AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT	1. CONTRACT ID CODE	PAGE 1 OF PAGES 6 plus Attachments

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE *(M/D/Y)*	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
A143	**See Block 16C**		

6. ISSUED BY CODE

U.S. Department of Energy
Office of River Protection
P. O. Box 450, MS H6-60
Richland, WA 99352

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP code)*

Bechtel National, Inc.
2435 Stevens Center Place
Richland, WA 99352

CODE FACILITY CODE

☐ 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED *(SEE ITEM 11)*

☒ 10A. MODIFICATION OF CONTRACT/ ORDER NO.

DE-AC27-01RV14136

10B. DATED *(SEE ITEM 13)*

December 11, 2000

11. THIS ITEM APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE DATE AND HOUR SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and amendment and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS SET FORTH IN ITEM 14.

CHECK ONE	
☐	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
☐	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO AUTHORITY OF FAR 43.103(b).
☒	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO THE AUTHORITY OF: Clause I.82 FAR 52.243-2 CHANGES – COST-REIMBURSEMENT (AUG 1987) – ALTERNATE III (APR 1984)
☐	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return _2_ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

See following page(s)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
W. S. Elkins **BNI Project Director**		**Michael K. Barrett** **Contracting Officer**	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(original signed by) *(Signature of person authorized to sign)*	**January 16, 2009**	BY *(original signed by)* *(Signature of Contracting Officer)*	**January 16, 2009**

Purpose of Modification:

The purpose of this contract modification is to: (i) re-structure Section B - *SUPPLIES OR SERVICES AND PRICES/COSTS*; (ii) update Sections C, F, H, I, and J (as described below); and (iii) incorporate a Contractor Statement of Waiver and Release of Claims as of the date of this modification.

Description of Modification:

The following changes are hereby incorporated into the Contract:

1. Contract Section B, *SUPPLIES OR SERVICES AND PRICES/COSTS* is replaced in its entirety with Attachment 1 – Contract Section B, Rev. Mod A143.

2. Contract Section C, *STATEMENT OF WORK* is replaced in its entirety with Attachment 2 – Contract Section C, Rev. Mod A143.

3. Contract Section F, *DELIVERIES OR PERFORMANCE* is replaced in its entirety with Attachment 3 – Contract Section F, Rev. Mod A143.

4. Under Contract Section H, *SPECIAL CONTRACT REQUIREMENTS*:

    a. The text of Clause H.13 *SELF-PERFORMED WORK* is replaced in its entirety as follows:

    The objectives for the amount of self-performed work by the Contractor is 60 percent of the Total Estimated Contract Cost. Self-performed work by the Contractor includes any teaming partner(s) and any parent, wholly-owned subsidiary or affiliated organizations It is the expectation of DOE that the remainder of the work shall be performed through competitive procurements with an emphasis on fixed price subcontracts.

    b. The text of Clause H.18 *RESPONSIBLE CORPORATE OFFICIAL* is modified to replace the listed Official as follows:

Name:	*David M. Walker*
Position:	*President*
Company/Organization:	*Bechtel National, Inc.*
Address:	*5275 Westview Dr.; Frederick, MD 21703*
Phone:	*240-379-3660*
Facsimile:	*301-620-9285*
E-mail:	*dwalker@bechtel.com*

    c. Clause H.45 *BASELINE CHANGE CONTROL PROCESS* is deleted in its entirety and Clause H.45 shown as "RESERVED."

5. Under Contract Section I, *CONTRACT CLAUSES:*

    a. Clause I.20 *FAR 52.216-10 INCENTIVE FEE (MAR 1997)* is deleted and shown as "*Reserved*."

    b. Clause I.29 *FAR 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)* is re-designated as Clause "*I.29A*."

    c. Clause I.29B *FAR 52.222-2 PAYMENT FOR OVERTIME PREMIUMS (JUL 1990)* is added to the Contract. The fill-in value is "$TBD".

d. Clause I.117 *DEAR 970.5204-2 LAWS, REGULATIONS, AND DOE DIRECTIVES (JUN 1997)* is citation-corrected from "*DEAR 970.5204-**2***" to "*DEAR 970.5204-**78***."

6. Contract Section J, *LIST OF ATTACHMENTS*, Attachment I, *FUNDING* is replaced in its entirety with Attachment 4 – Contract Section J, Attachment I, Rev. Mod A143.

7. Contract Section J, *LIST OF ATTACHMENTS*, Attachment J, *ADVANCE UNDERSTANDING ON COSTS* is replaced in its entirety with Attachment 5 – Contract Section J, Attachment J, Rev. Mod A143, which includes added Sub-Attachment A – *List of Inclusions from Equitable Adjustment Settlement* and Sub-Attachment B – *List of Exclusions from Equitable Adjustment Settlement*.

Statement of Waiver and Release of Claims:

In consideration for Modification No. A143, and except as expressly set forth below, the Contractor hereby waives and releases the Government from any and all liability and responsibility for all claims, causes of action, Requests for Equitable Adjustments (REAs), and demands of any kind arising under or related to the contract as modified that, as of the effective date of this modification, were known or should have been known by the Contractor including without limitation (1) REAs submitted, identified but not formally submitted, or withdrawn, and (2) subcontractor claims, demands, and causes of action (all such matters hereafter collectively described as "Released Claims"). The foregoing waiver and release does not affect the Contractor's entitlement to payment of properly-invoiced allowable costs and earned fee as set forth in the contract.

(a) This waiver and release includes, but is not limited to, Released Claims for the following REAs resulting from changes to the contract (including Government-directed and constructive changes), trends, and Baseline Change Proposals :

- REA-001 Revised Ground Motion
- REA-002 Pulsed Jet Mixers
- REA-003 Hydrogen Piping and Ancillary Vessels
- REA-004 10 CFR 851 Worker Safety & Health
- REA-005 Additional Fireproofing Requirements
- REA-006 Earned Value Management System Implementation
- REA-007 DOE Order 414.1C, Quality Assurance
- REA-008 DOE Order 226.1, DOE Oversight Policy
- REA-009 DOE Order 435.1 Radioactive Waste Management
- REA-012 DOE Standard 1186, Specific Administration Controls
- REA-013 Estimate At Completion Resubmittal
- REA-016 Inflation Impact
- REA-017 Black Cell Access
- REA-018 Maximum Achievable Control Technology (MACT) Testing and Demonstration
- REA-020 Defense Nuclear Safety Board Support
- REA-021 Analytical Laboratory Backfill
- REA-022 Increased Frequency of Risk Assessments
- REA-023 Thorp Event
- REA-024 Change to Fuel Oil
- REA-025 PT Rebar Offset Splices
- REA-026 Hexavalent Chromium-Impact of Regulation Changes
- REA-027 Borehole Drilling Support
- REA-028 Addition of Spare Melters in Low Activity Waste Facility and High Level Waste Facility

- REA-029 Schedule Impact
- REA-030 Operational Readiness Staffing Increase
- REA-031 Preservation/Start-up Support Maintenance
- REA-032 Labor Productivity Impacts
- REA-033 0.85 Design/Capacity Structural Margin
- (Unnumbered) Schedule Impact due to Contingency
- REA-034 External Flowsheet Review Team
- REA-035 Capacity Modifications
- REA-036 Schedule Impacts in BCP 2306 and BCP 2426
- REA-037 External Curtailment of Pretreatment Facility & High Level Waste Facility
- REA-038 Other DOE Directed Changes
- Trend/BCP 06-2646 Review of 420.1B for impacts
- Trend/BCP 06-2882 ICD-19 Reconciliation Study
- Trend/BCP 06-2941 Technology Maturation Plan IRP's & VE Study/Prep
- Trend/BCP 06-3410 Review DOE/RW-0333P QARD, Rev 20 for impacts
- Trend/BCP 06-3419 Implement QARD, Rev 18 and ASME NQA-1 by Duratek
- All Trends and Baseline Change Proposals listed in Item 18 "*Inclusions from Equitable Adjustment Settlement"* of Section J, Attachment J "Advance Understanding on Costs," in Modification No. A143."

(b) This Modification definitizes and provides full and complete equitable adjustment for the Government-directed changes described in the table below. The Government hereby deletes all Not-To-Exceed (NTE) values established in the "M Series" contract modifications listed in the table below.

Modification	Item Description
M080; M083; M136 Description, Item 1; M140	Capacity studies
M082; M096	Revised Standard 1 (Section C) including WBS 1.08 Deletion
M095	Implement DOE M 442.1-1 Differing Professional Opinions
M097	Implement DOE M 450.4-1, Integrated Safety Management System Manual
M098 Description, Item 1)	Perform Impact Assessment on PNNL Borehole Drilling results
M098 Description, Item 2)	Hexavalent Chromium Worker Protection Rules
M098 Description, Item 3)	DOE M 205.1-2 Clearing and Sanitization of Information
M098 Description, Item 4)	Project Execution Re-sequencing Plan, FY07
M098 Description, Item 5); M077	Estimate to Implement CRD, DOE O 210.2 DOE Corporate Operating Experience Program

Modification	Item Description
M098 Description, Item 6)	a. Implement DOE O 471.3-1 Identifying and Protecting Official Use Only Information; and b. Implement DOE M 471.3-1 Manual for Identifying and Protecting Official Use Only Information
M098 Description, Item 7)	Technical Feasibility Study for startup sequencing, LAW
M101 Description, Item 1)	Ground Motion (Seismic Attenuation Study to Support ORP) Trend 24590-03-01341
M101 Description, Item 3)	Supplemental LAW Treatment Study (Trend 24590-03-01318)
M101 Description, Item 4)	QA Testing of HEPA Filters at DOE test facility
M101 Description, Item 5)	Earned Value Management System “cross walk” to 32 DOE EVMS criteria
M101 Description, Item 6)	PTF Black Cell Access Trend 24590-03-01315
M102 Item 13, Trend 24590-03-01213	Concentrate Receipt Vessels Deletion
M102 Item 13, Trend 24590-05-01906	Subcontract Support for Seismic Bore Holes
M115	Conceptual Design Report – LAW First and Incorporate Updated Elements of LAW First into Performance Measurement Baseline
M117	Estimate for Third LAW Melter
M130	Implement: a. DOE O 435.1, Chg 1 Radioactive Waste Management b. DOE M 441.1-1 Nuclear Material Packaging c. DOE N 234.1 Reporting of Radioactive Sealed Sources
M133 Description, Item 2)	Partial Implementation of DOE O 420.1B Facility Safety
M134 Description, Item 1)	Implement DOE/RW-0333P QARD, Rev 20
M135	Implement QARD, Rev 18 and ASME NQA-1 by Duratek
M136 Description, Item 2	Implement DOE M 470.4-1 Safeguards and Security Program Planning and Management; and Implement DOE M 470.4-2 Physical Protection

Modification	Item Description
M136 Description, Item 3	a. Section J, Attachment J, *Advanced Understanding on Costs*, Item 13 is deleted. b. N/A
M141	a. Replace DOE O 551.1B Official Foreign Travel with DOE O 551.1C b. Conduct Analysis of Temporary Versus Permanent Structures For Assembly/Installation of Primary/Spare LAW and HLW Melters

(c) The only exception to this waiver and release is the Contractor's right to pursue equitable adjustments to the contract for those Trends and Baseline Change Proposals specifically identified in Item 19 "*Exclusions from Equitable Adjustment Settlement*" of Section J, Attachment J "*Advance Understanding on Costs*," in Modification No. A143. This exception is subject to the limitations contained in Clause B.10(e) and other terms and conditions of the Contract.

Attachments:

1 Contract Section B, SUPPLIES OR SERVICES AND PRICES/COSTS, Rev. Mod A143.

2 Contract Section C, STATEMENT OF WORK, Rev. Mod A143.

3 Contract Section F, DELIVERIES OR PERFORMANCE, Rev. Mod A143.

4 Contract Section J, LIST OF ATTACHMENTS, Attachment I, FUNDING, Rev. Mod A143.

5 Contract Section J, LIST OF ATTACHMENTS, Attachment J, ADVANCE UNDERSTANDING ON COSTS, Rev. Mod A143, including added Sub-Attachment A *List of Inclusions from Equitable Adjustment Settlement*, and Sub-Attachment B *List of Exclusions from Equitable Adjustment Settlement.*

SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

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SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 TYPE OF CONTRACT – ITEMS BEING ACQUIRED

This is a Cost–Plus Award-Fee Contract, with award and multiple fee incentives. The various incentive fee types are described in Clause B.4 *Incentive Fee Structure*. **(A143)**

The Contractor shall, in accordance with the terms of this Contract, provide the personnel, materials, supplies, and services (except as may be expressly set forth in this Contract as furnished by the Government) and otherwise do all things necessary and incident to designing, constructing, and commissioning the Hanford Tank Waste Treatment and Immobilization Plant (WTP) as described in Section C, *Statement of Work*. The WTP has five separate facilities: Pretreatment Facility (PT), High-Level Waste Facility (HLW), Low-Activity Waste Facility (LAW), Analytical Laboratory (LAB) and Balance of Facilities (BOF).

B.2 OBLIGATION AND AVAILABILITY OF FUNDS AND CONTRACT VALUE

(a) Subject to the Section I Clause entitled, *Limitation of Funds*, the amount presently obligated under the Contract is shown in the following table. Nothing in this paragraph or in the Clause entitled *Limitation of Funds* is to be construed as authorizing the Contractor to exceed limitations stated in the following table established by DOE and furnished to the Contractor from time to time under the contract. The following table establishes controls on the costs to be incurred and encumbrances to be made in the performance of the contract work. **(A058)**

Description	Appropriation Symbol	B&R No. (Control Point)	Budget Authority
	01250	1110401	$3,006,205,907.70
LAW	01250	1111183	$564,048,526.74
Lab	01250	1111184	$180,071,526.23
BOF	01250	1111185	$207,395,780.49
HLW	01250	1111186	$472,020,823.23
PT	01250	1111187	$643,403,021.97
Total of Budgetary Control Points (A142)			**$5,073,145,586.36**

An Inter-Office Work Order (IWO) has been established for work under this Contract performed by the Savannah River National Laboratory (SRNL) on behalf of the Contractor. The Work Description for this IWO is to conduct experimental studies for flow sheet verification, optimization, integration, and scale up in support of the technical basis for design and operation of the Hanford River Protection Project Waste Treatment Plant. This work is based on the Westinghouse Savannah River Company – SRTC Proposal Rev. III and subsequent Change Control that has been approved by the Contractor. The DOE identification number for this IWO is “M0SRLE60”. **(A030) (A121)**

The Government owns the IWO process; therefore, all funding under this IWO is approved by the Office of River Protection and work is conducted under the Contractor's management direction. At the Contractor's request, DOE has transferred work authority to SRNL totaling $74,049,617 through Amendment #36 of this IWO. This total IWO funding transfer is not reflected in funding amounts shown in the above table, but counts toward meeting ORP Contract funding requirements set forth elsewhere in this Contract. **(A058)(A121)(A129)**

Accordingly, the total obligated amount to the contract is $5,147,195,203.36.

(b) Except as may be specifically provided to the contrary in the Contract (Section I Clause entitled, *Nuclear Hazards Indemnity Agreement*) the duties and obligations of the U.S. Department of Energy (DOE) hereunder calling for the expenditure of appropriated funds shall be subject to the availability of funds appropriated by the U.S. Congress that DOE may legally spend for such purposes.

(c) The Total Estimated Contract Price is determined as follows:

Cost:						
	Total Estimated Contract Cost (TECC)					**$ 10,446,498,000**
Fee:						
A	Final Fee Determination - Pre-Mod No. A143			$ 102,622,325		
B	Maximum Available Award Fee			$ 139,377,675		
	B.1	Project Management Incentive	$ 44,377,675			
	B.2	Cost Incentive	$ 95,000,000			
C	Schedule Incentive Fee			$ 227,000,000		
	C.1	Activity Milestone Completion	$ 173,000,000			
	C.2	Facility Milestone Completion	$ 54,000,000			
D	Operational Incentive Fee			$ 91,000,000		
	D.1	Cold Commissioning	$ 45,000,000			
	D.2	Hot Commissioning	$ 46,000,000			
E	Enhancement Incentive Fee			$ 60,000,000		
	E.1	Enhanced Plant Capacity	$ 15,000,000			
	E.2	Sodium Reduction	$ 15,000,000			
	E.3	Enhanced Plant Turnover	$ 15,000,000			
	E.4	Sustained Production Achievement	$ 15,000,000			
	Total Maximum Available Fee					**$ 620,000,000**
		Total Estimated Contract Price				**$ 11,066,498,000**

B.3 ALLOWABILITY OF SUBCONTRACTOR FEE

If the Contractor is part of a consortium, joint venture, and/or other teaming arrangement, the team shall share in this Contract fee structure (i.e., separate additional "subcontractor fee" for teaming partners will not be considered an allowable cost under the Contract). If a subcontractor, supplier, or lower-tier subcontractor is a wholly owned, majority owned, or affiliate of any team member, any fee or profit earned by such entity will not be considered an allowable cost under this Contract.

B.4 INCENTIVE FEE STRUCTURE

The DOE objective under this Contract is to receive a completed WTP that meets or exceeds the contractual performance requirements. Incentives are structured to ensure a strong financial motivation for the Contractor to achieve the Contract requirements.

The Contract has five incentive fee elements:

- Incentive Fee A – Final Fee Determination for Work Prior to Modification No. A143
- Incentive Fee B – Maximum Available Award Fee
- Incentive Fee C – Schedule Incentive Fee
- Incentive Fee D – Operational Incentive Fee
- Incentive Fee E – Enhancement Incentive Fee

WTP Incentive Fee Structure

No.		Title	Fee Type	Performance Measure(s)	Fee Administration Terms and Conditions Reference
A		**Final Fee Determination for Work Prior to Mod. No. A143**	Fixed	Determined by Contracting Officer	Clause B.6, Attachment B-2-A
B		**Award Fee:**			
	B.1	Award Fee - Project Mgmt Incentive	Award	Performance Measures in PEMP	Clause B.7, Atch B-2-B & PEMP
	B.2	Award Fee - Cost Incentive	Award	Performance Measures in PEMP	Clause B.7, Atch B-2-B & PEMP
C		**Schedule Incentive Fee:**			
	C.1	Activity Milestone Completion	PBI	Completion of Specified Milestones	Clause B.6, Atch B-2-C & PEMP
	C.2	Facility Milestone Completion	PBI	Completion of Specified Milestones	Clause B.6, Atch B-2-C & PEMP
D		**Operational Incentive Fee:**			
	D.1	Cold Commissioning	PBI	Capacity	Clause B.6; Atch B-2-D; Section C, Standard 5, Table C.6-5.1
	D.2	Hot Commissioning	PBI	Capacity	Clause B.6, Atch B-2-D; Section C, Standard 5, Table C.6-5.2
E		**Enhancement Incentive Fee:**			
	E.1	Enhanced Plant Capacity	PBI	Plant Capacity Exceeding Treatment Capacity	Clause B.6, Atch B-2-E
	E.2	Sodium Reduction	PBI	Metric Tons Sodium Reduced	Clause B.6, Atch B-2-E
	E.3	Enhanced Plant Turnover	PBI	Reduced Plant Turnover Period	Clause B.6, Atch B-2-E
	E.4	Sustained Production Achievement	PBI	Post-Turnover Operations Capacity	Clause B.6, Atch B-2-E

These incentive fee elements are discussed in summary form below, with specific implementing details in Attachment B-2, *INCENTIVE FEE DETAILS*. Each fee incentive element is calculated independently of the others.

(a) A – Final Fee Determination for Work Prior to Modification No. A143: The final fee determination for all performance prior to Modification No. A143 is $102,622,325. This is composed of $54,500,000 of previously paid fee for schedule milestones, and $48,123,325 of previously paid provisional fee (which is considered earned).

(b) B – Maximum Available Award Fee: Beginning in calendar year (CY) 2009, and through the award fee periods specified in Attachment B-2-B, award fee may be earned by achieving performance objectives set forth in the semi-annual WTP Performance Evaluation and Measurement Plan (PEMP) and specific Contract terms in Attachment B-2-B. See Contract Section B.7 for award fee administration requirements under the Contract.

(c) C – Schedule Incentive Fee: The Schedule Incentive Fee consists of two elements:

(1) Activity Milestone Completion incentives are earned and payable upon the Contracting Officer's determination of the Contractor's completion of each milestone (listed in Attachment B-2-C) in accordance with the criteria set forth in the PEMP. The dates are considered as targets.

(2) Facility Milestone Completion incentives are earned and payable upon the Contracting Officer's determination of the Contractor's completion in accordance with the criteria set forth in Section C and/or the PEMP, as applicable. Facility Milestone Completion Incentive fees require meeting the specific dates listed in Attachment B-2-C. Fee reductions for late delivery are documented in Attachment B-2-C.

The "Complete Hot Commissioning" Facility Milestone Completion incentive is earned and payable upon the Contracting Officer's determination of the Contractor's meeting or exceeding the minimum throughput requirement (i.e., 60% of design capacity). Capacity testing incentives are included in Operational Incentive Fee Attachment B-2-D.

All Schedule Incentive Fees are earned and payable upon the Contracting Officer's determination of the Contractor's completion of each milestone. Each milestone represents and measures progress towards achieving the Contract requirements and do not represent payment for the specific named milestone itself.

(d) D – Operational Incentive Fee: Operational Incentive Fee is earned (in specified amounts) and payable upon the Contracting Officer's determination of the Contractor's achievement of prescribed performance testing rates for commissioning as described below and in Attachment B-2-D and applicable portions of Section C.6, *Standard* 5 *Commissioning*: (e) *Cold Commissioning*, (3)*Testing*, (ii) *Cold Commissioning Capacity Tests*; and (g) *Hot Commissioning*, (4) & (5) *Hot Commissioning Capacity Tests*. Achievement of each milestone is independently measured and earned.

(1) Cold Commissioning:

Operational Incentive Fee in the amount specified in Attachment B-2-D is earned for meeting the Capacity performance testing rates specified in Section C.6, Standard 5, and Table C.6-5.1, *Cold Commissioning Capacity Testing Criteria,* for all Facilities.

(2) Hot Commissioning:

Operational Incentive Fee in the amount specified in Attachment B-2-D is earned for meeting the Capacity performance testing rates specified in Section C.6, Standard 5, Table C.6-5.2, *Hot Commissioning Capacity Testing Criteria*.

A portion of the unearned Operational Incentive Fee from Cold Commissioning may be earned during Hot Commissioning under conditions specified in Attachment B-2-D.

(e) E – Enhancement Incentive Fee: Enhancement Incentive Fee contains four fee elements designed to reduce life-cycle operating costs of the WTP: (i) Enhanced Plant Capacity; (ii) Sodium Reduction; (iii) Enhanced Plant Turnover; and (iv) Sustained Production Achievement. Details for these sub-elements are provided in Attachment B-2-E.

Enhanced Incentive Fee is earned and payable upon the Contracting Officer's determination of the Contractor's achievement of prescribed requirements.

B.5 EQUITABLE ADJUSTMENTS TO COST, PERFORMANCE INCENTIVES, SCHEDULE, AND FEES

(a) Equitable adjustments to the cost, performance incentives (including fees) and the Schedule will be made when required in accordance with the Section I Clause entitled, *Changes – Cost Reimbursement - Alternate III*, and as expressly provided in other Contract provisions.

(b) For purposes of Contractor planning, Section J, Attachment I, *Funding Profile* sets forth a funding profile with an assumption that for each fiscal year, at least 25% will be made available by October 31, 50% by January 31, 75% by April 30, and the remainder by July 31. The clause places no obligation on DOE to request funding in accordance with the profile. To the extent that DOE obligates funds to this Contract on a schedule consistent with this funding profile, availability of funds shall not be a basis for equitable adjustment to any of the performance incentive fees described in Section B, and/or Section F milestone dates.

B.6 INCENTIVE FEE ADMINISTRATION

The Contractor will notify the Contracting Officer (CO) when the Contractor believes an incentive fee activity, milestone and/or performance measure has been met. The CO will: 1) make a determination whether the requirements of the Contract have been met, 2) make a determination of whether fee is earned, and 3) notify the Contractor of these determinations within thirty (30) calendar days (or such other time period as mutually agreed to between the CO and the Contractor) after receipt by the CO of the Contractor's notification. If the CO determines fee has been earned, then the Contractor can invoice for the fee as outlined in the CO determination on the next available invoice.

B.7 AWARD FEE ADMINISTRATION

(a) Definitions:

"Award Fee Evaluation Period" – The six (6)-month evaluation periods from January 1 through June 30 (Period 20XX-A), and July 1 through December 31 (Period 20XX-B).

(b) Award Fee: Award fee is available for meeting a combination of objective performance requirements and subjective performance requirements for each award fee component: Project Management Incentive and Cost Incentive. The Award Fee Evaluation Period for the Project Management Incentive and Cost Incentive will be every six (6) months of each calendar year (CY) starting in CY 2009, and ending after CY 2019. However, the first award fee period will only be five (5) months, February 1, 2009 through June 30, 2009.

(c) Fee Negotiations: Prior to the beginning of each award fee period, the Contracting Officer and Contractor shall enter into negotiation of the requirements to be set forth in the PEMP for the award fee period. In the event the parties fail to agree on the requirements and the evaluation areas, a unilateral determination will be made by the Contracting Officer prior to the beginning of the evaluation period.

(d) Determination of Available Award Fee Amount Earned:

(1) The Government shall, at the conclusion of each specified evaluation period, evaluate the Contractor's performance of the requirements set forth in the PEMP, including incentives completed during the period, and determine the award fee amount earned for each award fee component: Project Management Incentive and Cost Incentive. At the Contracting Officer's discretion, evaluation of incentivized performance may occur at the scheduled completion of specific incentivized requirements.

(2) The evaluation of Contractor performance shall be in accordance with the requirements attached to this section and set forth in the PEMP. The Contractor shall be promptly advised in writing of the fee determination, and the basis of the fee determination.

(e) Schedule for Award Fee Amount Earned Determinations: The Contracting Officer shall issue the award fee amount earned determination for each award fee incentive (Project Management Incentive and Cost Incentive) in accordance with: the schedule set forth in the PEMP; or as otherwise set forth in this contract. However, a determination must be made within sixty (60) calendar days after the receipt by the Contracting Officer of the Contractor's self-assessment, if one is provided by the Contractor, or seventy (70) calendar days after the end of the evaluation period, whichever is later, or a longer period if the Contractor and Contracting Officer agree. If the Contracting Officer evaluates the Contractor's performance of specific requirements on their completion, the payment of any earned fee amount must be made within seventy (70) calendar days (or such other time period as mutually agreed to between the Contracting Officer and the Contractor) after Contracting Officer notification of such completion, assuming the Contractor has submitted a voucher for payment within ten (10) calendars days after the Contracting Officer's determination. If the Contractor is delayed in submitting a voucher beyond the ten (10) calendar days, payment will incur a day-for-day delay.

(f) Contractor Self-assessment: Following each evaluation period, the Contractor may submit a self-assessment, provided such assessment is submitted within ten (10) calendar days after the end of the period. This self-assessment shall address both the strengths and weaknesses of the Contractor's performance during the evaluation period. Where deficiencies in performance are noted, the Contractor shall describe the actions planned or taken to correct such deficiencies and avoid their recurrence. The Contracting Officer will review the Contractor's self-assessment, if submitted, as part of its independent evaluation of the Contractor's management during the period.

B.8 CONDITIONAL PAYMENT OF FEE, PROFIT, OR INCENTIVES

In order for the Contractor to be eligible to earn all otherwise available fee under the Contract, the Contractor must meet the minimum requirements in paragraphs (a) and (b) of this section. If the Contractor does not meet the minimum requirements, the Fee Determining Official (FDO) [the Manager, U.S. Department of Energy, Office of River Protection (ORP) or designee], may make a unilateral determination to reduce the earned award fee under the Contract as follows:

(a) Minimum requirements for Environment, Safety, Quality and Health (ESQ&H) Program: The Contractor shall develop, obtain DOE approval and implement an Integrated Safety Management System (ISMS) in accordance with the provisions of Section I Clause entitled, *Integration of Environment, Safety and Health into Work Planning and Execution*. The minimal performance requirements will be set forth in the approved ISMS description document, or similar document. If the Contractor fails to obtain approval of the ISMS or fails to achieve the minimum performance requirements of the System, the FDO, at

his/her sole discretion, may reduce the total earned award fee payment for B.1 Project Management Incentive and B.2 Cost Incentive during the six (6)-month Award Fee period in which the incident occurred.

(b) Minimum Requirements for Catastrophic Event: If, in the performance of this Contract, there is a catastrophic event (such as, a fatality, or a serious workplace-related injury or illness to one or more Federal, Contractor, or subcontractor employees or the general public, loss of control over classified or special nuclear material, or significant damage to the environment), the FDO, at his/her sole discretion, may reduce the earned award fee payment for B.1 Project Management Incentive and B.2 Cost Incentive during the six (6)-month Award Fee period in which the incident occurred. In determining any diminution of fee resulting from a catastrophic event, the FDO, at his/her sole discretion, will consider whether willful misconduct and/or negligence contributed to the occurrence and will take into consideration any mitigating circumstances presented by the Contractor or other sources.

B.9 RESERVED

B.10 FEE RISK ALLOCATION

Except as set forth below, fee risks for changes under Clause I.82 *Changes – Cost Reimbursement – Alternate III*, and other applicable Contract provisions addressing equitable adjustment, shall be in accordance with the applicable Contract provisions(s). Equitable adjustments for the below-specified situations shall be subject to further limitations, clarifications and modifications provided below:

(a) Site Services and Interface Control Documents (ICD):

A contract change (subject to equitable adjustment in accordance with Clause I.82) shall be deemed to have occurred as the result of any changes in requirements regarding use of site services, including revisions to ICDs, both express (directed) and constructive. The Contractor shall use its best reasonable efforts to minimize and mitigate any such performance impacts.

(b) Waste Delivery:

A contract change (subject to equitable adjustment in accordance with Clause I.82) shall be deemed to have occurred as the result of failure by the Government to deliver waste feed in conformance to waste feed specifications, and/or failure to deliver feed in the quantity and/or timing necessary to support commissioning activities in accordance with Section C, Standard 5, *Commissioning*.

(c) Changes in Laws, Regulations, Codes, Standards and Directives:

A Contract change (subject to equitable adjustment in accordance with Clause I.82) shall be deemed to have occurred as the result of any changes in laws, regulations, codes, standards and Directives (other than Regulatory Actions covered by paragraph (d) below) in accordance with the Changes clause.

(d) Regulatory Actions:

(1) A Contract change (subject to equitable adjustment in accordance with Clause I.82) is deemed to have occurred upon unreasonable regulatory delays/interpretations/demands/ new requirements in responding to and/or approving permit and other applications ("Regulatory Actions") after reasonable collaboration with DOE to avoid such impacts. This includes, but is not limited to, impacts resulting from implementation of Maximum Available Control Technology (MACT) standards.

