931	537	383	252
Totals	5,353	7,229	8,260	8,448	6,714	5,910	5,047	4,828	4,495

1. Staffing needs for FY 2004 and beyond may be underestimated; not all Privatization Phase 2 activities have identified staffing needs. Out-year decline in planned activities may make operators available for Phase 2 activities.

2. FH staffing needs for FY 2006 through FY 2008 were not available. CHG assumed that FH staffing needs for FY 2006 through FY 2008 would be at same level as FY 2005 staffing needs.

A/E = architect/engineer.
CHG = CH2M HILL Hanford Group, Inc.
FH = Fluor Hanford, Inc.
FY = fiscal year.
RPP = River Protection Project.
NHC = Numatec Hanford Company.

CHG identified four staff skill areas that will experience growth and will be in demand. This growth and demand by competing companies is above their routine recruitment levels, as well as those levels provided through architectural/engineering vendors, local union halls, construction resources from Umatilla Army Depot out-year downsizing, and reduced Washington State construction resulting from passage of Initiative 695. These four skill areas include crafts, engineers, operators, and health physics technicians. Specific recruitment strategies have been developed for each of these areas to ensure that appropriate skills are available to meet mission objectives.

Based on the evaluation, CHG is confident that it can recruit the required staff to successfully support Phase 1. The identified recruitment strategies are flexible enough to accommodate changes in staff mix and support future changes in the RPP baseline.

It should be noted an increase in staff requirements in FY 2005 for 270 craft, operators, and operating engineers for the Privatization Contractor is in the CHG cost baseline. The data are included in the Staffing Plan to highlight the need for these resources at the Hanford Site. The baseline includes $26,376,000 for labor costs associated with hiring and training these individuals. However, the hiring and training of the individuals for these positions is not the contractual responsibility of CHG. Therefore, CHG requested that ORP resolve responsibility for hiring and training the staff for these positions through the Integrated Process and Product Development (IPPD)/ICD process "Contract Number DE-AC06-99RL14047, Coordination of Staffing and Training Plans" (Dehn 2000a) See Section 5.1 for further discussion of this hiring and training issue.

3.4 ABILITY TO SUPPORT ALTERNATIVES OTHER THAN THE BASELINE

The TFC has consistently demonstrated over the design evolution of the RPP project that it has built flexible plans that can deal with a large variety of feed delivery options, production rates, and delivery schedules. For example, the current RTP baseline strategy has been modified so that waste feed is available from multiple sources in the event a failure occurs in a tank or a farm. Contingency and back up feeds have been identified and scheduled in the baseline. These contingencies provide assurance that feed delivery will not result in idle facility penalties for unused capacity.

The TFC has developed a series of management and analytical tools that are used to support ORP issue evaluations, technical interface issues, project design questions, and support alternative "what if" analyses. These tools include:

- Best Basis Inventory of Tank Contents. This is the authoritative basis to project chemical and radionuclide content of each waste tank. It is updated on a regular basis to incorporate new sampling and operational information.

- Hanford Tank Waste Operations Simulator (HTWOS). This simulator which models chemical characteristics, physical transfers and routing, schedule analysis, and top-level logistics analysis. The simulator and associated special models are the workhorses behind the TFC OUP, the Operational Waste Volume Projections, the Salt Well pumping plan.

- Baseline Resource Loaded Critical Path Schedules. The schedules and the associated databases allow evaluation of cost and schedule impacts of various technical alternatives. Depending on the detail required, special planning cases can be developed to assess cost and schedule impacts to support decision making by ORP.

In the last two years, these tools have been used to develop information supporting baseline changes. These ongoing assessments have demonstrated that the TFC can respond to a variety of scenarios. The following are examples of these studies.

- Scenarios Supporting Feed Delivery Planning. More than a dozen alternative feed delivery strategies were modeled using the HTWOS model for the latest revision of the TFC O&UP. These were variations of three general scenarios:
  - Changes in start-up schedules for the Privatization Contractor's Waste Treatment Plant
  - Changes in the rate at which the RPP Waste Treatment Plant facilities are able to achieve their maximum sustainable operating rate
  - Changes in waste loading in the immobilized glass products.

  The results of these analyses were used by ORP to establish planning guidance for the RTP baseline update presented in this document.

- Alternative Generation and Analyses. Alternative generation and analyses studies were performed by the TFC leading to decisions on technical paths forward for the technical baseline. An example of this effort was the Immobilized Low-Activity Waste Disposal Alternatives study and decision to proceed directly with a remote handled trench, rather than using upgraded grout vaults. This change in baseline provided a cost savings of approximately $250M.

  Electrical substation capacity and interface hardware alternatives were evaluated and the project baseline changed to meet Waste Treatment Plant needs efficiently and cost effectively.

- System Optimization Studies Input was provided and results were incorporated into the baseline as directed for these major studies conducted by the Privatization Contractor. Examples of beneficial changes include the elimination of the transfer of a waste tank to the Privatization Contractor and the elimination of cesium and pretreated feed being returned to the TFC for interim storage.

Because TFC has built flexible plans, developed management and analytical tools, and applied these tools to support the design evolution and resulting baseline changes, CHG feels confident in its ability to support alternatives other than the baseline.

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4.0 MANAGEMENT SYSTEMS

The management systems include the essential elements of people, processes, tools, and structure that when integrated, form the basis for effective project and product delivery. The processes, tools, and structure as defined in management plans and procedures are addressed in Section 4.1. These processes are described in the context of the organizational structure shown in Figure 4-1.

CHG recognizes the importance of solid planning, policy, and execution documentation to conduct and control of the work. As part of the RTP evaluation process, existing TFC administrative systems and documentation were assessed and, where necessary, improved. CHG management and external consultants played an active role in the production of approved documentation that represented an integrated, comprehensive plan for the tank waste retrieval and disposal mission. Part of this documentation is the assumptions and risks. These are addressed in Section 4.2. In preparation for this declaration of readiness, CHG initiated and participated in a number of reviews to assess status. The review and audit teams provided valuable feedback to the organization for continuous improvement. These reviews are addressed in Section 4.3.

4.1 MANAGEMENT PLANS AND PROCEDURES

The *Draft Project Execution Plan for the Tank Farm Contractor*, RPP-6017 (Halverson 2000) describes how CHG executes the contract work scope, and provides guidance to managers, employees, other site supporting contractors and subcontractors on safe and efficient project delivery. The plan provides a mapping to key management policies, plans, and procedures with a focus on project delivery and compliance. The Project Execution Plan includes discussion on planning, work authorization, contract management, acquisition support, requirements management, change control, performance measurement, communications and information management, interface control, risk management and decision management. It also indicates which documents contain additional details of the Project Integrated Baseline and the baseline document hierarchy. The TFC document structure is shown in Figure 4-2.

The Project Execution Plan provides the structure for implementing the requirements that will be identified in the *River Protection Project Mission Analysis Report*, (ORP 2000a) and the *River Protection Project – Project Management Plan* DOE/ORP-2000-06 (ORP 2000b). These two documents (both the responsibility of the ORP) were not scheduled to be available for review before this memorandum and the RTP-2 deliverables are submitted. Therefore, the CHG commitment was to prepare a "draft" Project Execution Plan.

The *Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor* (Lake 2000) describes the Integrated Safety Management System (ISMS) used to ensure that safety and quality is integrated into management and work practices at various levels for work performed by CHG for ORP. This document demonstrates protection of the worker, public, and environmental safety for work supporting the RPP mission.

Figure 4-1. CHG Organization Chart.

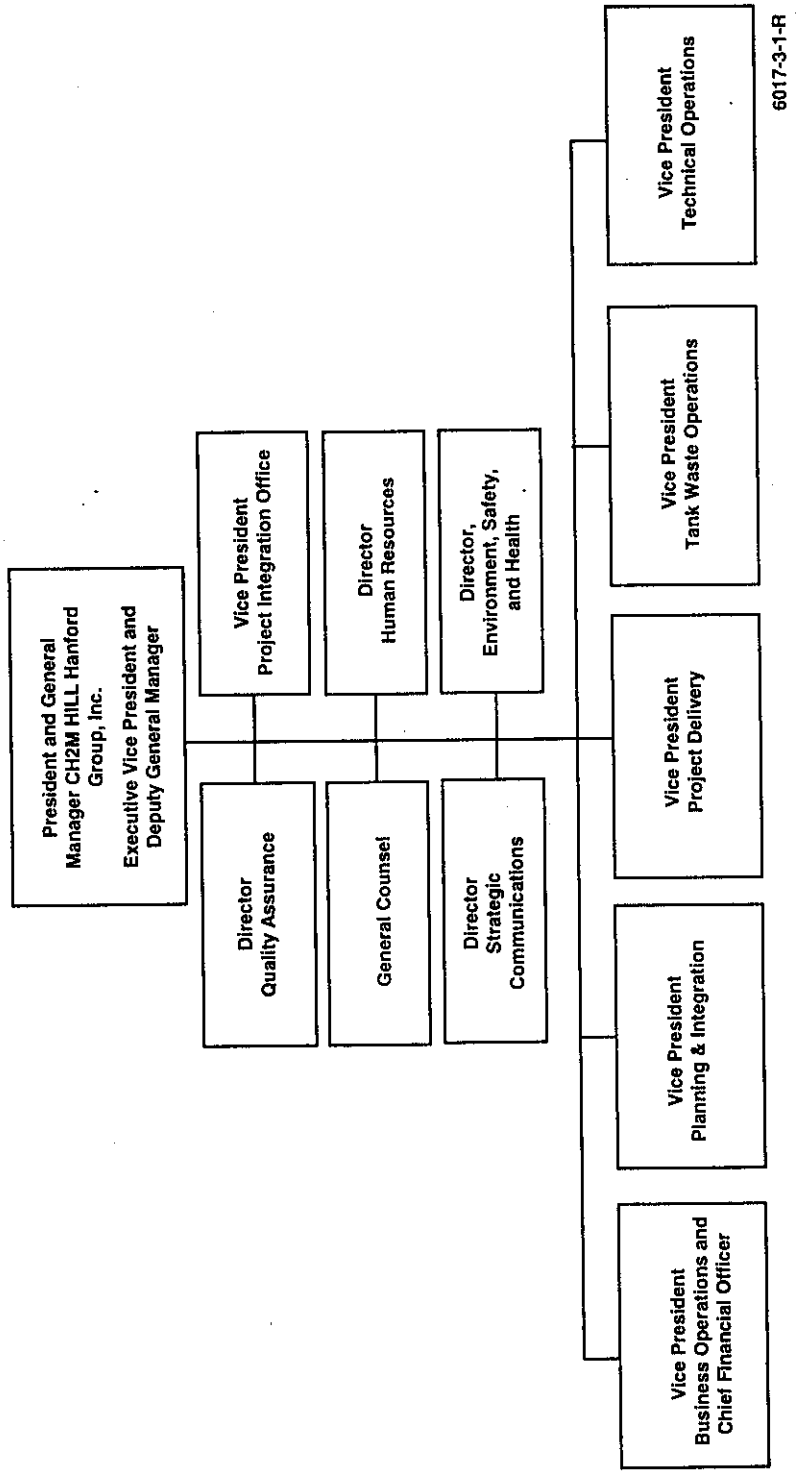
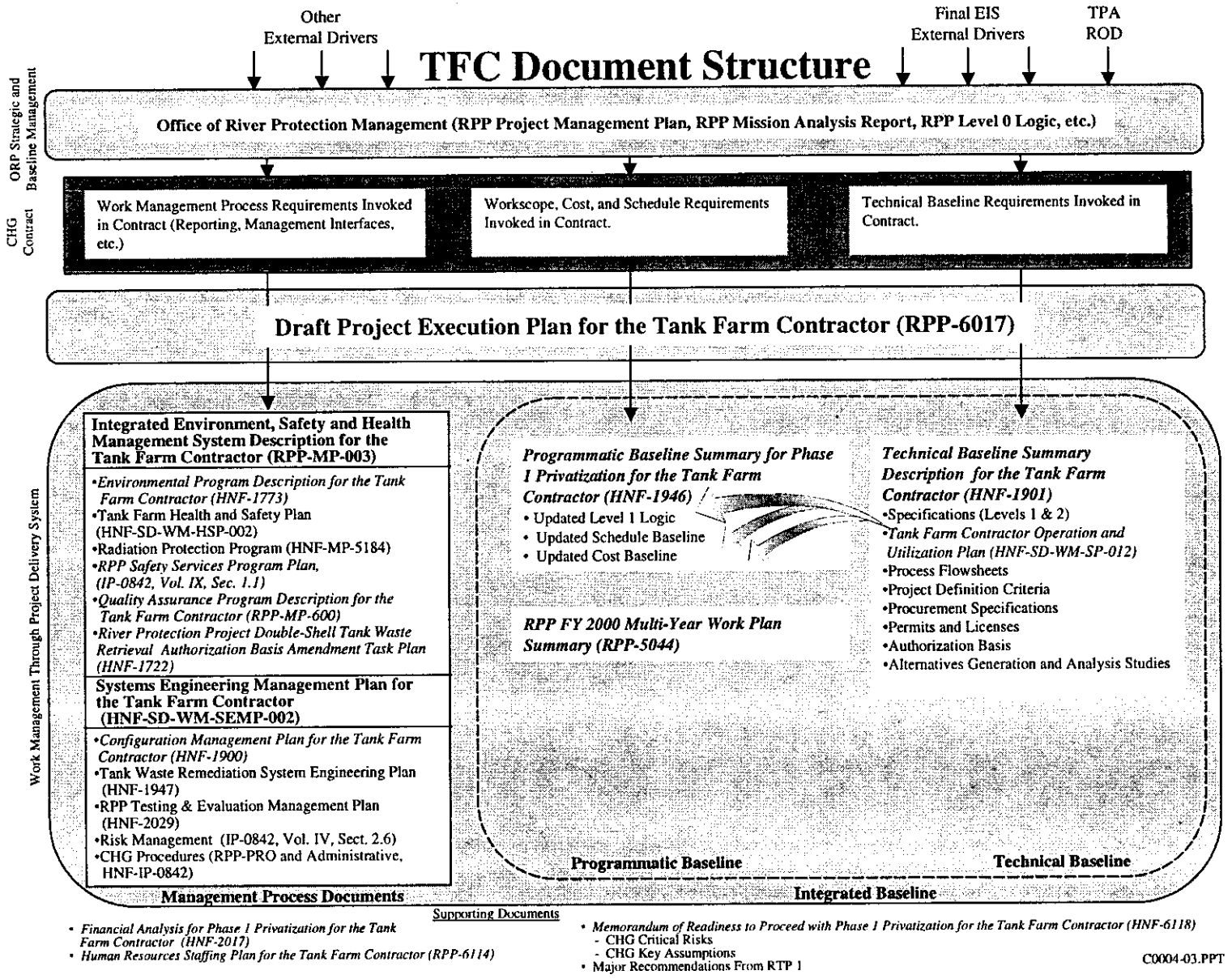


Figure 4-2. Tank Farm Contractor Document Structure.



A number of additional management process, program baseline, and technical baseline documents have been updated or prepared and submitted to ORP for this readiness to proceed. Those documents were listed in Table 1–1.

In addition to the information requested for this declaration, CHG also prepared or upgraded a number of other documents as part of the preparation for this mission. Review of these documents provides additional assurance that administrative systems are ready. Those documents are listed in Table 4-1.

Table 4-1. Other Documents Supporting Readiness to Proceed.

Document Title	Document No.*
Systems Engineering Management Plan for the Tank Farm Contractor	HNF-SD-WM-SEMP-002 (O'Toole 2000)
Project Delivery Acquisition and Contracting Plan for the Tank Farm Contractor	RPP-6113 (Mercado 2000)
River Protection Project Double-Shell Tank Waste Retrieval Authorization Basis Amendment Task Plan	HNF-1722 (Harris 2000)
Double-Shell Tank Process Waste Sampling Subsystem Specification	HNF-4154, Rev. 0 (CHG 2000)
Double-Shell Tank Monitor and Control Subsystem Specification	HNF-4155, Rev. 0 (CHG 2000)
Double-Shell Tank Utilities Specification	HNF-4157, Rev. 0 (CHG 2000)
Double-Shell Tank Maintenance and Recovery Subsystem Definition Report	HNF-4159, Rev. 0 (CHG 2000)
Double-Shell Tank Transfer Valving Subsystem Specification	HNF-4160, Rev. 0 (CHG 2000)
Double-Shell Tank Transfer Piping Subsystem Specification	HNF-4161, Rev. 0 (CHG 2000)
Double-Shell Tank Transfer Pump Subsystem Specification	HNF-4162, Rev. 0 (CHG 2000)
Double-Shell Tank Diluent and Flush Subsystem Specification	HNF-4163, Rev. 0 (CHG 2000)
Double-Shell Tank Mixer Pump Subsystem Specification	HNF-4164, Rev. 0 (CHG 2000)
Double-Shell Tank Ventilation Subsystem Specification	HNF-5196, Rev. 0 (CHG 2000)
System Specification for the Double-Shell Tank System	HNF-SD-WM-TRD-007, Rev. 0 (CHG 2000)
Financial Analysis for Phase 1 for the Tank Farm Contractor	HNF-2017 (Basche 2000)
Evaluation Criteria to Deliverables Crosswalk for the Tank Farm Contractor	RPP-6224 (Kingsbury 2000)

*Double-Shell Tank Waste Retrieval Specification (CHG 2000) reference citations are presented in a separate table at the end of Section 6.0.

4.2 KEY ENABLING ASSUMPTIONS AND CRITICAL RISKS

CHG Key Enabling Assumptions

Assumptions are required to enable programmatic planning to proceed in the absence of validated requirements. Planning assumptions are therefore documented as part of the technical or program baseline to support a defensible planning foundation. The CHG key enabling assumptions list (Appendix A) provides the major assumptions that enable planning for tank waste retrieval and disposal mission. The CHG key enabling assumptions come from several sources including:

- Planning guidance provided by the ORP
- Specifications in ORP's contract with the Privatization Contractor for tank waste treatment and immobilization services
- Technical assumptions developed internally by CHG.

CHG Critical Risks

Risks arise from uncertainties in technical assumptions or performance; estimates of cost and schedule; and changes in programmatic policies, procedures, guidance, and requirements. The consequences of the unplanned event happening (the risk actually comes to pass) can result in cost, schedule, and/or technical performance impacts.

As part of its work planning process, CHG has identified the critical risks that should be managed to successfully execute its tank waste retrieval and disposal mission for Phase 1 (Appendix B). Critical risks are defined as those risks that are elevated from the work planning, line item project, or program level because one or more or the following conditions are met.

- Risk value is high.
- Consequences are serious.
- Immediate action is required.
- Issue has high visibility/interest from stakeholders or the Federal Government.
- Required mitigation actions are difficult to coordinate.
- Senior management decision is required.

The risk management process is documented in CHG's *RPP Administration,* HNF-IP-0842, Vol. IV, Sec. 2.6, "Risk Management" (CHG 2000c).

Summary of Tank Waste Retrieval and Disposal Mission Risk

Overall the level of programmatic risk associated with CHG's portion of the RPP mission is acceptable. Mitigating actions for risk have been included in the planning. The level of technical uncertainty is considered to be low because of the following:

1. The required operations and facilities either exist or are well understood.
2. Contingencies have been incorporated into technical operations, e.g., back up tanks have been identified in the event that a primary tank does not meet the feed specification.
3. No technology breakthroughs are required to perform the mission.
4. The technical work is well understood for design, construction, and operations.
5. The technical uncertainties that appear on the list, e.g., mixer pump performance, are manageable.

Schedule delays are the primary source of risk for the tank waste retrieval and disposal mission. For example, Waste Feed Delivery's ability to recover from a pump failure is predicated on how quickly a pump can be replaced and/or whether an alternative waste transfer route or alternative source of tank waste can be used. Management of human resources (e.g., skill mix, sufficient construction forces, key support staff, construction activity interactions with on-going tank farm operations) are another source of potential schedule risk to CHG. The logistical constraints of interaction by multiple construction contractors are addressed in the critical risks CR-013 and CR-066 (Appendix B). Effective recruitment and training programs, coupled with careful work planning and prudent use of key human resources, can effectively mitigate much of the risk associated with these issues (Bosley 2000).

The planning and systems to avoid or mitigate schedule delays are in place, and additional improvements are planned. For example, CHG's schedules include schedule contingency; however, this contingency must be managed carefully to maintain the schedule through the key phases of construction and turnover/start up. An in-depth analysis of CHG's schedule risk is provided in HNF-2017 (Basche 2000).

Several of the CHG Critical Risks identified in Appendix B require actions by the ORP and/or the Privatization Contractor to effect an optimal mitigation strategy. Risks that require the attention of ORP in the near future are discussed further in Section 5.1.

CHG will work with the ORP and the Privatization Contractor to develop cost-effective risk mitigation strategies that will further enhance the probability of successfully executing the RPP mission.

4.3 REVIEWS

A series of reviews have been conducted to assure that CHG's administrative systems are in place to support the mission. The reviews have provided valuable feed back to management for continuous improvement.

ORP Preliminary Review

DOE ORP has developed a series of criteria review assessment documents (CRADs) based on *Life Cycle Asset Management*, DOE O 430.1A (DOE 1998) for use in conducting the RTP evaluation. The RTP criteria then were used to evaluate the CHG program planning and technical documentation. Results of that analysis and the CHG follow up actions essential to the Phase 1 RTP decision are shown in Table 4-2.

External Independent Review

The EIR is being conducted in response to a Congressional mandate that directed DOE to use non-proponent experts to conduct an EIR on all new-start projects whose value is greater than a specified threshold. The purpose of an EIR is to determine objectively whether the scope of the project; its underlying assumptions regarding technology and management; cost and schedule baselines; and contingency provisions are valid and credible within the budgetary constraints under which DOE must operate. The RPP evaluation is being conducted in a two-stage process, Tasks A and B. Task A had three purposes: (1) to assess the readiness of the RPP to undergo detailed review, (2) to develop Lines of Inquiries (LOI) to pursue during Task B, and (3) to develop a plan for Task B. Task B is the detailed Review and Analysis.

Table 4-2. Office of River Protection Criteria Requirements Analysis Document Review Issues and Resolution.

ORP CRAD Review Essential Actions		
CRAD	**Issue**	**Resolution**
1.4	Approve change control procedure	Complete, HNF-IP-0842, Vol. VIII, Section 1.1, "Baseline Change Control"
1.4	Implement change control training plan	Complete, Web based training www.rl.gov/twrs/training/baselinechange/index.htm
3.2/7.8	Correct procurement quality assurance problems	Temporary measures identified and corrective action plans in place
3.7	Continue to develop performance profiles per HNF-3943 (O'Toole and Rossi 1999)	Issue downgraded Letter CHG-0001661.1 (Wood 2000a)
4.8	Complete staffing plan	Complete, RPP-6114 (Bosley 2000)

CRAD = Criteria Requirements Analysis Document.
ORP = Office of River Protection.

The Task A conclusion of the EIR Team was that the RPP is ready to undergo Task B, Detailed Review and Analysis.

Lines of Inquiry for Task B have been developed in seven broad areas:

- Project Management
- Business, Finance, Contracting and Capital Finance
- Technical Processes (Vitrification)
- Nuclear Waste Processing
- Nuclear Regulation
- Environmental
- Facilities and Construction.

These LOIs were interpreted as being applicable to CHG. CHG documentation has been identified that addresses the EIR LOI.

CHG Criteria Review Assessment Document Crosswalk

Guidance and requirements for RTP are extensive, and a comprehensive set of mission documentation has been developed. Key planning products were updated for the RPP RTP and document hierarchy, as shown in Section 1.0 (Table 1-1) and Figure 4-2. As an aid to assure completeness, a crosswalk (RPP-6224, *Evaluation Criteria to Deliverables Crosswalk for the Tank Farm Contractor* [Kingsbury 2000]) was constructed to link each guidance or requirement item to one or more mission documents. This crosswalk served as a mechanism to assure that all of the CRADs and LOI are being addressed.

Internal Independent Review Team Assessment

Six independent experts were requested by CHG to assess CHG's RTP. The independent experts were selected based on expertise with the Hanford facilities and the readiness review topics.