(2) Absent Contractor's reasonable collaboration with DOE to avoid such impacts, Contractor shall not be entitled to an equitable adjustment to the Total Estimated Contract Cost or any fee for the first $5,000,000 of impact for any such single regulatory action (per occurrence).

(e) Items Excluded from Statement of Waiver and Release of Claims for Modification A143

The Contractor will not request, seek or claim entitlement to any fee for the first $350,000,000 of reasonable, allocable and allowable costs for the items identified in paragraph (c) of the Statement of Waiver and Release of Claims contained in Modification A143. The Contracting Officer will determine those reasonable, allocable and allowable costs pursuant to the applicable terms of the contract.

(f) Disposition of Government Property Credit:

The estimated cost of the contract assumes that the acquisition cost or salvage value, as applicable, of government property, such as and including spare parts and supplies not consumed during commissioning and limited operations and construction equipment purchased as a direct cost to support the project, would be credited against the final actual cost in accordance with FAR 52.245-5(i). This credit shall be determined upon submission of inventory schedules to the Contracting Officer. The intent of this provision is to adjust the final actual cost to eliminate the cost of Government Property that is to be or has been transferred off the Government Property records of the Contractor for the purposes of calculating the final Award Fee – Cost Incentive fee determination.

The Contracting Officer will make specific decisions as to which equipment, spare parts and supplies will be retained for future use by the Government. For equipment, spare parts and supplies which are deemed excess and not to be retained by the Government, the Contractor will dispose of those materials in a cost effective manner. The proceeds will be used to offset contract costs.

(g) RFP Deficiencies and Due Diligence Review:

Except as otherwise set forth in (a), (b), (c), (d), (e) and (f) above, the Contractor shall bear the full fee risk for cost and schedule impacts resulting from any actual or purported deficiencies, whether or not known to Contractor and whether or not such deficiencies were identified by Contractor during its due diligence review under Section C.5. (a)(3), which arise out of solicitation defects, specification defects, Conceptual Design defects, or deficient historical pricing or cost estimate information in any form.

B.11 ATTACHMENTS

ATTACHMENT B-1 – INCENTIVE FEE SUMMARY TABLE

ATTACHMENT B-2 – INCENTIVE FEE DETAILS

ATTACHMENT B-2-A – INCENTIVE FEE A – Final Fee Determination for Work Prior to Modification No. A143.

ATTACHMENT B-2-B – INCENTIVE FEE B – Maximum Available Award Fee

ATTACHMENT B-2-C – INCENTIVE FEE C – Schedule Incentive Fee

ATTACHMENT B-2-D – INCENTIVE FEE D – Operational Incentive Fee

ATTACHMENT B-2-E – INCENTIVE FEE E – Enhancement Incentive Fee

ATTACHMENT B-1 INCENTIVE FEE SUMMARY TABLE

Table B-1 - WTP Incentive Fee Structure

	Description	Reference	Amount
A	**Final Fee Determination Prior to Modification No. A143**	Attachment B-2-A	**$102,622,325**
B	**Maximum Available Award Fee:**		
B.1	Project Management Incentive	Attachment B-2-B	$44,377,675
B.2	Cost Incentive	Attachment B-2-B	$95,000,000
	Total Award Fee		**$139,377,675**
C	**Schedule Incentive Fee:**		
C.1.X	Activity Milestone Completion:	Attachment B-2-C	$173,000,000
C.2	Facility Milestones Completion:		
C.2.1	LAB Construction Substantially Complete	Attachment B-2-C	$4,000,000
C.2.2	LAW Construction Substantially Complete	Attachment B-2-C	$4,000,000
C.2.3	LBL Start Cold Commissioning (SCC)	Attachment B-2-C	$4,000,000
C.2.4	LBL Complete Hot Commissioning (CHC)	Attachment B-2-C	$4,000,000
C.2.5	HLW Start Cold Commissioning	Attachment B-2-C	$9,500,000
C.2.6	PT Start Cold Commissioning	Attachment B-2-C	$9,500,000
C.2.7	HLW Complete Hot Commissioning	Attachment B-2-C	$9,500,000
C.2.8	PT Complete Hot Commissioning	Attachment B-2-C	$9,500,000
	Total - Facility Schedule Incentive		$54,000,000
	Total Schedule Incentive Fee		**$227,000,000**
D	**Operational Incentive Fee:**		
D.1	Cold Commissioning:		
D.1.1	PT High Level Waste	Attachment B-2-D	$10,000,000
D.1.2	PT Low Level Waste	Attachment B-2-D	$10,000,000
D.1.3	HLW Vitrification	Attachment B-2-D	$13,000,000
D.1.4	LAW Vitrification	Attachment B-2-D	$12,000,000
	Subtotal-Cold Commissioning		$45,000,000
D.2	Hot Commissioning:		
D.2.1	PT High Level Waste	Attachment B-2-D	$10,000,000
D.2.2	PT Low Level Waste	Attachment B-2-D	$10,000,000
D.2.3	HLW Vitrification	Attachment B-2-D	$13,000,000
D.2.4	LAW Vitrification	Attachment B-2-D	$13,000,000
	Subtotal-Hot Commissioning		$46,000,000
	Total Operational Incentive Fee		**$91,000,000**
E	**Enhancement Incentive Fee:**		
E.1	Enhanced Plant Capacity	Attachment B-2-E	$15,000,000
E.2	Sodium Reduction	Attachment B-2-E	$15,000,000
E.3	Enhanced Plant Turnover	Attachment B-2-E	$15,000,000
E.4	Sustained Production Achievement	Attachment B-2-E	$15,000,000
	Total Enhancement Incentive Fee		**$60,000,000**
	TOTAL MAXIMUM AVAILABLE FEE (A+B+C+D+E)		**$620,000,000**

ATTACHMENT B-2 INCENTIVE FEE DETAILS

The administrative details of each fee incentive are shown in each attachment listed below:

ATTACHMENT B-2-A – INCENTIVE FEE A – Final Fee Determination for Work Prior to Modification No. A143

ATTACHMENT B-2-B – INCENTIVE FEE B – Maximum Available Award Fee

ATTACHMENT B-2-C – INCENTIVE FEE C – Schedule Incentive Fee

ATTACHMENT B-2-D – INCENTIVE FEE D – Operational Incentive Fee

ATTACHMENT B-2-E – INCENTIVE FEE E – Enhancement Incentive Fee

ATTACHMENT B-2-A – INCENTIVE FEE A – FINAL FEE DETERMINATION FOR WORK PRIOR TO MODIFICATION NO. A143.

The final fee determination for all Contract performance prior to Modification No. A143 is $102,622,325. This is composed of $54,500,000 of previously paid fee for schedule milestones (which is considered earned), and $48,123,325 of previously paid provisional fee. The $48,123,325 is earned based on the completion of the following significant construction milestones.

Construction Milestones	Fee ($)
Low-Activity Waste Facility	
Completion of Facility Superstructure – March 2007 Description: Completed installation of structural steel frame, roofing and siding (dried-in).	**$25,600,000**
Completion of Process Vessel Installation – December 2006 Description: Fourteen process vessels installed and accepted in the wet process cell.	**$3,200,000**
Completion of Canister Handing System – March 2008 Description: Completed canister handling system in the melter pour caves including turntables, canister elevator, receipt conveyor, bogies and monorails.	**$2,200,000**
Analytical Laboratory	
Completion of Facility Superstructure – April 2008 Description: Completed installation of structural steel frame, roofing and siding.	**$10,700,000**
Completion of Installation of Hotcell Structures – February 2008 Description: Completion on physical hotcell structure, shield window frames, monorail, and coatings.	**$2,300,000**
Balance of Facilities	
Construction Complete on Steam Plant – September 2007 Description: Completed construction and ready for system checks	**$1,400,000**
Construction Complete on Cooling Tower Facilities – March 2007 Description: Completed construction and ready for system checks	**$1,100,000**
Construction Completions on Chiller Compressor Building and Systems – March 2008 Description: Completed building structure, support frames, major equipment installation and process piping installation.	**$1,623,325**

ATTACHMENT B-2-B – INCENTIVE FEE B – MAXIMUM AVAILABLE AWARD FEE

Table B-2-B-1. Incentive Fee B – Maximum Available Award Fee

Calendar Year (CY)	Award Fee Period	Maximum Available Award Fee - Cost Incentive	Maximum Available Award Fee - Project Management Incentive	Total Maximum Available Award Fee
2009	2009-A	$ 4,500,000	$ 2,188,838	$ 6,688,838
	2009-B	$ 4,500,000	$ 2,188,837	$ 6,688,837
2010	2010-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2010-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2011	2011-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2011-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2012	2012-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2012-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2013	2013-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2013-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2014	2014-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2014-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2015	2015-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2015-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2016	2016-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2016-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2017	2017-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2017-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2018	2018-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2018-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
2019	2019-A	$ 4,300,000	$ 2,000,000	$ 6,300,000
	2019-B	$ 4,300,000	$ 2,000,000	$ 6,300,000
	Totals	**$ 95,000,000**	**$ 44,377,675**	**$ 139,377,675**

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ATTACHMENT B-2-B – INCENTIVE FEE B – MAXIMUM AVAILABLE AWARD FEE (continued)

B.1 PROJECT MANAGEMENT INCENTIVE

The Project Management Incentive is fully described in the PEMP based on subjective and/or objective evaluation of important project management performance elements to be developed semi-annually and set forth in the PEMP. Important emphasis areas will include a collection of diverse emphasis areas, such as: general project management considerations, labor management, safety, quality management, technical issue resolution, engineering and construction performance, procurements process effectiveness, and environmental performance, etc.

B.2 COST INCENTIVE

The Cost Incentive is fully described in the PEMP based on subjective and/or objective evaluation of important cost performance elements to be developed semi-annually and set forth in the PEMP. The primary objective of the Maximum Available Award Fee – Cost Incentive is to incentivize the Contractor to achieve a final actual cost that is equal to or less than the Total Estimated Contract Cost (TECC). The TECC for the purposes of this incentive is defined as the Contractor's Performance Management Baseline plus Management Reserve. TECC is also referred to under EVMS as the Total Allocated Budget.

The Cost Incentive will be evaluated based on a combination of subjective and/or objective evaluation of important cost performance elements to include, but not be limited to: cost performance indices, schedule performance indices, management reserve utilization, number and value of variances, and Estimate at Completion based on the Monthly Status Report.

ATTACHMENT B-2-C – INCENTIVE FEE C – SCHEDULE INCENTIVE FEE

All Schedule Incentive Fees are milestones that represent and measure progress toward achieving the Contract as set forth in the PEMP and do not represent payment for the specific named milestone itself. Schedule Incentive Fee Definitions are set forth in the PEMP.

C.1 ACTIVITY MILESTONE COMPLETION

The following Activity Milestones are earned and payable upon successful completion. Schedule Dates shown below are only target dates and are based upon Late Finish schedule dates for each activity. These Milestones are not time-dependent. The fee will be earned and payable when the Contracting Officer determines the milestone has been completed in accordance with the Activity Milestone Definition Sheets set forth in the PEMP. These sheets contain: Milestone Definitions, Inclusions, Exclusions, Key Predecessor Activities, and Objective Evidence of Milestone Completion.

INCENTIVE C.1 - ACTIVITY MILESTONE COMPLETION INCENTIVE FEE

Facility	Milestone Designation	Function	Description	Date	CY	Fee Amount
LAB-01	1GT00E0918	Engineering	Title II Design Complete	01/30/09	2009	$ 3,875,000
BOF-04	1GB16C1050	Construction	Complete Installation of Cathodic Protection System	02/20/09	2009	$ 3,875,000
PTF-02	1GP12CFM02	Engineering	IFC Drawings for Concrete Walls EL 56 - 77 Ft	04/28/09	2009	$ 3,875,000
LAB-02	1GT48P0921	Plant Equip	Receive Waste Transfer System Equipment	04/29/09	2009	$ 3,875,000
LAW-06	1GL14C0915	Construction	Erect Switchgear Building	10/15/09	2009	$ 3,875,000
LAW01	1GL47P0922	Plant Equip	Receive Offgas Mercury Adsorber, PA #09-A EL +48	10/19/09	2009	$ 3,875,000
HLW-02	1GH48P0942	Plant Equip	Receive and Accept Melter Cave 1 Crane Maintenance Shield Door HSH-DOOR-05	11/11/09	2009	$ 3,875,000
PTF-01	1GP14CFM01	Engineering	DOE Approval of M-12 Closure	12/30/09	2009	$ 3,875,000
HLW-05	1GH13C1145	Construction	Erect Structural Steel EL 0 Ft - EL 14 Ft	01/20/10	2010	$ 4,428,000
PTF-03	1GP15CFM03	Engineering	PD Rack Design - IFC Complete	01/28/10	2010	$ 4,428,000
LAB-04	1GT47P1036	Plant Equip	Receive Autosampler (ASX) Equipment	02/23/10	2010	$ 4,428,000
LAW-03	1GL46P1030	Plant Equip	Melter #2 Lid+Bal of Components Ready for Assembly	06/15/10	2010	$ 4,428,000
BOF-02	1GB5MC1043	Construction	Complete Construction Water Treatment Building	07/27/10	2010	$ 4,428,000
HLW-01	1GHZZE0941	Engineering	Complete HVAC Design (Title II)	09/15/10	2010	$ 4,428,000
LAW-02	1GL36P1027	Plant Equip	CATOX LVP-SKID-0002 Received +Ready to Install	10/06/10	2010	$ 4,428,000
HLW-04	1GH36P1044	Plant Equip	Receive and Accept Plant Wash Vessel: RLD-VSL-8	02/16/11	2011	$ 2,500,000
HLW-03	1GHZZE1043	Engineering	Civil Engineering Design Complete (Title II)	02/23/11	2011	$ 2,500,000
BOF-01	1GB47P1040	Plant Equip	Receive Anhydrous Ammonia System	02/25/11	2011	$ 2,500,000
PTF-04	1GP30CFM04	Construction	Set Hot Cell Frames for Areas 1, 24, and 25	07/19/11	2011	$ 2,500,000
HLW-09	1GH27C1249	Construction	Set HEPA Filter Housing Installation at EL 14 Ft	08/31/11	2011	$ 2,500,000
LAB-03	1GT47C1356	Construction	Complete Installation of Autosampler System	10/10/11	2011	$ 2,500,000
HLW-07	1GH15C1247	Construction	Complete Pipe and Hanger Installation in PA06	12/06/11	2011	$ 2,500,000
HLW-10	1GH36C1250	Construction	Set Offgas Cat Oxidizers: HOP-SCO-2 and 3	12/07/11	2011	$ 2,500,000
PTF-09	1GP31CFM09	Construction	Set PT Vessel FEP-SEP-00001A/1B in Planning Area 02	01/10/12	2012	$ 2,858,000
PTF-05	1GPZZCFM05	Engineering	C&I Design Complete	03/14/12	2012	$ 2,858,000
BOF-03	1GB5JC1046	Construction	Complete Chiller Compressor Plant Construction	03/22/12	2012	$ 2,858,000
HLW-06	1GH47C1146	Construction	Set Offgas Carbon Adsorber	05/31/12	2012	$ 2,858,000
PTF-08	1GP30CFM08	Construction	Set Remaining Pretreatment Vessel at EL 0 Ft	08/27/12	2012	$ 2,858,000
PTF-07	1GPZZCFM07	Engineering	Electrical Design Complete	09/04/12	2012	$ 2,858,000
HLW-11	1GH27C1351	Construction	Installation of HVAC Duct at EL 0 Ft Corridors	11/15/12	2012	$ 2,858,000
				SUBTOTAL		**$ 102,002,000**

INCENTIVE C.1 - ACTIVITY MILESTONE COMPLETION INCENTIVE FEE (cont.)

Facility	Milestone Designation	Function	Description	Date	CY	Fee Amount
			SUBTOTAL (from prior page)			**$ 102,002,000**
BOF-06	1GB12C1253	Construction	Complete Emergency Diesel Generator Base Slab	03/14/13	2013	$ 2,500,000
PTF-10	1GP12CFM10	Construction	Complete Concrete Slabs at EL 56 Ft	03/19/13	2013	$ 2,500,000
HLW-12	1GH14C1352	Construction	Complete Annex Building Weathering	04/30/13	2013	$ 2,500,000
PTF-11	1GP12CFM11	Construction	Complete 5th Lift Walls	05/09/13	2013	$ 2,500,000
HLW-13	1GH46C1453	Construction	Set HEME Vessels 2A and 2B at EL 0 Ft	06/12/13	2013	$ 2,500,000
PTF-14	1GP30CFM14	Construction	Set Filter Cave HEME / HEPA / Demister Equipment	11/05/13	2013	$ 2,500,000
PTF-06	1GP47CFM06	Plant Equip	Receipt of all PSA Pipe Racks	11/12/13	2013	$ 2,500,000
HLW-08	1GH15C1248	Construction	Install Pipe and Hangers in PA02B	12/04/13	2013	$ 2,500,000
PTF-16	1GP15CFM16	Construction	Complete Bulk In-cell Pipe Installation	01/30/14	2014	$ 3,333,000
PTF-15	1GP28CFM15	Plant Equip	Receipt of Electrical Equipment in Control Building Electrical Rooms	04/03/14	2014	$ 3,333,000
HLW-16	1GH27C1556	Construction	Set C2V/C3V Air Handling Units at EL 58 Ft	04/21/14	2014	$ 3,333,000
PTF-13	1GP27CFM13	Construction	Air Handling Units EL 98 Ft	05/23/14	2014	$ 3,333,000
PTF-12	1GP14CFM12	Construction	Install Roofing at EL 98 Ft	10/28/14	2014	$ 3,333,000
PTF-18	1GP30CFM18	Construction	Set Hot Cell Major Equipment	10/30/14	2014	$ 3,333,000
LAW-04	1GL00C1505	Construction	Complete Melter #1 Movement into Building	01/07/15	2015	$ 1,667,000
HLW-14	1GH12C1454	Construction	Placement of HLW Concrete Slabs at EL 58 Ft	01/12/15	2015	$ 1,667,000
PTF-19	1GP14CFM19	Construction	Complete Main Building Weathering	02/04/15	2015	$ 1,667,000
LAW-05	1GL00C1515	Construction	Complete Melter #2 Movement into Building	03/09/15	2015	$ 1,667,000
PTF-17	1GP11CFM17	Engineering	Complete Pretreatment Design	03/24/15	2015	$ 1,667,000
HLW-15	1GH46C1555	Construction	Move Melter 1 into Building	04/22/15	2015	$ 1,667,000
BOF-07	1GB28C1360	Construction	Set (2) Emergency Diesel Generators	05/26/15	2015	$ 1,667,000
BOF-05	1GBC2S1463	Start Up	Complete Elec Distrb Sys Testing LVE / MVE (Site Energization)	05/29/15	2015	$ 1,667,000
HLW-17	1GH14C1557	Construction	Complete Main Building Weathering	06/16/15	2015	$ 1,667,000
PTF-21	1GPC2CFM21	Construction	Construction Turnover of PIH Crane to Startup	08/10/15	2015	$ 1,667,000
PTF-22	1GPC2CFM22	Start Up	Demonstration of Resin Addition to Ion Exchange Columns	10/19/15	2015	$ 1,667,000
PTF-20	1GPC0CFM20	Construction	Final System Turnover Complete	11/30/15	2015	$ 1,667,000
HLW-18	1GH00C1558	Construction	Construction Commence Turnover to Startup (Elec Sys Package)	05/26/16	2016	$ 2,749,000
PTF-23	1GPE2CFM23	E&NS	Submit FSAR 2016 Update	06/29/16	2016	$ 2,749,000
HLW-20	1GHC2S1660	Construction	Final System Turnover Complete	09/22/16	2016	$ 2,749,000
HLW-19	1GHC2S1659	Start Up	Demonstrate Canister Lid Weld	12/21/16	2016	$ 2,749,000
				TOTAL		**$ 173,000,000**

C.2 FACILITY MILESTONE COMPLETION

The following table governs the Facility Milestone Completion Incentive Fee. The fee will be earned and payable when the Contracting Officer determines the milestones have been completed in accordance with the Facility Milestone Definition Sheets set forth in the PEMP. These sheets contain: Milestone Definitions, Inclusions, Exclusions, Key Predecessor Activities, and Objective Evidence of Milestone Completion. Unearned milestone completion fee is total fee available at scheduled dates minus actual schedule completion fee earnings. The "Complete Hot Commissioning" Facility Milestone Completion incentive fee is earned upon meeting or exceeding the minimum hot commissioning throughput requirement (i.e., 60% of design capacity).

Table B-2-C-1. Facility Milestone Completion Schedule

Facility	Activity Code	Facility Milestone Description	Schedule Date	Fee Amount
LAB	4TT0099	Substantially Complete Construction	December 31, 2012	$ 4,000,000
LAW	4LL0000999	Substantially Complete Construction	December 31, 2014	$ 4,000,000
LAW	5HLC2A0110	Start Cold Commissioning (SCC)	February 28, 2018	$ 4,000,000
LAW	5HLC4A0010	Complete Hot Commissioning (CHC)	May 30, 2019	$ 4,000,000
HLW	5HHC2A0115	Start Cold Commissioning	June 30, 2018	$ 9,500,000
HLW	5HHC4A0010	Complete Hot Commissioning	July 30, 2019	$ 9,500,000
PT	5HPC2A0115	Start Cold Commissioning	September 30, 2017	$ 9,500,000
PT	5HPC4A0056	Complete Hot Commissioning	February 28, 2019	$ 9,500,000
		Total		**$ 54,000,000**

Facility Milestone Completion Incentive Fees are subject to the following conditions:

(a) On-Time Milestone Delivery.

If the Contractor completes a Facility Milestone on or before the Schedule Date in Table B-2-C-1 *Facility Milestone Completion Schedule*, the total fee amount for that incentive is achieved and final. If the Complete Hot Commissioning milestone for a facility is achieved, the fee is earned per Table B-2-C-1, *Facility Milestone Completion Schedule*, and in addition, 50% of any unearned Cold Commissioning Fee for that particular facility is earned.

In addition, the Contractor may switch the dates of SCC-LAW/CHC-LAW and SCC-HLW/CHC-HLW. If the Contractor decides to switch the dates, the Contractor shall notify DOE on or before eighteen (18) months prior to the SCC-LAW of its decision to swap the schedule date of the SCC-HLW with the date scheduled for SCC LAW.

(b) Late Milestone Delivery.

(1) Substantially Complete Construction (SubCC) Milestones: If the Contractor completes a SubCC milestone ninety (90) days or longer after the Schedule Date in Table B-2-C-1 *Facility Milestone Completion Schedule*, the Contractor will earn no fee and 50% of the fee will be carried forward and added to the Complete Hot Commissioning milestone for PT fee amount. If the Contractor completes the milestone up to ninety (90) days late, the amount of fee earned will be a straight-line pro-rata share of the fee, with 50% of the unearned balance carried forward to the Complete Hot Commissioning milestone for the LAW fee amount.

(2) Cold and Hot Commissioning Milestones: If the Contractor is late achieving Start Cold Commissioning (SCC) or Complete Hot Commissioning (CHC) for one of the specified facilities (LAW, HLW, PT), it remains eligible to earn a reduced portion of the available fee for that facility milestone completion incentive, as follows:

(i) The Facility Milestone Completion incentive fee late start fee reduction criteria are designed to encourage the Contractor to continue to exert best efforts to accomplish SCC and CHC in an expeditious fashion. Accordingly, each of the specified facilities has a specific SCC date and CHC date. The SCC date can be exceeded by 180 days before all SCC fee is unearned and 50% of the unearned balance is carried forward to the Complete Hot Commissioning milestone for that facility. The CHC date can be exceeded by 365 days before all CHC fee as well as any unearned fee from Substantially Complete Construction milestones and/or SCC milestones is lost. The CHC date will not be revised based on late achievement of Substantially Complete Construction milestone and/or SCC milestone.

(ii) Late achievement of a Start Cold Commissioning milestone will result in a reduction in fee earned for SCC for that facility according to the following schedule:

(A) If the SCC milestone completion is between one (1) and forty-five (45) days late to the Schedule Date, a 0.333% reduction per day to the SCC Milestone incentive fee shall be made, up to a maximum of 15%.

(B) If the SCC milestone completion is between forty-six (46) and ninety (90) days late to the Schedule Date, a 0.444% reduction per day to the SCC Milestone incentive fee shall be made, up to a maximum of an additional 20%.

(C) If the SCC milestone completion is between 91 and 180 days late to the Schedule Date, a 0.722% reduction per day to the SCC Milestone incentive fee shall be made, up to a maximum of an additional 65%.

(D) If the SCC milestone completion occurs more than 180 days late, the Milestone incentive fee for that facility is reduced to zero.

(E) Fifty percent (50%) of all unearned SCC milestone fee is carried forward to the Complete Hot Commissioning milestone for that facility.

(iii) Late achievement of a Complete Hot Commissioning milestone will result in a reduction in fee earned for CHC for that facility according to the following schedule:

(A) If the CHC milestone completion is between one (1) and ninety (90) days late to the Schedule Date, a 0.166% reduction per day to the CHC Milestone incentive fee shall be made, up to a maximum of 15%.

(B) If the CHC milestone completion is between 91 and 180 days late to the Schedule Date, a 0.222% reduction per day to the CHC Milestone incentive fee shall be made, up to a maximum of an additional 20%.

(C) If the CHC milestone completion is between 181 and 365 days late to the Schedule Date, a 0.351% reduction per day to the CHC Schedule Incentive Fee shall be made, up to a maximum of an additional 65%.

(D) If the CHC milestone completion occurs beyond 365 days late then the Schedule Incentive Fee is reduced to zero.

Table B-2-C-2. Facility Milestone Completion Fee Earnings Under Early, On Time, and Late Delivery

If SubCC Is Achieved:	**Amount of SubCC Fee Earned Is:**	**Unearned SubCC Fee Carried Forward to CHC per C.2(b)(1) Is:**
Early	All	N/A
On Time	All	N/A
Late < 90 Days	Reduced Per C.2(b)(1)	50% of Unearned Fee
Late ≥ 90 Days	None	50% of Available Fee

If SCC Is Achieved:	**Amount of SCC Fee Earned Is:**	**Unearned SCC Fee Carried Forward to CHC Is:**
Early	All	N/A
On Time	All	N/A
Late < 180 Days	Reduced Per C.2(b)(2)(ii)	50% of Unearned Fee
Late ≥ 180 Days	None	50% of Available Fee

If CHC Is Achieved:	**Amount of CHC Fee Earned Is:**	**Carry Forward SubCC and/or SCC Fee Earned Is:**
Early	All	All
On Time	All	All
Late < 365 Days	Reduced Per C.2(b)(2)(iii)	None
Late ≥ 365 Days	None	None

ATTACHMENT B-2-D – INCENTIVE FEE D – OPERATIONAL INCENTIVE FEE

Table B-2-D-1. Operational Incentive Fee

Facility	Plant Capacity Level	
	Minimum	Treatment*
Cold Commissioning:		
PT High Level Waste	$ 6,000,000	$ 10,000,000
PT Low Activity Waste	$ 6,000,000	$ 10,000,000
HLW Vitrification	$ 7,500,000	$ 13,000,000
LAW Vitrification	$ 7,500,000	$ 12,000,000
Total Operational Incentive Fee - Cold Commissioning	**$ 27,000,000**	**$ 45,000,000**
Hot Commissioning:		
PT High Level Waste	$ 6,000,000	$ 10,000,000
PT Low Activity Waste	$ 6,000,000	$ 10,000,000
HLW Vitrification	$ 7,800,000	$ 13,000,000
LAW Vitrification	$ 7,800,000	$ 13,000,000
Total Operational Incentive Fee - Hot Commissioning	**$ 27,600,000**	**$ 46,000,000**

* As described in Contract Section C.6, Standard 5, Table C.6-5.1, *Cold Commissioning Capacity Testing Criteria*, and Table C.6-5.2, *Hot Commissioning Capacity Testing Criteria.*

Operational Incentive Fee is subject to the following conditions:

(a) Definitions:

(1) "Minimum Capacity" as specified in Standard 5, Tables C-6.5.1 and C.6-5.2 is at least 60%, but less than 70% of Design Capacity; "Treatment Capacity" as specified in Table C-6.5.1 and C.6-5.2 is 70% of Design Capacity. All percentages are rounded to the nearest tenth.

(2) "Unearned Cold Commissioning Fee" is total fee available at Treatment Capacity level minus actual cold commissioning fee earnings.

(b) Fee achievements for the Operational Incentive Fee are determined on a stand-alone basis for each facility and based on the Cold and Hot Commissioning Performance Test results.

(c) In the event that during the cold and hot commissioning capacity performance tests throughput for a facility is determined to be less than Minimum capacity, the conditions set forth in Section C.6 (5)(h) shall apply to that facility.

(d) If a commissioning capacity achieved is equal to or greater than Minimum capacity but less than Treatment capacity, the Minimum capacity fee is subject to increase for results above the Minimum capacity level per the following formula:

(1) For Cold Commissioning: Each 0.1% in increase over Minimum capacity results in an increase to the fee of:

(A) For PT High-Level Waste $40,000 up to a maximum of 9.9% or $3,960,000.

(B) For PT Low-Activity Waste $40,000 up to a maximum of 9.9% or $3,960,000.

(C) For HLW $55,000 up to a maximum of 9.9% or $5,445,000.

(D) For LAW $45,000 up to a maximum of 9.9% or $4,455,000.

(2) For Hot Commissioning: Each 0.1% in increase over minimum capacity results in an increase to the fee of:

(A) For PT High-Level Waste $40,000 up to a maximum of 9.9% or $3,960,000.

(B) For PT Low-Activity Waste $40,000 up to a maximum of 9.9% or $3,960,000.

(C) For HLW $52,000 up to a maximum of 9.9% or $5,148,000.

(D) For LAW $52,000 up to a maximum of 9.9% or $5,148,000.

(e) If cold commissioning capacity achieved for a particular facility is equal to or greater than Treatment capacity, then Cold Commissioning Treatment Capacity-level fee is earned per Table B-2-D-1 *Operational Incentive Fee*.

(f) If hot commissioning capacity achieved for a particular facility is equal to or greater than Treatment Capacity, then Hot Commissioning Treatment Capacity-level fee is earned per Table B-2-D-1, *Operational Incentive Fee*, and in addition, 50% of any unearned Cold Commissioning Fee for that particular facility is earned.

(g) Additional fee for achieving capacity above Treatment Capacity is covered under Incentive Fee E.1 – Enhanced Plant Capacity.

ATTACHMENT B-2-E – INCENTIVE FEE E – ENHANCED INCENTIVE FEE

INCENTIVE FEE E.1 – ENHANCED PLANT CAPACITY

Under this performance incentive, the Contractor is afforded the opportunity to demonstrate greater than treatment capacity during commissioning. Capacity values are demonstrated using Cold and Hot Commissioning Performance Testing results. Measurement of each facility capacity will use the approach described in Contract Section C.6, *Standard* 5 *Commissioning*: (e) *Cold Commissioning*, (3)*Testing*, (ii) *Cold Commissioning Capacity Tests*; and (g) *Hot Commissioning*, (4) & (5) *Hot Commissioning Capacity Tests*.