This Internal Independent Review Team assessed the CHG readiness in the *River Protection Project Readiness-to-Proceed 2 Internal Independent Review Team Final Report*, HNF-5835 (Schaus 2000). A summary of their findings stated:

> "The Internal Independent Review Team reviewed the Readiness-to-Proceed 2 (RTP-2) documentation, interviewed appropriate CHG personnel, and assessed the status of the construction projects needed to ensure the program's success. The Internal Independent Review Team concluded that CHG has a clear and complete understanding of the work to be accomplished and adequate planning is in place to support Phase 1 of Privatization. CHG has the plans in place to provide the following:
>
> 1. The necessary infrastructure support to BNFL
> 2. The HLW feed to BNFL when it is needed
> 3. Storage of the immobilized HLW and disposal of the IHLW.

> The construction projects needed to support Phase 1 are well planned and, with adequate funding, can be in place when needed. The Internal Independent Review Team found some areas of deficiency that CHG management should correct before the RTP-2 memorandum and deliverables are submitted and other areas that, while not crucial to DOE's decision on RTP, are weaknesses that should be corrected in a longer period to improve the overall program."

The deficiencies noted by the review team are listed in Table 4-3. All recommendations for correction prior to RTP-2 have been addressed.

Fluor Hanford, Inc., Readiness Review

FH evaluated its readiness to support the ORP Phase 1 Part B-2 decision against the CRADs. The FH readiness effort was integrated with that performed by ORP and its contractor's. In preliminary results shared with the TFC, FH found that it was ready to proceed. The assessment identified risks and mitigating actions with particular emphasis on several interface concerns and analytical laboratory funding. These issues are addressed further in Section 5.0.

Other Reviews

In addition to the items identified above, CHG considered two other recent relevant reports. The conclusions and recommendations of the recent Audit Report (*"Audit Report, The Management of Tank Waste Remediation at the Hanford Site, January 2000 - Holbrook Report,"*[DOE 2000]) were considered in the execution of this RTP evaluation as they apply to Phase 1. In Section 5.0 several of the issues brought up in this report regarding integrated life-cycle planning are further discussed.

Table 4-3. Internal Independent Review Team Pre-Readiness-To-Proceed Review. (2 sheets)

CRAD	Issue	Resolution
1.0	CHG should sign ICDs; consider adding ICDs to CHG contract; place ICDs under configuration control	Complete Letter CHG-000125 (Dehn 2000b)
1.0	Identify plans, policies, procedures, and directives to revise	Complete RPP-6118
3.0	Update the SEMP	Complete HNF-SD-WM-SEMP-002
3.0	Improve control of study requests and requirement changes from ORP	Complete RPP-6117

Table 4-3. Internal Independent Review Team Pre-Readiness-To-Proceed Review. (2 sheets)

CRAD	Issue	Resolution
3.0	Develop action plan for timely issuance of Level 1 and Level 2 specifications	The following specifications have been prepared: HNF-4154, HNF-4155, HNF-4157, HNF-4159, HNF-4160, HNF-4161, HNF-4162, HNF-4163, HNF-4164, HNF-5196, HNF-SD-WM-TRD-007 (Double-Shell Tank Waste Retrieval Specifications, CHG 2000)
7.0	ES&H Program Plan and Integrated ES&H Management System Plan should include all safety and health programs	Complete RPP-MP-003 (CHG 2000), HNF-IP-0842, Vol. IX, Section 1.1 (CHG 2000e)

CHG = CH2M HILL Hanford Group, Inc.
CRAD = criteria review assessment document.
ES&H = Environment, Safety, and Health.
ICD = Interface Control Document.
ORP = Office of River Protection.
RTP = readiness to proceed.
SEMP = Systems Engineering Management Plan.

The conclusions and recommendations of the recent Office of Science and Technology Tanks Focus Area report, (DOE/EM-0493, "Technical Alternatives to Reduce Risk in the Hanford Tank Waste Remediation System Phase I Privatization Project," September 1999 - Harmon Report) were also considered in the RTP evaluation. The TFC technical and programmatic baselines include technology efforts, such as the mixer pump testing in Tank AZ-101, that were strongly supported by the reviewing team. The baseline support for analytical services is further discussed in Section 5.0.

5.0 IDENTIFIED MANAGEMENT ISSUES, DEFICIENCIES AND CORRECTIVE ACTIONS

During the course of CHG's readiness assessment, a number of issues were identified that require attention to assure that they do not become impediments to achieving success in the tank waste retrieval and disposal mission. Sources included the CRAD and LOI review and the critical risk list. Issues have been identified, and corrective actions are planned where appropriate and included in the updated project baseline. They are grouped to represent the primary party responsible for action. The issues that have identified deficiencies and corrective actions are summarized in Tables 5-1 and 5-2. In each case the issue can be resolved in time to meet the necessary feed delivery and storage and disposal scheduled activities. While some of the indicated dates are before August 2000, none are considered to be necessary to be completed before a decision to proceed.

5.1 RECOMMENDATIONS AND ACTIONS FOR OFFICE OF RIVER PROTECTION ATTENTION

Table 5-1 summarizes the list of the recommended improvements and associate corrective actions recommended completion dates.

Table 5-1. Deficiencies and Corrective Actions for the Office of River Protection. (2 sheets)

Deficiency	Corrective Action	Date
1a. Offstandard feed batches	Modify feed envelope specifications to accommodate feeds contained in feed staging plan	Prior to start of construction of DST retrieval systems (est. 12/2000)
1b Analytical differences in feed certification samples	Establish sampling reconciliation process.	Prior to transfer of waste to Privatization Contractor facilities (4/2006)
1c. Disposition of out-of-specification feed	Establish a waste disposition reconciliation process.	
2. Informal interfaces	Require CHG commitment and signatures on all ICDs and establish CHG contractual relationship with other site contractors to support the RPP project	9/2000
3. Lack of clarity about CHG responsibility for hiring and training certain BNFL staff	Resolve responsibility for hiring and training the staff	Prior to contract being finalized with Privatization Contractor (8/24/00)

Table 5-1. Deficiencies and Corrective Actions for the Office of River Protection. (2 sheets)

Deficiency	Corrective Action	Date
4. Updated RTP baseline does not address any different, new WDOE milestones	Reconcile updated RTP baseline with newly imposed TPA milestones and incorporate into new guidance to TFC	6/2000 (MYWP BUG)
5. Lack of common scheduling basis for Privatization Contractor and TFC	Resolve difference in planning guidance to TFC with Privatization Contractor agreed upon schedule.	Concurrent with decision to proceed with Phase 1 B-2 (8/24/00)
6. Additional sampling requirements	Identify additional sampling requirements to meet, LDR, RCRA and safety basis needs	6/2000 (MYWP BUG)
7. Inadequate funding for 222-S Analytical Lab	Work with RL to provide baseline funding to support needed analytical capability.	6/ 2000 (MYWP BUG)
8. Planning basis for the Privatization Contractor	Privatization Contractor development of production models and interface data.	Ongoing, beginning with next update to ICDs and associated schedules
9. Phase 2 mission definition key issues	Develop a defensible, technically based plan for Phase 2	6/2003

BUG = Baseline Update Guidance.
CHG = CH2M HILL Hanford Group, Inc.
DST = double-shell tank.
ICD = interface control document.
LDR = land disposal restrictions.
MYWP = multi-year work plan.
RCRA = *Resource Conservation and Recovery Act of 1976.*
RL = U.S. Department of Energy, Richland Operations Office.
RTP = readiness to proceed.
TFC = Tank Farm Contractor.
TPA = Tri-Party Agreement.

1. Feed Envelopes and Management of Out-of-Specification Feed Batches

The planning assumptions specified a waste tank delivery sequence that may limit CHG's ability to meet all applicable feed envelope specifications. CHG has developed a feed staging plan that is projected to meet the majority of the component specifications, but a small number of feed batches are currently projected to exceed the specification for one or more waste constituents. Although the ORP planning assumption directs us to assume that the Privatization Contractor will accept these wastes, CHG recommends adjustments to the feed envelope specifications. See CHG Critical Risk CR-050 in Appendix B.

The waste feed envelopes were originally developed in 1995, since then, additional sampling and analysis of candidate waste feed tanks has taken place. Considerable random and systematic uncertainty exists in the sampling, analysis, and reconciliation of the various sample results. The analytical results will be obtained by differing techniques at different times by various laboratories in the certification process. CHG recommends that ORP establish, in advance, a

sampling reconciliation process to deal with analytical differences between various feed certification samples.

While CHG is planning to deliver material in specification, CHG believes it is likely that individual components may exceed current feed envelopes in the feed delivery process. An agreed reconciliation process is recommended that bounds ORP's liability for out of specification material. There will be little available tank space to transfer the material back to the TFC. Once the material has been transferred to the Privatization Contractor and it is determined that one or more constituents are outside the feed envelope specification, schedule delays and cost impacts are likely. CHG plans to have only one or two backup feed tanks certified and staged at any point in the schedule.

The feed envelope specification issues should be resolved before start of construction of retrieval systems for the planned feed tanks to avoid changes to the planning sequence for waste feed delivery.

2. Formalization of Interfaces

ORP currently manages a defined set of interfaces with the Privatization Contractor through the IPPD process. Technical interfaces are informally managed between CHG, the Privatization Contractor, and Project Hanford team. The management between these interfaces needs to be formalized through changes in the contracts of the various performing parties to assure accountability and cost effectiveness in meeting ORP's requirements. Currently contractual mechanisms exist between ORP and the Privatization Contractor; ORP and CHG; and U.S. Department of Energy, Richland Operations Office (RL) and the Project Hanford team. Assignment of responsibility and accountability for work that FH performs through CHG to support the Privatization Contractor is now only coordinated by the IPPD process. See Critical Risk CR-002 in Appendix B.

CHG recommends that (1) ORP modify the IPPD process and require CHG commitment and signatures on ICDs and (2) CHG establish contractual relationships with other site contractors to support the RPP project. These actions should be completed by September 2000 contract documents to establish roles and responsibilities for the remainder of the Phase1 mission.

3. Provision and Training of the Privatization Contractor Operators and Staff

The schedule for the planning case (Diediker, 2000) includes an increase in staff requirements in FY 2005 for 270 craft, operators, and operating engineers in the CHG funding baseline. The staff to support these actions is for the Privatization Contractor. The data are included in the Staffing Plan to highlight the need for these resources at the Hanford Site and to acknowledge the $26,376,000 included in the baseline for labor costs associated with hiring and training these individuals. Hiring and training of the individuals for these positions are not the contractual responsibilities of CHG.

CHG has requested that ORP resolve responsibility for hiring and training the staff for these positions through the IPPD/ICD process (Dehn, 2000a). CHG recommends that this reconciliation be resolved prior to finalizing contract arrangements with the Privatization Contractor.

4. Washington State Department of Ecology Imposed Milestones (Interim and Final)

The Washington State Department of Ecology (WDOE) has recently imposed a series of retrieval, treatment, storage and disposal milestones (Fitzsimmons and Clarke 2000) on ORP that are different than the Baseline Summary (Diediker 2000). The Baseline Summary was developed in consonance with the ORP planning assumptions, and does not consider the impact of these imposed milestones.

CHG recommends that ORP evaluate the impact of the WDOE directed milestones on the RPP.

5. Common Scheduling Basis for the Privatization Contractor and CH2M HILL Hanford Group, Inc.

The Privatization Contractor's master plan is developed around a "planning case" schedule that initiates hot operations as early as 2005. ORP direction to the TFC is planning to the Privatization Contractor "90% trend planning case" schedule, with hot commissioning in 2006. CHG recommends that ORP resolve these planning differences. If the Privatization Contractor is successful in achieving this acceleration, the TFC needs to revise its plans to successfully meet the accelerated feed delivery and immobilized waste storage requirements.

When ORP finalizes its decision to proceed with the Privatization Contractor, CHG recommends that direction should be given to the TFC to match a schedule defined in the Privatization Contractor's contract.

6. Ability of the Privatization Contractor to Reach Agreement with Ecology and DOE Regulatory Unit on the Characterization Program Needed to Meet LDR, RCRA and Safety Basis Requirements

The ongoing Privatization Contractor negotiations with Ecology and the DOE Regulatory Unit may establish additional sampling requirements that must be met by the TFC. This could have a significant cost impact and may also become part of the 222-S analytical laboratory funding issue discussed below.

CHG recommends that ORP resolve these negotiations prior to the FY 2001 MYWP update, so that detailed costs and plans can be included in the TFC baseline.

7. Base Funding Requirements to Support 222-S Analytical Laboratory

FH manages the 222-S Analytical Laboratory. The laboratory receives funding from the site service pools for base operations and upgrades and incremental funding based on actual sample volume. FH has identified an issue with adequate funding for minimum staffing levels, along with funding for needed upgrades. CHG has included $8.8M in the updated RTP baseline to support laboratory upgrades. This may help solve part of the problem but additional resolution of the base staffing level is required. See Critical Risk CR-032 in Appendix B.

CHG recommends that ORP work with RL to establish a workable funding strategy that meets the baseline requirements for analytical services at a reasonable cost. Upgrade requirements to maintain the physical capability also must be provided. CHG recommends that this coordination be completed before the FY 2001 multi-year program plan planning cycle for RL and ORP.

8. Planning Basis for the Privatization Contractor Interfaces

ORP planning guidance provides CHG with a series of schedule and process efficiency assumptions and requires the TFC to estimate performance of the Privatization Contractor facilities to establish planning baselines. The Privatization Contractor has completed preliminary design, and CHG has helped the Privatization Contractor build a production modeling capability. It is more appropriate for the Privatization Contractor to define feed and product interfaces. CHG expects that feed delivery interfaces should be defined as amounts of feed envelopes required on a given date. Immobilized product storage and disposal should be defined as numbers of canisters to be transported as a function of time. This would be supplemented by the necessary design parameters such as dimensions, weight, radiation levels, etc.

CHG is ready to assist ORP and the Privatization Contractor in developing the necessary product models and information.

9. Key Technical Issues for Phase 2 Mission Definition

Life-cycle technical analysis conducted in support of the RTP activities identified key technical issues that should be resolved prior to the initiation of Phase 2 process design activities. Sensitivity analysis indicated that the total HLW glass volume could double if a technical solution for chromium removal during sludge washing is not identified.

To meet the ORP guidance planning rates for Phase 2 vitrification capacity, the *Tank Farm Contractor Operation and Utilization Plan* (Kirkbride 2000) assumed that up to seven SSTs could be retrieved concurrently, with up to two SSTs retrievals operating concurrently in a given tank farm. This is substantially higher than the TFC believed reasonable in HNF-2021, *Management Assessment of Tank Waste Remediation System Contractor Readiness to Proceed with Phase 1B Privatization* (Payne et al 1998).

As identified in the IG-30 audit (DOE 2000), ORP has not developed a defensible, technically based plan for Phase 2 retrieval, treatment, and disposal. With the completion of 241-C-106 sluicing, the completion of waste retrieval activities at the Oak Ridge National Laboratory, retrieval and immobilization mission nearly complete at West Valley, New York, and extended operation of the Defense Waste Processing Facility at the Savannah River Plant, much real operating and cost data are now available that were not available when the current Phase 2 life-cycle costs were prepared.

CHG recommends that an effort be initiated to gather and organize the new information that is available, use the HTWOS and Project Integration Office life-cycle models, conduct selective technology demonstrations, and develop a technically defensible proposal for Phase 2. This would be a logical extension from the Privatization Contractor proposal and would improve the credibility for the strategy articulated in the ORP Strategic Plan.

CHG recommends that the development of a credible Phase 2 plan should be completed in the next three years to build a basis for the Phase 2 decisions, the upcoming tank closure Environmental Impact Statement, and ongoing negotiations with Washington State Department of Ecology. This would facilitate negotiation of program milestones for completion of the mission.

5.2 ISSUES FOR CH2M HILL HANFORD GROUP, INC. TO RESOLVE

Table 5-2 summarizes the list of the manageable deficiencies and associated corrective actions with dates where the TFC has the action.

Table 5-2. Manageable Deficiencies and Associated Corrective Actions.

Deficiency	Corrective Action	Date
1. Breakdown of Quality Management	Corrective Action Plans in place	Complete
2. Incomplete implementation of a risk management system	Develop risk management plan	12/00
3. Deficiencies in the assessment of integrity of the DSTs	Establish a life-cycle tank integrity program	9/00 (incorporating ORP MYWP BUG)
4. Incomplete Design Specifications for Ongoing Construction	Reconcile engineering work with active projects.	CY 2000
5. ORP, Privatization Contractor, and TFC document and data consistency	Gap analysis and Resolve important document inconsistencies	5/00 8/00 (Privatization Contractor authorization to proceed)
6. Sole source construction management	Pursue a range of construction managers and contract mechanisms	FY 2001

BUG = Baseline Update Guidance.
CHG = CH2M HILL Hanford Group, Inc.
CY = calendar year.
DST = double-shell tank.
MYWP = multi-year work plan.
ORP = Office of River Protection.
TFC = Tank Farm Contractor.
QAPD = quality assurance program description.

1. Breakdown of Quality Management

Recently CHG identified a quality management issue associated with a construction supplier for the W-314 Tank Farm Upgrade Project. CHG identified this as a potential breakdown of the desired management process required in the CHG quality assurance program policy. Construction work on Safety Class equipment was suspended and an aggressive corrective action plan was developed. A Quality Assurance Director reporting to the president was appointed. Responsibilities were clarified and the organization is being trained on the lessons learned. Relationships between site contractors and other subcontract suppliers were reviewed and modifications were made to the quality requirements.

The corrective actions that came from the independent investigation recommendations, the corrective action plan, and the W-314 Transfer Pipe Procurement event include improvements in construction management, procurement, and quality assurance program. Temporary measures have been identified and corrective action plans are in place.

2. Implementation of Risk Management

The CHG Risk Management Procedure describes the process of risk identification, analysis, and mitigation. Through this process, technical and programmatic risks are communicated to decision-makers so that actions can be taken to ensure program success. It requires that technical documents be reviewed as part of the risk identification process and that identified risks be recorded in the TBRs and have planned mitigation activities. It uses Monte Carlo simulation to assist with the cost risk analysis and schedule risk analysis.

Analysis results are provided to the project planners to support development and change management of the TBRs. Risk lists are generated at the TBR level. A Critical Risk List is also generated at the PBS level, using information from the lower tier lists as well as from other management layers. Mitigation actions are included in the TBRs and MYWPs, assigned to responsible individuals and tracked to closure.

The CHG Contract was effective on October 1, 1999, and requires the contractor to have a Risk Management Plan. The previous contractor, while a subcontractor to FDH, decided that a separate risk management plan was no longer necessary. The procedure, HNF-IP-0842, Vol. IV, Sec. 2.6, "Risk Management" (CHG 2000c), along with references in the *Systems Engineering Management Plan for the Tank Farm Contractor*, HNF-SD-WM-SEMP-002 (O'Toole 2000), served the purpose of a plan.

The TFC will develop an updated Risk Management Plan that fully addresses the requirements of the contract, and will update the risk management procedure to implement any modified requirements. This is planned to be completed by December 2000.

3. Double-Shell Tank Integrity Issues

The Department of Ecology has notified RPP that it intends to initiate enforcement action regarding deficiencies in the assessment of integrity of the DSTs. ORP and CHG have developed a proposed resolution plan that would establish a life-cycle tank integrity program that recognizes the value of the DST asset in executing the RPP mission ("Notice of Intent [NOI] to Take Formal Enforcement Action Resulting from Violation of Article VII within the Hanford Federal Facility Agreement and Consent Order, or Tri-Party Agreement," French and Klein 2000). Some of this proposed work is not currently included in the ORP FY 2000 MYWP. If this proposal is accepted and CHG is directed to incorporate this work into the MYWP baseline, it is predicted that minor adjustments to outyear budgets and operating and construction plans may need to be made. These adjustments are not anticipated to have an impact on feed delivery.

The necessary timing on the resolution of this issue remains open pending agreement between DOE/ORP and the State of Washington on a constructive path forward.

4. Status of Project Design Specifications and Ongoing Construction

The Level 1 and Level 2 requirement specifications include technical elements that remain to be finalized. Feed delivery projects are proceeding at some risk, that subsequent engineering and design work may result in rework of some project designs, procurement, and construction. The TFC is proceeding with a conservative design approach and has accepted the risk, based on the feed delivery schedule.

The engineering work to support reconciliation with the active projects and finalization of the requirement baseline is included in the Baseline Summary (Diediker 2000). The TFC expects to complete comparison with project design activities and necessary reconciliation planning by December 2000.

5. ORP and TFC Document and Data Consistency

ORP and the TFC are updating technical plans, resource-loaded schedules, management systems, and definition of interfaces in parallel for delivery by April 24, 2000. As a result it is anticipated that differences will exist in the plans, documents, and procedures on that date.

An action plan will be developed during the month of May to identify the key disconnects and to initiate planning to bring the various plans, documents, and procedures into agreement.

The TFC will develop a schedule that maximizes the use of normally scheduled updates and revisions to reduce implementation costs, and to allow evaluation of more efficient and effective ways to conduct the TFC business. Important document inconsistencies will be resolved prior to the Privatization Contractor authorization to proceed in August 2000.

6. Sole Source Construction Management

At the current time, CHG has a sole source relationship with Fluor Federal Services for construction management. The RTP baseline (Diediker 2000) includes approximately $800M worth of design and construction activity prior to hot operations of the Waste Treatment Plant. While most elements of the design and construction performance chain have several alternative choices for performance, construction management represents a single point failure. A management or subcontractor problem that stalls procurement of field construction on one project by the sole construction manager could result in a delay for the entire program. For example, a quality procurement issue could require shutdown of all procurement on all projects until the issue is resolved. This represents a risk for execution of the RTP baseline.

CHG should pursue the consideration of a range of construction management performers and contract mechanisms. While this will help alleviate the single point failure discussed above, it could also improve competition between the performers and result in cost and schedule savings. Alternatives should be in place during FY 2001.