During Cold and Hot Commissioning, enhanced plant capacity fee shall be earned and payable upon the Contracting Officer's determination that the Contractor has achieved capacities as follows up to the maximum amounts contained in Table B-2-E-1:

Cold Commissioning:

Each 0.1% in increase over Treatment Capacity (70%) results in an increase to the fee of:

1. For PT (High or Low) $10,000 up to the maximum listed below.

   Example, if PT-High achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $1,400,000 ((84-70) = 14% (140) x $10,000 = $1,400,000).

2. For LAW $5,833 up to a maximum listed below.

   Example, if LAW achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $816,620 ((84-70) = 14% (140) x $5,833 = $816,620).

3. For HLW $5,833 up to a maximum listed below.

   Example, if HLW achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $816,620 (84-70) = 14% (140) x $5,833 = $816,620).

Hot Commissioning:

Each 0.1% in increase over Treatment Capacity (70%) results in an increase to the fee of:

1. For PT (High or Low) $5,833 up to the maximum listed below.

   Example, if PT-High achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $816,620 ((84-70) = 14% (14) x $5,833 = $816,620).

2. For LAW $3,333 up to a maximum listed below.

   Example, if Law achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $466,620 ((84-70) = 14% (140) x $3,333 = $466,620).

3. For HLW $3,333 up to a maximum listed below.

   Example, if HLW achieved a capacity of 84% the resulting Enhanced Plant Capacity fee would be $466,620 ((84-70) = 14% (140) x $3,333 = $466,620).

INCENTIVE FEE E.1 – ENHANCED PLANT CAPACITY (cont.)

Table B-2-E-1. Enhanced Plant Capacity

Activity	Maximum Available Fee
Cold Commissioning:	
PT High Level Waste	$ 3,000,000
PT Low-Activity Waste	$ 3,000,000
HLW Vitrification	$ 1,750,000
LAW Vitrification	$ 1,750,000
Subtotal - Cold Commissioning	**$ 9,500,000**
Hot Commissioning:	
PT High Level Waste	$ 1,750,000
PT Low-Activity Waste	$ 1,750,000
HLW Vitrification	$ 1,000,000
LAW Vitrification	$ 1,000,000
Subtotal - Hot Commissioning	**$ 5,500,000**
Total Fee - E.1 Enhanced Plant Capacity	**$ 15,000,000**

Total Available Fee for E.1 Enhanced Plant Capacity = $15,000,000

ATTACHMENT B-2-E – INCENTIVE FEE E – ENHANCED INCENTIVE FEE (cont.)

INCENTIVE FEE E.2 – SODIUM REDUCTION

The Contractor may optimize the process flowsheet, feed delivery and blending considerations, glass formulations, and the physical plant configuration to reduce the quantity of process-added waste sodium. The incentive requires the Contractor to reduce the mass of waste sodium added in the WTP baseline flowsheet compared to the estimate presented in 24590-WTP-MRR-PET-08-002, Rev. 2, *WTP Contract Run-G(2) Dynamic Model Run Results Report*.

This proposal and technical outcome:

- Shall not result in an increase in the quantity of HLW canisters produced over the RPP mission or an extension of the mission duration.

- May include options to limit aluminum leached from HLW solids in combination with improvements of aluminum waste loading in the HLW glass, and pretreatment facility process optimization.

Successful demonstration that sodium additions in the process have been reduced should be determined using process models, technology testing (laboratory, bench and engineering scale), and information from the literature and/or consultants. WTP Cold Commissioning process demonstration of the optimized flowsheet is required. The WTP Cold Commissioning simulant composition and Cold Commissioning strategy shall be selected with DOE concurrence. The recommended stimulant shall consider demonstration of the optimized process flowsheet. The WTP Cold Commissioning demonstration may be part of or separate from the Cold Commissioning performance testing, at the Contractor's discretion.

The Contractor, if electing to pursue this incentive, shall present a proposal to DOE on the strategy, approach, work products, specific measurements, and cost and schedule for achieving this performance objective. Costs associated with developing a proposal shall assume use of WTP Management Reserve (MR) to fund a baseline change proposal, shall not be considered new Contract Scope and shall be accounted for separately. Funding associated with executing a proposal shall be from a mutually agreed apportionment between Contractor's MR and Government's Owner's contingency as reflected in an approved baseline change proposal (BCP). In the event the cost at completion exceeds the BCP value, the difference is funded in the same proportion.

The technical outcome will be provided in an interim and final summary report that shall:

- Identify the proposed optimized flowsheet(s) as a function of feed type and predicted sodium use
- Identify feed staging and blending strategies to reduce sodium use
- Identify glass formulations to increase aluminum loading in HLW glass, to the extent that this approach is used
- Summarize laboratory testing, bench scale testing, engineering scale testing and modeling results that demonstrate the reduced usage
- Specify the plant testing requirements needed to confirm assumptions (interim report)
- Document WTP cold commissioning results used to confirm the assumptions and results

Information and data gained from lab and engineering scale testing to close External Flowsheet Review Team issues about leaching, ultrafiltration performance, and process limits can be credited to earn the sodium reduction fee enhancement.

INCENTIVE FEE E.2 – SODIUM REDUCTION (cont.)

Enhanced fee for Sodium Reduction will be determined based on the Contractor's success in reducing sodium in accordance with the following stepped schedule:

Metric Tons Sodium Reduced		
At Least	**But Less Than**	**Incentive Fee**
5,000	10,000	$ 3,000,000
10,000	15,000	$ 3,000,000
15,000	20,000	$ 3,000,000
20,000	25,000	$ 3,000,000
25,000		$ 3,000,000
TOTAL		$ 15,000,000

* Fee earnings in the table represent earnings at the applicable Sodium-reduction level achieved and are cumulative.

Enhanced fee shall be earned and payable upon the Contracting Officer's determination of the Contractor's completion of the following activities:

1. Completion of initial model and bench scale testing for runs demonstrating sodium reduction: 30% of the fee for the predicted improvement. If the runs are also demonstrated on the Pretreatment Engineering Platform and engineering scale melter tests (if aluminum loading in the high-level waste glass is part of the strategy) fee is increased to 50% of the fee for the predicted improvement.
2. Completion of cold commissioning testing and final report (Section C.6, *Standard* 5 *Commissioning*: (e) *Cold Commissioning*, (5) *Cold Commissioning Results and Documentation)*: final fee determination, less any fee paid under paragraph (1.) above.

Total Available Fee for E.2 Sodium Reduction = $15,000,000

ATTACHMENT B-2-E – INCENTIVE FEE E – ENHANCEMENT INCENTIVE FEE (cont.)

INCENTIVE FEE E.3 – ENHANCED PLANT TURNOVER

An enhanced fee is earned and payable to the Contractor upon the Contracting Officer's determination of the Contractor's ability to reduce the six (6)-month plant turnover period for the LAB, LAW, HLW, and PT facilities. The schedule calls for each of these facilities to be transitioned to the Tank Operations Contractor within six (6) months of the completion of hot commissioning. For the LAB, LAW, and HLW facilities, one million dollars is earnable for each facility if the Contractor has reduced the transition period by one (1) month. Three million dollars is earnable for each facility if the Contractor has reduced the transition period by three (3) months. A straight-line incremental amount, on a daily basis, is earnable for each facility (LAB, LAW, and HLW facilities) if the Contractor has reduced the transition period between one (1) month and three (3) months. For the PT Facility, the same criteria are in place, and two million dollars is earnable if the Contractor has reduced the transition period by one (1) month and six million dollars for three (3) months. A straight-line incremental amount, on a daily basis, is earnable if the Contractor has reduced the transition period for the PT Facility between one (1) month and three (3) months. Completion of transition for fee determination purposes is considered complete upon providing items listed in the Facility Transition Plan section of Contract (Section C.6, *Standard* 5 *Commissioning,* (j) *Transition)* to the Operating Contractor.

Facility	Per Month Early	Total
LAB	$1,000,000	$3,000,000
LAW	$1,000,000	$3,000,000
HLW	$1,000,000	$3,000,000
PT	$2,000,000	$6,000,000
Total		**$15,000,000**

Total Available Fee for E.3 Enhanced Plant Turnover = $15,000,000

ATTACHMENT B-2-E – INCENTIVE FEE E – ENHANCED INCENTIVE FEE (cont.)

INCENTIVE FEE E.4 – SUSTAINED PRODUCTION ACHIEVEMENT

An enhanced fee is earned and payable to the Contractor upon the Contracting Officer's determination of the Tank Operations Contractor being able to sustain specific plant capacities for a continuous ninety (90)-day period in the first six (6) months after turnover of each process facility (LAW, HLW, and PT). This incentivizes the Contractor to work with the Tank Operations Contractor to achieve sustained operations. Two million dollars is earnable, for PT-High, PT-Low, HLW, and LAW each, if the Contractor has achieved minimum capacity values. An additional two million dollars is earnable, for PT-High, PT-Low, and HLW each, if the Contractor has achieved treatment capacity values and one million dollars for LAW. A straight-line incremental amount is earnable if the Contractor has achieved values between minimum and treatment capacities. The minimum and treatment capacity values are specified in Section C.6, *Standard* 5 *Commissioning*, (g) *Hot Commissioning,* (4) & (5) *Hot Commissioning Capacity Tests*, Table C.6-5.2. *Hot Commissioning Capacity Testing Criteria*.

FACILITY	MINIMUM CAPACITY	TREATMENT CAPACITY	TOTAL AVAILABLE
PT-High	$2,000,000	$2,000,000	$4,000,000
PT-Low	$2,000,000	$2,000,000	$4,000,000
HLW	$2,000,000	$2,000,000	$4,000,000
LAW	$2,000,000	$1,000,000	$3,000,000
Total	**$8,000,000**	**$7,000,000**	**$15,000,000**

Total Available Fee for E.4 Sustained Production Achievement = $15,000,000

SECTION C

STATEMENT OF WORK

SECTION C

STATEMENT OF WORK

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SECTION C

STATEMENT OF WORK

C.1 INTRODUCTION

Hanford tank waste consists of approximately 190 million curies in 53 million gallons of highly radioactive and mixed hazardous waste stored in underground storage tanks at the Hanford Site. The tank waste includes solids (sludge), liquids (supernatant), and salt cake (dried salts that will dissolve in water forming supernatant). The tank waste will be remediated through treatment and immobilization to protect the environment and meet regulatory requirements.

The U.S. Department of Energy (DOE) determined that the preferred alternative to remediate the Hanford tank waste is to:

- Pretreat the waste to separate it into two fractions, Low-Activity Waste (LAW) and High-Level Waste (HLW);
- Immobilize the LAW for on-site disposal; and
- Immobilize the HLW for ultimate disposal in the national repository.

The first tank waste fraction, LAW, is comprised of the tank waste liquids (and dissolved salt cake) and contains the bulk of the tank waste chemicals and certain radionuclides (e.g., cesium [Cs], strontium [Sr], and transuranics [TRU]) that must be mitigated prior to immobilizing the waste. LAW is a mixed, characteristic, and listed waste regulated under the *Resource Conservation and Recovery Act of 1976* (RCRA), and must meet certain treatment standards and performance standards for on-site disposal of the final waste form in accordance with the specific requirements of the Contract.

The second tank waste fraction, HLW, is comprised of the long half-life radioactive tank waste solids (as well as other non-radioactive solids) and the radionuclides separated from the LAW fraction. HLW is a mixed, characteristic, and listed waste regulated under RCRA, and must meet specific treatment and performance standards for storage and repository disposal of the final waste form in accordance with the specific requirements of the Contract.

The Waste Treatment and Immobilization Plant (WTP) is comprised of five major facilities: Pretreatment, LAW Vitrification, HLW Vitrification, Analytical Laboratory, and the Balance of [Plant] Facilities (BOF). The WTP facilities shall be designed in accordance with the specific requirements of the Contract.

The Hanford tank waste treatment mission is defined by the assumptions presented in the *Tank Farm Contractor Operation and Utilization Plan* (HNF-SD-WM-SP-012, Revision 6, January 2007) in terms of the tank waste quantities and compositions to be treated and immobilized. The WTP facilities, combined with additional support from supplemental LAW and TRU treatment facilities, will be used to treat and immobilize the entire inventory of the Hanford tank waste.

To perform the activities necessary to remediate the Hanford tank waste, DOE assigned responsibility to the Office of River Protection (ORP) in Richland, Washington. Through this Contract, ORP will manage and oversee the design, construction, and commissioning of the WTP that will treat and immobilize a portion of the waste for ultimate disposal.

The Statement of Work for this Contract is divided into nine sections: (1) introduction; (2) summary of contract approach; (3) summary of interactions with the Contractor; (4) summary of environment, safety, quality, and health requirements; (5) description of Contract requirements and deliverables; (6) detailed identification of standards/requirements; (7) description of facility design specification; (8) detailed operational specifications; and (9) summary of the Interface Control Documents (ICD).

C.2 CONTRACT APPROACH

To accomplish the ORP mission, DOE established the River Protection Project (RPP). RPP consists of two main contractors responsible for performing work necessary to complete the mission. The first is the current Tank Farm Contractor, responsible for ensuring safe storage, retrieval, and disposal of the immobilized waste; decontamination and decommissioning; and initiation of post-closure monitoring of the tank farms. The second is the WTP Contractor (hereafter referred to as the "*Contractor*") responsible for designing, constructing, commissioning, and supporting the transition of the WTP to the WTP Operating Contractor (hereafter referred to as the "*Operations Contractor*") to be selected by DOE.

The Contractor has full responsibility for the WTP from the transition of an existing Conceptual Design through the completion of transition to the future Operations Contractor. The WTP Contract will focus on an initial Contract award for design and construction of the WTP. Schedule performance is an important consideration for RPP, and, specifically, the WTP. After successful hot commissioning by the Contractor, DOE will, under a separate contract, operate the WTP and treat and immobilize the balance of the Hanford tank waste.

The WTP Conceptual Design and supporting information are provided to the Contractor. In the interim period prior to Contract award, the Tank Farm Contractor will maintain the WTP Conceptual Design and supporting information, conduct limited additional design and optimization, and transition the WTP Conceptual Design to the Contractor. Additional information developed for the WTP Conceptual Design will be transitioned from the Tank Farm Contractor to the Contractor subsequent to Contract award.

The Contractor will review the WTP Conceptual Design and supporting information, complete process and facility design, manage construction and procurement, conduct acceptance testing, select and integrate a subcontractor into the project team to provide the necessary operability and commissioning capability, and conduct all required environmental, safety, quality, and health actions. From Contract Award, the Contractor will be the design authority responsible for the WTP design. DOE will expect full Contractor accountability for performance, cost, and schedule throughout the Contract period of performance.

The WTP Conceptual Design provides a reference solution that appears to meet project requirements, but has significant potential for optimization. DOE will seek to improve the WTP by incentivizing the Contractor to optimize life-cycle performance, cost, and schedule of the WTP, including the process design, facility design, and technologies. DOE will evaluate Contractor performance against Contract requirements and review Contractor proposed changes to Contract requirements, but will not accept performance or approve changes that adversely impact overall system-level performance, life-cycle cost, or schedule. DOE reserves the unilateral right to disapprove any adverse change.

C.3 INTERACTIONS WITH THE WASTE TREATMENT AND IMMOBILIZATION CONTRACTOR

(a) DOE, the Tank Farm Contractor, and the Operating Contractor have specific responsibilities and defined interactions with the Contractor. DOE will use a partnering approach to manage interactions among DOE, the Contractor, the Operating Contractor, the Tank Farm Contractor, and other Hanford Site contractors. This approach will: encourage a common vision with supporting goals and missions for each participant; promote the principles of teamwork, mutual respect, openness, honesty, trust, professionalism, and understanding; and include joint commitments to:

(1) Maintain high safety performance;

(2) Complete the WTP on schedule and within cost;

(3) Complete the RPP mission to treat and immobilize the Hanford tank waste;

(4) Eliminate barriers to an efficient and more cost-effective project;

(5) Promote innovation;

(6) Improve communication and understanding;

(7) Provide early identification and recovery from performance problems;

(8) Resolve conflicts through a coordinated work effort that avoids adversarial relationships;

(9) Reinforce the partnered relationship through honest feedback and continual improvement; and

(10) Collaboratively prepare the WTP systems, personnel, and procedures for plant operations.

The Contractor shall provide the resources necessary to establish and implement the partnering approach, including the requirements of Section H Clause 34, *Alternative Dispute Resolution*, throughout the Contract period of performance. The Contractor shall be responsible for actively participating in the partnering approach in a constructive manner.

(b) DOE is responsible as the "*Owner*" and "*Regulator*" of the WTP.

(1) As the Owner, DOE will:

(i) Establish requirements, administer the Contract, and confirm that the Contractor meets Contract requirements;

(ii) Integrate the WTP into the overall RPP mission;

(iii) Approve all changes to the RPP system-level flowsheet, interface control documents (bolded items in Responsibilities Section), feed and product specifications, design basis, safety basis, and the future WTP operations baseline;

(iv) Perform design, construction, safety and reliability/availability/ maintainability/inspectability (RAMI), and operability oversight of the WTP; where required, engage other contractors to provide design, construction, RAMI, and operability oversight of the WTP;

(v) Perform review (and where required, engage other contractors) of Contractor environmental, safety, quality, and health actions for compatibility and integration with site-wide Environment, Safety, Quality, and Health (ESQ&H) activities;

(vi) Provide oversight and approval of the Contractor's operational readiness review process per DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*;

(vii) Inspect and accept the WTP, including a determination that it is ready for safe operations with radioactive wastes;

(viii) Certify that the immobilized high-level waste (IHLW), immobilized low-activity waste (ILAW), and secondary wastes products meet DOE and regulatory requirements for additional treatment or disposal;

(ix) Manage project progression through the critical decision process (DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, and DOE Manual 413.3-1, *Project Management for the Acquisition of Capital Assets*) **(M076)**;

(x) Provide Quality Assurance (QA) oversight; and

(xi) Require compatibility of reporting and management systems.

DOE may utilize an Owners Agent to perform some of the functions identified above.

(2) As the Regulator, DOE will regulate radiological, nuclear, and process safety, as well as non-radiological worker safety and health.

(c) The Tank Farm Contractor will transition the WTP Conceptual Design to the Contractor upon Contract award.

(d) DOE, the Tank Farm Contractor, and other Hanford Site contractors provide site services to the Contractor as directed by DOE (see Section C.9, *Interface Control Documents*).

(e) The DOE will provide an Operating Contractor to support facility transition and subsequent operations and maintenance of the WTP following Contract completion.

(f) The Contractor shall:

(1) Perform the requirements of this Contract, integrating activities with DOE, the Tank Farm Contractor, Operating Contractor, and other Hanford Site contractors, as needed.

(2) Be the design authority for the design and engineering of the WTP process and facilities. As such, the Contractor shall have authority and responsibility to ensure that:

(i) The design of the WTP facilities complies with all requirements in the Contract, and design requirements identified in approved deliverables and work products specified in Sections C.6, *Standards,* C.7, *Facility Specification,* C.8, *Operational Specifications*, and C.9, *Interface Control Documents.*

(ii) The planned operation of the WTP can achieve the capacity requirements specified in Section C.6, Standard 5, *Commissioning*.

(iii) The Contractor shall identify, quantify, and manage process and facility equipment sizing, technical operating performance, environmental permitting and the safety authorization basis to achieve the Contract specified requirements of the WTP.

(3) The WTP Contractor shall construct the WTP in accordance with the detailed design, safety basis, pertinent regulations, approved regulatory permits, Section C.6, *Standards*, specified in the Contract, and other approved industry standards, as applicable.

(4) In cooperation with DOE (as lead), Tank Farm Contractor, and the other Hanford Site contractors, establish an interface management process to assure effective control of technical, administrative, and regulatory interfaces.

(5) Support DOE in external communications on the WTP Project with stakeholders, regulators, Tribal Nations, and other special interest groups.

(6) Train commissioning staff to operate and maintain the WTP in accordance with DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.

(7) Transition the successfully commissioned WTP to the Operations Contractor.

(8) Provide DOE or its designee(s) access to, and the right to, conduct assessments, audits, and/or surveillance of the Contractor (and its subcontractors/suppliers, at any level) records, premises, activities, and of radioactive materials in possession or use related to the WTP, as necessary to effectuate the responsibilities of DOE.

(g) The Operating Contractor shall:

(1) Participate in the development of, and concur with, the Facility Transition Plan.

(2) Assume management of the WTP facilities following the completion of the Contractor's Contract.

C.4 ENVIRONMENT, SAFETY, QUALITY, AND HEALTH

(a) The Contractor will provide a WTP that processes DOE-owned highly radioactive and dangerous waste. In order to deliver the WTP within the appropriate level of controls consistent with the hazards to be encountered, the Contractor shall establish and maintain an Integrated Safety Management System (ISMS).

The Contractor shall be responsible for protecting human health and the environment from radioactive chemicals, hazardous materials, and dangerous waste contamination, as well as non-radiological worker safety and health from conventional, construction, industrial, and occupational hazards. The Contractor shall also provide safe and healthful working conditions for employees, subcontractors, and all other personnel under the Contractor's control who work in the general vicinity of the Contractor site and facilities.

The Contractor shall comply with applicable Federal, DOE, State, and local regulations and requirements for:

(1) Non-radiological worker safety and health;

(2) Radiological, nuclear, and process safety;

(3) QA; and

(4) Environmental protection.

(b) DOE will provide existing ESQ&H documentation with the WTP Conceptual Design and supporting information to allow the Contractor to review, modify, and implement required ESQ&H actions under this Contract.

(c) The regulatory environment for this Contract is structured into four principal areas of responsibility and requirements on Contractor performance. Detailed Contractor performance requirements are provided in Section C.6, Standard 7, *Environment, Safety, Quality, and Health*.

(1) Non-Radiological Worker Safety and Health: DOE will regulate non-radiological worker safety and health. The Contractor shall develop and implement the WTP-specific worker safety and health program.

(2) Radiological, Nuclear, and Process Safety: DOE will regulate radiological, nuclear, and process safety to ensure that the Contractor provides for and operates within the required levels of public and worker protection.
The Contractor shall develop and implement a WTP-specific radiological, nuclear, and process safety program.

(3) Quality Assurance: DOE will oversee all Contractor performance in accordance with a Contractor-developed, DOE-approved program. The Contractor shall develop and implement an integrated WTP-specific QA Program, supported by documentation that describes overall implementation of QA requirements.

(4) Environmental Protection: The Contractor shall develop and implement a WTP-specific environmental protection program, prepare all required permit applications, and obtain, in conjunction with DOE, all necessary permits for the WTP.

(A) DOE is responsible for meeting compliance obligations under the *National Environmental Policy Act of 1969* (NEPA). If proposed Contractor actions are outside the analysis performed for the *Final Environmental Impact Statement for the Tank Waste Remediation System* (April 1996), *Record of Decision for the Tank Waste Remediation System*, and/or related supplement analyses, then the Contractor shall provide technical information and support to DOE for NEPA compliance on the proposed Contractor actions.

(B) The U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and/or the Washington State Department of Health (WDOH) will regulate radioactive and non-radioactive air emissions. The Contractor shall support integration within the Hanford Site-wide air compliance framework, including the Hanford Air Operating Permit.

(C) EPA and Ecology will regulate and administer all permits for treatment and storage operations under the RCRA and the *State of Washington Hazardous Waste Management Act* (HWMA). Contractor actions shall support integration with the Hanford RCRA Permit (WA7890008967).

(D) Ecology, WDOH, and/or local agencies will regulate liquid effluent and solid waste. The Contractor shall provide technical and regulatory support for all required permitting and compliance activities associated with WTP liquid effluent and solid waste.

(E) EPA regulates certain substances under the *Toxic Substances Control Act of 1976* (TSCA). TSCA regulations are applicable to Hanford tank waste. Portions of the Hanford tank waste contain polychlorinated biphenyls (PCB) at concentrations below 50 parts per million (ppm) which are regulated under TSCA as PCB bulk remediation waste.
The presence of PCBs may be concurrently regulated under other environmental regulations including RCRA, *Clean Air Act*, and *Clean Water Act*. Certain vitrification secondary waste stream disposal activities (e.g., waste water discharges to the Effluent Treatment Facility) may be subject to existing PCB discharge limitations.

DOE is pursuing a PCB regulatory strategy with EPA, Region 10, and Ecology under risk-based disposal pathway in accordance with 40 CFR 761.61(c). DOE has established an initial engineering basis of 50 ppm total PCBs as PCB bulk remediation waste for the WTP waste feed envelope. DOE is also pursuing a radiological exemption for waste under 40 CFR 761.50.

The Contractor shall provide technical and regulatory support for WTP activities, and product and secondary waste disposition related to TSCA regulation.

(d) The Defense Nuclear Facilities Safety Board (DNFSB) is responsible for nuclear safety oversight authority of DOE and its activities related to the WTP. As directed by the Contracting Officer, the Contractor shall conduct activities in accordance with DOE

commitments to the DNFSB, which are contained in implementation plans and other DOE correspondence to the DNFSB. The Contractor shall support preparation of DOE responses to DNFSB issues and recommendations that affect Contract scope.
As directed by the Contracting Officer, the Contractor shall fully cooperate with DNFSB and provide access to work areas, personnel, and information, as necessary.
The Contractor shall maintain a document process consistent with the DOE Manual on interface with the DNFSB (DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*) and shall ensure that these requirements flow down to the lowest-tier subcontractors.

C.5 DESCRIPTION OF CONTRACT REQUIREMENTS AND DELIVERABLES

The Contractor shall perform five major activities: (1) Design Transition; (2) Facility and Process Design; (3) Construction Management and Procurement; (4) Acceptance Testing; and (5) Facility Commissioning. Summary-level requirements for each of these activities are provided in this section, with additional requirements provided in Sections C.6, *Standards*; C.7, *Facility Specification*, C.8, *Operational Specifications*; and C.9, *Interface Control Documents*. Best commercial practices shall apply when a Standard, Specification, or Interface Control Document (ICD) is not provided.

(a) Design Transition: The Contractor shall update the plan for transition submitted as part of the Contractor's proposal, install Contractor management systems, and evaluate the WTP Conceptual Design and supporting information.

(1) Plan for Transition: The Contractor shall submit a plan for transition to DOE in accordance with Standard 1, *Management Products and Controls*.

(2) Receive the Waste Treatment and Immobilization Plant Conceptual Design: The Contractor shall receive the WTP Conceptual Design and supporting information from the Tank Farm Contractor as described in Section J, Attachment K, *Listing of WTP Conceptual Design and Supporting Information*; additional information shall also be provided.

(3) Due-diligence Reviews: The Contractor shall evaluate the WTP Conceptual Design and supporting information as part of the Contractor's responsibility as design authority. Key areas of review include:

(i) All process and facility design documentation and analyses;

(ii) Technology planning and testing information;

(iii) Waste form qualification strategies;

(iv) Environmental permitting documentation (e.g., Dangerous Waste Permit Application [DWPA], Air Permits);

(v) ISMS, hazards and safety analysis information, authorization basis, and safety standards;

(vi) Limited Construction Authorization Request;

(vii) Safeguards and Security (SAS) requirements;

(viii) ICDs; and

(ix) Cost and schedule baseline.

(4) The Contractor shall select and integrate a subcontractor into the WTP Project team to provide the necessary operability and commissioning capability. Selection of the subcontractor shall be completed by April 15, 2001, (Table C.5-1.1, Deliverable C5.1) and is subject to DOE approval. This deliverable shall describe the basis for selection, including the subcontractor's qualifications and experience.

(5) Project Baseline: The Contractor shall use the WTP Project Baseline information provided as part of the WTP Conceptual Design and supporting information and provide a WTP baseline in accordance with requirements in Standard 1, *Management Products and Controls*.

(b) Facility and Process Design: The Contractor shall prepare all design documents and required supporting information.

(1) Design Process: The Contractor shall prepare all design documents and required supporting information.

(2) Design Requirements: The Contractor shall ensure that the facility is designed to meet all requirements, and that these requirements are captured in the Design Criteria Database (DCD).

(3) Design Documents: The Contractor shall design the WTP (Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and Balance of [Plant] Facilities [BOF]) consistent with the functional requirements identified in Standard 2, *Research, Technology, and Modeling*, Standard 3, *Design*, Section C.7, *Facility Specifications*, Section C.8, *Operational Specifications*, and Section C.9, *Interface Control Documents*.

(4) Waste Treatment and Immobilization Plant Optimization: The Contractor shall perform optimization as described in Standard 3, *Design*.

(5) Design Reviews: The Contractor shall conduct periodic design, constructability, and operability reviews to status the design activities, and resolve design oversight comments from DOE in accordance with Standard 3, *Design*.

Additional requirements are provided in Standard 3, *Design*.

(c) Construction Management and Procurement: The Contractor shall plan and execute all construction, procurement, and acceptance testing.

(1) Provide a Construction, Procurement, and Acceptance Testing Plan;

(2) Identify all long lead procurement actions and describe the contracting approach and method of performance;

(3) Procure all required material and equipment;

(4) Prepare bid and work packages;

(5) Manage or perform all required construction; and

(6) Manage the construction site and provide all required construction support services.

Additional requirements are provided in Standard 4, *Construction, Procurement, and Acceptance Testing*.

(d) Acceptance Testing: The Contractor shall provide integrated construction acceptance test plans and procedures for DOE approval. Additional requirements are provided in Standard 4, *Construction, Procurement, and Acceptance Testing*.

(e) Facility Commissioning: The Contractor shall commission, demonstrate operational performance, and transition the WTP to the Operations Contractor. Additional requirements are provided in Standard 5, *Commissioning*.

(f) Objectives for the amount of Contractor self-performed work are contained in Section H, Clause H.13, *Self Performed Work.*

(g) Table C.5-1.1, Deliverables, summarizes the specific deliverables the Contractor shall provide to DOE and the subsequent DOE actions. Neither the DOE review of the deliverables nor the decision of DOE to proceed with construction or commissioning shall impose any responsibility on the DOE for adequacy, quality, or completeness of the deliverables. The Contractor remains solely responsible for the adequacy, quality, and completeness of such work and the performance of the WTP under this Contract.

Unless otherwise specified, DOE will provide written comments to the Contractor within 30 days of receipt of the deliverable identified in Section C, *Statement of Work*.

If requested in writing by DOE, the Contractor shall address all DOE mandatory comments and resubmit the deliverable within 30 days after receipt of DOE comments.