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APPENDIX A

CH2M HILL HANFORD GROUP, INC. KEY ASSUMPTIONS

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CHG Key Assumptions

CHG #	Assumption Title	CHG Key Assumption	Source/Basis for Assumption	Action to Validate/Resolve Assumption	Assumption Owner
CHG-01	Unconstrained Budget beyond FY 2001	Fiscal year (FY) 2001 funds for CHG are constrained to $382.1 million. Budget/fund levels are unconstrained from FY 2002 through life-cycle and tied to full compliance requirements.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 1, as amended by the 4/8/00 review with CHG management.	Congress authorizes DOE to proceed with the Privatization initiative in accordance with the B2 Decision Package.	Planning and Integration
CHG-02	Regulatory Permitting	Permits and other regulatory agency approvals will be available on time and will establish conditions that are in accordance with, and do not cause delays to, the Integrated Baseline Schedule. DOE and other funding sources will be sufficient to maintain the required level of agency support.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 2 and KEA-29. Regulatory agency approvals and decision will be required during the RPP life cycle. Many procurement, construction , and operation activities must obtain prior agency review and concurrence before they may begin. DOE provides substantial funding through permit fees and other sources to help offset the fiscal burdens on the agencies.	ORP provides sufficient annual funding to the Regulatory Agencies to support timely review and approval of permits.	Environmental, Safety and Health
CHG-03	Authorization Basis Design Features and Controls	The Tank Farm Contractor's Authorization Basis will be amended to encompass double-shell tank (DST) waste retrieval activities, operations, and equipment.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 3. Many aspects of waste retrieval and feed delivery are similar to the Safe Storage mission activities from the perspective of possible hazards and bounding accidents. Processes to modify the current approved AB, as necessary, and to seek timely approval from ORP are firmly established.	ORP approves the Authorization Basis change.	Technical Operations
CHG-04	Flammable Gas Watch Lists Tanks	Flammable Gas Watch Lists Tanks - ORP approval of the retrieval authorization basis amendment will authorize DST waste retrieval activities, operations, and equipment, including performing activities in Flammable Gas Watch List Tanks. DOE Secretarial approval will be obtained in a timely manner for adding waste to tanks currently on the Watch List.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 4. Wastes currently in six Flammable Gas Watch List tanks are expected to fit envelope criteria and are planned to be retrieved during Phase 1. Once this occurs for the first time, retrieval of the waste > 80% of volume from these tanks supports the technical basis for removal of the tanks from the watch list. Also, the retrieved diluted waste will not cause staging/feed tanks to become Watch List Tanks or category one tanks as defined in the BIO.	ORP will obtain approvals to remove tanks from the watch list and designate their use as staging tanks after the existing safety issue is resolved on a tank by tank basis.	Tank Waste Operations
CHG-05	Interface Management	An Integrated Process and Product Development (IPPD) process, such as described in the BNFL contract, will be used to manage interfaces between ORP, BNFL and CHG, and between CHG and other onsite contractors, e.g., Waste Management Federal Services, Inc. and Fluor Hanford (reference BNFL Contract, Section C.2). CHG will design, build, and operate its systems to specifications that are based on and traceable to the Interface Control Documents established between CHG and BNFL Inc.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 5.	ORP and CHG need to formalize CHG's role in the ICD process so that the BNFL/CHG Technical Baseline is aligned, defined and controlled.	Planning and Integration
CHG-06	Availability of Non-RPP Facilities	Key support facilities/personnel that are currently managed by Hanford Site contractors (non-RPP), such as, 242-A Evaporator, Effluent Treatment Facility, and 222-S Laboratory, will be available to support the RPP mission through the duration of Phase 1 (2018). Interface requirements will be managed under the IPPD process.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 6. HTWOS modeling identifies the existing non-RPP infrastructure necessary to execute the Phase 1 mission.	RL and ORP determine how PHMC facilities will be maintained and funded to support the RPP mission.	Tank Waste Operations / Characterization Project
CHG-07	Operational Readiness	Evaluation of operational readiness will be planned as an integrated activity among ORP, BNFL, CHG, and other site interfaces.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 7	ORP approves the CHG approach for integrated startup and operational readiness reviews for new/modified facilities with interfaces to both contractors.	Tank Waste Operations
CHG-08	Tank Waste Inventory Basis	The Best Basis Inventory (BBI) is the common basis for the tank waste inventory. As new CHG and BNFL characterization results are generated, modifications will be agreed on among ORP, CHG, and BNFL through the change control process.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 8	No decision is required until the reconciliation process is completed.	Characterization Project
CHG-09	Planning Basis for Feed Delivery Sequence and Rates	Parameters for the Minimum Order are listed in Tables 2 and 3 of RPP-5993. See BNFL contract, Specification 7 for definition of Envelopes A, B, and C, and Specification 8 for definition of Envelope D.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 9	ORP contractually commits BNFL to the proposed tank sequence in Mod 13, including plans for backup feed tanks.	Project Delivery
CHG-10	Tank AW-103 Planning	Tank AW-103, an Extended Order source tank, will be planned for delivery in the same timeframe as C-104/AY-101.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 10	ORP accepts risk mitigation action for waste feed contingency as part of RTP-2 planning package.	Project Delivery

CHG Key Assumptions

CHG #	Assumption Title	CHG Key Assumption	Source/Basis for Assumption	Action to Validate/Resolve Assumption	Assumption Owner
CHG-11	Integrated Baseline Schedule	Integrated Baseline Schedule - ORP, BNFL, and CHG will develop and maintain an Integrated Baseline Schedule based on key startup dates that define the framework for the FY 2006 Baseline Case/90% Trend Planning Case. a. Delivery of first LAW batch initiated February 28, 2006 b. First batch of LAW delivered April 30, 2006 c. Delivery of first HLW batch initiated August 31, 2006 d. First batch of HLW delivered October 31, 2006 e. Delivery of first batch from second HLW staging tank initiated January 31, 2008 f. First batch from second HLW staging tank delivered March 31, 2008 g. Earliest date delivery of first AN-102 batch is initiated December 31, 2008 h. Earliest date first AN-102 batch is delivered February 28, 2009 i. Start LAW facility hot commissioning November 30, 2006 j. Start HLW facility hot commissioning May 31, 2007 k. Start LAW hot vitrification services March 1, 2008 l. Start HLW hot vitrification services September 1, 2008	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 11	ORP contractually obligates CHG and BNFL to a consistent and executable baseline schedule.	Project Delivery
CHG-12	Waste Feed Delivery and Processing Ramp Up Parameters	Key CHG waste feed delivery planning parameters and BNFL processing ramp up parameters for the Minimum Order are provided in Tables 4 and 5 of RPP-5993.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 13	ORP accepts RTP-2 planning package.	Project Delivery
CHG-13	Contingency Waste Planning	During the Minimum Order, CHG will plan to deliver at least 10% and 20% extra LAW and HLW feed, respectively, to mitigate the combined risks associated with waste retrieval efficiency, acceptability of delivered feeds, and glass waste loading. The availability of contingency feed is a key feature for ensuring 80% confidence for successful feed delivery. CHG will also plan to deliver the equivalent of at least 1-year of contingency feed beyond the BNFL contract completion date of February 2018. Contingency tanks planned for the Minimum Order, if not used as a source of feed, will be processed during the Extended Order.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 14	ORP accepts RTP-2 planning package.	Project Delivery
CHG-14	Backup Tank Planning	CHG will deliver certified LAW and HLW backup waste to BNFL in the event that waste in the planned tank sequence is unacceptable or unavailable for delivery. Backup waste may include unblended certified HLW feeds contained in individual HLW source tanks. CHG will deliver backup wastes in accordance with the envelope sequence when envelope-compliant waste is available.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 15	ORP accepts CHG's waste feed contingency planning basis as part of RTP-2 planning package.	Project Delivery
CHG-15	Chemical Adjustments	Sodium hydroxide may be added to tanks to mitigate waste corrosivity risks. Subsequent resampling and analysis of the tanks to requalify the wastes will not be required.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 16	ORP provides direction and funding to add caustic to AN Farm tanks and to verify AN-102 fitness for use as a staging tank.	Project Delivery
CHG-16	Unintentional Blending Impacts	Additional characterization will not be required, if blending of wastes occurs when source tank waste is added to residual heel waste in an interim or final staging tank.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 17	ORP specifies contractually that incidental blending will not render the blended waste unacceptable for delivery to BNFL Inc.	Project Delivery
CHG-17	Mixer Pumps	Mixer pumps (the baseline technology) will adequately mix and successfully retrieve the waste from DSTs to satisfy feed certification, basis-for-pay requirements, and minimum order quantities of waste feed.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 18a, as amended by 4/8/00 review with CHG management. State-of-the-art 300-Hp pumps will be used to mix DST wastes. Similar pumps have been successfully used at Savannah River and West Valley.	CHG must determine if auxiliary mixing is required to accomplish the WFD mission.	Project Delivery
CHG-18	AP-101 Certification	Waste in AP-101 will not be mixed before it is sampled and transferred to BNFL. The AP-101 waste will be certified in the unmixed condition.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 18b	ORP specifies contractually the AP-101 waste sampling/waste certification strategy.	Characterization Project

CHG Key Assumptions

CHG #	Assumption Title	CHG Key Assumption	Source/Basis for Assumption	Action to Validate/Resolve Assumption	Assumption Owner
CHG-19	Sampling Schedule	CHG will provide BNFL samples of waste from staged waste tanks for permitting and licensing testing between 270 and 720 days before the projected waste transfer date, in accordance with the BNFL contract. No additional sampling is required. In accordance with the Integrated Baseline Schedule, CHG will provide samples from candidate backup tanks for treatability testing no later than 2 years before the waste is scheduled for transfer to BNFL. Backup tanks that were previously sampled and certified by both BNFL and CHG will not require recertification after 720 days have elapsed from the date of the certification.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 20	ORP accepts the RTP-2 Planning package.	Characterization Project
CHG-20	HLW Feed Certification Sampling	CHG certification of HLW feed will require only one sampling event per staging tank (i.e., resampling of HLW staging tank after each HLW feed batch is transferred from the staging tank is not required). Grab samples will be taken after shutting down mixer pump operations.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 2, as amended by 4/8/00 review with CHG management.	CHG and BNFL sign, and ORP approves, ICD-20 which defines the RPP analytical waste certification strategy for HLW feed.	Characterization Project
CHG-21	BNFL Feed Certification Sample Preparation	Certification samples collected from staging tanks will be composited, split, and sent to BNFL within 7 days, as required by ICDs 19 and 20. Homogeneity testing may not be completed until several days after the samples are sent to BNFL. The 7-day clock will begin upon collection of the last grab sample or core segment from the staging tank.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 22	ORP incorporates results from the sample holding time study into ICDs 19 & 20.	Characterization Project
CHF-22	Representative HLW Core Samples	Core samples taken from unmixed tanks per the Sampling Plan will be acceptable for BNFL process design and permitting documentation development.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 23	BNFL and CHG sign, and ORP approves, ICD modifications to accommodate waste compositional uncertainty.	Characterization Project
CHG-23	Out-of-specification Waste Limitations	LAW and HLW feed delivered by CHG will be accepted and processed by BNFL unless the waste does not meet permitting and/or authorization basis requirements for the BNFL facilities. ORP will develop an approach for compensating BNFL for accepting nearly off-specification waste. No more than one staged tank of LAW or HLW will be rejected by BNFL. CHG will prepare for retaining a maximum of one rejected staged tank of LAW feed or one rejected staged tank of HLW feed within the DST system during the Minimum Order.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 25	BNFL and CHG sign, and ORP approves, ICD modifications to accommodate waste compositional uncertainty.	Project Delivery
CHG-24	HLW Transfers	CHG will have up to 55 days to complete a HLW feed batch transfer (nominally 600,000 liters, but other volumes may be determined acceptable at ORP discretion). BNFL will plan for receiving the full batch of HLW feed without interruption.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 28	ORP includes language in Modification 13 of BNFL contract, for BNFL to provide sufficient storage for accepting a full batch of HLW without interruption.	Tank Waste Operations
CHG-25	LAW Transfers	CHG will have a minimum of 30 days and up to 60 days to complete a LAW feed batch transfer. This assumption is based on BNFL receiving an uninterrupted delivery of a new batch of LAW at the same time approximately 500,000 gallons of LAW feed from the previously transferred batch are still available in the BNFL facility for processing. The 500,000 gallons of "feed forward" capacity provides CHG about 60 days to complete the LAW feed transfer, assuming LAW feed with a concentration of 8 molar sodium (or 30 days at 4 molar sodium) was delivered previously and BNFL processes the feed at a rate no greater than required to support the nominal BNFL LAW vitrification design rate of about 4.45 MT sodium/day.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 29	No decision or action required - Mod 12 to BNFL contract contains necessary "Feed Forward" storage capacity language.	Tank Waste Operations
CHG-26	Feed Forward Flexibility	CHG will support BNFL requests to reduce the feed receipt and feed forward volumes defined in "HLW Transfers" and "LAW Transfers," and complete deliveries within 30 days of the waste transfer day.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 30	ORP accepts the RTP-2 Planning package.	Tank Waste Operations
CHG-27	Responsibility for Operational Idle Time	Idle time in the CHG feed delivery system caused by problems within the BNFL system will be added to the nominal 55 to 60-day maximum waste feed transfer period.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 31, as amended by 4/8/00 review with CHG management.	ORP finalizes the Responsibility for Operational Idle Time clause in proposed Mod 13 to BNFL contract.	Tank Waste Operations
CHG-28	Availability of DST Space	Each of the existing 28 DSTs will be available through Phase 1 of the retrieval mission; no new tanks will be built. Additional RPP support facilities, such as the DCRT and the cross-site transfer line, will also be maintained and operable through Phase 1 (2018).	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 32a and KEA-40. Current DSTs are sound, based on results of ultrasonic testing of tanks.	CHG must develop and maintain tank waste volume projections and contingency plans for unusual or unexpected events, such as loss of use of a DST or leakage of waste from a DST.	Tank Waste Operations