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
C.5.1	Select a Commissioning Contractor	Section C.5 [C.5(a)(4)]	A	D	COR (M131)	4/15/2001
1.1	Plan for Transition		A	D	COR (M131)	2/15/2001
1.2	Project Execution Plan	Standard 1 [Std. 1 (b)(2)]	A	D	COR (M131)	12/15/2006 with updates as required
1.3	Project Control System Description	Standard 1 [Std. 1 (b)(3)]	A	D	COR (M131)	4/15/2001 with updates as required
1.4	Interface Management Plan	Standard 1 [Std. 1 (b)(1)]	A	D	COR (M131)	6/29/2001 with updates as required
1.5	WTP Project Baseline	Standard 1 [Std. 1 (d)(3)]	A	D	COR (M131)	4/15/2001 with updates as required
1.6	WTP Baseline Risk Plan	Standard 1 [Std.1 (c)(1)]	A	D	COR (M131)	7/1/2001 with annual updates as required
1.7	Monthly Status Report	Standard 1 [Std. 1 (d)(1)]	I	D	COR (M131)	First Wednesday of the second month
1.8	Occurrence Reporting	Standard 1 [Std. 1 (d)(6)]	A	D	COR (M131)	as required
1.9	ES&H Reporting	Standard 1 [Std. 1 (d)(7)]	A	D	COR (M131)	as required
1.10	Contract Performance Report	Standard 1 [Std. 1 (d)(2)	I	D	COR (M131)	Last Tuesday of each month
1.11	Baseline Change Control Program Procedure	Standard 1 [Std. 1(a)(4)]	A	D	COR (M131)	05/15/03 with updates as required Delivery 30 days after contract modification – implementation 60 days after Approval
1.12	Electronic Data	Standard 1 (d)(4)	I	D	COR (M131)	Last Tuesday of each month

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
2.1	Updated Research and Technology Program Plan	Standard 2 [Std. 2 (a)(1)(ii)]	A	D	COR (M131)	4/15/2001 with annual updates through 2004 and with updates as needed from 6/30/2008 through the initiation of cold commissioning
2.2	R&T Test Plans	Standard 2 [Std. 2]	I	D	COR (M131)	as required
2.3	R&T Test Reports	Standard 2 [Std. 2]	C	D	COR (M131)	as required
2.4	Regulatory Data Quality Objective (DQO)	Standard 2 [Std. 2 (3)(i)(D)]	A	D	COR (M131)	TBD as negotiated
2.5	Operations Research Assessment	Standard 2 [Std. 2 (b)1]	C	D	COR (M131)	12/19/2008, 12/19/2009, 12/19/2010 with bi-annual updates thereafter
2.6	WTP Tank Utilization Assessment	Standard 2 [Std. 2 (b)2]	C	D	COR (M131)	12/19/2008, 12/19/2009, 12/19/2010 with bi-annual updates thereafter
2.7	Material Balance and Process Flowsheet	Standard 2 [Std. 2 (b)3]	C	D	COR (M131)	12/19/2008, 12/19/2009, 12/19/2010 with bi-annual updates thereafter
2.8	Technical Report on Oxidative Leaching	Standard 2 [Std. 2 (a)(3)(ix)]	C	D	COR (M131)	TBD
2.9	Test Report on Oxidative Leaching	Standard 2 [Std. 2 (a)(3)(ix)]	C	D	COR (M131)	TBD
2.10	Proposed Process Steps for Sludge Treatment	Standard 2 [Std. 2 (a)(3)(iii)]	A	D	COR (M131)	TBD
2.11	Proposed Deminimus Organic Concentration in Received Tank Waste	Standard 2 [Std. 2 (a)(3)(viii)]	A	D	COR (M131)	TBD
3.1	Design Process	Standard 3 [Std. 3 (a)(2)]	I	D	COR (M131)	2/15/2001 1/15/2004

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
3.2	Functional Specification	Standard 3 [Std. 3 (b)(1)]	I	D	COR (M131)	8/20/2001 with updates as required
3.3 (a)	Basis of Design	Standard 3 [Std. 3 (b)(2)]	A	D	COR (M131)	8/20/2001 with updates as required
3.3 (b)	Design Criteria Database	Standard 3 [Std. 3 (b)(3)]	M	D	COR (M131)	30 days after issue of Basis of Design, with updates as required
3.4	Operations Requirements Document	Standard 3 [Std. 3 (b)(4)]	A for bolded document text and M for non-bolded document text	D	COR (M131)	8/20/2001
3.5	Master Equipment List	Standard 3 [Std. 3,(c) (6)	C	D	COR (M131)	Prior to ORR completion
3.6	Analytical Laboratory Design Requirements	Standard 3 [Std. 3 (c)(18) & C.7(a)(8)]	A	D	COR (M131)	10/1/2001 and as required thereafter
3.7	Site Layout Drawings	Standard 3 [Std. 3 (c)(19)]	A	D	COR (M131)	4/15/2001 and as required thereafter
3.8	Optimization Studies	Standard 3 [Std. 3 (d)]	A	D	COR (M131)	3/15/2001
3.9	Spare Parts List	Standard 3 [Std. 3 (c),(6)]	C	D	COR (M131)	Prior to Completion of the Operational Readiness Review
3.10	Deleted					
4.1	Construction, Procurement, and Acceptance Testing Plan	Standard 4 [Std. 4(a), (f)(3) & (i)]	A on initial Deliverable and I for any subsequent updates	D	COR (M131)	As Required
4.2	Purchasing System	Standard 4 [Std. 4 (b)(2)]	A	D	COR (M131)	As required
4.3	Construction Bid and Work Packages	Standard 4 [Std. 4(c)]	I	D	COR (M131)	As required

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
4.4	Construction and Acceptance Testing Program	Standard 4 [Std. 4(f)(1)]	A	D	COR (M131)	Prior to start of construction
4.5	Construction Overview Meetings	Standard 4 [Std. 4(h)]	M	D	COR (M131)	Ongoing
4.6	Construction Emergency Response Plan	Standard 4 [Std. 4(j)]	I	D	COR (M131)	Prior to Start of Limited Construction
4.7	As-built Program Description	Standard 4 [Std. 4(f)(5)	C	D	COR (M131)	June 2009
5.1	Commissioning Plan	Standard 5 [Std. 5(b)]	A	D	COR (M131)	12 months prior to start of cold commissioning, as required thereafter
5.2	Deleted					
5.3	Waste Form Qualification Tests	Standard 5 [Std. 5 (d)(5)(i)]	P	D	COR (M131)	during cold commissioning
5.4	Cold Commissioning Capacity Tests	Standard 5 [Std. 5 (d)(5)(ii)]	A	D	COR (M131)	during cold commissioning
5.6	Resultant Products from Cold Commissioning	Standard 5 [Std. 5 (d)(1)]	P	D	COR (M131)	during cold commissioning
5.7	Environmental Performance Test	Standard 5 [Std. 5 (d)(iv)]	A	D	COR (M131)	during cold commissioning
5.8	Cold Commissioning Results	Standard 5 [Std. 5 (d)(6)]	A	D	COR (M131)	prior to hot commissioning
5.9	Certification of Completion of Cold Commissioning	Standard 5 [Std. 5 (d)(7)]	A	D	COR (M131)	when complete
5.10	Certification of Readiness for Hot Commissioning Start	Standard 5 [Std. 5 (f)(1)]	A	D	COR (M131)	prior to hot commissioning
5.11	Certification of Hot Commissioning Start	Standard 5 [Std. 5 (f)(3)]	A	D	COR (M131)	Upon receipt of Tank Farm waste feed
5.12	Hot Commissioning Capacity Tests	Standard 5 [Std. 5(g)(5)]	A	D	COR (M131)	during hot commissioning
5.13	Resultant Products from Hot Commissioning	Standard 5 [Std. 5 (f)(iii & iv)]	P	D	COR (M131)	during hot commissioning
5.14	Hot Commissioning Results and Documentation	Standard 5 [Std. 5 (f)(5)]	A	D	COR (M131)	upon completion of hot commissioning
5.15	Certification of Completion of Hot Commissioning	Standard 5 [Std. 5 (f)(6)]	A	D	COR (M131)	when complete

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
5.16	Facility Turnover	Standard 5 [Std. 5(h)]	A	D	COR (M131)	after successful commissioning
5.17	Deleted					
5.18	Cold Commissioning Simulant Definition	Standard 5 [Std. 5 (d)]	A	D	COR (M131)	24 months prior to the initiation of cold commissioning
5.19	WTP Facility Transition Plan	Standard 5 [Std. 5 (h)]	A	D	COR (M131)	12 months prior to the initiation of hot commissioning
5.20	Cold Commissioning Capacity Test Criteria	Standard 5 (Std. 5)	A	D	COR (M131)	Prior to completion of Deliverable 5.8
5.21	Hot Commissioning Capacity Test Criteria	Standard 5 (Std. 5)	A	D	COR (M131)	Prior to completion of Deliverable 5.14
6.1	Secondary Wastes Compliance Plan	Standard 6 [Std. 5 (d)(5)(i & ii), Std. 6(b), (c)(3 & 4), C.7(d)(3)(i), Spec. 9.2.2.5, Spec 9.3]	A	D	COR (M131)	2004, 2006, 2008, and as required thereafter
6.2	IHLW Waste Form Compliance Plan	Standard 6 [Std. 2 (a) (3)(vii)(B), Std. 6 (b), (c)(2 & 4), Std. 5 (d)(5)(i), C.7(d)(2)(i), Spec. 1 (1.4)]	A	D	COR (M131)	2004, 2005, 2007, 2009, and as required thereafter
6.3	ILAW Product Compliance Plan	Standard 6 [Std. 2 (a)(3)(v)(B),Std. 5 (d)(5)(ii), Std. 6(b) & (c)(1 & 4), C.7(d)(3)(i) Spec. 2.2.2.8, 2.2.2.11, 2.2.2.17, Spec. 2.4]	A	D	COR (M131)	2004, 2006, 2008, and as required thereafter
6.4	IHLW Waste Form Qualification Report	Standard 6 [Std. 6 (c) (5) & (6)]	C/A	D	COR (M131)	Plan in 2004, report in 2008 and as required thereafter
6.5	Production Documentation for IHLW Product	Standard 6 [Std 6 (c)(9)]	A	D	COR (M131)	at time of production

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
6.6	ILAW Product Qualification Report	Standard 6 [Std. 6(c)(5) Spec. 2.2.2.7]	C/A	D	COR (M131)	Plan in 2004, report in 2007 and as required thereafter
6.7	Production Documentation for ILAW Product	Standard 6 [Std 6(c)(9) Spec. 2.2.2.7]	C/A	D	COR (M131)	at time of production
6.8	Deleted					
6.9	Reserved					
6.10	Secondary Wastes Production Documentation	Standard 6 [Std. 6 (c)(9)]	C/A	D	COR (M131)	at time of production
6.11	Deleted					
7.0	Non-radiological Worker Safety and Health	Standard 7 [Std 7 (e)(1)]	R	D	COR (M131)	per Standard 7.a(1)
7.1	Radiological, Nuclear and Process Safety	Standard 7 [Std 7 (e)(2)]	R	D	COR (M131)	per Table S7-1
7.2	Quality Assurance	Standard 7 [Std 7 (e)(3)]	A/R	D	COR (M131)	4/15/2001
7.3	Environmental Plan	Standard 7 [Std 7 (e)(4)]	A	D	COR (M131)	3/15/2001 and as required thereafter
7.4	Deleted					
7.5	Dangerous Waste Permit Application	Standard 7 [Std 7 (e)(4)(vi)(B)]	A	D	COR (M131)	as required
7.6	Risk Assessment Work Plan	Standard 7 [Std 7 (e)(4)(vi)(C)]	A	D	COR (M131)	as required
7.7	Notice(s) of Construction	Standard 7 [Std 7 (e)(4)(vi)(D)]	A	D	COR (M131)	150 days prior to submission to the regulators
7.8	Prevention of Significant Deterioration (PSD) Permit Application	Standard 7 [Std 7 (e)(4)(vi)(E)]	A	D	COR (M131)	150 days prior to submission to the regulators
7.9	Petition for Exemption or Exclusion for IHLW	Standard 7 [Std 6(c)(7), Std 7 (e)(4)(vi)(F)]	A	D	COR (M131)	06/2005
7.10	Petition for a New Treatment Standard	Standard 7 [Std 6 (c)(8), Std 7 (e)(4)(vi)(G)]	A	D	COR (M131)	08/2003
8.0	Safeguards and Security	Standard 8	A	D	COR (M131)	see Table S8-1

Table C.5-1.1, Deliverables

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
C.7.1	Procedure to Determine the Waste Feed Treatment Approach	C.7(d) (1)(viii)	A	D	COR (M131)	TBD
C.9.1	Interface Control Documents	Section C.9 Spec.	J	D	COR (M131)	7/15/2001, 3/15/2002, and as required
H.1	Environmental Permit Applications	Clause H.26	A	D	COR (M131)	ongoing
H.2	Litigation Management Plan	Clause H.33	A	D	COR (M131)	4/15/2001
H.3	Deleted					
H.4	Property Management System (M120)	Clause H.51	A	D	COR (M131)	10/1/2008, with annual updates thereafter

Legend Definitions:

A Approval — The deliverable shall be provided to DOE for review and approval. DOE will review the deliverable and provide comments in writing. Comments will be discussed through the partnering process and the Contractor is required to provide written responses using Review Comment Records. Documents shall be re-written to incorporate all DOE mandatory comments. Once a deliverable or document has been approved by DOE, it shall be placed under change control and no changes to that document shall be made without DOE approval. All documents and deliverables that previously had a “K” designation and that were concurred upon by DOE shall be deemed “approved” by DOE.

C Review and Comment — The deliverable shall be provided to DOE for review and comment. DOE will have the option for reviewing the information and providing comment. The Contractor shall respond to all written comments in Review Comment Records form. DOE comments that cannot be resolved in the appropriate partnering team shall be elevated to the Project Management Team for resolution.

D U.S. Department of Energy, Office of River Protection.

COR Contracting Officer’s Representative (M131)

I Information — The deliverable shall be provided for information purposes only. DOE will have the option of reviewing the information and providing comments through the partnering process. Such comments do not require resolution under the Contract.

J Jointly Developed, Review and Comment — The ICDs shall be jointly developed with DOE, the Tank Farm Contractor, and Hanford Site contractors. The deliverable shall be provided to DOE for

review and comment. DOE will have the option for reviewing the information and providing comment. The Contractor shall respond to all written comments. DOE comments that cannot be resolved in the appropriate partnering team shall be elevated to the senior management for resolution.

M Monitor — The deliverable shall be developed with input from DOE. DOE will be highly involved as the deliverable is developed, and will monitor the progress of the deliverable. DOE comments shall be discussed in the partnering teams as the deliverable develops. If DOE direction is determined to be appropriate, DOE shall provide such direction in writing.

P Product Acceptance — As defined in Specification 13.

R Regulatory Deliverable Approval — Will be performed in accordance with Standard 7.

C.6 STANDARDS

This Section consists of the following Standards, which describe requirements for managing, constructing, and commissioning the WTP, and related activities:

Standard 1: Management Products and Controls
Standard 2: Research, Technology, and Modeling
Standard 3: Design
Standard 4: Construction, Procurement, and Acceptance Testing
Standard 5: Commissioning
Standard 6: Product Qualification, Characterization, and Certification
Standard 7: Environment, Safety, Quality, and Health
Standard 8: Safeguards and Security

1.0 References

The following listed References are not included in Section J, Attachment E - List of Applicable Directives (List B-DEAR 970.5204.78)

1.1 HNF-3638. Revision 1. *Standard Electronic Format Specification for Tank Waste Characterization Data Loader: Version 2.4*

1.2 PNNL-12040. Revision 0. *Regulatory Data Quality Objectives Supporting Tank Waste Remediation System Privatization Project*. K.D. Wiemers, et al. Dated December 1998.

1.3 PL-W375-EN00003. Revision 1. *Environmental Performance Demonstration Plan*, J.R. Markillie. Dated April 28, 2000

1.4 HNF-SD-WM-SP-012. Revision 6. *Tank Farm Contractor Operation and Utilization Plan*. Dated January 2007.

1.5 Washington Administrative Code (WAC) 173-303. “Dangerous Waste Regulations”

1.6 SW-846. *Test Methods for Evaluating Solid Waste*, *Physical/Chemical Methods*. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

1.7 ASMES/NQA-1. 2000. *National Consensus Standard* (M066)

Standard 1: Management Products and Controls

This Standard describes the required management products and controls. The Contractor shall provide all necessary management and technical information and support necessary to meet the requirements of U.S. Department of Energy (DOE) Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, and its associated manual, DOE Manual 413.3-1, to enable DOE to meet the data requirements of the Integrated Planning, Accountability, and Budgeting System (IPABS), and to ensure transparency in project performance and efficiency in project execution. The Contractor shall also support the DOE Office of River Protection (ORP) in developing and maintaining the integrated River Protection Project (RPP) Baseline. All management and technical information developed under this Contract shall be accessible electronically by the Government.

(a) Baseline Description and Requirements:

The Contractor shall develop and maintain a contract-compliant integrated and traceable technical scope, schedule, and cost baseline for the Waste Treatment and Immobilization Plant (WTP) Project. The baseline shall be managed in accordance with the process documented in the Project Control System Description (Table C.5-1.1, Deliverable 1.3) and the Baseline Change Control Program Procedure (Table C.5-1.1, Deliverable 1.11) consistent with the below concepts and provisions:

Variances will be managed and approved through the Contractor's Trend Process as defined in Deliverables 1.3 and 1.11. Variances are accrued following the realization of circumstances that could have plausibly been anticipated or mitigated by the responsible control account manager(s).

Baseline Change Proposals (BCPs) will be managed and approved through the Contractor's processes as defined in Deliverables 1.3 and 1.11. BCPs are processed when circumstances could not have plausibly been anticipated or mitigated by the responsible control account manager(s). BCPs are generated and approved at the Contractor's discretion with the below exceptions:

- BCPs generated to convert project variances to budget, effectively reconciling a variance to enable improved manageability.
- BCPs generated to support the cost and schedule impacts from a Request for Equitable Adjustment. These BCPs (for REAs) will change the Total Estimated Contract Cost and may become the basis for earning additional fee.

The baseline and management thereof shall comply with this standard; ANSI/EIA-748A-1998, *Earned Value Management Systems* (EVMS); DOE Order 413.3A; and DOE Manual 413.3-1. The baseline shall include:

- WTP Project technical requirements as delineated in (a)(1);
- Schedule to implement project work scope as described in (a)(2); and
- Project cost to implement project work scope on the schedule as described in (a)(3).

The technical scope, schedule, and cost baseline (WTP baseline) shall be maintained using a baseline change control process as further described in (a)(4).

(1) Technical Baseline: The Contract technical baseline is represented by a series of documents which define the basis for current cost or schedule estimates. Changes to these documents shall be evaluated for impact to project cost and/or schedule and captured by a baseline change proposal where necessary.

The following documents shall be viewed collectively as the baseline technical scope for the cost/schedule control system:

(i) Contract Statement of Work;

(ii) Approved Functional Specification pursuant to Contract Standard 3, paragraph (b)(1);

(iii) Approved Basis of Design pursuant to Contract Standard 3, paragraph (b)(2);

(iv) Approved Authorization Basis pursuant to 10 CFR 835;

(v) Approved Operations Requirements Document (bolded text);

(vi) Approved Interface Control Documents;

(vii) Permit Requirements; and

(viii) Approved Level 2 Work Breakdown Structure (WBS) Dictionary Sheets.

(2) Schedule Baseline: The WTP baseline schedule shall be an activity-based, logic-driven schedule. The schedule logic shall be integrated with a networked hierarchy containing detailed tasks necessary to ensure successful project execution. The schedule shall support networked summarization at Level 1, Project Summary Schedule, Level 2, Executive Level Schedule, Level 3, Project Intermediate Schedule, to the Level 4, Detailed Working Schedule.
The scheduled activities shall be vertically traceable to the RPP Integrated Master Plan (IMP), the WBS, and EVMS control accounts. The WTP schedule shall be used to verify attainability of the contract level milestone defined in Contract Section F.1(b), to evaluate progress toward meeting program objectives through tracking Activity and Facility Milestones as outlined in Section B.4(c), and to integrate the program schedule activities with all related work activities and milestones.

The following requirements shall be addressed at the appropriate level within the schedule hierarchy:

(i) Scheduling Requirements: The WTP schedule shall be developed using a 24-month rolling schedule concept which is statused monthly and extended semi-annually. The near-term schedule shall be more detailed than activities past the 24-month cutoff.

a. The schedule shall include all significant external interfaces and critical items from suppliers, teammates, or other detailed schedules that depict significant and/or critical elements and Government furnished equipment or information dependencies. The determination of significant and critical Government interface requirements shall be mutually defined and documented.

b. The schedule shall be updated according to the Contractor's management control system and shall be submitted no less frequently than monthly. The schedule may reflect data either as of the end of the calendar month or as of the Contractor's accounting period cutoff date, provided it is consistent and traceable to the Monthly Status Report.

c. The schedule shall contain discrete tasks/activities through contract completion including Contract milestones contained in Section B, Attachment B-2-C.

d. Monthly schedule analysis shall be performed to assess schedule progress to date and included as part of the monthly status report (see paragraph (d)(2)(v)b). The analysis shall include changes to schedule assumptions, variances above agreed thresholds to the baseline schedule, causes for the variances, potential impacts, and recommended corrective actions to minimize schedule delays. The analysis shall also identify potential problems and an assessment of the critical path and near-critical paths for the five subprojects and the overall contract.

e. The schedule shall be created using a Critical Path Method (CPM), network capable Commercially Off-The-Shelf (COTS) scheduling software application. The schedule shall be delivered electronically in the native digital format (i.e., an electronic file produced within the Contractor's scheduling tool) as part of the monthly report.

f. The level of detail in the schedule (including number and duration of tasks/activities) shall follow the Contractor's Project Controls System Description, program directives, etc. A sequence of discrete tasks/activities in the network that has the longest total duration through each subproject and the overall WTP Contract shall be identified as the subproject and project critical paths, respectively.

(ii) In addition, the Contractor shall develop the necessary modeling capability at a rough order of magnitude (ROM) level of accuracy to support "what-if" evaluations within five (5) working days of request. This modeling system shall provide model by dollars and reasonably represent planned expenditures by month for the first fiscal year and each fiscal year thereafter. Level of effort activities shall be added to the model as well as undistributed budget in planning packages so that each fiscal year can balance against known funding.

(3) Cost Baseline: The WTP cost baseline is the latest DOE-approved Performance Measurement Baseline (PMB) and Total Allocated Budget (TAB) including any negotiated or directed changes and approved baseline change proposals, together with the following PMB supporting documentation:

(i) Total contract cost and subproject costs including a summary description of facility design, process design, operational concept, and schedule.

(ii) Status of facility design, construction, and related procurements.

(iii) Description of the methodology of how the estimate was developed.

(iv) A WBS dictionary which includes a detailed technical description of the scope to be performed at the WBS level; 2 as defined in paragraph (b)(3)(ii).

(v) Backup materials necessary to understand the estimate shall be agreed to prior to submittal of the estimate. Examples include quantity takeoffs, equipment lists, detailed specifications, plans and drawings, calculations, databases used, historical data, cost estimating relationships, and actual quotes.

(vi) Details of distributable costs, methods of allocation, and a description of the work covered by distributable costs and how they were estimated and developed.

(vii) Explanation and description of Defense Contract Audit Agency (DCAA)-validated overhead and general and administrative rates used.

(viii) Examples of how standard base rates are burdened to arrive at estimated hourly rates.

(ix) Definitions and delineation for and categorization of costs into labor, material, equipment, travel, taxes, contingency, and other.

(x) Full delineation of any use of productivity or related factors that clearly identifies when and where used and basis for the utilization.

(xi) Written analysis of how cost and schedule contingency was determined. This includes all pertinent information necessary to understand and perform the calculations.

(xii) Estimate history; if the current estimate is a revision to an earlier estimate, provide reconciliation between estimates.

(xiii) Basis of escalation.

(xiv) Subcontractor cost estimates, traceable to the WTP cost estimate and WBS, if available, shall be provided upon request.

(xv) Risk mitigation plans and activities.

(4) Baseline Change Control Process: The baseline change control process will be rigorous and disciplined to ensure that the scope, schedule and cost baseline is accurate, up-to-date, and capable of providing meaningful data and information. In concert with DOE, the Contractor shall develop and implement a WTP Baseline Change Control Program Procedure (Table C.5-1.1, Deliverable 1.11). The procedure shall be submitted to DOE for approval prior to implementation and shall address:

(i) Establishing and maintaining a WTP change control board (CCB).

(ii) Authority levels and processes for approving variances and baseline change proposals.

(iii) Minimum BCP documentation requirements.

(iv) Cost and schedule estimate requirements.

(v) Advance Work authorization process.

(vi) Incorporating changes into the baseline EVMS cost and/or schedule modules.

(vii) Budget source and impact on project risk.

(viii) BCP impact on facility BCWS profiles.

(ix) Categorization methods for BCPs that clearly differentiate between in-scope and out-of-scope changes and variances.

(5) Spending at Variance: In some circumstances, the Contractor may exceed authorized budget levels for a specific control account when a baseline change is not warranted, such as cost overruns. The Contractor's change control system shall track and manage changes in estimates at completion (EAC) as a separate but integrated part of the overall change control process. Change control records shall maintain clear distinction between approved baseline and EACs.

(6) Calculated Estimate at Completion (CEAC): The total project and facility CEACs shall be maintained and reported in the monthly status report. The CEAC will be developed and reported at the Control Account level, and at WBS Levels 1 and 2. The CEAC does not replace the Project Manager or Control Account Manager

EACs. The CEACs shall be calculated without distribution of Shared Services as follows:

CEAC = ACWP + (BCPs + BAC - BCWP)/(SPI*CPI)

SPI and CPI shall be a six month rolling average of the monthly performance indices (not inception to date).

In addition to the CEAC calculation, the contractor project manager may report modified EACs, explaining differences to the CEACs based on factors such as Contractor's forecasts of effective mitigation actions, additional risk recognition, other actions not captured by the calculations, or calculation anomalies.

(7) Project Funding:

The Contractor shall use the DOE-approved WTP Project cost baseline as the basis for the subproject and total project funding profile that is required to complete the Contract scope. The WTP funding profile shall comply with Congressional appropriations. The funding profile shall include engineering, procurement, construction, and commissioning baseline costs, including management reserve as well as DOE contingency),and estimated fees that will be paid. The Contractor shall provide on a monthly basis, Form DD 1586, Aug 96, DID-MGMT-81268, Contract Funds Status Report (CFSR), or approved equal for each control point (Table C.5-1.1, Deliverable 1-10)

Identification of management reserve shall be reported monthly and shall include the impact on the life cycle of the Contract.

(b) Controlled Management Documents: The following documents shall be submitted for approval by DOE in accordance with the schedule in Table C.5-1-1, Deliverables:

(1) Interface Management Plan: DOE (as lead), the Tank Farm Contractor, and the WTP Contractor shall develop and implement an interface management plan (Table C.5-1.1, Deliverable 1.4). The interface management plan shall:

(i) Recognize the DOE role as the owner of the WTP and as the final decision authority for any interface issues that are not resolved between the other parties.

(ii) Define the scope of each interface and provide a brief description of the required deliverables (products, documents, procedures, services, etc.) through interface control documents (ICD).

(iii) Define organizational points of contact for participants.

(iv) Define interface requirements, controls, and applicable source documents for each interface.

(v) Involve appropriate RPP organizations and Hanford Site contractors in the integration, review, and approval process of ICDs and implement changes to ICDs through the appropriate change control process and, if necessary, contract changes.

(vi) Involve individuals with the appropriate level of organizational responsibility and authority to ensure the interface is implemented and functioning. DOE/ORP will identify points of contact for each interface document.

(vii) Identify, track, and elevate issues for management review in the Monthly Status Report.

(2) Project Execution Plan (PEP): The Contractor shall prepare a PEP that describes the approach for managing and controlling the project at the Contractor level. The PEP shall be approved by DOE (Table C.5-1.1, Deliverable 1.2), and shall focus on Contractor policies, methods, and approaches for the integration of project scope, schedule, and cost information in ensuring compliance with Contract and regulatory requirements. The Contractor PEP shall address the approach the Contractor will use to implement the requirements pertaining to project control processes including:

(i) Management structure, responsibilities, and authorities;

(ii) Integrated safety management;

(iii) Quality assurance;

(iv) Safeguards and security;

(v) Permitting;

(vi) Construction acceptance, test, and evaluation;

(vii) Acquisition planning;

(viii) Contract management;

(ix) Systems engineering;

(x) Configuration management;

(xi) Waste Treatment process change control;

(xii) Information management and reporting;

(xiii) External Interface management;

(xiv) Work management;

(xv) Risk management;

(xvi) Construction project management; and

(xvii) Communications and stakeholder involvement.

(3) Project Control System Description: The Contractor shall provide for DOE approval a Project Control System Description meeting the requirements of DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*; DOE Manual 413.3-1, *Project Management for the Acquisition of Capital Assets*; and ANSI/EIA-748-A-1998, *Earned Value Management Systems* (EVMS) (Table C.5-1.1, Deliverable 1.3). The system description shall describe the management processes and controls that will be utilized to manage and control work and complete contract requirements. Upon approval by the Contracting Officer, the Contractor shall fully implement the project control system. The Contractor shall obtain Contracting Officer approval prior to implementing materially significant changes to the system description. The Contracting Officer may direct compliance reviews to determine whether the Contractor is operating in accordance with the approved system description and producing accurate planning, budgeting, reporting, and change control data. The Contractor shall provide the Contracting Officer or designated representatives with access to all pertinent records, data, and plans for purposes of initial approval, approval of proposed changes, and the ongoing operation of the project control system.

The Project Control System Description shall, at a minimum, include:

(i) A Work Breakdown Structure (WBS) including companion "*dictionary*" descriptions of work for each Level 2 WBS element. The WBS shall provide the basis for all project control system components, including estimating, scheduling, budgeting, performing, managing, and reporting, as required under this Contract.

(ii) The authorized contract Level 2 WBS for this project is as follows:

WBS	TITLE
1	WTP Contract DE-AC27-01RL14136
1.01	Pretreatment
1.02	Low-Activity Waste
1.03	High-Level Waste
1.05	Balance of Facilities
1.06	Analytical Laboratory
1.08	Plant Wide EPCC
1.90	Shared Services

(iii) The organizational breakdown structure with identification of key management positions. A control account shall be assigned to a manager with responsibility and authority to plan and budget the work, and control the resources and work activities within the approved technical, schedule, and cost baselines. The Contractor is also responsible to report status to allow complete rollup of technical, schedule, and cost performance for current reporting periods, cumulative to-date, and at-completion. The Contractor shall maintain and provide a current list of Control Account Managers.

(iv) A description of the technical scope, cost, and schedule baseline development process, and the hierarchy of documents that will be used to describe and maintain that baseline.

(v) Documentation of the process the Contractor intends to use for document control, configuration control, and change control.

(vi) A brief summary of any supporting project control procedures that will be used.