CHG Key Assumptions

CHG #	Assumption Title	CHG Key Assumption	Source/Basis for Assumption	Action to Validate/Resolve Assumption	Assumption Owner
CHG-29	Piping for Emergency Returns	Piping and valving will be provided to return waste from BNFL to the tank farms, ensuring capability for emergency transfers, out-of-specification waste returns (including HLW supernates), and entrained solids returns, but no DSTs should be reserved for this eventuality. Any returned waste will meet CHG permits and Authorization Basis.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 32b, as amended by 4/8/00 review with CHG management.	ORP directs CHG and BNFL to establish the enabling documentation as required to transfer waste from the BNFL Plant to the tank farms, with focus on waste that has been chemically altered by BNFL.	Project Delivery/ Technical Operations
CHG-30	Emergency Space Allocation	Space for emergency transfer returns will be accounted for within the existing two million-gallon tank farm emergency space location, but no additional storage capacity will be specifically maintained for any other waste returns.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 32d	ORP reaches formal agreement with Ecology on the adequacy of 2 million gallons of emergency space for use by both BNFL and CHG.	Tank Waste Operations
CHG-31	Impacts of Future Analytical Requirements	New waste qualification and certification requirements will not impair the ability of the 222-S Laboratory to complete certification analyses within 7 months for LAW feed and 9 months for HLW feeds. Interface requirements will be managed under the IPPD process.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 33	No action by CHG required to validate assumption.	Characterization Project
CHG-32	Disposal of Failed Melters	BNFL will send failed LAW and HLW melters intact to CHG for disposal. Prior to shipment/transport, the melters must be categorized as non-HLW and meet all Hanford Site Solid Waste Acceptance Criteria and disposal requirements.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 35	ORP contractually obligate BNFL to comply with the Hanford Solid Waste Acceptance Criteria and Hanford Disposal Requirements.	Project Delivery
CHG-33	Onsite Disposal of ILAW	Pretreatment of Envelopes A, B and C waste will allow the resulting ILAW to be disposed of as incidental waste (i.e., non-HLW), based on previous determination by DOE and the Nuclear Regulatory Commission (NRC). Therefore, it is not subject to NRC licensing requirements. The remote trench can be used for disposal of ILAW after: a) confirmation by Performance Assessment; b) confirmation that NRC criteria are met; and c) DOE authorization to proceed with disposal.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 36. Onsite disposal of ILAW without NRC licensing is consistent with guidance from DOE and NEPA documentation. The NRC has determined that Hanford Site tank waste can be classified as incidental waste and is not subject to NRC regulation provided these criteria are met: 1. The waste meets the concentration limits in 10 CFR 61.55. 2. Radionuclides are removed to the extent technically and economically practical. 3. Public health is protected consistent with 10 CFR 61.	NRC must sustain the incidental waste determination.	Project Delivery
CHG-34	Receipt of ILAW for Disposal	Table 6 provides the relationship between BNFL production ramp-up rates (shown in parenthesis) the number of canisters of ILAW produced, and the first shipment date. The ILAW disposal facility maximum receipt rate is 3285 cylinders/year. The maximum daily receipt rate is 5 cylinders/day transferred one at a time. Each ILAW cylinder is 1.22 meters in diameter and 2.28 meters in height and contains 6 MT of waste glass.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 37	ORP accepts RTP-2 Planning package.	Project Delivery
CHG-35	Onsite Storage of IHLW	IHLW transferred from BNFL to CHG will be stored in the Canister Storage Building on the Hanford site. The IHLW will be transferred from CHG to a federal repository for final disposal based on the Integrated Repository Receipt Scenario.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 38. DOE has directed that IHLW will be sent to a geologic disposal repository for disposal.	ORP contractually impose the Waste Acceptance System Requirements Document on BNFL and Quality Assurance Requirements Document on CHG and BNFL.	Project Delivery
CHG-36	Receipt of IHLW at the CSB	Table 7 of RPP-5993 provides the relationship between BNFL production ramp-up rates (shown in parenthesis), the number of canisters of IHLW produced, and the first shipment date. The IHLW maximum production rate is 100 canisters/year for the first 2 years increasing to 120 canisters/year in the third and subsequent years. The maximum weekly receipt rate is five canisters/week. Canisters will be delivered one at a time.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 39a, as amended by 4/8/00 review with CHG management.	ORP accepts RTP-2 Planning package.	Project Delivery
CHG-37	IHLW Canister Specifications	IHLW canister is 0.61-meters in diameter and 4.5-meters in height. The average heat load of IHLW canister is 200 W. The maximum IHLW canister heat load is 1500 W.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 39b.	ORP accepts RPP Planning package.	Project Delivery
CHG-38	CSB Capacity	The Canister Storage Building (Vaults 2 and 3) will retain Phase 1 minimum order IHLW (modified).	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 39c. MOA between SNF and RPP for vaults 2 and 3 of the CSB, CDR for project W464 to use the CSB for Phase 1 storage. The remainder of the Phase 1 storage will be stored in new facilities per AGA / Path forward performed in FY96.	No action by CHG required to validate assumption.	Project Delivery

CHG Key Assumptions

CHG #	Assumption Title	CHG Key Assumption	Source/Basis for Assumption	Action to Validate/Resolve Assumption	Assumption Owner
CHG-39	Repository Requirements	BNFL will be able to meet the Waste Acceptance System Requirements Document and Waste Acceptance Product Specification for IHLW. Both BNFL and CHG will meet the requirements in Quality Assurance Requirements Document, DOE-RW-0333P for IHLW.	Barrett, M.K., to DeLozier, M.P., letter 00-PGO-002, April 10, 2000 RPP Key Enabling Assumptions which transmitted RPP-5993. This assumption is based on RPP Assumption 40	ORP contractually impose the Waste Acceptance System Requirements Document on BNFL and Quality Assurance Requirements Document on CHG and BNFL.	Project Delivery
CHG-40	85% Retrieval Based on PPS	For purposes of estimating the amount of waste feed available for delivery to BNFL in Phase 1, 85% of the waste per SST will be retrieved during Phase 1, based on using Past Practice Sluicing (PPS) as the reference technology for SST waste retrieval.	KEA-02: Previous sluicing campaigns of SSTs have shown that approximately 85% of the waste per tank can be mobilized and removed using this method.	Results of C-106 retrieval will provide an initial validation of this assumption. Subsequent retrieval of SSTs designated for retrieval in Phase 1 will provide further validation.	Project Delivery
CHG-41	Phase 1 Infrastructure	The W-519 Privatization Infrastructure Project as currently planned will be sufficient for completing the Phase 1 mission.	KEA-07: The project baseline reflects the ORP/BNFL Phase 1 Contract, specifically Interface Control Documents (ICDs) Rev. 2. This is consistent with current FY 2000 ORP Guidance.	Monitor and evaluate changes to the ICDs and baseline which develop from the IPT Process. ICDs have been submitted to ORP by BNFL and changes to CHG baseline via ORP direction are expected.	Project Delivery
CHG-42	BNFL and CHG Responsibilities for Sampling and Analysis	RCRA, permitting, and Safety Authorization Bases analytical activities to support the waste feed acceptance process will be performed by BNFL. CHG will support the BNFL sampling analysis needs in the source and/or staging tanks for these analyses.	KEA-20: April 1, 1999 Guidance Letter 9952261, planning assumption number 31 as clarified in LMHC-955261A R1, Item 11, as amended by 4/8/00 review with CHG management.	Continue monitoring decisions and direction from ORP. Participate in meetings with ORP and WIT regarding implementation of Regulatory DQO. Participate in planning, development, review and comment on permit activities for DST system and BNFL facility. Solidify ORP decisions in contract and planning guidance and incorporate as programmatic requirements in the baseline and MYWP.	Characterization Project
CHG-43	Timely Budget Validation	Budget validation to support responsibilities for RPP line-item projects will be achieved in time to support the Phase 1 schedule.	KEA-26 The normal DOE budget validation process may not support early Phase 1 activities.	Confirm early budget validation for Phase 1 startup processes in association with ORP authorization-to-proceed decision, and submit financial analysis and request for additional funds if needed.	Planning and Integration
CHG-44	Authorization Basis for IHLW Storage	Storage of IHLW in the CSB will require a modification of the SFP Authorization Basis.	KEA-27 The CSB is an extension of the SFP (vault 1) Authorization Basis.	CSB integrated planning will validate this assumption via an approved permitting plan.	Project Delivery
CHG-45	New AB for Remote Trench Operation	Disposal of ILAW in remote trenches will require a new Authorization Basis.	KEA-28 Disposal of ILAW will require a separate Authorization Basis due to significant differences from tanks Authorization Basis.	Integrated planning for the ILAW Disposal Facility will validate this assumption via an approved permitting plan.	Project Delivery
CHG-46	Impacts of Regulatory Changes	TWRS S/RIDS are in the base set of regulatory requirements for baseline development.	KEA-30 Planning is based on currently identified regulatory requirements.	Track proposed changes to the DOE Orders and other federal and state regulatory agencies and evaluate the impacts.	Environmental, Safety and Health
CHG-47	No Labor Strikes or Disruptions	The Hanford Atomic Metal Trades Council (HAMTC) Bargaining unit and construction trades personnel will comply with the "No Strike" clause of the HAMTC agreement, and no labor disruption will result because of contract negotiations.	KEA-38 Recent labor / management relations have been good. Labor slowdown / strikes have been minimal.	Maintain open communications with HAMTC and other unions regarding future labor needs to support the RPP mission.	Human Resources
CHG-48	No TSCA-regulated Wastes	Waste feed for delivery to BNFL will not be TSCA regulated.	KEA-42 CHG's Regulatory Permitting has advised that there is no reason to believe that tank wastes are regulated under TSCA.	CHG Environmental will continue to monitor and will advise once there is a definitive position established regarding the status of PCBs in tank farm wastes.	Environmental, Safety and Health
CHG-49	Idle Plant Fees	CHG will not be liable for any idle plant fees.	KEA-45	None	Tank Waste Operations
CHG-50	Authorization Basis Requirements	ORP will be the regulatory agent and will have approval authority for Authorization Basis changes.	Pending legislation placing RPP under NRC oversight	Monitor Congressional actions regarding this legislation	Technical Operations

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APPENDIX B

CH2M HILL HANFORD GROUP, INC. CRITICAL RISKS

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CHG Critical Risks

Risk Event #	Risk Title	CHG Key Assumption/Issue	Risk Statement	Risk Owner	Mitigation Action Description
CR-002	Definition of interface requirements (ICDs)	Key Assumption CHG-05: An Integrated Process and Product Development (IPPD) process, such as described in the BNFL contract, will be used to manage interfaces between ORP, BNFL and CHG, and between CHG and other onsite contractors, e.g., Waste Management Federal Services, Inc. and Fluor Hanford (reference BNFL Contract, Section C.2). CHG will design, build, and operate its systems to specifications that are based on and traceable to the Interface Control Documents established between CHG and BNFL Inc.	If the technical baseline scope at the BNFL/CHG interface is not aligned, defined, configured and controlled, then the probability increases that CHG will not meet BNFL requirements or schedules.	Planning and Integration	1. CHG will be added to the ICD approval process. 2. ICDs will be negotiated by CHG and BNFL and maintained by BNFL. Changes identified by the ICDs require accompanying baseline change requests reviewed by the ORP/BNFL Project Management IPT. 3. Support IPT methods to maintain timely communication and technical exchange.
CR-003	Budget validation for line item projects	Key Assumption CHG-43: Budget validation to support responsibilities for RPP line item projects will be achieved in time to support the Phase 1 schedule.	If budget validation for line item projects is not achieved on schedule, then unrecoverable schedule slippage may occur.	Project Delivery	1. Provide accurate and timely budget information to support the budget process.
CR-011	Unplanned radiological exposures	RTP-1 CRL 11: Highly contaminated equipment must be removed from the tanks to install new or replacement equipment to support Phase 1.	If unplanned radiological exposures or releases occur while contaminated equipment is being removed, then installation of retrieval equipment and subsequent feed delivery operations may be delayed.	Tank Waste Operations	1. Use ISMS enhanced work planning process. 2. Practice techniques for high risk jobs with mock up training.
CR-013	Concurrent retrieval system construction	RTP-1 CRL 13: The schedule for installing retrieval systems requires concurrent construction of four separate systems.	If planned construction of retrieval systems performed concurrently with on-going TF operations causes logistical conflicts, then cost overruns and schedule delays may be incurred.	Project Delivery	1. Develop an integrated operations and construction schedule with resource requirements for installing retrieval systems, maintaining operations, and performing safety surveillances.
CR-025	Definition of waste certification strategy	Key Assumption CHG-20: CHG certification of HLW feed will require only one sampling event per staging tank (i.e., resampling of HLW staging tank after each HLW feed batch is transferred from the staging tank is not required). Grab samples will be taken after shutting down mixer pump operations.	If the process for acceptance of out-of-spec feed is not established in advance, then feed transfer may be delayed.	Project Delivery	1. ORP develops and contractually obligates BNFL and CHG to a process for dealing with out of specification feed.
CR-027	Plugged transfer lines	RTP-1 CRL 27: Waste feed delivery to the Privatization Contractor will be made in a timely manner so that there are no unplanned shutdowns of the Privatization Contractor's facilities.	If transfer lines become plugged, then delays of waste transfers may occur.	Tank Waste Operations	1. Conduct pre-transfer analysis to confirm that waste will not plug lines during transfer. 2. Develop methods for unplugging lines. 3. Identify alternate transfer routes to bypass plugged lines (AY and AZ have single paths). 4. Identify alternate feed tanks in separate farms. 5. Install redundant transfer line as part of Project W-314. 6. Utilize SR and WV experience with Hanford simulation and newly accumulated data to support waste transfer process control.