(c) Risk Management:

(1) The Contractor shall implement the risk management process defined in the Contractor's PEP, DOE Order 413.3A, and DOE Manual 413.3-1. The Contractor shall provide a WTP Baseline Risk Plan (Table C.5-1.1 Deliverable 1.6) documenting Contractor budget base risks (scope, schedule, and cost) for DOE approval. The WTP Baseline Risk Plan shall identify the major risks to completing the project within the approved contract baseline, the Contractor's risk management strategies, and mitigation action plans. The Contractor shall submit annual updates of the status of the WTP Baseline Risk Plan. The WTP Baseline Risk Plan shall meet the following requirements:

(i) Project risks shall be identified along with their probabilities and consequences.

(ii) Risks identified as Critical (Critical Risk List) shall be evaluated with each submittal for change in the unmitigated and residual risk levels.

(iii) Management reserve identification shall be documented by facility.

(2) The Contractor shall provide a monthly status of work scope actions directly attributed to DOE-owned risks (Technology, Programmatic, and Operational). The Contractor shall also support the identification, categorization, and development of risk-handling strategies for newly identified DOE-owned risks, and support the annual update to the RPP Risk Management Plan as requested by DOE.

(3) Risk and decision management activities, for DOE owned risks, shall be coordinated on a continuing basis with DOE (as lead), Tank Farm Contractor, and Hanford Site contractors. Contractor risk analysis information pertaining to "cross-cutting" decisions shall be communicated to DOE, the Tank Farm Contractor, and Hanford Site contractors, including recommendations as to who should have the lead for managing each risk. The Contractor shall document risks associated with ICDs and prepare issue resolution plans for DOE approval.

(4) The Contractor shall include forecasts of expected changes to risk assessment status in the Monthly Status Report (Table C.5-1.1, Deliverable 1.7).

(d) Project Reporting: The Contractor shall develop a reporting system that reports project performance on the technical scope, schedule, and cost profile. The requirements and procedures for this system shall be defined in the Project Control Systems Description. The following routine reports are required:

(1) Monthly Status Report: The Contractor shall prepare a monthly status report representing the prior month's performance and transmit it to DOE by the first Tuesday of the second month following data cutoff (Table C.5-1.1, Deliverable 1.7). The Monthly Status Report shall be a written report that includes, but is not limited to, the following:

(i) Project manager narrative assessment;

(ii) Safety statistics;

(iii) Quality issues;

(iv) Significant accomplishments and progress towards completion of project milestones and objectives;

(v) Monthly summarized earned value analysis for WBS Level 1;

(vi) Rolling six (6)-month Schedule Performance and Cost Performance Indices for WBS Level 2;

(vii) Potential problems, impacts, and alternative courses of action; for example staffing issues, assessment of the effectiveness of actions taken previously for significant issues, or the monitoring results of recovery plan implementation;

(viii) Status of decisions, including DOE decisions, and information requirements for those decisions;

(ix) Change control section that summarizes the scope, technical, schedule and cost impacts resulting from approved and implemented as well as proposed baseline change actions;

(x) Project and subproject cost avoidance actions taken;

(xi) Forecasted changes to last risk assessment;

(xii) Six (6)-month critical path look-ahead and milestone (Activity, Facility, and Contract level milestones) at Level 2 WBS;

(xiii) Report of proposed changes that impact DOE, site interfaces, or Contract level milestones; and

(xiv) Single driving critical path analysis derived from Level 4 Schedule for WBS 1 and 2.

(2) Contract Performance Report: The Contractor shall prepare monthly EVMS information reports by WTP Project and subproject in the listed Office of Management and Budget (OMB) Contract Status Report formats (DID-MGMT-81466) representing the prior month's performance and transmit the report to DOE by the last Wednesday of the month following data cutoff (Table C.5-1.1, Deliverable 1.10). Reporting requirements below shall be reviewed on an annual basis and necessary adjustments will be authorized by the Contract Officer.

(i) Format 1, DD Form 2734/1, Mar 05, Work Breakdown Structure (WBS);

a. At Level 2 WBS, Control Account Level (CA)

(ii) Format 2, DD Form 2734/2, Mar 05, Organizational Categories;

a. At Level 2 Organizational Breakdown Structure (OBS), Level 3 OBS, CA

(iii) Format 3, DD Form 2734/3, Mar 05, Baseline;

a. At the Control Account Level by Contract changes, management reserve application, and internal replanning categories

(iv) Format 4, DD Form 2734/4, Mar 05, Staffing;

a. At Level 2 Organizational Breakdown Structure (OBS), Level 3 OBS, CA

(v) Format 5, DD Form 2734/5, Mar 05, Explanations and Problem Analysis;

a. Variance Analysis in accordance with the following thresholds:

i. At the Control Account Level

(a) Current Period Variance: $250K

(b) Cumulative Variance: +/- 10 percent or $1,000K, whichever is less

(c) Variance at Completion: +/- 10 percent or $5,000K, whichever is less

b. Schedule analysis in accordance with Data Item Description DI-MGMT-81650, Integrated Master Schedule:

i. WBS Level 2 critical paths against construction completion: < 0 days total float; critical paths addressed through the monthly report (paragraph (1)(xiv)) do not have to be duplicated in Format 5.

ii. Progress against milestones; performance against milestones addressed through the monthly report (paragraph (1)(viii)) do not have to be duplicated in Format 5.

iii. Performance against planned system turnover and startup sequence

iv. Provide analysis native files of the following:

1. The schedule activities that have slipped six (6) months (relative to their corresponding baseline activity) OR lost 50 percent of their float from the current baseline schedule.
2. An analysis of the activities meeting the above criteria AND have less than or equal to 100 days of float in the current schedule will be provided in the CPR format 5 as well as electronically.
3. An Early Start and Early Finish stepchart metrics will be provided that shows the number of activities in the current schedule that have moved outside their baseline schedule completion year, the number of activities that have remained in their baseline schedule completion year, and the metrics from paragraph 1 above.
4. Graphical presentation of the number of activities with less than 100 days float in the current schedule compared to the number of activities with less than 100 days float in the baseline through completion of the project.
5. All graphical data shall be provided in tabular form.
6. Graphical presentation of cumulative number of baseline activities scheduled to be complete and number of those activities that did not complete.

(vi) DD Form 1586, Aug 96, DID MGMT-81268, Contract Funds Status Report or approved equal for each control point.

(3) Baseline Revisions and Data Maintenance Report: The Contractor shall prepare monthly reports that document and reconcile the current baseline (scope, schedule and budget elements) with the project baseline established through the May 2006 submittal of the WTP Project Baseline update (Table C.5-1.1, Deliverable 1.5) and transmit it electronically to DOE by the last Wednesday of the month following data cutoff (Table C.5-1.1, Deliverable 1.12). At a minimum, this report shall include logs and metrics that track and trend change activity by WBS Level 2 and OBS Level 3, Control Account. Include CPR Format 3 detail, Contract Budget Base Log; Performance Measurement Baseline Log; and Baseline Change Proposal Log.

(4) Electronic Data: Earned value data provided via compact disc for the following: (a) Engineering Performance and Progress Report data files; (b) Quantity Unit Rate Report data files; (c) COBRA data files and reports; (d) baseline schedule; (e) current schedules; (f) Cost and Commitment Log; (g) Equipment Management System database; (h) Inception to Date Report for Permanent Plant Equipment Awards (i) Bechtel Estimating Tool Kit (BETK); (j) Commodity Curves; and (k) Special Purpose Charge Code Activity Log for all Not to Exceed Contracting Officer Authorizations. Earned value data is to be provided on the last Wednesday of the month following the data cutoff to the Contracting Officer and the Contracting Officer's Representative (Table C.5-1.1, Deliverable 1.12).

(5) Occurrence Reporting: The Contractor shall adhere to DOE Order 231.1A, *Environment, Safety, and Health Reporting*, with Hanford Site-specific requirements and methods for notification (Table C.5-1.1, Deliverable 1.8).

(6) Environment, Safety, and Health Reporting: In addition to the *Occupational Safety and Health Act of 1970* and the *Price Anderson Amendments Act of 1988* (10 CFR 820) reporting requirements, the Contractor shall report all events and information specified in DOE Order 231.1A. The process and form of reporting will meet the requirements of this Order and DOE Manual 231.1-1A, *Environment, Safety and Health Reporting Manual*. The Contractor process will specify this requirement in contracts down to the lowest-tier subcontractor. The Contractor process will accumulate and provide a single report responding to required information for both the Contractor and all subcontractors (Table C.5-1.1, Deliverable 1.9).

(7) Accident Investigation: The Contractor and, as necessary, all subcontractors shall support Type A and Type B accident investigations for accidents that may occur during Contractor activities. The Contractor and all its subcontractors shall establish and maintain readiness to respond to accidents, mitigate potential consequences, assist in collecting and processing evidence, and assist with the accident investigation. This shall include preserving the accident scene and providing support to the accident investigation board.

Standard 2: Research, Technology, and Modeling

This Standard describes the Research and Technology (R&T) Testing Program requirements as well as process and facility modeling requirements.

(a) Research and Technology Testing Program:

(1) Research and Technology Program Plan:

(i) The Contractor shall maintain and update an R&T Program Plan that describes the research and testing work activities that will be conducted to support process and facility design, determine plant process operating limits, support qualification testing of the waste forms (IHLW and ILAW) and secondary wastes, and provide information to support environmental permitting and the authorization basis.

(ii) The Contractor shall submit for DOE approval, the revised R&T Program Plan (Table C.5-1.1, Deliverable 2.1). All Contractor-proposed changes shall be clearly identified. The R&T Program Plan activities will be logically tied to the project baseline and baseline risk assessment described in Standard 1, *Management Products and Controls*. For each testing activity, the R&T Program Plan shall identify the following summary-level information: the purpose and scope of the test, including the extent of information known at the time the plan is issued; the performing organization; and the method(s) to test and analyze information used to support the design process, determination of operating limits, permitting, operations, and/or waste qualification activities.

(iii) The R&T Program Plan will be updated as needed to close out technical risks. All Contractor-proposed changes to the R&T Program Plan shall be traceable to the driver for the change; for example, if an optimization change in Standard 3, *Design*, results in the need to change planned research and technology, the driver for the change shall be identified in the revised R&T Program Plan.

(2) Research and Technology Requirements:

(i) The Contractor shall provide DOE copies for information of the Contractor-approved draft test plans for all process verification, including the determination of process operating limits and product qualification testing, at least fifteen (15) calendar days in advance of conducting the test(s). Approved test plans shall be provided to DOE (Table C.5.-1.1 Deliverable 2.2).

(ii) DOE will be provided draft copies of test reports for comment during the Contractor report review period, and the Contractor shall provide to DOE completed test reports for process verification testing and product qualification within two (2) months after the approval by R&T Program Manager (Table C.5-1.1, Deliverable 2.3). At DOE's request, for tests lasting more than six (6) months, an interim report or update via presentations shall be provided at approximately the halfway point of the test. When a test is run with simulants rather than actual tank waste, the report shall compare the results to work performed with tank waste, if data is available.

(iii) The Contractor shall utilize the results of completed and ongoing testing activities performed as part of the WTP Conceptual Design and supporting documentation in estimating facility and unit operations performance. The Contractor shall not reinitiate or repeat a test unless the scope of the test plan is presented to DOE in writing, and DOE agrees to the conduct of the testing.

(iv) The integrated process flowsheet and material balances shall be supported by the process verification test results. All process verification and product qualification tasks shall be conducted in accordance with the DOE-concurred upon QA Program.

(v) All IHLW qualification work shall be conducted in accordance with a DOE-concurred upon QA Program that complies with the requirements of the *Quality Assurance Requirements and Description Document* (QARD), DOE/RW-0333P, Revision 20. No HLW glass testing scoping work will be performed without prior agreement by DOE.

(3) Required Research and Technology Testing:

(i) Characterization of Low-Activity Waste and High-Level Waste Feeds: The Contractor shall characterize Hanford tank waste for purposes of determining that feed meets feed specification requirements, supporting WTP environmental permitting activities, establishment of the WTP authorization basis, process verification testing, and product qualification testing. The Contractor shall request tank waste samples for this scope through ICD 23, *Waste Treatability Samples*, in order to perform the studies.

The analysis requirements for the as received and treated tank waste samples shall be defined by the Contractor in Contractor test plans. The Contractor shall provide test plans and interim reports to DOE at appropriate intermediate steps, and final reports in accordance with the requirements of Standard 2, *Research, Technology, and Modeling*. All analytic results shall be reported to DOE in accordance with *Standard Electronic Format Specification for Tank Waste Characterization Data Loader: Version 2.4* (HNF-3638, Revision 1), Lockheed Martin Corporation, Richland, Washington.

Characterization information for the samples shall include: viscosity, density, particle size distribution (if sufficient solids are present in samples), chemical composition, radiochemical composition, hazardous materials composition consistent with the analysis requirements of the Dangerous Waste Permit, authorization basis, and solids solubility versus concentration (if sufficient solids are present in samples).

(A) The Contractor shall compare actual tank waste analytical data to waste stream-modeling results to validate modeling results. If errors in modeling are observed the models shall be adjusted appropriately.

(B) The Contractor shall use tank waste samples to analyze, test, and assess the capability of the proposed waste treatment processes to meet the requirements for producing an IHLW form that can meet HWMA and RCRA de-listing technical requirements in accordance with Specification 1, *Immobilized High-Level Waste*, and for producing a Land Disposal Restrictions (LDR)-compliant ILAW form

in accordance with Specification 2, *Immobilized Low-Activity Waste*.

(C) The Contractor shall determine if the sample materials meet Specification 7, *Low-Activity Waste Envelopes Definition*, limits for LAW samples and Specification 8, *High-Level Waste Envelope Definition*, limits for HLW samples. The entrained solids in the LAW feed samples shall be characterized (where solids of sufficient quantity are available in the treatability samples) in accordance with Specification 7.2.2.1.

(D) The Contractor shall implement and execute the Regulatory Data Quality Objectives (DQO) entitled *Regulatory Data Quality Objectives Supporting Tank Waste Remediation System Privatization Project*, K.D. Wiemers, et al., dated December 1998, Revision 0, No. PNNL-12040 (Table C.5-1.1, Deliverable 2.4).

During the Contract period, the Contractor shall propose to DOE methods to optimize the DQO, and develop the test specifications and plans consistent with the DOE-revised DQO. As available, data and data needs identified during the treatment facility permitting process, the Risk Assessment Work Plan, and LDR/Delisting efforts will be used as inputs to the optimization process.

(E) The DQO characterization scope for R&T testing shall include characterization of the first HLW feed and first LAW feed (AY-102 [solids and supernatant]) (unless agreed to otherwise with DOE through optimization of the DQO).

(ii) Waste Separations Processing Testing: The Contractor shall continue to test and validate the capability of LAW pretreatment processes for removal of entrained solids (where solids of sufficient quantity are available in the treatability samples), ^{137}Cs, ^{90}Sr, and TRU elements, to meet ILAW product requirements. Activities shall address ability to meet contract requirements, operating requirements, operating limits, plant throughput requirements, and information for regulatory permits and the authorization basis. Radioactive testing shall be used to validate simulants and the results from simulant testing. Process scale-up shall be demonstrated with tank waste or appropriate simulants, as described below.

(A) Ion exchange chemical and radiological durability and regeneration properties shall be demonstrated. Determination of gas generation from the columns shall be determined. Scale-up of resin manufacturing shall be demonstrated and batch-to-batch consistency requirements shall be determined and the impacts addressed.

(B) The ^{90}Sr and TRU removal precipitation reaction mechanism shall be characterized via testing.

(iii) Validation of Sludge-Washing Processes: The Contractor shall conduct sludge treatment testing using radioactive samples provided by DOE, and nonradioactive testing to develop and demonstrate process flowsheets and equipment systems to perform sludge washing, caustic leaching and oxidative leaching to minimize the volume of HLW glass produced.

Development testing of the sludge treatment process steps shall include evaluation of process recycles and ultrafilter system cleaning.

The testing results shall be provided to DOE for review and comment. Proposed process steps shall be submitted to DOE for review and approval (Table C.5.1-1, Deliverable 2.10).

(iv) Immobilized Low-Activity Waste Process Testing: The Contractor shall conduct testing to determine the appropriate operating conditions for the LAW melter. Information to be obtained shall include:

(A) Determination of maximum waste loading (including sulfate incorporation) and melter throughput rates for waste envelopes A, B, and C. The Contractor shall continue to investigate glass formulations optimized to incorporate sulfate. These glasses prepared from simulants shall be subjected to the Product Consistency Test and Vapor Hydration Test in accordance with ILAW Specification 2.2.2.17, *Waste Form Testing.* In addition, the process ability of the glass formulation shall be assessed.

(B) Determination of offgas compositions for regulatory purposes and effects on the mass material balance due to recycle streams and secondary waste streams.

(C) Confirmation of the design concept for selected offgas equipment.

(D) Determination of operating conditions or melter feed additive requirements to minimize foaming and process-upset conditions.

(E) Monitor testing to assist in estimating maximum offgas flow requirements in an upset condition.

(F) Determination that glasses produced from a continuously-fed melter meets product specifications and requirements.

(G) Ability to remotely fill and seal full scale packages to Contract requirements (Specification 2).

(v) Immobilized Low-Activity Waste Qualification Testing:

(A) The Contractor shall prepare laboratory scale samples of ILAW glasses from the waste samples provided by DOE. The waste samples shall have been pretreated in accordance with the Contractor's LAW feed pretreatment processes.

(B) The Contractor shall use glasses prepared from DOE-supplied samples and Contractor prepared simulants to demonstrate that Contract requirements can be met (Specification 2). The tests shall be consistent with the DOE-concurred upon ILAW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.3). Glass composition ranges that meet operating and contract requirements shall be identified with non-radioactive glass testing. A planned target composition shall be identified for each glass composition range.

(C) For target glass compositions, radioactive glasses prepared with pretreated tank waste shall be used to demonstrate the ILAW durability requirements of Specification 2.2.2.17, *Waste Form Testing*. For Specifications 2.2.2.17.1 and 2.2.2.17.3, non-radioactive glasses may be used provided that the results from 2.2.2.17.2 are consistent for the non-radioactive glass and the radioactive glass.

(D) The Contractor shall obtain sufficient information for determining that the products meet LDR requirements in accordance with Standard 6, *Product Qualification, Characterization, and Certification*, and as needed to implement the DOE-concurred upon *Final Approach for ILAW LDR Compliance*, and to support the Standard 7 Contractor-prepared petitions for Hanford tank waste treatment standards.

(E) The Contractor shall provide samples, testing data, and compositional analysis to DOE for performance assessment analysis. Samples will only be provided when requested in advance by DOE; archiving of these samples is not required. The Contractor shall actively participate in the performance assessment effort to arrive at suitable compositions for processing and disposal purposes.

(vi) Immobilized High-Level Waste Process Testing: The Contractor shall conduct testing to determine the appropriate operating conditions for the HLW melter. Information to be obtained shall include:

(A) Determination of maximum waste loading and melter throughput rates for waste Envelope D and the products resulting from pretreatment of the LAW feed.

(B) Determination of offgas compositions for regulatory purposes and effects on the mass material balance due to recycle streams.

(C) Confirmation of the appropriateness of selected offgas equipment.

(D) Determination of operating conditions or melter feed additive requirements to minimize foaming and process-upset conditions.

(E) Determination of maximum offgas flow requirements, in an upset condition.

(F) Determination that glasses produced from a continuously fed melter produce glass that meets product specifications.

(G) Ability to fill full-scale packages to Contract requirements (Specification 1).

(vii) Immobilized High-Level Waste Qualification Testing:

(A) The Contractor shall prepare laboratory scale samples of IHLW glasses from the waste samples provided by DOE. The waste samples shall incorporate pretreatment Envelope D products from the pretreatment of the LAW samples provided by DOE.

(B) The Contractor shall use glasses prepared from DOE supplied samples and Contractor prepared simulants to demonstrate that Contract requirements can be met (Specification 1). The tests shall be consistent with the DOE-concurred upon IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2) and relevant documents. Glass composition ranges that meet operating and contract requirements shall be identified with non-radioactive glass testing. A planned target composition shall be identified for each glass composition range.

(C) For target glass compositions, radioactive glasses prepared with pretreated tank waste shall be used to demonstrate the IHLW durability requirements described in Specification 1.

(D) The Contractor shall provide IHLW glass properties data and information in a form that allows DOE to further develop glass properties models. These models will include: (1) liquidus temperature; (2) volume fraction of crystals below the liquidus temperature; (3) viscosity as a function of temperature; (4) Toxicity Characteristic Leach Procedure; and (5) Product Consistency Test.

(E) The Contractor shall obtain sufficient information for determining that the products meet LDR and can be delisted in accordance with Standard 6, *Product Qualification, Characterization, and Certification*, as needed to implement the DOE-concurred upon *Final Approach for IHLW Delisting*, and to support the Contractor-developed Standard 7 petitions for exemption or exclusion of IHLW from RCRA.

The Contractor shall prepare full-scale prototype IHLW canister waste forms composed of simulated IHLW glass within the 4.5-meter tall, austenitic stainless steel canister. After filling the canister with simulated IHLW glass and canister closure, the Contractor shall test the IHLW canister to demonstrate compliance with the *Waste Acceptance System Requirements Document* (WASRD), Specification 4.8.3, *Dimensional Envelope for HLW Canisters*, and 4.8.4, *Filled HLW Canister Weights*. Drop tests shall be conducted to demonstrate compliance with WASRD Specification 4.8.8, *HLW Canister Drop*. **(M047)**

(viii) Effects of Separable Organics: The Contractor shall evaluate the effects of trace quantities (~25 ppm) of separable organics (tributyl phosphate and normal paraffin hydrocarbon) in the tank waste liquid feed to the WTP and the fate of the separable organics within the system. Each potentially affected unit operation (including ion exchange elution and evaporation) shall be examined for process, safety, and permitting implications. Based upon the results of these tests, the Contractor shall propose a deminimus concentration level for separable organics that could be sent to the WTP without adversely affecting the WTP (Table C.5-1.1, Deliverable 2.11).

(ix) Oxidative Leaching: The Contractor shall conduct a literature review and prepare a technical report (Table C.5-1.1, Deliverable 2.8 Technical Report on Oxidative Leaching) that evaluates the treatment processes for the oxidative leaching of chemical components (principally chromium [Cr] and associated components; i.e., sulfate) that limit the loading of HLW solid oxides in the HLW glass waste form. The literature review shall summarize existing experimental results and data, and present conceptual and realistic process flowsheets including the identification of process equipment and operating conditions. Based upon the study results, the Contractor shall provide a recommendation on the preferred process to conduct required separations.

The Contractor shall conduct technology testing work using simulants and actual waste testing to provide design and process operational information on the process used to remove Cr from the HLW waste stream. The process should have the capability to remove Cr from the pretreated HLW stream such that this chemical component, or reagents added to remove this component does not limit the HLW waste loading in the glass waste form. The Contractor shall test a minimum of (2) radioactive tank waste samples. (SY-102 and a second sample that must be provided so that analysis with sample SY-102 can be run concurrently) The test shall be conducted to provide proof of process demonstration (part of Deliverables 2.2 and 2.3), identify operating limits for plant processes, and to determine any impacts to the facility throughput and/or availability. The Contractor shall make recommendations to ORP for the modification of Specification 12, *Procedure to Determine the HLW Feed Treatment Approac*h and Specification 1, *Immobilized High-Level Waste*, Table TS-1 limits for Cr_2O_3 and sulfate, based upon the results of this experimentation. (Table C.5-1.1 Deliverable 2.9, Test Report on Oxidative Leaching).

(b) Process and Facility Modeling Requirements:

The Contractor shall develop and use analytical models to predict and evaluate plant performance using ORP provided tank waste characterization information, waste feed vectors, and WTP Research and Technology (R&T) data, to support WTP process and facility design, support pre-operational planning assessments, and support technical integration with Tank Farm Contractor waste feed staging and product and secondary waste acceptance activities. The Contractor shall, at a minimum, use the following models:

(1) Operations Research Assessment of the Waste Treatment and Immobilization Plant: The Contractor shall conduct Operations Research assessments for the Pretreatment Facility, HLW Vitrification Facility, LAW Vitrification Facility, and Analytical Laboratory to determine that the WTP design incorporates appropriate design and operational features to meet integrated facility availability requirements

and reduce construction and/or operations costs. The assessment shall include Balance of Facilities (BOF) including the glass former facility and where separate evaluations show a BOF system's predicted availability could impact integrated plant availability. Integrated facility assessments shall be performed to evaluate compliance with Contract Section C.7 (b) integrated facility availability. The scope of the assessments to estimate WTP facility availability shall include:

(i) Sampling and analysis requirements including sample turnaround times;
(ii) Vessel capacities;
(iii) Times to conduct individual process steps in unit operations;
(iv) Time for mechanical handling steps;
(v) Equipment reliability and availability time estimates;
(vi) Failure rates of critical instrumentation and control systems;
(vii) Time to diagnose equipment failures and preparation for repair; and
(viii) Time estimates for maintenance and repair of facility and process systems.

The Contractor shall separately document the basis for equipment reliability including estimates of mean time before failure, mean time to repair, and probability distributions for these assumptions.

The Contractor shall use the Operations Research Model to estimate the waste treatment capacity of each of the WTP facilities and the integrated WTP facility. The confidence level for the Operations Research Model assessment waste treatment capacity results shall be presented. Key equipment components and equipment systems which influence treatment capacity shall be identified and ranked.

The Operations Research Assessment shall be used to provide a basis for establishing the spare parts inventory list (Standard 3(c)(6)).

Where reliability, availability, maintainability, and inspectability (RAMI) data is not currently available, the Contractor shall make reasonable assumptions based upon best available information. The proposed configuration of the Operational Research Model, and major assumptions (e.g., process flow configuration, process flowsheet, RAMI input data) shall be presented to U.S. Department of Energy (DOE) for review and approval prior to completion of the model runs used to demonstrate Section C.7 compliance with treatment capacity requirements.

The Operations Research Model results, assumptions, model input parameters, and definition of the model output results shall be clearly documented and provided to DOE for comment (Table C.5-1.1, Deliverable 2.5). The Operations Research Model and outputs shall be updated as necessary, to support major design change assessments and reflect the latest design and information from R&T that would impact availability.

Electronic copies of the Operations Research assessments shall be provided to DOE with each completed assessment.

(2) Waste Treatment and Immobilization Plant Tank Utilization Assessments:
The Contractor shall perform Tank Utilization Assessments under specific feed vector assumptions provided by DOE. The Contractor shall perform Tank Utilization Assessments to support assessments of design changes that would affect model outcomes. The models shall reflect the latest design and information from research and technology. DOE shall review and approve the specific assumptions when the Tank Utilization Assessment model is used to evaluate Contract Section C.7 (b) design capacity requirements. The primary software used to run the dynamic

flowsheet shall be Gensym G2 or other software as agreed to by DOE.
The Contractor shall assess utilization of process tank capacity and supporting equipment capability and operational characteristics, to ensure that the tanks are appropriately sized to support process operations, sampling and analysis turnaround times, process control requirements, and waste form qualification requirements. The model assessments shall include material balance summaries of major chemical and radiochemical components to support demonstration of model assessment integrity. Results shall be provided to DOE for review and comment (Table C.5-1.1, Deliverable 2.6).

(3) Evaluation of River Protection Project Mission Waste Feed Vector: The Contractor shall evaluate the waste feed vector, provided by the Tank Farm Contractor, through DOE, to identify the characteristics that may limit the WTP treatment rate prior to completing Tank Utilization Assessments used to evaluate WTP performance. Comments, if any, shall be provided to the Tank Farm Contractor on any characteristics (e.g., solids concentration, chemical composition and radiochemical composition) that can improve processability of the projected waste feed compositions. The waste feed vector shall be adjusted by the Tank Farm Contractor, prior to use by the Contractor, to evaluate WTP performance. Tank Farm Contractor adjustments to the waste feeds are constrained by data limitations, as well as waste storage and retrieval infrastructure.

Electronic copies of the Tank Utilization assessments shall be provided to DOE with each completed assessment.

(4) Material Balance and Process Flowsheet: The Contractor shall use the ASPEN model to conduct and document process flowsheet material balance analyses for the treatment of tank waste. The Material Balance and Process Flowsheet analysis shall be used to evaluate flowsheet chemistry under similar operating and throughput conditions as evaluated in the Tank Utilization Assessments, and the Operations Research Assessment.

The data sources for the material balance assessments shall be reviewed by DOE for acceptability and will be based upon the compositional limits defined in Specification 7, *Low-Activity Waste Envelopes Definition* and Specification 8, *High-Level Waste Envelope Definition*, tank waste inventory estimates, and the results of testing with actual tank waste samples. The flowsheet and material balances shall estimate the quantity of ILAW, IHLW, and relevant secondary streams on a feed-tank-by-feed tank basis, as well as on annual basis. The material balances will be based on three standards for chemical composition estimation. The Standards are:

(i) Best available information that is based upon the analysis of tank waste samples planned to be treated in the WTP;

(ii) Agreed upon waste input inventory; and

(iii) Specification 7, *Low-Activity Waste Envelopes Definition*, and Specification 8, *High-Level Waste Envelope Definition*, concentration maximums.

The flowsheet and material balances shall be sufficiently detailed to support permitting and safety activities under Standard 7, *Environment, Safety, Quality, and Health*, and to track DOE-supplied feed through the Hanford system for product acceptance and establishing that the waste treatment was performed.

The Material Balance and Process Flowsheet shall be updated in accordance with Table C.5-1.1, Deliverable 2.7. The material balance shall be consistent with the latest process verification testing, product qualification activities, and feed characterization information, as appropriate. The Contractor should evaluate the process chemistry predictions based on the Material Balance and Process Flowsheet assessment results. Unresolved process chemistry predictions should be verified through additional literature reviews and process chemistry testing.

The flowsheet and material balances shall be updated during cold commissioning, and prior to and following hot commissioning operations based upon characterization of WTP process stream compositions.

The Material Balance and Process Flowsheet shall be used to compare the results of the primary design tools used in the WTP design including the Engineering Mass Balance and Process and System Component calculations. Significant differences in model predictions shall be reconciled.

Electronic copies of the Material Balance and Process Flowsheet assessments shall be provided to DOE with each completed assessment.

(5) Configuration Control: The Contractor will establish and maintain a configuration control system to manage the models and analyses. The models and analyses will be subject to the QA and configuration control requirements imposed upon the Design Process in Section C.4, *Environment, Safety, Quality, and Health*, and Standard 1, *Management Products and Controls*.

Standard 3: Design

This Standard describes the Contractor's responsibilities for conducting facility design functions, maintaining design documentation, and conducting design reviews. The intent is to ensure that the Contractor has the necessary systems, processes, information, and deliverables in place to allow DOE evaluation that the WTP Project is proceeding appropriately.

(a) Design Process:

The Contractor shall perform the following activities:

(1) Acquire and place under configuration control all records from previous contractors within one (1) month of Contract award. The Contractor shall transition the WTP Conceptual Design and supporting information developed through Contract award.