CHG Critical Risks

Risk Event #	Risk Title	CHG Key Assumption/Issue	Risk Statement	Risk Owner	Mitigation Action Description
CR-029	Delayed regulatory decisions	Key Assumption CHG-02: Permits and other regulatory agency approvals will be available on time and will establish conditions that are in accordance with, and do not cause delays to, the Integrated Baseline Schedule. ORP and other funding sources will be sufficient to maintain the required level of agency support.	If the required regulatory support is not available, then key regulatory decisions may be delayed.	Environmental, Safety and Health	1. Provide RPP schedule and decision needs information to ORP and the regulatory agencies far enough in advance to support resource planning and funds negotiations.
CR-032	222S analytical laboratory capability	Key Assumption CHG-06: Key support facilities/personnel that are currently managed by Hanford Site contractors (non-ORP), such as, 242-A Evaporator, Effluent Treatment Facility, and 222-S Laboratory, will be available to support the RPP mission through the duration of Phase I (2018). Interface requirements will be managed under the IPPD process.	If the analytical and certification requirements do not support maintaining the laboratory core staff and capability then the turnaround time and cost of analytical services may increase.	Characterization Project	1. DOE maintain minimum funding levels to sustain laboratory function. 2. ORP to provide planning direction on utilization of 222-S lab and other PHMC facilities by the Privatization Contract during Phase 1 operations.
CR-044	Shortage of tank space	Key Assumption CHG-28: Each of the existing 28 DSTs will be available through Phase 1 of the retrieval mission; no new tanks will be built. Additional RPP support facilities, such as the DCRT and the cross-site transfer line, will also be maintained and operable through Phase 1 (2018).	If the requirements for DST space are significantly greater than currently forecast, then sufficient tank volume may not be available to stage waste in support of BNFL process requirements or maintain committed reserve/emergency capacity.	Tank Waste Operations	1. Manage the tank space using the Operational Waste Volume Projection process.
CR-046	CHG funding for 80% confidence of success	Key Assumption CHG-01: Fiscal year (FY) 2001 funds for CHG are constrained to $382.1 million. Budget/fund levels are unconstrained from FY 2002 through life-cycle and tied to full compliance requirements.	If the next 5 out-year funding levels are less than needed to meet requirements, then CHG may not be able to support the BNFL 90% Trending Case date.	Planning and Integration	1. Clearly identify funding needs.
CR-047	Mixer pumps	Key Assumption CHG-17: Mixer pumps (the baseline technology) will adequately mix and successfully retrieve the waste from DSTs to satisfy feed certification, basis-for-pay requirements, and minimum order quantities of waste feed.	If mixer pump technology is not sufficiently effective or efficient, then the CHG may not be able to deliver sufficient certified HLW feed to BNFL.	Project Delivery	1. Evaluate results of 101-AZ process tests. 2. Evaluate auxiliary mixing options. 3. Ensure back-up/contingency wastes are available for feed transfer.
CR-050	Potential for rejected feed	Key Assumption CHG-23: LAW and HLW feed delivered by CHG will be accepted and processed by BNFL unless the waste does not meet permitting and/or authorization basis requirements for the BNFL facilities. ORP will develop an approach for compensating BNFL for accepting nearly all off-specification waste. No more than one staged tank of LAW or HLW will be rejected by BNFL. CHG will prepare for retaining a maximum of one rejected staged tank of LAW feed or one rejected staged tank of HLW feed within the DST system during the Minimum Order.	If a feed batch does not fit within BNFL's permit and safety basis limits, then it may be rejected.	Project Delivery	1. Maintain back up feed tank. 2. Blend tanks to meet specifications.

CHG Critical Risks

Risk Event #	Risk Title	CHG Key Assumption/Issue	Risk Statement	Risk Owner	Mitigation Action Description
CR-058	Access to Watch List tanks	Key Assumption CHG-04: Flammable Gas Watch Lists Tanks - ORP approval of the retrieval authorization basis amendment will authorize DST waste retrieval activities, operations, and equipment, including performing activities in Flammable Gas Watch List Tanks. DOE Secretarial approval will be obtained in a timely manner for adding waste to tanks currently on the Watch List.	If permission to transfer waste to "watch list" tanks is not received from DOE in accordance with the WFD schedule, then CHG may not have sufficient tank space to support delivery of waste feed to BNFL on schedule.	Project Delivery	1. CHG provide analyses and documentation supporting ORP's request for DOE Secretarial approval to add waste to "watch list" tanks.
CR-062	Application of Toxic Substances Control Act (TSCA) to Tank Farm Facilities.	Key Assumption CHG-48: Waste feed for delivery to BNFL will not be TSCA regulated.	If the PCB designation status for the tank waste is changed, then new requirements for permitting, equipment and operations will result in increased cost and schedule challenges.	Environmental, Safety and Health	1. CHG to provide analyses and documentation supporting ORP's resolution of the Toxic Waste Substance Control Act (TSCA) requirements.
CR-064	Retrieval of SST wastes	Key Assumption CHG-40: For purposes of estimating the amount of waste feed available for delivery to BNFL in Phase 1, 85% of the waste per SST will be retrieved during Phase 1, based on using Past Practice Sluicing as the reference technology for SST waste retrieval.	If past practice sluicing is unacceptable for retrieval of SST waste (based on regulatory and/or technical requirements), then alternate technologies may need to be demonstrated and qualified for use in SSTs.	Project Delivery	1. Complete preliminary engineering studies early such that alternative technologies are could be used if necessary.
CR-065	Maintaining configuration management of critical drawings	Creating as-built drawings of non-accessible systems is not practical. Configuration issues will not exceed the line-item project cost and schedule contingencies.	If as-built drawings for underground or non-accessible systems are not correct, then delays in design, construction and turnover phases may occur, when unexpected configurations are encountered.	Project Delivery	1. Provide sufficient schedule float and back up waste feed contingency.
CR-066	General manpower shortfalls	CHG and BNFL will be increasing staff levels at the same time. Sufficient numbers of the required skill types will be available to support the Integrated Baseline Schedule.	If general manpower and/or unique skill shortfalls occur, then it may not be possible to execute work as planned.	Human Resources	1. Develop integrated staffing plan (RPP-6114) based on detailed staffing requirements identified in the TBRs, and follow its recommendations. 2. Recruit/train additional staff as required.
CR-067	Emerging retrieval and disposal requirements	ORP and CHG have defined the necessary and sufficient set of requirements for the Tank Farm systems support to the Privatization Contractor.	If new requirements for the retrieval and disposal mission emerge late, (e.g., resolution of Level 2 specification TBDs), then design and schedules may be impacted.	Project Delivery	1. Maintain an interface with ORP and BNFL to identify and assess emerging requirements before they are provided via the contract.
CR-070	Major failure off a Tank Farm system or its infrastructure	Key Assumption CHG-28: Each of the existing 28 DSTs will be available through Phase I of the retrieval mission; no new tanks will be built. Additional RPP support facilities, such as the DCRT and the cross-site transfer line, will also be maintained and operable through Phase 1 (2018).	If one or more DSTs or other major systems fails, then waste feed delivery may be delayed.	Tank Waste Operations	1. Complete integrity assessment/corrosion studies. 2. Provide sufficient schedule float and backup waste feed contingency. 3. Manage the tank space using the Operational Waste Volume Projection process.

CHG Critical Risks

Risk Event #	Risk Title	CHG Key Assumption/Issue	Risk Statement	Risk Owner	Mitigation Action Description
CR-074	Availability of Non-River Protection Project Facilities	Key Assumption CHG-06: Key support facilities/personnel that are currently managed by Hanford Site contractors (non-RPP), such as, 242-A Evaporator, Effluent Treatment Facility, and 222-S Laboratory, will be available to support the RPP mission through the duration of Phase I (2018). Interface requirements will be managed under the IPPD process.	If key PHMC support facilities fail to execute key support activities to the baseline dates, then alternative capabilities may need to be identified and acquired.	Project Delivery	1. CHG will define the reliability and availability requirements for non-RPP facilities and services required to support Phase 1. 2. FH will submit a plan for how it will provide non-RPP facilities and services for Phase 1 to meet RPP's availability and reliability requirements. 3. FH will provide a time-phased estimate of resources required to implement its plan.
CR-079	Onsite Disposal of ILAW	Key Assumption CHG-33: Pretreatment of Envelopes A, B and C waste will allow the resulting ILAW to be disposed of as incidental waste (i.e., non-HLW), based on previous determination by DOE and the Nuclear Regulatory Commission (NRC). Therefore, it is not subject to NRC licensing requirements. The remote trench can be used for disposal of ILAW after: a) confirmation by Performance Assessment; b) confirmation that NRC criteria are met; and c) DOE authorization to proceed with disposal.	If the necessary separations are not achieved, then disposal in a NRC licensed ILAW disposal facility may be required resulting in increased costs and/or schedule delays.	Project Delivery	1. CHG will perform a Performance Assessment to ensure that the ILAW disposal system meets the requirements of 10CFR61.
CR-081	Changes in Regulatory Authority	Key Assumption CHG-50: ORP will be the regulatory agent and will have approval authority for Authorization Basis changes.	If other government agencies assume regulatory authority over RPP, then cost and schedule impacts may result.	Environmental, Safety and Health	1. Evaluate potential impacts from regulation by other government agencies based on experience at US Enrichment Corporation facilities at Portsmouth and Paducah, as directed.
CR-082	Tank Space Availability	Key Assumption CHG-23: LAW and HLW feed delivered by CHG will be accepted and processed by BNFL unless the waste does not meet permitting and/or authorization basis requirements for the BNFL facilities. ORP will develop an approach for compensating BNFL for accepting nearly all off-specification waste. No more than one staged tank of LAW or HLW will be rejected by BNFL. CHG will prepare for retaining a maximum of one rejected staged tank of LAW feed or one rejected staged tank of HLW feed within the DST system during the Minimum Order.	If more than one tank of staged feed is rejected by BNFL, then CHG may not have sufficient tank space to meet retrieval and other tank farm waste storage objectives.	Project Delivery	1. Develop blending strategy to bring feed into compliance with specifications. 2. ORP widens the feed specification requirements.

APPENDIX C

KEY FINDINGS

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APPENDIX C

KEY FINDINGS

The *TFC Operation and Utilization Plan (TFC O&UP)* describes the technical results from evaluating different scenarios for retrieving waste from the double-shell tanks (DSTs) and single-shell tanks (SSTs), staging, delivering, treating, immobilizing, storing, and disposing of the tank waste, and possible impacts for accomplishing the RPP mission. It is based upon the PIO guidance received from ORP in early April.

Key findings from the TFC O&UP are:

- Contingency in Feed Delivery – A number of guidance features (Barrett 2000) and assumptions ensure that project upgrades are in place in advance of feed delivery actions. In addition, the staging strategy has been modified so that feeds are available from multiple sources in the event a failure occurs in a tank or a tank farm. This contingency provides good assurance that feed delivery will not result in an idle waste treatment processing facility.

- Flowsheet Variables – The quantity of glass produced (and the processing schedule) are influenced by uncertainties in waste inventory characterization, retrieval efficiencies, blending strategies, HLW solids wash/leach factors, and key glass-loading concentrations. Sensitivity cases have been run to bracket these variables such that where uncertainties exist, the impacts are understood (i.e. cases with and without sulfate removal have different, but predictable, glass volumes). Glass quantities and schedules are generally reliable for Phase 1.