(2) Provide to DOE for information the Contractor's design process (Table C.5-1.1, Deliverable 3.1). The process shall meet all requirements; laws and regulations; ensure that design is performed in controlled, safe, and efficient manner; and implement best industry practices. As changes to the process are made, the changes shall be provided to DOE for information.

(b) Establish and Maintain Facility Design Requirements: The Contractor shall comply with the Contract design process and the following:

(1) Functional Specification: The Contractor shall prepare a Functional Specification that defines the technical operational requirements of the WTP based on the WTP Conceptual Design and supporting documentation (Table C.5-1.1, Deliverable 3.2). This document shall define the waste treatment requirements, environmental compliance requirements, and authorization basis requirements of the facility as currently known and understood. The Functional Specification shall describe the process/functional requirements of the WTP, including:

(i) WTP feed characteristics including quantities, treatment rates, and mechanical, physical, chemical, and radiological properties (by ranges, envelopes, tanks, or transfer batches);

(ii) ILAW and IHLW product characteristics such as quantities, mechanical, physical, chemical, and radiological properties (by ranges, envelopes, tanks, or transfer batches);

(iii) Services and utility requirements, operating materials and supplies, and other inputs;

(iv) Estimates of effluents, emissions, solid wastes, by-products, and other outputs; and

(v) WTP operations limits.

(2) Basis of Design: The Contractor shall prepare for DOE review and approval (Table C.5-1.1, Deliverable 3.3(a)), and as significant changes occur, a Basis of Design Document that identifies directly or by reference design requirements and design codes and standards that will serve as a basis for the continued design of the WTP. The Basis of Design shall be based on the WTP Conceptual Design, (including the Basis of Design directly developed in that phase), and supporting

documentation. The Basis of Design shall be generally organized by discipline and shall at a minimum identify:

(i) Environmental permitting requirements from State laws and regulations, the Dangerous Waste Permit Application (DWPA), Notice(s) of Construction (NOC), Prevention of Significant Deterioration (PSD), etc.;

(ii) Summary of the WTP site characteristics, including climatic, geotechnical, and natural phenomena data (with numerical values specifically preferred where practical; otherwise, referenced to identified source);

(iii) Design requirements for the WTP;

(iv) Allowable process and atmospheric temperatures, pressures, flow rates, for design conditions (with numerical values specifically preferred where practical; otherwise, reference to identified source); and

(v) Applicable codes and standards, regulations and guidelines.

(3) The Contractor shall prepare for DOE review a Design Criteria Database (DCD) (Table C.5-1.1, Deliverable 3.3(b)). The DCD shall be used to identify potential design inputs from the design criteria contained in the source documents. The DCD shall be based on the WTP Conceptual Design and supporting documentation and updated as source documents are revised. The DCD shall contain design criteria extracted verbatim from the following source documents (and others as appropriate):

(i) Initial Safety Analysis Report (Preliminary Safety Analysis Report [PSAR]/Final Safety Analysis Report [FSAR] when submitted/approved);

(ii) Integrated Safety Management Plan;

(iii) Radiation Protection Plan for Design and Construction;

(iv) Safety Requirements Document-Volume II;

(v) Quality Assurance Manual;

(vi) RPP-WTP Contract;

(vii) Basis of Design;

(viii) Functional Specification;

(ix) Operations Requirements Document;

(x) Limited Construction Authorization Request(s);

(xi) Partial Construction Authorization Requests(s) (when submitted/approved);

(xii) Construction Authorization Request(s) (when submitted/approved);

(xiii) Dangerous Waste Permit Application (when submitted/approved);

(xiv) Notices of Construction (when submitted/approved);

(xv) Prevention of Significant Deterioration to the Environment (when submitted/approved); and

(xvi) Interface Control Documents.

(4) Operations Requirements Document: The Contractor shall prepare an Operations Requirements Document for DOE review and approval (Table C.5-1.1, Deliverable 3.4) based on the WTP Conceptual Design and supporting documentation. The operations requirements document shall define requirements for WTP life-cycle operations, including commissioning. These requirements will influence WTP design features to ensure cost efficient operations and provide for accurate life-cycle cost estimates, planning, and informed decision-making. The Operations Requirements Document shall include at a minimum:

(i) The operations and maintenance philosophy and requirements for the WTP, including requirements for reliability, availability, maintainability, and inspectability;

(ii) Description of the operations and maintenance philosophy for each of the WTP facilities (Balance of Facilities, Pretreatment, HLW Vitrification, and LAW Vitrification);

(iii) Requirements for change rooms, first aid stations, decontamination facilities, lunch rooms, training facilities, control rooms, and operating galleries;

(iv) Requirements for facilities and computer based (simulator) training facilities;

(v) Equipment accessibility for maintenance and operations including both contact and remotely maintained systems, clearances and tolerances allowed in mechanical systems, and housekeeping features;

(vi) Instrument and control requirements for control room and local instruments;

(vii) General sampling and analyses requirements;

(viii) Ergonomics and human factors requirements for operations and maintenance;

(ix) Maintenance and spares philosophy and requirements (including items to be present at transition to the Operations Contractor);

(x) Environmental compliance requirements; and

(xi) Health, safety, and site emergency services requirements.

Upon approval of the Operations Requirement Document, DOE will control the **bolded** text in the Operations Requirement Document and will consider any proposed changes.

(5) The Contractor shall compare R&T test results with the associated design calculations and design basis when appropriate. Any significant differences shall be reconciled. Test results and any subsequent calculations relating to the design shall be referenced within the appropriate system descriptions and other design control documentation.

(c) Establish and Maintain Design Documentation: The Contractor is required to establish a design process including design documentation and media, that complies with the Design Criteria Documents identified in Standard 3, (b).

Process and equipment design changes with potential impact on plant capacity, operability, or throughput shall require a technical analysis using an Operations Research model and Tank Utilization model to assess impact. (See Standard 2, *Research, Technology, and Modeling*.) Proposed design changes that impact the capacity, operability, and throughput shall be presented to DOE for review.

DOE shall have access to all Contractor-developed design documents and information, including paper and electronic files. The information shall be in the form of controlled copies updated by the Contractor. Information shall include, but not be limited to, the information described below.

Information shall contain relevant references, such as, system descriptions, process data sheets, and equipment data sheets and shall address Pretreatment, LAW Immobilization, HLW Immobilization, Analytical Laboratory, and Balance of Facilities. Changes to the products shall be documented in accordance with approved engineering procedures. DOE shall be invited to attend meetings where design products are updated, revised, or changed and DOE will be provided with copies of design change documentation upon request.

(1) System Descriptions: The system descriptions shall include references to all design documents (process flow diagrams, piping and instrumentation diagrams, engineering calculations, process data sheets, R&T development work and test reports, material handling diagrams, mechanical flow diagrams, design proposal drawings, etc.) associated with the applicable systems.

(2) Process Data Sheets (Equipment): Provide unrestricted access to a complete file that includes every piece of equipment as an electronic sortable file of all process data sheets with all available information including: the equipment identification number; equipment name and description; the piping and instrument diagrams where the equipment is shown; capacity and operation parameters; and materials of construction.

(3) Process Data Sheets (Instrument Database): Provide unrestricted access to a complete file that includes every instrument as an electronic sortable file of all instrumentation process data sheets, with all available information, including:

(i) The instrument identification number;

(ii) The instrument name and/or description;

(iii) The piping and instrument diagrams where the instrument is shown; and

(iv) The associated R&T test plan results and references to the applicable test plans tied to design decisions via the design requirements documents.

(4) Calculations for Equipment Sizing: The calculation and technical basis for the capacity of major vessels, equipment, and piping shall be provided. The basis shall include, as applicable, sample analysis turnaround times and address reliability, availability, maintainability, and inspectability (RAMI).

(5) General Arrangement Drawings: General arrangement drawings for the WTP (e.g., Balance of Facilities, Pretreatment, LAW Conditioning, Analytical Laboratory, HLW Vitrification, and LAW Vitrification). The general arrangement drawings shall identify plan and elevation views of the facilities in sufficient detail to understand facility layout and the preliminary layout of major equipment components.

(6) Establishment of Master Equipment List:

The Contractor shall develop a Master Equipment List and Spare Parts List to support continuous and safe operations of the WTP facilities. The Master Equipment List and Spare Parts List shall meet the following requirements:

(i) A Master Equipment List shall be developed in an electronically sortable format with sufficient information to provide traceability to the WTP design, sufficient information to procure qualified spare parts, and linkage to preventative and corrective maintenance records (Table C.5-1.1 Deliverable 3.5).

(ii) Spare Parts List shall be established to support WTP operations. The Spare Parts List shall be developed by:

(A) Assessment of the mean time before failure of equipment as identified by the Operational Research Assessments (Standard 2, Deliverable 2.5); and

(B) Assessment of the time required to procure and modify replacement equipment.

(C) Ensuring that the spare parts list supports WTP operations for one (1) year following completion of Hot Commissioning.

(iii) Protected storage locations shall be identified for storage of the spare parts. The Spare Parts List shall be turned over to the Operations Contractor at the time of Contract completion.

(iv) The Spare Parts List, and basis, shall be provided to DOE for review and comment (Table C.5-1.1, Deliverable 3.9).

(7) 3-Dimensional Design Model (3-D Model): The Contractor shall provide access to all files of the 3-Dimensional Design Model (3-D Model). Access is required to support DOE awareness of current and contemplated changes to the design layout and assess proposed changes to the WTP and associated processes.

(8) Process Flow Diagrams: The Contractor shall prepare process flow diagrams for the Pretreatment Plant, HLW Vitrification Plant, and LAW Vitrification Plant. The process flow diagrams shall identify all main process equipment including in-cell equipment and supporting equipment for cold chemical makeup. Identification shall include names, functions, capacities, identification numbers, and include material balance line identifiers in the process flow lines using the numbers traceable to the material balance deliverable. Supporting documentation shall specify the capacity and duty of the equipment systems, the process scheme and sequence description, and operating conditions.

(9) Material Balance: See Standard 2, *Research, Technology, and Modeling*.

(10) Piping and Instrument Diagrams: The Contractor shall prepare the piping and instrument diagrams for the Pretreatment, HLW Vitrification, Analytical Laboratory, and LAW Vitrification and balance of all other facilities and systems in the WTP. The piping and instrument diagrams shall identify all process and support equipment, instrument requirements, pipe sizes, and line numbers. Simplified control system information shall be presented on piping and instrument diagrams.

(11) Instrument and Control Documents: The Contractor shall prepare the instrument and control documents for the Pretreatment, HLW Vitrification, Analytical Laboratory, and LAW Vitrification and balance of all other facilities and systems in the WTP. These design documents shall include control system specifications, data sheets, software design specifications, and instrument databases.
This design shall include features to address process safety and process control for product quality.

(12) Electrical Diagrams: The Contractor shall prepare electrical one-line diagrams for all process and facility systems. Electrical loads and systems, as well as the basis to support specification of the electrical systems, shall be identified.

(13) Equipment Design/Equipment Arrangement Diagrams: The Contractor shall prepare the design of all process and mechanical handling equipment for the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and Balance of Facilities. Equipment design data sheets shall be completed for all process equipment components. Equipment general arrangement drawings shall specify plan and elevation views.

(14) Equipment Arrangement and Piping Diagrams: The Contractor shall perform all physical design in the 3D model for the Pretreatment, HLW Vitrification, Analytical Laboratory, and LAW Vitrification facilities.

(15) Facility Ventilation System Design: The Contractor shall prepare the ventilation flow diagrams and heating, ventilation, and air conditioning system design for the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and Balance of Facilities. The diagrams shall identify the individual systems, all equipment components, and flows in the facilities. Sample locations and methods shall be specified. Equipment to provide motive force and ventilation control shall be identified.

(16) Facility Civil, Structural, and Architectural Design: The Contractor shall prepare the civil, structural, and architectural designs of the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and Balance of Facilities. The building sizes, location and requirements of load-bearing, shielding and internal walls shall be identified. Major penetrations in walls and floors shall be identified. All crane structures, filter housings, and facility mechanical systems shall be identified. Seismic analysis for the facilities for Pretreatment, HLW Vitrification, LAW Vitrification, and support facilities shall be completed in accordance with DOE and Ecology requirements to support structural analysis, definition of the facility, the Limited Work Authorization Request, and Construction Authorization Request.

(17) Mechanical Flow Diagrams: The Contractor shall prepare mechanical handling diagrams for the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and Balance of Facilities. The diagrams shall be prepared with sufficient detail to support the hazards analysis review and the operations research model. The diagrams shall identify mechanical equipment and each step and sequence of the operation.

(18) Analytical Laboratory Facility Design: The Contractor shall further develop and provide the sampling and analysis requirements to support process control, environmental compliance and waste form qualification for DOE approval (Table C.5-1.1, Deliverable 3.6). The information shall include sample locations, sample purpose, analysis requirements, and frequency and turnaround times. Results of the assessment of process tank capacities and process operations will be used to verify and establish the specification and design of the Analytical Laboratory to support the WTP.

Reserve capacity in the Analytical Laboratory, to the extent there is any, shall be utilized for "limited technology testing" or increase throughput (e.g., Pretreatment, LAW and HLW capacity changes). Limited technology testing includes investigation of anticipated WTP operational performance, evaluation of process upsets, process improvements, analytical methods optimization, and qualification of new instruments.

Limited technology testing capabilities shall include: compositional and physical property analysis of the waste feeds; and small scale testing of the cross-flow filtration, sludge washing and leaching, cesium (Cs) ion exchange, and LAW and HLW glass melting processes. Testing of the waste feeds shall be completed to confirm planned operational flowsheets for the tank wastes to be treated in the WTP. Testing may be done in alternative facilities with prior DOE approval.

The Contractor shall identify samples from WTP operations that will be analyzed at non-WTP analytical facilities. The definitions of the outsourced samples shall include sample type and analyses required. The identification of the outsourced samples is to be included in the Sampling and Analyses Plan used to support the requirements definition for the Analytical Laboratory.

The Analytical Laboratory Facility design shall incorporate features and capability necessary to ensure efficient WTP operations and meet all permitting, process control, authorization basis, and waste form qualification requirements.
The design should be validated with information from tank utilization modeling of the process tankage, and operational research modeling of the treatment process, as appropriate.

(19) Site Layout Drawings: The Contractor shall complete all site layout drawings, which shall include the exterior arrangement of all facilities and structures on the site in relation to one another, and their exterior interface points with all piping and electrical systems. The drawings shall identify all above-grade and below-grade structures, piping, and electrical systems. The drawings will reflect requirements during the construction and operations activities. Site drawings and documents shall be updated and provided to DOE for review and approval (Table C.5-1.1, Deliverable 3.7).

(20) Other Applicable Design Products Including:

(i) Ventilation and instrumentation diagrams;

(ii) Instrument schedules;

(iii) Electrical single line diagrams;

(iv) Electrical load schedules;

(v) Mechanical flow diagrams;

(vi) Material handling diagrams; and

(vii) Design proposal drawings (equipment procurement drawings).

(21) Oxidative Leaching: The Contractor shall complete the necessary design products, including process flowsheets, material balances, and equipment designs to implement the recommended process for the oxidative leaching of HLW sludge and entrained solids.

(d) Waste Treatment and Immobilization Plant Optimization Study: The Contractor shall prepare for DOE review and approval a proposed set of optimization studies that improve life-cycle performance, cost, and schedule of the WTP. This will include process design (such as improved radiochemical separations), facility design (such as improved space utilization), and technologies (such as second generation treatment and immobilization technologies that are ready for demonstration and application); these will affect the Contract requirements (Table C.5-1.1, Deliverable 3.8). Optimization studies that do not affect the Contract requirements are the Contractor's responsibility and are separate from this activity. The Contractor shall seek input from DOE and the Tank Farm Contractor in developing the list of proposed studies. DOE and the Contractor shall jointly agree upon which studies shall be performed. All optimization studies shall address the following:

(1) Description of the item, process, system, or facility to be optimized and the basis for such optimization;

(2) Description of the research and technology program elements that are required to validate the required performance prior to incorporating the change into the baseline;

(3) Description of the design changes that are required to incorporate the change into the baseline;

(4) Effects of the proposed optimization on the tank farm operator authorization basis and the authorization basis interfaces between the WTP and the Tank Farm Contractor;

(5) Effects on WTP cost, schedule, plant capacity, and waste loading;

(6) Near-term impacts for Tank Farm Contractor;

(7) Estimated life cycle cost impacts to ORP;

(8) An evaluation of potential impacts on long-term interfaces with the Tank Farm Contractor;

(9) Technical risks eliminated, changed, or amplified by the proposed change;

(10) Regulatory issues eliminated, changed, or amplified by the proposed change;

(11) Potential changes in secondary waste and on returnable material volume and

type; and

(12) An evaluation of the potential changes in energy needs and other ORP supplies material quantity.

The Contractor shall involve all affected parties to ensure a balanced and complete picture. DOE will evaluate the studies and consider changes to the Contract requirements if they are found to be in the best interest of the Government.

(e) U.S. Department of Energy Participation in Design Process: DOE staff and other Hanford Site contractor staff identified by DOE shall be invited to participate in all Design Overview activities. Design overview activities include any meeting that discusses significant issues associated with the establishment, development, and/or progress of the technical requirements for the design.

Design reviews and multi-disciplined topical overviews will be conducted on an as-mutually agreed upon basis.

In order to improve communications, the Contractor shall provide dedicated office space in the Contractor's design facility for five (5) DOE staff.

(f) Support to DOE Design Oversight Process: The Contractor shall support DOE as owner/operator of the WTP, in their independent oversight of the WTP design. This support shall include:

(1) Acquisition of design media;

(2) Access to key personnel involved in the development of the design;

(3) Preparation of formal responses to questions raised in the design process;

(4) Timely review of the DOE design oversight report; and

(5) Formal and timely resolution of any Findings and Assessment Follow-up Items.

The scope of the DOE design oversights shall include all contract work.

(g) Resolution of Technical and Design Issues identified by the External Flowsheet Review Team (EFRT):

The Contractor shall manage resolution and closure of technical and design issues identified in the EFRT report, *Comprehensive Review of the Hanford Waste Treatment Plant Flowsheet and Throughput*, March 2006. The Contractor shall:

(1) Prepare Issue Response Plans (IRP) for the 28 technical and design issues identified in the EFRT Report. DOE approval on the IRPs shall be obtained.

(2) Advise DOE on progress on resolving the issue, including schedule and issues status meetings, at a frequency agreed to with DOE.

(3) Summarize progress for each issue in the Contractor's Monthly Status Report (Deliverable 1.7 in Table C.5-1.1). This shall include technical progress; identification of new issues; cost, and schedule performance; and identification of potential project impacts from issue resolution.

(4) Prepare input for Closure Packages for each EFRT Issue. The Closure Packages will be finalized by DOE and shall provide a complete reference list to the supporting documentation. Final Closure Packages shall have both DOE and contractor approval.

(5) Design and construction changes identified by closure of the IRP issues shall be identified and documented using the WTP Trend process.

(6) All EFRT Issues shall be resolved through the submittal of Closure Packages as they are completed.

Standard 4: Construction, Procurement, and Acceptance Testing

The purpose of this Standard is to describe additional requirements for Construction, Procurement, and Acceptance Testing. In the context of this Standard, the terms "*acceptance testing*" and "*acceptance*" refer to the Contractor's testing and acceptance of systems, components, equipment, etc., as needed for mechanical completion of the WTP. The DOE and/or Owners Agent will be allowed to observe system turnover from Construction to Commissioning. Acceptance does not refer to DOE acceptance of the WTP from the Contractor; DOE acceptance of the WTP will not occur until "Completion of Hot Commissioning".

(a) Construction, Procurement, and Acceptance Testing Plan: The Contractor shall prepare and submit a Construction, Procurement, and Acceptance Testing Plan for DOE approval (Table C.5-1.1, Deliverable 4.1) and update the Plan as required after initial submission. The Plan shall include:

(1) Description of procurement, construction bid, and work packages;

(2) Construction management and force account construction;

(3) Construction site management;

(4) Acceptance testing; and

(5) Descriptive linkage to the Project Execution Plan (PEP) described in Standard 1 and the Environment, Safety, Quality, and Health program described in Standard 7.

(b) Procurement:

(1) The Contractor shall procure all required material and equipment; prepare bid packages and solicitations; evaluate, award, and manage subcontracts; accept subcontractor materials and equipment; and verify subcontractor acceptance tests.

(2) The Contractor shall submit a Purchasing System for DOE approval in accordance with Section I Clause, *Subcontracts* (Table C.5-1.1, Deliverable 4.2, Purchasing System).

(c) Construction Bid and Work Packages: The Contractor shall prepare bid and work packages; solicit, evaluate, award, and manage subcontracts; accept subcontractor construction; and verify subcontractor acceptance tests (Table C.5-1.1, Deliverable 4.3).

(d) Construction Management and Force Account Construction: The Contractor shall manage or perform all: supervision; required construction; furnish labor, equipment, and materials, management, and supervise construction and acceptance testing; and provide required systems and support for environmental protection, safety, quality, labor relations, and security.

(e) Construction Site Management: The Contractor shall manage the construction site and provide all required construction support services, construction site security, industrial hygiene, and temporary and permanent construction facilities.

(f) Construction and Acceptance Testing:

(1) The Contractor shall maintain an adequate construction inspection system and acceptance testing system and perform such inspections and testing, as well as ensure that the work performed under the Contract conforms to Contract

requirements. The Contractor shall maintain complete inspection and testing records and make them available to DOE. The DOE and/or Owner's Agent shall be allowed to observe acceptance testing and system turnover. The Contractor shall develop and submit an integrated Construction and Acceptance Testing Program to DOE for approval (Table C.5-1.1, Deliverable 4.4) that includes the following elements:

(i) Checking and approval of all vendors' shop drawings to assure conformity with the approved design and working drawings and specifications;

(ii) Acceptance test plans and procedures for on-site Contractor/ subcontractor inspection of construction workmanship, compliance with design drawings and specifications, management of the design construction changes, and criteria for acceptance of fabricated and constructed items;

(iii) Identification and description of Contractor and vendor components to be tested and accepted including the identification of component, systems, and integrated facility testing;

(iv) Inspection of construction to assure adherence to approved working drawings and specifications;

(v) Identification of Contractor-proposed and DOE-specified construction witness or hold points;

(vi) Methods to complete field and laboratory tests to verify construction workmanship, materials and equipment, and approved working drawings and specifications;

(vii) Approaches and methods to troubleshoot and correct material acceptance and construction deficiencies;

(viii) Preparation of partial, interim, and final estimates, as well as reports of quantities and values of construction work performed, for payment or other purposes; and

(ix) Approach to transition from acceptance to facility cold commissioning and hot commissioning.

(2) The Contractor shall prepare, as part of the monthly report defined in Standard 1, *Management Products and Controls* (Table C.5-1.1, Deliverable 1.7), a monthly Construction Inspection and Acceptance Status Report that will document the progress of construction and facility acceptance and include the following information:

(i) Status on the deliverables of materials and fabricated items;

(ii) Estimates and reports on the quantities, value, and type of construction work completed for payment or other purposes; and

(iii) Status on the performance of the acceptance program and level of rework/non-conforming items received/constructed and identification of corrective actions.

(3) During the construction and acceptance phase, the Contractor shall remain current on the process and facility as-built program. The status on the as-built program is to be reported in accordance with the process defined in the Construction, Procurement, and Acceptance Testing Plan (Table C.5-1.1, Deliverable 4.1).

(4) The Contractor shall provide all necessary labor, equipment, materials, test equipment, any spare parts sufficient to maintain all structures, systems, and components (SSC) to meet the objectives of the testing program.

(5) The Contractor shall prepare for DOE review and comment an As-Built Program Description (Table C.5-1.1, Deliverable 4.7). The As-Built Program Description and associated procedures shall identify:

- Description of the as-built process, including the role of DOE;
- Drawing series to be as-built;
- Document control process for maintaining as-built; and
- Procedures for modification of the as-built.

(g) Certification for Start of Construction: The Contractor shall certify to DOE that construction has been initiated. "*Start of Construction*" is defined as the first pour of structural concrete for one (1) of the three (3) WTP facilities, Pretreatment, LAW Vitrification, or HLW Vitrification.

(h) U.S. Department of Energy Participation in Construction Review: The DOE staff, Tank Farm Contractor, and other Hanford Site contractor staff identified by DOE shall be invited to participate in all overview activities (Table C.5-1.1, Deliverable 4.5 Construction Overview Meetings). Construction overview activities include any meeting that discusses significant issues associated with the establishment, development, and/or progress of the WTP construction.

(i) Certification of Facility Acceptance Completion: The Contractor shall certify to DOE that facility acceptance has been completed. "*Completion of Facility Acceptance*" is defined when all components and systems associated with the Pretreatment, LAW Vitrification, and HLW Vitrification, have been installed and functionally tested, and the facility design as-built has been submitted in accordance with the Construction, Procurement, and Acceptance Testing Plan (Table C.5-1.1, Deliverable 4.1).

(j) Construction Emergency Response Plan: The Contractor shall develop and adhere to a Construction Emergency Response Plan that is compliant with the applicable requirements of Hanford Emergency Management Plan, DOE/RL-94-02, and the operational emergency and abnormal event reporting requirements of HFID 232.1B (attachment to letter 01-OSR-0280 [CCN 021926] provided the requirements for the Construction Emergency Response Plan to be compliant with HFID 232.1B and DOE/RL-94-02, provided it meets the definition of an Administrative Facility), and the emergency and fire prevention requirements of 29 CFR 1910.38 and 29 CFR 1926.35 as required by RL/REG-2000-04 (see Section J, Attachment E(a) (Table C.5-1.1, Deliverable 4.6).

Standard 5: Commissioning

The purpose of this Standard is to describe the requirements and deliverables to commission the WTP. Commissioning is defined as the testing, operations, maintenance, procedure development, and training to complete the requirements contained in Standard 5. Commissioning of the WTP facilities begins with the turnover of individual facility systems from construction to the Contractor's startup/commissioning organization and continues through to turnover to the future Operations Contractor.

The Commissioning process begins with simple component tests and progresses through system level tests, testing during Cold Commissioning making production runs using agreed upon simulant waste, and Hot Commissioning using actual tank waste. Initial component tests and system tests will be performed in a planned sequence at each facility. The Contractor may choose to commission the facilities in a sequential order or a parallel order.

(a) Objectives: The Contractor shall:

(1) Demonstrate that the waste treatment capacity performance of the WTP facilities meets the facility minimum capacity criteria specified in Tables C.6-5.1 and C.6-5.2;

(2) Provide a Commissioning Plan that documents how objectives of Commissioning will be met;

(3) Demonstrate that the waste form products and secondary wastes produced in commissioning testing comply with DOE-approved compliance plans;

(4) Demonstrate facility remotability in areas designed for remote operations;

(5) Ensure WTP facilities, programs, and personnel are prepared for, and successfully complete an Operational Readiness Review in accordance with DOE Order 425.1C, *Startup and Restart of Nuclear Facilities,* prior to start of Hot Commissioning;

(6) Complete Critical Decision (CD) 4 in accordance with DOE Manual 413.3-1, *Project Management for the Acquisition of Capital Assets*. Prerequisites for CD-4 will be completed prior to Hot Commissioning. Post CD-4 activities shall be completed prior to completion of Project Closeout; and

(7) Transition WTP facilities, programs, and operations personnel to the Operations Contractor.

(b) Simulant Testing: Simulant shall be used to demonstrate the normal flow of WTP feed material, individual facility production capability, and the ability to predict product quality, and produce acceptable ILAW and IHLW products.

A simulant(s) shall be defined to support cold commissioning performance testing. The waste feed simulant(s) shall be mutually agreed to by both DOE and the Contractor to represent typical feeds to the WTP. This simulant may be comprised of a baseline composition that with spiking will demonstrate water washing, caustic, and oxidative leaching to solubilize aluminum (Al) and chromium (Cr). The simulant compositions will be specified in a Cold Commissioning Simulant Definition deliverable (Table C.5-1.1, Deliverable 5.18) due to DOE, 24 months prior to the start of Cold Commissioning.

The Pretreatment Facility simulant properties for demonstrating capacity shall:

- Support caustic and oxidative leaching;

- Be based on the average chemical composition, solids loading, operating conditions and leaching performance based on the design basis G2 Model Run (24590-WTP-MRR-PET-08-002, Revision 2, *WTP Contract Run – (G2) Dynamic Model Run Results Report, August 25, 2008*);
- Have average physical properties including particle size, particle density and rheological properties;
- Contain the major chemical constituents required to cost effectively demonstrate treatment; and
- Support LAW and HLW Vitrification facility melter operations.

(c) Commissioning Plan: The Contractor shall prepare a Commissioning Plan for DOE review and approval (Table C.5-1.1, Deliverable 5.1), a minimum of twelve (12) months prior to the introduction of waste feed simulant to the WTP facilities (i.e., start of cold commissioning). The Plan shall:

(1) Meet the Commissioning objectives stated in Standard 5, (a);

(2) Define the sequence for commissioning of the WTP facilities;

(3) Describe the process for ensuring readiness to start cold commissioning;

(4) Define the WTP test control program;

(5) Define the Cold Commissioning and Hot Commissioning phase organizations; and

(6) Identify planned actions to ensure readiness, prior to Hot Commissioning, for an Operational Readiness Review per DOE Order 425.1C, *Startup and Restart of Nuclear Facilities* (e.g., facility testing, programmatic controls, qualification of personnel, and regulatory permits).

The Commissioning Plan shall be updated as required and provided to DOE for approval.

(d) Joint Test Group (JTG): The Contractor 's JTG will be responsible for:

(1) Verifying the correct functioning of applicable systems to engineering approved test acceptance criteria;

(2) Testing process and facility systems to test and evaluate the design basis operating envelope;

(3) Demonstrating emergency procedures for recovery from simulated off-normal events using drills, tabletop exercises or the simulator;

(4) Validating operating procedures and instructions during the commissioning test program;

(5) Completing corrective actions derived from the commissioning test program; and

(6) Confirming successful conduct and performance of Technical Safety Requirements (TSR) surveillance.

The DOE, DOE's Owner's Agent, and Operations Contractor will participate in the JTG as observers.

The JTG will approve the test procedures and results for Safety Class (SC), Safety Significant (SS), Environmental Performance, and DOE/RW-0333P QARD system acceptance testing during Commissioning, as well as Contract technical performance test results as defined in Standard 5, (d) for *Cold Commissioning* and Standard 5, (f) for *Hot Commissioning*.

(e) Cold Commissioning: During the Cold Commissioning test period, the Contractor shall conduct testing operations to verify that the WTP will perform in accordance with design specifications using DOE-approved non-radioactive simulated waste feeds that demonstrate the ability of the facility to treat tank waste. Prior to Cold Commissioning, the Contractor shall have in-place required permits, licenses, necessary safety programs (including initial authorization basis), and interfaces per Section C.9, *Interface Control Documents*, to support Cold Commissioning.

(1) The Contractor shall carry out the Cold Commissioning performance tests of the Pretreatment, LAW Vitrification, and HLW Vitrification facilities to:

(i) Verify through the Waste Form Qualification Tests (e)(3)(i) that the WTP can produce qualified waste products (Specification 1, *Immobilized High Level Waste* and Specification 2, *Immobilized Low-Activity Waste*) and secondary wastes based upon DOE-approved waste compliance plans (Deliverable 6.1. 6.2 and 6.3, Table C.5-1.1).

(ii) Demonstrate through the Cold Commissioning Capacity Tests (e)(3)(ii) the WTP capacity for process systems as defined in Table C.6-5.1.

(iii) Perform the Integrated Operations as described further in (e)(3)(iii).

(iv) Demonstrate through the Remotability Test (e)(3)(iv) the remotability of components installed in areas designed for remote operations.

(v) Demonstrate through the Environmental Performance test (e)(3)(v) that the WTP is operating in accordance with applicable permit requirements.

The testing, combined with other operational readiness activities, shall be planned and conceived to provide the basis necessary to support the Certification for Readiness for Hot Commissioning Start (Table C.5-1.0, Deliverable 5.10).

The Contractor shall provide a strategy to achieve the Cold Commissioning performance test objectives specified in the WTP Commissioning Plan. Representative temporary analytical facilities may be used to perform elements of these demonstrations. Resultant products from Cold Commissioning (Table C.5-1.1, Deliverable 5.6) shall be transferred to DOE in accordance with the *Interface Control Documents*. During the tests, the Contractor shall provide documentation of the waste form products for DOE acceptance in accordance with Specification 13, *Commissioning Waste Product Inspection and Acceptance.*

(2) Request for Approval to Initiate Cold Commissioning: Cold Commissioning begins with introduction of simulants into the process facility, vessels as defined in the PEMP. The Contractor shall request approval from DOE to initiate Cold Commissioning following:

- The Contractor's completion of a management assessment to evaluate the readiness of facilities and personnel to initiate cold commissioning based upon the Minimum Core Requirements identified in DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*. The results of the management assessment shall be provided to DOE.

- Identification of the status of the authorization basis implementation, permits and safety program implementation, and any remaining construction scope that requires completion before simulant introduction.

The Contractor shall not proceed with introduction of simulants without DOE approval. The Contractor shall notify DOE that Cold Commissioning has commenced.

(3) Testing:

(i) Waste Form Qualification Tests: The Contractor shall complete WTP waste form qualification testing during cold commissioning to demonstrate the production of acceptable non-radioactive products (ILAW and IHLW) and secondary wastes in accordance with the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1), ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), and IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2). Applicable process unit operations, sampling and analysis, process control systems, and operating procedures shall be utilized in these qualification tests in a manner that represents planned operations with actual wastes. Test results will be evaluated and documented as part of the waste form qualification reports identified in Standard 6, *Product Qualification, Characterization, and Certification*.

(ii) Cold Commissioning Capacity Tests:

Cold commissioning testing shall be conducted to demonstrate the capacity of the WTP as noted in Table C.6-5.1. Waste form products and secondary wastes will be produced in accordance with the qualification strategies and requirements identified in the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1), ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), and IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2), and meet the relevant specification and interface requirements. The results shall be provided to DOE for review and approval. (Table C.5-1.1, Deliverable 5.4).

The Cold Commissioning Capacity Tests shall test the individual facility operations in terms of function and capacity. Applicable facility system components, both process and mechanical, shall be tested.

The water washing, caustic, and oxidative leaching process steps shall be performed consistent with the process model used to develop Table C.6-5.1 and the process steps as defined in Standard 2, Deliverable 2.10. Leaching effectiveness is not a criterion for acceptability of Cold Commissioning Capacity Test results.

The minimum testing duration for the Cold Commissioning Capacity Testing is defined below:

- The HLW and LAW Vitrification facilities shall be operated for 20 days.

- The Pretreatment testing duration is based on four Ultrafiltration cycles (two in each Ultrafiltration train).

- An Ultrafiltration cycle is a series of process steps including receipt, treatment, and transfer.

- The Cold Commissioning Capacity Test is based on the measurement of waste treated between the following points:

  - For HLW Pretreatment (i.e., solids) between UFP-VSL-00001A/B and HLP-VSL-00027A/B or HLP-VSL-00028.

  - For LAW Pretreatment (i.e., sodium) between UFP-VSL-00001A/B and TCP-VSL-00001.

  - The measure of HLW Pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and product vessels (HLP-VSL-00027A/B or HLP-VSL-00028) and adjusted for any changes to vessel heels. An insoluble component may be used to determine the quantity of treated solids.

  - The measure of LAW Pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and the product vessel (TCP-VSL-00001) and adjusted for any changes to vessel heels. This determination shall be based on waste Na as defined in Table C.7-1.1.

The Contractor shall have the right to extend the testing period for any facility beyond the testing duration indicated above, and in such an event the Contractor may choose any consecutive window within that period to report against.

Table C.6-5.1. Cold Commissioning Capacity Testing Criteria

Facility	Minimum Capacity	Treatment Capacity	Design Capacity
LAW Pretreatment	2244 MT Na per year	2620 MT Na per year	3740 MT Na per year
HLW Pretreatment	735 MT as-delivered solids per year	860 MT as-delivered solids per year	1225 MT as-delivered solids per year
LAW Vitrification	18 MT Glass per day	24 MT Glass per day	30 MT Glass per day
HLW Vitrification	3.6 MT Glass per day	4.2 MT Glass per day	6.0 MT Glass per day

Notes to Table C.6-5.1

1. Production rates in Table C.6-5.1 are based on the Facility Specification treatment capacity for treating all waste feed batches from the HNF-SD-WM-SP-012, Revision 6, Tank Farm Contractor Operation and Utilization Plan (TFCOUP Revision 6, feed vector.) Characterization of the as-delivered DOE approved simulant (Deliverable 5.18, Table C.5-1.1) and an updated model reflecting

changes to design, assumptions, and administrative controls affecting throughput shall be used to re-establish performance criteria in Table C.6-5.1. .For example, model assumptions may change following completion of Phase I Pretreatment Engineering Platform testing. Changes to the model reflecting design, assumptions, and administrative controls shall be approved by DOE.

2. The revised values for Table C.6-5.1 will be documented in Cold Commissioning Capacity Test Criteria (Deliverable 5.20, Table C-5.1-1) due prior to completion of Deliverable 5.8. The Contract will be revised to incorporate the new table.

3. Interface service delays in excess of that assumed in the process models used to create Table C.6-5.1 shall not be counted in the duration of the performance runs.

4. The contractor shall manage the excess treated LAW simulant from the Cold Commissioning tests.

(iii) Integrated Operations Demonstration: The Contractor may choose to perform Cold Commissioning Capacity Tests of each of the facilities in a sequential order or in parallel, but ultimately shall be required to perform 10-day integrated operations demonstration of all five (5) WTP facilities. If sufficient recycle streams are not available, appropriate simulated recycle streams will be used. Credit for the 10-day integrated operations may be taken during the Cold Commissioning Capacity Test or the 10-day integrated operations demonstration may be performed separately.

The recycle of process streams are to be simulated in the process flowsheet if the facilities are operated in a sequential operating mode and representative recycle solutions are not available. The WTP process is comprised of a number of unit batch operations which are performed concurrently and in series to produce a number of discrete IHLW canisters and ILAW containers. The unit batch operations are linked by lag storage vessels which serve to decouple the process and preclude process interruptions. At no time are all operations expected to be occurring simultaneously.

(iv) Remotability Test: The Contractor shall demonstrate by prototypic remotability testing, and the use of the planned operating and maintenance procedures, all normally required remote maintenance activities to support operation of the WTP during hot operations. This testing shall include verification of remote access and viewing to remotely maintain equipment including the ability to install, connect, disconnect, remove and reconnect remote replaceable components, calibration and replacement of instruments located in areas serviced by remote cranes and manipulators, and the use of remote and direct viewing technologies.

This testing may be demonstrated and documented prior to commencing Cold Commissioning and shall be completed before the end of Cold Commissioning. Any design changes required, based upon these test results, shall be corrected and the specific systems retested to verify acceptability prior to the completion of Cold Commissioning.

(v) Environmental Performance Test: The Contractor shall complete environmental testing as required under the Dangerous Waste Permit Application, Air Permitting Requirements, and applicable Federal, State, and local laws, regulations, and permits to demonstrate the operation of the WTP in accordance with applicable legal and permit requirements. The testing requirements shall be based upon the Environmental Performance Test Plan described in the WTP conceptual design and supporting information and as modified by the Dangerous Waste Permit Application permitting process.

The Contractor shall produce an environmental performance test report(s) after the completion of each environmental performance test trial (Table C.5-1.1, Deliverable 5.7). The report shall, at a minimum, provide the required information identified in the Risk Assessment Work Plan (Table C.5-1.1, Deliverable 7.6), including a description of the sampling and analysis activities conducted during the testing, definition of the simulants, and assess the performance of the LAW and HLW Melter Treatment Units. The report shall also provide recommended operating conditions for the WTP to assure compliance with required permits and statutes.

(4) Completing Cold Commissioning: Cold Commissioning is considered complete, for Operational Performance Fee determination purposes, at the point when the capacity tests for Cold Commissioning described in Standard 5, (e(3)(ii) are complete and the test results are approved by the JTG (except as otherwise provided in Standard 5(h)). The Contractor shall not proceed to Hot Commissioning until Table C.6-5.1 Minimum Treatment Capacity values have been achieved or otherwise accepted by DOE as completed in accordance with Standard 5(h).

(5) Cold Commissioning Results and Documentation: The Contractor shall provide results from Cold Commissioning testing to DOE for review and approval (Table C.5-1.1, Deliverable 5.8). The information shall be in the form of controlled documents (hardcopy or electronic) maintained and updated by the Contractor. Information shall include, but not be limited to:

(i) System startup plans and system verification reports;

(ii) Test Plans and Summary Test Reports for demonstrating and/or establishing permitting conditions; and

(iii) Test Plans and Summary Test Reports for process verification and product qualification.

(6) Certification of Completion of Cold Commissioning: The Contractor shall certify to DOE that Cold Commissioning is complete and that the Contractor met the requirements contained in Standard 5(d) (Table C.5-1.1, Deliverable 5.9) or as outlined in Standard 5(h).

(f) Operational Readiness Review: The WTP Operational Readiness Review process shall be conducted in accordance with DOE Order 425.1C, *Startup and Restart of Nuclear Facilities,* prior to the start of Hot Commissioning.

(g) Hot Commissioning:

The objective of the Hot Commissioning phase is to:

- Demonstrate the operability of the WTP during radioactive operations
- Achieve the capacity criteria specified in Table C.6-5.2.

The Hot Commissioning period begins upon receipt of permission to commence Hot Commissioning from the DOE Authorization Authority in accordance with DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*. DOE/ORP approval is required for the introduction of radioactive waste into the WTP. The approval for Hot Commissioning will be granted by DOE/ORP following DOE Authorization Authority approval for Hot Commissioning startup.

Hot Commissioning includes testing the facility using radioactive materials transferred from the tank farms. The Pretreatment Facility shall be tested to demonstrate the flow of radioactive feed material through the facility to produce LAW and HLW feed, which may be placed into lag storage or fed forward to support coincident LAW and/or HLW Hot Commissioning. Each WTP processing facility may be tested individually to demonstrate that the facility performs in accordance with operational, safety, and Contract performance requirements.

(1) Certification of Readiness for Hot Commissioning Start: The Contractor shall certify to DOE that the facility is ready to receive waste feed (Table C.5-1.1, Deliverable 5.10) and all Contractor requirements in the Section C.9, *Interface Control Documents* are complete.

(2) Waste Transfer Notification: For Hot Commissioning, the Contractor shall provide a written notice to the DOE Contracting Officer, specifying the date the Contractor requests the start of a transfer of a batch of feed, herein referred to as the waste transfer date. The written notice shall be provided to the DOE Contracting Officer at least two (2) months prior to the requested waste transfer date.

(3) Certification of Hot Commissioning Start: The Contractor shall certify to DOE that the facility Hot Commissioning has started (Table C.5-1.1, Deliverable 5.11). Start of Hot Commissioning is defined as receiving actual tank farm waste feed into one of the WTP processing facilities.

(4) Hot Commissioning Capacity Tests: Hot commissioning testing shall be conducted to demonstrate the capacity of the WTP as identified in Table C.6-5.2.

(5) The plant capacity test results shall be demonstrated using the plant instrumentation, and sampling, analyses, and product control systems. The JTG approved results of the Hot Commissioning Capacity Tests shall be provided to DOE for review and approval (Table C.5-1.1, Deliverable 5.12).

The capacity tests shall test the individual facility operations in terms of function and capacity. Applicable facility system components, both process and mechanical, shall be tested.

The leaching process shall be performed as required per Specification 12 and consistent with the process model used to develop Table C.6-5.2. Leaching effectiveness is not a criterion for acceptability of Hot Commissioning Capacity Test results.

The minimum testing duration for the Hot Commissioning Capacity Testing is defined below:

- The HLW and LAW Vitrification facilities shall be operated for 20 days.
- The Pretreatment testing duration is based on four Ultrafiltration cycles (two in each Ultrafiltration train). An Ultrafiltration cycle is a series of process steps including receipt, treatment, and transfer.
- The Hot Commissioning Capacity Test is based on the measurement of waste treated between the following points:
    - For HLW Pretreatment (i.e., solids) between UFP-VSL-00001A/B and HLP-VSL-00027A/B or HLP-VSL-00028
    - For LAW Pretreatment (i.e., sodium) between UFP-VSL-00001A/B and TCP-VSL-00001.
    - The measure of HLW Pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and product vessels (HLP-VSL-00027A/B or HLP-VSL-00028) and adjusted for any changes to vessel heels. An insoluble component may be used to determine the quantity of treated solids.
    - The measure of LAW Pretreatment production will be based on a mass balance between the feed (UFP-VSL-00001A/B) and the product vessel (TCP-VSL-00001) and adjusted for any changes to vessel heels. This determination shall be based on waste Na as defined in Table C.7-1.1.

The Contractor shall have the right to extend the testing period for any facility beyond the testing duration indicated above, and in such event the Contractor may choose any consecutive window within that period to report against.

Processing of Vitrification Facility recycles will be done in parallel with continued Pretreatment Facility feed preparation during Vitrification Facility performance runs for at least 10 days or until Pretreatment feed is no longer available, whichever is sooner.

Table C.6-5.2. Hot Commissioning Capacity Testing Criteria

Facility	Minimum Capacity	Treatment Capacity	Design Capacity
LAW Pretreatment	2244 MT Na per year	2620 MT Na per year	3740 MT Na per year
HLW Pretreatment	735 MT as-delivered solids per year	860 MT as-delivered solids per year	1225 MT as-delivered solids per year
LAW Vitrification	18 MT Glass per day	24 MT Glass per day	30 MT Glass per day
HLW Vitrification	3.6 MT Glass per day	4.2 MT Glass per day	6.0 MT Glass per day

Notes to Table C.6-5.2:

1. Production rates in Table C.6-5.2 are based on the Facility Specification (Table C.7-1.1) capacity for treating all waste feed batches from the HNF-SD-WM-SP-012, Revision 6, Tank Farm Contractor Operation and Utilization Plan (TFCOUP Revision 6, feed vector.) Characterization of the actual delivery feed to WTP and an updated model reflecting changes to design, assumptions, and administrative controls affecting throughput will be used to re-establish performance criteria in Table C.6-5.2. For example, model assumptions may change following completion of Phase I Pretreatment Engineering Platform testing. Changes to the model reflecting design, assumptions, and administrative controls shall be approved by DOE. The revised values for Table C.6-5.2 will be documented in Hot Commissioning Capacity Test Criteria (Deliverable 5.21, Table C-5.1-1) due prior to completion of Deliverable 5.14. The Contract will be revised to incorporate the new table.

2. Waste feed delivery delays, and other interface service delays in excess of that assumed in the process models used to create Table C.6-5.2 shall not be counted in the duration of the capacity runs.

3. If Supplemental LAW Treatment lag storage facilities are not available to receive the excess treated LAW, the LAW Pretreatment rates will be adjusted to align with LAW Vitrification performance.

(i) HLW Pretreatment: The HLW Pretreatment line shall be operated in order to produce feed to HLW Vitrification that results in IHLW in compliance with Specification 1.

(ii) LAW Pretreatment: The LAW Pretreatment line shall be operated to produce feed to the LAW that results in ILAW in compliance with Specification 2.

(iii) Low-Activity Waste Vitrification: The LAW Vitrification Facility shall produce containers of ILAW. Each container shall be routed through the complete process and equipment system, including level measurement, sampling as required, inert fill as required, lid closure, decontamination, and placement in position for shipment. In accordance with ICD-15. documentation requirements for the production of the ILAW containers are described in Specification 13, and shall be transmitted to DOE per deliverable, Resultant Products from Hot Commissioning (Table C.5.1-1, Deliverable 5.13).

(iv) High-Level Waste Vitrification: The HLW Vitrification Facility shall produce canisters of IHLW. Each canister shall be routed through the complete process and equipment system, including level measurement, sampling, lid closure, decontamination, and placement of the canister in HLW storage in accordance with ICD-14. Documentation requirements for the production of the IHLW canisters are described in Specification 13, and shall be transmitted to DOE per deliverable, Resultant Products from Hot Commissioning (Table C.5.1-1, Deliverable 5.13).

(6) Hot Commissioning Results and Documentation: The Contractor shall provide Hot Commissioning test results to DOE for review and approval (Table C.5-1.1, Deliverable 5.14). The information shall be in the form of controlled copies or electronic media as requested by DOE. The information shall include, but not be limited to:

(i) Test Plans and Test Reports for demonstrating and establishing permitting conditions (RCRA, authorization basis, air, performance test plan, etc.);

(ii) Test Plans and Test Reports for process verification and product qualification, including documentation and certification, that the IHLW and ILAW products meet requirements per Specification 1 and Specification 2, respectively.

(iii) Updated process model assessments (Standard 2, (b)) that are reconciled with Cold and Hot Commissioning test data to demonstrate that the WTP has the capability to process the waste feed compositional variations that will be provided by the Tank Farm;

(iv) Certify waste product (ILAW and IHLW) and secondary waste acceptability per Standard 6, *Product Qualification, Characterization and Certification* through implementation of the Waste Compliance Plans;

(v) Copies of required information sent to regulators (RCRA, air, authorization basis, etc.), and as required elsewhere in the Contract.

(7) Hot Commissioning Results and Documentation: The Contractor shall provide Certification of Completion of Hot Commissioning. The Contractor shall certify to DOE that the Hot Commissioning is complete and that the Contractor met the requirements contained in Standard 5(f) (Table C.5-1.1, Deliverable 5.15 or as outlined in Standard 5(h).

(h) Cold and Hot Commissioning Capacity Testing Deficiency Remedial Actions: The Contractor and DOE agree that the Contractor shall be allowed to exercise best efforts to achieve the waste treatment capacity testing levels prescribed in Tables C.6.5-1 and C.6.5-2 for each WTP facility. However, in the event that a significant deficiency is encountered during Commissioning that degrades the performance of any facility so significantly that the minimum capacity levels for cold or hot commissioning of that facility cannot be achieved, the Contractor shall notify DOE of the need to expend additional time and funds to correct the deficiency.

It is the Contractor's responsibility within the scope of Commissioning to provide a realistic estimate of the cost and schedule for any such requisite remedial response. If both parties agree that a deficiency exists and that remedial measures are necessary then:

(1) If the deficiency results from an inadequate and/or incomplete test procedure, the Contractor shall correct the test procedure and re-test within its scope of Commissioning;

(2) If the deficiency results from a design or construction nonconformance, the Contractor shall correct the nonconformity and re-test within its scope of Commissioning;

(3) If the cause of a deficiency cannot be determined, the Contractor shall propose a reasonable investigation program to determine the cause and following ORP approval of the investigation cost and schedule, shall implement the investigation program.

(4) If DOE does not wish to fund additional remedial expenses, the related testing is consequently accepted as completed at the Minimum level defined in Section B.11 Attachment B-2-D.

(i) Facility Transition Plan: The Contractor shall prepare for DOE review and approval a WTP Facility Transition Plan (Table C.5-1.1, Deliverable 5.19) that describes the strategy, schedule, and requirements for safe and efficient transition of the WTP facilities to the Operations Contractor. The Plan shall identify, at a minimum for each facility, the proposed schedule for facility turnover and provide a checklist of requirements to be completed to ensure that the facilities can be safely transitioned and operated by the Operations Contractor. The Transition Plan shall also identify provisions to retain appropriate qualified engineering, operations, and maintenance staff to support continued safe operations of the WTP facilities at designed treatment rate of the facilities.
The Contractor shall obtain input and concurrence on the Facility Transition Plan from the Operations Contractor, if available, before transmittal to DOE. The Facility Transition Plan is due to the DOE 12 months prior to the start of Hot Commissioning.

(j) Transition: The following items shall be provided to the Operations Contractor at facility transition. In addition, systems and other items necessary to facilitate safe and efficient operation of the WTP shall be provided during the transition period in accordance with the WTP Facility Transition Plan (Deliverable 5.19, Table C.5-1.1).

(i) Adequate facilities and equipment to ensure operational support services are adequate for operations. Such support services include operations, training, maintenance, waste management, environmental protection, industrial safety and hygiene, radiological protection and health physics, emergency preparedness, fire protection, quality assurance, criticality safety, and engineering.

(ii) Facility safety documentation that is in place and has been implemented that describes the “safety envelope” of the facility. The safety documentation should characterize the hazards/risks associated with the facility and should identify preventive and mitigating measures (system, procedures, administrative controls, etc.) that protect workers and the public from those hazards/risks. Safety structures, systems, and components (SSCs) are defined and a system to maintain control over their design is established.

(iii) A written program is in place to confirm and periodically reconfirm the condition and operability of safety SSCs. This includes examinations of records of tests and calibration of these systems. The material condition of all safety, process, and utility systems will support the safe conduct of work.

(iv) The facility systems and procedures, as affected by facility modification, are consistent with the description of the facility, procedures, and accident analysis included in the safety basis.

(v) Adequate and correct procedures and safety limits are in place for operating the process systems and utility systems that include revisions for modifications that have been made to the facility.

(vi) A routine drill program and emergency operations drill program, including program records, have been established and implemented.

(vii) The formality and discipline of operations is adequate to conduct work safely and programs are in place to maintain this formality and discipline. This item is satisfied by transition of Conduct of Operations program.

(viii) Training program compliant with DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.

The facility transition period shall be planned to complete transition of all facilities within ninety (90) days following DOE's acceptance of the Contractor's Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).

(k) Completion of Contract Workscope Requirements: The Contractor shall complete post-Critical Decision 4 activities, *Approve Start of Operations or Project Closeout*, in accordance with DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets.*

(l) Post-Commissioning Services:

Following hot commissioning, the Contractor shall conduct necessary activities to ensure that the facility is safe and ready for hot operations and facility turnover.

DOE may request the Contractor to provide additional waste treatment from the successfully commissioned facility or to maintain standby status for a period of time.

If standby status is requested, the Contractor shall maintain the necessary staff for full facility operations as determined by the Contractor.

If DOE requests standby status, or additional waste treatment, beyond that required for hot commissioning, such requests will be pursuant to the Section I, I.82, *Changes*.

(m) Project Closeout: Project Closeout is complete when:

(1) DOE approves the Contractors Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).

(2) DOE accepts all ILAW and IHLW waste products produced during Hot Commissioning in accordance with Specification 13, *Waste Product Inspection and Acceptance.*

(3) The Contractor responds to technical questions from the DOE or Operations Contractor, as instructed by DOE for a period not to exceed six (6) months following DOE's approval of the Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).

(4) The Contractor provides support to DOE in the conduct of internal and external technical reviews and presentations for a period not to exceed six (6) months following DOE's approval of the Certification of Completion of Hot Commissioning (Table C.5-1.1, Deliverable 5.15).

(5) The Contractor assures operations, maintenance, engineering, licensing, and purchasing activities developed under this contract are transitioned to the Operating Contractor as instructed by DOE.

(6) The Contractor transitions spare parts to the Operating Contractor, as instructed by DOE.

(7) The Contractor completes transition of the WTP facilities to the Operating Contractor in accordance with the approved WTP Facility Transition Plan (Table C.5-1.1, Deliverable 5.19).

Standard 6: Product Qualification, Characterization, and Certification

The purpose of this Standard is to describe the requirements for documentation that is used to qualify the immobilized waste products (IHLW and ILAW) and secondary wastes (solid waste, non-radioactive non-dangerous liquid effluents, radioactive dangerous liquid effluents, and air emissions).

Product qualification, characterization, and certification activities and deliverables shall be integrated with all technical, regulatory, and operability aspects of the WTP.

(a) The Contractor shall:

(1) Identify, quantify, and describe each immobilized waste product and secondary waste to be produced or generated by the WTP.

(2) Conduct activities necessary to qualify each immobilized waste product and to provide confidence, prior to commissioning operations, that the products will conform to the specifications and requirements in this Contract.

(3) Conduct activities necessary during commissioning to characterize and provide a basis for certifying that the immobilized waste products, and secondary wastes conform to the specifications and requirements in this Contract.

(4) Issue a certification document for each filled and sealed canister that the canister meets product specifications and the basis for the certification.

(5) Perform all product qualification, characterization, and certification activities in accordance with the requirements of Section C.4.

(b) The Contractor shall update the IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2), the ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), and the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1) describing the plan for qualification, characterization, and certification of each immobilized waste product and secondary wastes included under this Contract. These Plans shall provide the following information:

(1) Identification, quantification, and description of each immobilized waste product and secondary waste. The description shall include chemical and radiochemical composition, physical properties, and a comparison to Contract requirements.

(2) Planned compliance strategies, compliance activities, and documentation to qualify each immobilized waste product and secondary waste for each requirement.

(3) Planned methods and documentation to characterize and provide a basis for certifying that each immobilized waste product, and secondary waste meets Contract requirements.

(4) Planned methods and documentation to comply with dangerous and hazardous waste regulations as required under law and in the Contract.

(5) Identification and description of documentation to be provided with each product package submitted for acceptance, and secondary waste submitted for transfer that (a) describes the product, (b) documents characterization activities, and (c) provides a basis for certifying that the product or waste conforms to the Contract requirements.

(c) The Contractor shall complete the following activities and prepare the documentation identified below:

(1) Update the ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3) for DOE review and approval.

(2) Update the IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2) for DOE review and approval that addresses the requirements of the WASRD and identified in Specification 1, *Immobilized High-Level Waste Product*, for DOE approval. The Contractor shall provide documentation and technical support to DOE during the approval process. **(M047)**

(3) Update the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1) for DOE review and approval.

(4) Implement the DOE-concurred upon ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3) and IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2), and the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1), including all planned qualification, certification, and characterization activities.

(5) Prepare qualification documentation for DOE review and comment related to ILAW, and IHLW products. Qualification documentation (Table C.5-1.1, Deliverables 6.4, IHLW Product Qualification Report, and 6.6, ILAW Product Qualification Report) shall be submitted for DOE approval during the facility cold and hot commissioning activities. The qualification documentation shall address each requirement of each specification and shall compile the results of testing, analyses, demonstrations, and inspections to demonstrate that each product will comply with Section C.8, *Operational Specifications*, of the Contract.

(6) The IHLW Product Qualification Report shall be submitted for DOE approval during the facility cold and hot commissioning activities. The Contractor shall provide documentation and technical support to DOE during the approval process.

(7) In accordance with Standard 7, DOE will be responsible for submitting the Contractor developed petition for exempting or excluding the IHLW product from RCRA and HWMA regulation (Table C.5-1.1, Deliverable 7.9). The Contractor shall develop the petition and support DOE in the petitioning process. If the exemption or exclusion is obtained, the Contractor shall implement the necessary procedures to provide IHLW that is exempted or excluded from RCRA and HWMA.

(8) In accordance with Standard 7, DOE will be responsible for submitting the Contractor-developed petition for a new treatment standard, specific to Hanford tank waste. The Contractor shall support DOE during the petitioning process, in accordance with Standard 7 (Table C.5-1.1, Deliverable 7.10). If the petition is approved, the Contractor shall implement the necessary procedures to treat the waste in accordance with the new treatment standard.

(9) Prepare production documentation for ILAW (Table C.5-1.1, Deliverable 6.7) and IHLW (Table C.5-1.1, Deliverable 6.5) products, and secondary wastes (Table C.5-1.1, Deliverable 6.10). The production documentation shall verify that the analyses, demonstrations, inspections and testing to characterize each product package, canister, or liquid stream for transfer and provide a basis for certification that each product and secondary waste complies with Section C.8, *Operational Specifications*, and requirements of this Contract.

(10) Submit to DOE all required documentation that qualifies, characterizes, quantifies, and certifies each immobilized waste product, and secondary wastes conforms to Contract requirements.

Proposed ILAW glass composition ranges shall be provided to DOE for approval no less than two (2) years before production of glasses in that range. DOE approval (or non) will be provided within six (6) months of the proposal. The Contractor shall only produce glasses that have received DOE approval.

(d) Dangerous and Hazardous Waste Requirements for the Immobilized High-Level Waste Product (Specification 1):

(1) The Contractor shall plan and perform process and product development testing, sampling and analysis, reporting, and certification necessary to: (1) characterize and designate the IHLW product for dangerous waste characteristics, dangerous waste criteria and dangerous waste sources pursuant to WAC 173-303-070 and demonstrate that the IHLW product does not exhibit any dangerous waste characteristics, WAC 173-303-090, and does not meet any dangerous waste criteria, WAC 173-303-100; (2) support the petition for exemption or exclusion of the IHLW product from RCRA and HWMA and the implementing regulations; and (3) comply with required applicable laws or regulations. The sampling, preparation, and testing methods shall conform to the requirements in WAC 173-303-110.

(2) The Contractor shall plan, develop, obtain, report, and certify the information required: (1) to demonstrate that the IHLW product does not exhibit any dangerous waste characteristics, WAC 173-303-090, and does not meet any dangerous waste criteria, WAC 173-303-100; (2) to demonstrate that the treated waste in the IHLW product is not prohibited from land disposal pursuant to WAC 173-303-140 and 40CFR268, “Land Disposal Restrictions”; (3) to petition EPA and Ecology for an exemption from RCRA and HWMA, and the implementing regulations; (4) to show that the IHLW meets the TSCA radioactive waste exemption criteria in 40CFR761.50 (b)(7)(ii); and (5) to comply with applicable laws, regulations, permits, licenses, other regulatory authorizations and approvals, and this Contract.

(e) Dangerous and Hazardous Waste Requirements for the Immobilized Low-Activity Waste Product (Specification 2):

The Contractor shall plan and perform process and product development testing, sampling, analysis, reporting, and certification necessary to:

(1) Characterize, support, and designate the ILAW product for dangerous waste characteristics, dangerous waste criteria, and dangerous waste sources pursuant to WAC 173-303-070 and demonstrate that the ILAW product does not exhibit any dangerous waste characteristics, WAC 173-303-090, and does not meet any dangerous waste criteria, WAC 173-303-100.