- Meeting LAW and HLW Feed Specifications - The current tank sequence may not comply with the envelope specifications for every tank. These issues appear to be manageable and can probably be resolved by expanding the specification limits to fit the waste feeds after the processing impacts are reviewed.

- Risk Based Retrieval Sequence – SST retrieval is prioritized in 10 categories to retrieve tanks that: 1) have the greatest environmental hazard (high ^{99}Tc), and 2) least complicated to retrieve (leaking tanks last). The sequence is optimized to keep LAW and HLW feed balanced to avoid processing shutdowns and to enhance incidental blending that occurs during retrieval.

- Number of Simultaneous Retrievals – Case 3S6E is based on a Phase 2 processing rate that enables completion of the mission by 2032. The modeling assumes seven simultaneous retrieval machines are available for operation (RTP 1 assumed a maximum of 5). This assumption is used for all cases. Retrieval does not constrain processing in any case. The risk based retrieval sequence does add simultaneous retrievals per tank farm.

- Product Returns – Case 3S6E assumes (per PIO 2000) no return streams from BNFL, Inc. and existing spare space in the DST's would cover a tank failure. This guidance relieves peak tank space concerns just prior to feed delivery and must be preserved. The routings to make transfers back to the tank farms are still intact.

Several alternatives were evaluated in the period leading up to the Readiness To Proceed 2 activity. Generally, these evaluations were conducted as part of the Integrated Product and Process Development approach together with DOE, BNFL, and the other Hanford Site contractors.

Scenarios Supporting TFC O&UP

More than a dozen alternatives were modeled using the HTWOS model for the latest revision of the TFC O&UP. These were variations of three general scenarios:

- Changes in start-up schedules for the RPP Waste Treatment Plant
- Changes in the rate at which the RPP Waste Treatment Plan facilities are able to achieve their maximum sustainable operating rate.
- Changes in waste loading in the immobilized glass products.

The TFC O&UP details the alternative cases, input parameters, and associated results.

The 3S6D scenario was prepared to model the FY 2000 Tank Farm Contractor guidance from DOE. More recently, the 3S6E scenario was prepared to approximate the guidance from the DOE as contained in the PIO Key Enabling Assumptions (Barrett 2000). Table 1 shows a comparison of the 3S6D and 3S6E and Construction Project Baseline Guidance and Results.

The 3S6D scenario was prepared to model the FY 2000 Tank Farm Contractor guidance from DOE. More recently, the 3S6E scenario was prepared to approximate the guidance from the DOE as contained in the PIO Key Enabling Assumptions (Barrett 2000). Table 1 shows a comparison of the 3S6D and 3S6E and Construction Project Baseline Guidance and Results.

The initial start-up dates are the same for both the 3S6D and 3S6E cases. The key differences lie in the amount of waste loading in the ILAW, the melter ramp up rate, the ILAW produced, and the ramp up of LAW feed delivered to BNFL. In case 3S6D, BNFL removes sulfate and so the sodium loading for Envelope B, the sulfate containing waste, has a high waste loading (19.5%). As a result, fewer canisters of glass are produced (12500). In case 3S6E BNFL does not remove sulfate and so the sodium loading for envelope B has a low waste loading (7.5%). As a result for the same ramp up of LAW feed delivered to BNFL as case 3S6D, the number of canisters of glass is higher than the 3S6D case (13500). The Proposed RTP Project Baseline has the same high waste loading (19.5%) as case 3S6D. However, the TFC has planned to deliver feed at a faster ramp up rate than the two previous cases. Therefore even with the higher waste loading, BNFL produces more canisters of glass (almost as many as with the low waste oxide loading of 3S6E (13366 versus 13500). To do this, BNFL must have a significantly higher melter ramp up rate. This means that the TFC Proposed RTP Project Baseline for LAW feed is able to accommodate the case 3S6E corresponding to a significantly higher BNFL melter ramp-up rate.

Table 1. Comparison of 3S6D and 3S6E Guidance and Results – Phase 1.

Phase 1 Guidance		
Cases	FY2000 Contract Guidance[1,2,3] (Case 3S6D)	April PIO Planning Guidance[4] (Case 3S6E)
Key Differences	1) Sulfate Removal and 2) 1 times the BNFL Integrated Master Plan Ramp-up Rate for LAW	1) No Sulfate Removal and 2) ~2 times the BNFL Integrated Master Plan Ramp-up Rates for LAW
Low-Activity Waste		
Initiate PT Hot Start	4/30/06	4/30/06
First LAW Delivery AP-101	4/30/06	4/30/06
Initiate LAW Hot Start	11/30/06	11/30/06
Initiate LAW Vit. Services	3/1/08	3/1/08
LAW Treatment Ramp Up -Nominal rate = 754 units/yr -2.38 ILAW packages/day	From – To Units/Yr 11/30/06 – 11/30/07 151(20%) 11/30/07 – 11/30/08 452(60%) 11/30/08 – 11/30/09 754(100%) Through Ext. Order 1100(146%)	From – To Units/Yr 11/30/06 – 11/30/07 279(37%) 11/30/07 – 11/30/08 830(110%) 11/30/08 – 11/30/09 1011(134%) Through Ext. Order 1100(146%)
BNFL Sulfate Removal -Na_2O Loading in Envelope B	Yes 19.5 wt.%	No 7.5 wt.%
Product Return Starts When BNFL Lag Storage is X% Full	(ILAW/IHLW) 50%/50%[5]	(ILAW/IHLW) 50%/50%
High-Level Waste		
First HLW Delivery AZ-101	10/31/06	10/31/06
Initiate HLW Hot Start	5/31/07	5/31/07
Initiate HLW Vit. Services	9/1/08	9/1/08
HLW Treatment Ramp Up -Nominal rate = 102 cans/yr -0.28 IHLW canisters/day	From – To # Canisters 9/1/08 – 8/31/09 41(40%) Through Ext. Order 120(117%)	From – To # Canisters 9/1/08 – 8/31/09 41(40%) Through Ext. Order 120(117%)
HLW Waste Oxide Loading	Glass Properties Model Calc.	Glass Properties Model Calc.
Phase 1 Projections Through the BNFL Inc. Contract Period (2/28/18)		
#ILAW Packages	12,500	13,500
#IHLW Packages	1,060	1,070
Date When BNFL Lag Product Storage is 50% Full	ILAW – January 2008 IHLW – April 2009	ILAW – August 2007 IHLW – April 2009
LAW Feed Delivery Dates	All tanks are staged for delivery on the same dates for both cases	
HLW Feed Delivery Dates	All tanks are staged for delivery on the same dates for both cases	

[1] Multi-Year Work Plan Update Guidance for FY2000 (DOE-ORP 1999b)
[2] Lockheed Martin Hanford Corporation Work Authorization for FY 2000 (DOE-ORP 1999)
[3] Mission Planning Guidance for FY 2002 (DOE-ORP 2000)
[4] Project Integration Office April 2000 Guidance (PIO 2000)
[5] Appendix A Modeling Assumption A6.13

Table 1. Comparison of 3S6D and 3S6E Guidance and Results – Phase 2.

Phase 2 Guidance		
Cases	FY2000 Contract Guidance[1,2,3] (Case 3S6D)	April PIO Planning Guidance[4] (Case 3S6E)
Key Differences	2X/4X LAW/HLW Phase 2 Rates	4X/8X LAW/HLW Phase 2 Rates
Vitrification Rates	2X LAW/4X HLW Phase 1 rates	~4X LAW/8X HLW Phase 1 rates
Na_2O Loading in ILAW	20 wt.%	~20 wt.%
Phase 2 Projections		
LAW Completion	March 2042	September 2031
HLW Completion	April 2043	May 2032
Total ILAW Production (# ILAW Packages)	63,200	64,100
Total IHLW Production (# IHLW Canisters)	12,600	12,700

[1] Multi-Year Work Plan Update Guidance for FY2000 (DOE-ORP 1999b)
[2] Lockheed Martin Hanford Corporation Work Authorization for FY 2000 (DOE-ORP 1999)
[3] Mission Planning Guidance for FY 2002 (DOE-ORP 2000)
[4] Project Integration Office April 2000 Guidance (PIO 2000)

In comparing the three cases for HLW, no significant differences exist from a feed standpoint. Thus, the comparison shows that the TFC Proposed RTP Project Baseline for HLW Feed is able to accommodate the case 3S6E. Furthermore, the total amount of IHLW canisters for Phase 1 for Case 3S6E (1070 canisters) can be accommodated by the TFC Proposed RTP Project Baseline (1120 canisters)

The TFC Proposed RTP Project Baseline for ILAW Disposal Facility attains critical decision 4 in June 2007. At this point TFC has completed their operational readiness review and is ready to receive waste from BNFL. In the PIO guidance of April upon which case 3S6E is based TFC received different constraints of the date at which ILAW canisters shipments from BNFL would be started. One constraint of the guidance stated that TFC would need to begin receiving shipment when BNFL storage capacity reached 50%. This date was calculated to be August 2007. Another constraint that PIO provided in their guidance was that the date should be December 2007. Either of these dates can be accommodated by the TFC Proposed Baseline.

The TFC Proposed RTP Project Baseline for IHLW attains critical decision 4 in June 2008 and thus is ready to receive IHLW canisters from BNFL. Again similar multiple constraints were provided in PIO guidance. For the 50% of storage capacity case, TFC needs to begin receiving IHLW in April 2009. PIO guidance also provided the constraint that the shipments would begin in September 2009. Either of these dates can be accommodated by the TFC Proposed Baseline.

Table 2 demonstrates that the case 3S6E is compliant with the Privatization contract from the standpoint of the total amount of LAW units of feed delivered to the Privatization Contractor. The minimum order quantity of LAW (6000 units) is completed during the processing of SY-101 in 2012. Extended order quantities of LAW are also provided in the table.

Table 2. Low-Activity Waste.

PIO Guidance				Results	
Delivery sequence	**Source tank**	**Expected envelope**	**Estimated delivered quantity (units)**	**Modeled units delivered**	**Modeled delivery date**
1	AP-101	A	615	615	04/29/06
2	AZ-101	B	869	866	07/08/07
3	AZ-102	B	447	445	03/29/08
4	AN-102	C	1112	1112	04/10/08
5	AN-104	A	845	845	09/29/10
6	AN-107	C	808	808	07/08/11
7	AN-105	A	839	839	04/01/12
8[a]	SY-101	A	826	827	01/16/13
9	AN-103	A	1084	1084	10/08/13
10	AW-101	A	1070	1070	10/04/14

LAW = Low-activity Waste

PIO = Project Integration Office

[a]Minimum delivery order of 6000 units is reached during processing SY-101 waste. The subsequent tanks provide contingency waste feed.

Table 3 demonstrates that the case 3S6E is compliant with the Privatization contract from the standpoint of total amount of HLW delivered to the Privatization Contractor. The minimum order quantity for HLW (equivalent to 600 canisters of IHLW) is completed during the processing of C-104 and AY-101 in 2012. Extended order quantities of HLW are also provided in the table.

Table 3. High-Level Waste.

PIO Guidance				Results	
Delivery sequence	**Source tank[(a)]**	**Expected envelope**	**Estimated delivered quantity (canisters)[(b)]**	**Modeled delivery quantity (canisters)**	**Modeled delivery date**
1	AZ-101	D	81	81	09/01/05
2	AZ-102	D	123	123	02/01/08
3	AY-102	D	191	191	10/01/10
4[(c)]	C-104 and AY-101	D	343	343	06/01/12
5	SY-102	D	226	227	04/01/15

HLW = High-level waste

PIO = Project Integration Office

[a] Sodium in supernates in AY-102, C-104/AY-101, and SY-102 is not included in the estimated quantity of low-activity waste (LAW).

[b] Includes impacts of strontium and manganese additions for pretreating Envelope C waste, use of the Pacific Northwest National Laboratory (PNNL) Glass Properties Model, and results of sludge washing testing for predicting waste loading in glass.

[c]The minimum delivery order of 600 canisters is reached during processing C-104/AY-101 waste. The subsequent tank provides contingency waste feed.

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