(2) The Contractor shall plan, develop, obtain, report, and certify the information required to:

(i) Demonstrate that the treated waste in the ILAW product is not prohibited from land disposal pursuant to WAC 173-303-140 and 40 CFR 268, “Land Disposal Restrictions”;

(ii) Demonstrate that the ILAW product does not exhibit any dangerous waste characteristics, WAC 173-303-090, and does not meet any dangerous waste criteria, WAC 173-303-100;

(iii) Show that the ILAW meets the TSCA radioactive waste exemption criteria in 40 CFR 761; and

(iv) Comply with applicable laws, regulations, permits, licenses, other regulatory authorizations and approvals, and this Contract.

(3) Support the petition for a new treatment standard for Hanford tank waste as described in Standard 7.

(4) Comply with required applicable laws or regulations.

(5) The sampling preparation and testing methods shall conform to requirements in WAC 173-303-110.

(f) The Contractor shall be responsible for characterizing the HLW and LAW Feed. The characterization may be based upon the available historical data and will use analysis of DOE-provided splits of representative samples of the waste feed to support compliance with regulatory, authorization basis, and technical requirements for the WTP and as otherwise required by this Contract. The Contractor shall perform analyses of the waste feed based on the analyses and requirements in the applicable DQO.

(g) The Contractor shall qualify and characterize the immobilized waste products, and secondary wastes using analysis, testing, inspection, and demonstration as defined for each specification or requirement shown in Table S6-2, *Qualification and Characterization*.

Table S6-2. Qualification and Characterization

Requirement	Qualification	Product Characterization
Chemical and Radiochemical Composition	A, D, I, T	A, D, I, T
Dangerous and Hazardous Wastes	A, D, I, T	A, D, I, T
Waste Loading	A, D, T	A, D, T
Waste Form Leaching/Durability	A, T	A, T
Waste Form Stability	A, D, T	D
Free Liquids, Explosivity, Pyrophoricity, Organic Materials, and Gases	A, D, I	A, D, I
Heat Generation and Surface Temperature	A	A
Dose Rate and Criticality	A	A, I
Package and Canister Dimensions	D, I	D, I
Weight and Mass	A, D, I	D, I
Void Space and Fill Height	D	D, I
Package and Canister Materials	D, I	D, I
Package and Canister Mechanical Strength	A, D, T	D
Labeling	D, I	I
Package and Canister Handling Features	D, I	D, I
Package and Canister Closure and Sealing	D, I	D, I
Surface Contamination	D	D, I

Legend
A = Analysis
D = Demonstration
I = Inspection
T = Testing

Definition of Terms: The following terms and definitions shall apply to this Standard.

Analysis (A) — As used in the specifications, an analysis is a set of engineering or scientific calculations that demonstrate that a product meets or exceeds a specification requirement. These calculations are typically based upon available data and assumptions regarding process operating conditions or materials. Analysis is required to identify conditions or assumptions, which might limit validity, and to identify specific documentation or measurements made during production to ensure validity (waste loading, container material, process additives, process measurements, etc.). Analyses shall be conducted and documented

in sufficient detail in such a way that a knowledgeable technical person can review and concur in their accuracy and validity. Evidence of peer review for accuracy for each analysis shall be provided. An analysis will be considered to demonstrate compliance with specification requirements when: (a) approved by DOE; and (b) when the conditions for validity or assumptions are verified by independent means (e.g., process control records, raw material certifications).

Demonstration (D) — A demonstration is the proof-of-principle of a specimen, article, or process test used to verify conformance to the conditions of an analysis or product specification. Demonstrations are conducted where analysis is insufficient to provide proof-of-product acceptability or where analysis indicates the need for verification of assumptions (e.g., waste loading, explosivity, scale-up, process control). Demonstration reports shall identify: (1) the demonstration being conducted; (2) the limits of the demonstration's validity; and (3) those inspections or tests that will be conducted during operations to confirm that the demonstration results are still applicable to the product being produced. Proposed demonstrations will be submitted as part of the Compliance Plans. A demonstration will constitute verification of compliance with a specification requirement when: (1) it has been approved by DOE; and (2) when the conditions for validity or assumptions have been verified by independent means (e.g., process control records, raw material certifications) during operation.

Inspection (I) — Inspection is a non-destructive examination or measurement of a product characteristic that confirms compliance with product specifications. Inspections are conducted when product characteristics can be easily determined by direct measurement (e.g., weight, dimensions, labeling, external temperature, etc.) or where the results of the calculations leave some doubt as to satisfaction of the product requirements.

Test (T) — A test is the evaluation of a product characteristic in which representative samples are destructively examined or measured to confirm compliance with product specifications. Tests are typically conducted where product characteristics cannot be readily determined by inspections, or where an inspection by itself, does not provide adequate confirmation of compliance (e.g., chemical composition, radionuclide release rate). Upon request by DOE, the Contractor shall split and provide DOE samples obtained from or representative of the delivered products. The Contractor is responsible for defining what constitutes a statistically representative sample (e.g., based on the extent of process control achieved for that product).

Qualification — Qualification is composed of activities conducted by the Contractor to provide confidence, prior to full-scale production operations, that the planned immobilized waste products and secondary wastes will conform to the specifications in the Contract.

Characterization — Characterization is composed of activities conducted by the Contractor to provide confidence that the actual immobilized waste products and secondary wastes produced during production operations conform to the specifications and requirements in the Contract.

Certification — Certification is the endorsement or guarantee by the Contractor that an immobilized waste product or secondary waste conforms to the Contract requirements and specifications.

Validation — Validation is composed of activities conducted by the Contractor with actual wastes or with full-scale process equipment to confirm that the results of the analyses, demonstrations, inspections, and test(s) conducted by the Contractor to qualify a product or process are representative of the product and process characteristics.

Verification — Verification is composed of activities conducted by DOE to confirm that each immobilized waste product or secondary waste conforms to the Contract requirements and specifications.

Standard 7: Environment, Safety, Quality, and Health

The purpose of this Standard is to: (1) define Contractor responsibilities for conventional non-radiological worker safety and health; radiological, nuclear, and process safety; environmental protection; quality assurance; and (2) identify specific deliverables the Contractor shall submit to DOE.

Where this Contract or references contained in this Contract, makes reference to the "DOE Regulatory Unit," in place of "DOE Regulatory Unit," read "DOE" (as the regulator of radiological, nuclear, and process safety).

(a) The primary objectives of ESQ&H are to:

(1) Demonstrate compliance with established requirements;

(2) Apply best commercial practices to provide conventional non-radiological worker safety and health protection; radiological, nuclear, and process safety, and environmental protection; and

(3) Implement a cost-effective program that integrates environmental protection, safety, quality, and health in all Contractor activities.

Environmental protection, safety, quality, and health program activities and deliverables shall be integrated with all technical and regulatory aspects of the WTP Project.

(b) The Contractor shall integrate safety and environmental awareness into all activities, including those of subcontractors at all levels. Work shall be accomplished in a manner that achieves high levels of quality; protects the environment, as well as the safety and health of workers and the public; and complies with all requirements. The Contractor shall identify hazards; manage risks; identify and implement good management practices; and make continued improvements in environment, safety, quality, and health performance.

(c) The Contractor is responsible for providing safe and healthful working conditions for employees and all other persons under the Contractor's control who work in the general vicinity of the Contractor site, including subcontractors. The Contractor shall develop and implement integrated programs for conventional non-radiological worker safety and health; radiological, nuclear, and process safety; and environmental protection. The Contractor shall implement its program, and submit the deliverables described in paragraphs (d) and (e) of this Standard.

(d) The Contractor shall develop and implement an integrated standards-based safety management program to ensure that radiological, nuclear, and process safety requirements are defined, implemented, and maintained. The Contractor shall conduct work in accordance with the Contractor developed and DOE approved Safety Requirements Document (SRD). The SRD is the set of ESQ&H tailored requirements as referenced in Section I Clause, *Laws, Regulations, and DOE Directives*.

(e) The specific deliverables and program requirements are divided into four categories: (1) non-radiological worker safety and health protection; (2) radiological, nuclear, and process safety; (3) quality assurance; and (4) environmental protection. The deliverables shall reflect the current degree of design and project maturity. The following information is provided to support development of deliverables required in each area of the ESQ&H program:

(1) Non-radiological Worker Safety and Health (Table C.5-1.1, Deliverable 7.0):

(i) The Contractor shall develop and implement an integrated standards-based safety management program. The Contractor's safety management program shall reflect proven principles of safety management and work planning that promotes accident prevention, employee involvement, and sound hazard analysis and control.

(ii) The Contractor's non-radiological worker safety and health program shall conform to the DOE oversight program described in RL/REG-2000-04, *Industrial Health and Safety Oversight Plan*, until the Plan is superseded by 10 CFR 851, "Worker Safety and Health Program," at the effective implementation date of May 15, 2007. **(M114)**

(iii) DOE is responsible for the conduct of worker safety and health inspections and granting variances. **(M114)**

(2) Radiological, Nuclear, and Process Safety (Table C.5-1.1, Deliverable 7.1):

(i) The Contractor shall develop and implement an integrated standards-based safety management program to ensure that radiological, nuclear, and process safety requirements are defined, implemented, and maintained. Radiological, nuclear, and process safety requirements shall be adapted to the specific hazards associated with the Contractor's WTP activities.

(ii) The Contractor's integrated standards-based safety management program shall be developed to comply with the specific nuclear safety regulations defined in the effective rules of the 10 CFR 800 series of nuclear safety requirements and with the regulatory program established in the following four documents:

(A) DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment and Immobilization Plant Contractor*;

(B) DOE/RL-96-0004, *Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for the RPP Waste Treatment Plant and Immobilization Plant Contractor*;

(C) DOE/RL-96-0005, *Concept of the DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment and Immobilization Plant Contractor;* and

(D) DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment and Immobilization Plant Contractor.*

Changes to the four documents will be analyzed under RL/REG-98-14, *Regulatory Unit Position on New Safety Information and Back-fits*, and, if implemented, dispositioned in accordance with the Section I Clause, *Changes*.

The integrated standards-based safety management program shall integrate the appropriate planning and practices elements specified in 29 CFR 1910.119, "Occupational Safety and Health Act of 1970, Process Safety Management of Highly Hazardous Chemicals," to the extent that highly hazardous chemicals are present in quantities covered by 29 CFR 1910.119.

The Contractor's Integrated Safety Management Plan shall conform with both RL/REG-97-13, *Regulatory Unit Position on Contractor-Initiated Changes to the Authorization Basis*, and RL/REG-98-14, *Regulatory Unit Position on New Safety Information and Back-fits.*

The Contractor shall prepare and submit to DOE for review and approval the radiological, nuclear, and process safety deliverables (Table C.5-1.1, Deliverables 7.1) defined in Table S7-1, *Radiological, Nuclear, and Process Safety Deliverables.* Each deliverable is structured around the following six activities:

(A) Standards Approval;
(B) Initial Safety Evaluation;
(C) Authorization for Construction and Cold Commissioning;
(D) Authorization for Hot Commissioning;
(E) Oversight Process Determination; and
(F) Deactivation Safety Assessment.

(iii) DOE may observe WTP design reviews (and question the presenters) as ex-officio members. These observations provide DOE with continuing information concerning the safety aspects of the evolving design and do not constitute regulatory approval of the matters discussed.

(iv) An authorization request associated with a particular regulatory action may be segmented and incrementally submitted. The prescribed time frame for DOE review of a deliverable begins with receipt of the last component of the deliverable, and may be shortened at the discretion of DOE based on the quality and content of the components. For each request, the Contractor shall demonstrate the need for the phased authorization and provide sufficient detail in the request for DOE to review the request and reach an approval decision. The Contractor shall notify DOE of the intent to submit a partial Operating Authorization Request, complete with scope and content of the proposed request, not less than twelve (12) months prior to its submission.

The Contractor may provide limited authorization requests as mutually agreed.

DOE will establish review guidance for these partial authorization requests in advance of the submission of the request. The review guidance will incorporate existing requirements of the Contract but will be tailored to the scope of the work that the Contractor proposes to accomplish.

(v) DOE shall develop and provide additional guidance for the preparation and review of other documents and activities identified in Table S7-1, *Radiological, Nuclear, and Process Safety Deliverables*. The format and content of guidance shall establish the approach and basis that DOE will use to review the Contractor submittals and report the results of the

reviews. The Authorization for Hot Commissioning guidance shall be provided to the Contractor no less than nine (9) months prior to the scheduled submission of the authorization request. Guidance for Deactivation Safety Assessment shall be provided prior to cold commissioning.

(vi) DOE and the Contractor shall mutually ensure that the Authorization Basis (Preliminary Safety Analysis Report [PSAR]) is modified during construction to transition to the requirements of 10 CFR 830 Safe Harbour methodology for the Documented Safety Analysis (i.e., DOE-STD-3009, Change Notice 3 methodology).

Prior to implementation of guidance, the Contractor shall notify the Contracting Officer of any impacts that the guidance may have on cost or schedule. Proposed changes that impact cost and/or schedule will be analyzed under RL/REG-98-14, *Regulatory Unit Position on New Safety Information and Back-fits*, and if implemented, will be dispositioned in accordance with the Section I Clause, *Changes*.

(vii) All regulatory information submitted will be handled in accordance with RL/REG-97-05, *Regulatory Unit Management Directives,* Directive 2.1, *Information Management*, and shall be made immediately available to the public by DOE, as appropriate.

Table S7-1. Radiological, Nuclear, and Process Safety Deliverables

Regulatory Action	Deliverable (Note 1 Applicable to ALL Deliverables)	References	Deliverables included in Conceptual Design and Supporting Documentation	Start of Construction	Start of Hot Commissioning
Standards Approval	Safety Requirements Document, Note 1, Note 4	DOE/RL-96-0003	Final	Revision (Revision Note 3)	Revision
	Integrated Safety Management Plan, Note 1, Note 4	DOE/RL-96-003, 10CFR830, 29CFR1910	Final	Revision	Revision
	Hazards Analysis Report Revision (Note 3) Note 1	DOE-STD-3009-94, 29CFR1910.119	Final	Revision	Revision
	Radiation Exposure Standard for Workers Under Accident Conditions Note 1	DOE/RL-96-0006	Final		
	Quality Assurance Program Note 1	10CFR830.120	Final	Revision	Revision
Initial Safety Evaluation	Initial Safety Assessment Note 1, Note 4	DOE/RL-96-0003	Final		
Authorization for Construction and Cold Commissioning	Construction Authorization Request Note 1, Note 4	DOE/RL-96-0003	Outline	Final	N/A
	Construction Occurrence Reporting Plan Note 1, Note 4	DOE/RL-96-0003	Outline	Final	N/A
	Deactivation Plan Note 1, Note 4	DOE/RL-96-0003	Outline	Revision	Revision
Authorization for Hot Commissioning	Safety Analysis Report Note 1, Note 4	DOE/RL-96-0003, 29CFR1910.119	Initial	Preliminary	Final
	Emergency Response Plan Note 1	See Note 2	Outline	Draft	Final
	Unreviewed Safety Question Plan Note 1, Note 4	DOE/RL-96-0003	Outline	Draft	Final
	Conduct of Operations Plan Note 1	DOE/RL-96-0006, 29CFR1910	Outline	Draft	Final
	Technical Safety Requirements Note 1	DOE/RL-96-0006	Outline	Draft	Final
	Maintenance Implementation Plan Note 1	DOE/RL-96-0006, WAC246-247	Outline	Draft	Final
	Occurrence Reporting Plan Note 1	DOE/RL-96-0006, DOE Manual 231.1-1A, Environmental Safety, and Health Reporting Manual	Outline	Draft	Final
	Environmental Radiological Protection Program Note 1	DOE/RL-96-0006, 29CFR1910, 40CFR68	Outline	Draft	Final
	Radiation Protection Program #1	DOE/RL-96-0006	Outline	Revision	Final
Oversight Process Determination	Plan for Operational Assessment Reports Note 1, Note 4	DOE/RL-96-0003	Outline	Draft	Final
Deactivation Safety Assessment	Deactivation Safety Assessment Note 1, Note 4	DOE/RL-96-0003		Outline	Draft

(Entire Table revised M033)

Notes:
1. In addition to the deliverables listed, supplemental information for each regulatory action shall be submitted as required by DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP-WTP Contractor.*
2. Shall comply with requirements of 40 CFR 68, 40 CFR 355, DOE/RL-94-02, and 29 CFR 1910.38, and WAC 246-247 (Plan must comply with DOE/RL-94-02, but exposure standards are contained in SRD Vol. II, Section 2.1)
3. The Hazards Analysis Report and Safety Requirements Document (SRD) will be submitted with the Construction Authorization Request rather than the Standards Approval Package submittal. The Hazards Analysis Report may be submitted as part of the Preliminary Safety Analysis Report.
4. The addition of DOE Order 425.1C compliance, applied in a phased graded approach authorization for hot commissioning, will allow removal of redundant assessment requirements presently in the Contract and under the DOE/RL 96-0003 document.

(3) Quality Assurance (Table C.5-1.1, Deliverable 7.2):

The Contractor shall develop a QA Program, documented in a QA program manual(s), and supported by documentation that describes overall implementation of QA requirements. Supporting documentation shall include procedures, instructions, plans, and manuals used to implement the Contractors QA program within the Contractors scope of work. Specific requirements for process development, waste form qualification and testing are described in Standards 2 and 6. The Contractor's QA program manual(s) shall be submitted to DOE for review and approval (Table C.5-1.1, Deliverable 7.2). The Contractor shall utilize a technically defensible graded approach to develop the QA program based upon the requirements of: **(M066)**

(i) QA for radiological, nuclear, and process safety shall be conducted in accordance with 10 CFR 830.120, Subpart A and DOE O 414.1C. **(M066)**

(ii) QA for process development, waste form qualification and testing shall be conducted as described in Standards 2 and 6. QA program requirements for all HLW and ILAW work shall be covered by the approved QA program. The QA program manual(s) shall address the following requirements: **(M066)**:

(A) The Contractor shall implement the Office of Civilian Radioactive Waste Management's, *Quality Assurance Requirements and Description Document* (QARD), DOE/RW-0333P, Revision 20, for elements of the Contractor's scope that may affect the Immobilized High-Activity Waste (IHLW) product quality, including but not limited to, waste form development, qualification, characterization, production process control, and certification of the IHLW products.

(B) The Contractor shall implement the *National Consensus Standard* ASME NQA-1-2000, Part I and Part II, Subpart 2.7 for elements of the Contractor's scope that may affect product quality of the Immobilized Low-Activity Waste (ILAW) product, entrained solids, and sludge washing, including, but not limited to, waste form development, qualification, characterization, production process control, certification of ILAW product, entrained solids, and sludge washing. Furthermore, all research and technology activities (other than IHLW – see (A)) shall be conducted in accordance with NQA-1. **(M066)**

(iii) QA for permitting activities shall be conducted in accordance with all applicable laws and regulations, including RCRA, TSCA (if later directed by DOE), and WAC 173-303 QA requirements.

(iv) QA for facilities, projects, and secondary wastes not subject to the above requirements shall be done in accordance with DOE Order 414.1C. The Contractor shall maintain its QA program in accordance with DOE Order 414.1C. The Contractor has the option to not incorporate the elements of ANSI/ASQ Q 9001-2001, *Quality Management System,* requirements (for non-nuclear activities), which is referenced in the Contractor Requirements Document of DOE Order 414.1C. **(M066)**

(v) The Contractor may be required to use additional consensus standards in order to describe and implement a fully functional, systematic QA program for nuclear facility construction or for nuclear safety-related work. The RPP adopted the NQA-1-2000 as the primary QA reference document and the Contractor shall utilize this Standard to help achieve the quality objectives of this Contract, as necessary. **(M066)**

(vi) DOE or its designee(s) shall have access to and the right to conduct assessments, audits, and/or surveillance of the Contractor (and its subcontractors/suppliers, at any level) activities to ensure compliance with the appropriate requirements and the Contractor's QA program, at DOE discretion.

(4) Environmental Protection (Table C.5-1.1, Deliverable 7.3):

(i) The Contractor shall develop and implement an integrated environmental protection program. The Contractor shall design, construct, manage, and commission the WTP to assure compliance with environmental requirements, permits, licenses, and other regulatory approvals and agreements.

(ii) The Contractor shall develop and implement an integrated program to provide environmental protection and compliance. The Contractor shall integrate all permitting and compliance actions with the future WTP operator.

(iii) The Contractor shall identify all necessary permits, licenses, and other regulatory approvals and authorizations for the design, construction, commissioning, and operation of the WTP, unless otherwise identified in this Contract. The Contractor shall develop the necessary permit applications, license applications, requests for other regulatory authorizations, and supporting materials and documentation in accordance with Clause H.26, *Environmental Permits*. The Contractor shall provide all technical and regulatory information, documentation, and support to ensure that permits, licenses, and other regulatory authorizations and approvals are obtained in a timely manner to support the design, construction, commissioning, and operation of the WTP and other Hanford Site facilities that support the WTP.

(iv) The Contractor shall implement a program to track and address environmental compliance issues, and to implement and comply with all requirements (including, but not limited to, permitting, environmental reports, enforcement actions, consent decrees, *Hanford Federal Facility Agreement and Consent Order* milestones/reports/management commitments, NEPA, pollution prevention, and waste minimization).

(v) The Contractor shall work with the appropriate Hanford Site contractor in providing legally and regulatory required air and liquid effluent and near-facility environmental monitoring. The Contractor shall collect, compile, and/or integrate air and liquid effluent monitoring data from operations and activities under their control. The Contractor shall compare the monitoring data with regulatory and/or permit standards applicable to their activities and/or operations and provide the data and analyses to the appropriate Hanford Site contractor for use in preparing the mandatory State and Federal environmental reports for the Hanford Site in a timely

manner. In addition, the Contractor shall provide appropriate environmental data for the WTP to support Hanford Site assessments and preparation of the Hanford Site Environmental Report.

(vi) The Contractor shall prepare and submit to the Contracting Officer for review and action the following environmental protection deliverables. The deliverables shall be consistent with the design and schedule for construction and commissioning the WTP. Identification of the following deliverables does not modify or affect the Contractor's responsibilities for environmental permitting, compliance, and protection identified in the Contract or as required under applicable law or regulation. The Contractor shall have the responsibility to identify and develop any necessary modifications to existing permit applications, license applications, requests for regulatory authorizations/approvals, and supporting materials to support the design, construction, commissioning, and operation of the WTP.

(A) Environmental Plan (Table C.5-1.1, Deliverable 7.3): The Contractor shall develop a detailed plan that identifies the Contractor's structured approach for environmental protection, compliance, and permitting, including: (1) planned environmental permitting and compliance activities for design, construction, and commissioning the WTP; (2) detailed permitting and compliance schedule integrated and linked to the technical baseline; and (3) environmental monitoring and reporting requirements. The Contractor shall review permit applications, license applications, and other requests for regulatory authorizations/ approvals, and supporting materials that are in draft form and/or were submitted to regulatory agencies and identify any modifications necessary to support the design, construction, commissioning, and operation of the WTP in the Environmental Plan.

The Environmental Plan (Table C.5-1.1, Deliverable 7.3) shall be submitted for DOE review and approval, and include identification of where and when DOE or other site contractor action is anticipated or required. The Plan shall be submitted within three (3) months after contract award. The Plan shall be updated as significant changes to the permitting schedules warrant.

(B) Dangerous Waste Permit Application (Table C.5-1.1, Deliverable 7.5): Prepared as a chapter to the *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage and Disposal of Dangerous Waste at the Hanford Facility* (Permit No. WA 7890008967).

Dangerous Waste Codes are identified in the *Double-Shell Tank System Unit Permit Application* (DOE/RL-88-21, October 1, 1996). The Contractor facilities shall be permitted to assure that the facility may manage and treat all waste codes applicable to the Hanford Double-Shell Tank system.

The Contractor shall develop and implement a plan for DOE review and approval for revising the Dangerous Waste Permit Application and obtaining the final status permit modification. The plan shall be developed in cooperation with DOE and the regulatory agencies. The Contractor shall revise the Dangerous Waste

Permit Application (Table C.5-1.1, Deliverable 7.5), support the dangerous waste permitting process, and work with the regulatory agencies and DOE to obtain final status under the Dangerous Waste Regulations to support WTP construction and commissioning activities. Construction of the treatment facility may commence prior to a final status permit being issued provided the regulatory agencies agree.

(C) Risk Assessment Work Plan (Table C.5-1.1, Deliverable 7.6): The Contractor shall implement the Risk Assessment Work Plan as agreed to with DOE and the regulatory agencies, and conduct environmental performance tests during commissioning to validate the risk assessment and demonstrate WTP performance. The Risk Assessment Work Plan shall be the documented outcome of the Contractor's negotiated agreement with regulators to demonstrate that WTP will meet required environmental performance standards for a thermal treatment facility. The Risk Assessment Work Plan (Table C.5-1.1, Deliverable 7.6) may be a supplement to the Dangerous Waste Permit Application.

(D) Notice(s) of Construction (Table C.5-1.1, Deliverable 7.7): The Contractor shall prepare Notice(s) of Construction (NOC) for both radioactive and non-radioactive air emissions related to Contractor activities in accordance with applicable regulations. NOCs (Table C.5-1.1, Deliverable 7.7) shall be submitted for DOE approval no less than 150 days prior to scheduled submission to the regulators. The Contractor shall also provide draft permit modification language for the air-operating permit to the appropriate site contractor based on regulator approvals of NOC and consistent with the project schedule, Environmental Plan, and provisions of this Contract.

(E) Prevention of Significant Deterioration Permit Application (Table C.5-1.1, Deliverable 7.8): The Contractor shall prepare a Prevention of Significant Deterioration (PSD) Permit Application for air emissions related to Contractor activities in accordance with applicable regulations. The Permit Application (Table C.5-1.1, Deliverable 7.8) shall be submitted for DOE review, comment, and approval no less than 150 days prior to scheduled submission to the regulators. The Contractor shall also be responsible for providing draft permit modification language to the appropriate site contractor for the air-operating permit consistent with the project schedule and provisions of this Contract.

(F) Petitions for Exemption or Exclusion for Immobilized High-Level Waste (Table C.5-1.1, Deliverable 7.9): The Contractor shall develop a set of documents for DOE use in petitioning Ecology and EPA to exempt or exclude the IHLW from regulation under HWMA and RCRA and their implementing regulations, respectively. The petitions and supporting technical and regulatory materials shall be developed in accordance with applicable law, regulation, and permit. The Contractor shall include DOE-provided information in the petitions, and shall be responsible for establishing a schedule with DOE for when such information is needed. The Contractor shall collect and analyze characterization data and demonstration-scale treated waste product data to support the petition and

compliance demonstration. The Contractor shall support DOE in the petitioning process and interactions with the regulators. The petition (Table C.5-1.1, Deliverable 7.9) shall be submitted to DOE for review and approval.

(G) Petition for a New Treatment Standard for Hanford Tank Waste (Table C.5-1.1, Deliverable 7.10): The Contractor shall develop a petition for submittal to the regulatory agencies that proposes vitrification as the specified treatment technology for Hanford tank waste. The Contractor shall collect and analyze characterization data and demonstration-scale treated waste product data to support the petition and compliance demonstration. The Contractor shall support DOE in the petitioning process and interactions with the regulators. The Contractor shall obtain, report, and certify required information to DOE to demonstrate that the ILAW product is acceptable for land disposal. The petition (Table C.5-1.1, Deliverable 7.10) shall be submitted to DOE for review and approval.

Standard 8: Safeguards and Security

The purpose of this Standard is to describe the Safeguards and Security (SAS) requirements relevant to the WTP facility and operations.

(a) The Contractor shall develop and implement an SAS Program to ensure the protection of DOE-owned material, property, and information. The Contractor shall maintain and update all relevant aspects of the SAS Program that was previously concurred upon by DOE or part of the WTP Conceptual Design and supporting documentation.

(b) The SAS Program shall ensure the protection of DOE-owned material, property, and information.

(1) The scope of DOE SAS requirements includes:

(i) Physical protection;

(ii) Material control and accountability if found applicable throughout the period of the Contract;

(iii) Protection of DOE information and the Hanford Site access requirements; and

(iv) Government property protection.

(2) The Contractor's program shall comply with the applicable regulations, DOE Orders, and DOE-provided top-level SAS requirements stipulated in the DOE approved *Hanford Tank Waste Treatment and Immobilization Plant Safeguards and Security Plan*, 24590-WTP-PL-SS-02-001. The Contractor shall design the facility in a manner to provide adequate response time for the Hanford Patrol.

(3) The SAS deliverables shall be updated per Table S8-1 and as required to reflect known changes.

(c) The Contractor shall comply with the "Richland Regional Office Site Counterintelligence Support Plan Hanford Site - Bechtel National, Inc." (SCSP), and subsequent ORP approved revisions of the SCSP. The SCSP incorporates requirements listed in DOE Order 475.1 *Counterintelligence Program*, and its CRD O 475.1. (M071)

Table S8-1. Safeguards and Security Deliverables

Deliverable Description	Reference	Contract Award	Start of Construction	Start of Cold Commissioning	During Hot Commissioning
Safeguards and Security Program Plan consisting of:					
MC&A Plan	Standard 8 and 24590-WTP-PL-SS-02-001	Not Required[1]	NA	NA	NA
Security Plan	Standard 8 and 24590-WTP-PL-SS-02-001	Existing DOE approved preliminary draft	See Note 2	Annual Revision	Annual Revision
Vulnerability/Risk Assessment Data	Standard 8 and 24590-WTP-PL-SS-02-001	NA	Ongoing, See Note 3	Ongoing	Ongoing
Internal Assessment Reports	Standard 8 and 24590-WTP-PL-SS-02-001	NA	NA	Final	Annual
External Assessment Reports	Standard 8 and 24590-WTP-PL-SS-02-001	Submission of Corrective Action Plan within 30 days of receipt of external review report.			

1. Based upon material attractiveness, it was confirmed that a separate MC&A plan is not required. MC&A requirements (if any) shall be tracked in the Security Plan.
2. Submit final Security Plan for DOE approval within 45 days of receipt of DOE comments to the preliminary draft plan.
3. Provide vulnerability/risk assessment data for the HLW, LAW, Pretreatment, Analytical Laboratory, and Balance of Facilities at the 60 percent and 90 percent design stages.

C.7 FACILITY SPECIFICATION

The Facility Specification provides minimum functional requirements for the process and facility design and the waste treatment capacity requirements. Additional requirements are contained in Section C.6, *Standards*. DOE will consider changes to the Facility Specifications that improve life-cycle performance, cost, and schedule.

(a) Functional Design Requirements**:** The WTP is comprised of five major facilities, Pretreatment (PT), LAW immobilization, HLW immobilization, Analytical Laboratory, and Balance of Plant Facilities (BOF). The WTP shall be designed to:

(1) Have a forty (40)-year operating life for the operating facilities (PT, HLW, LAW), Analytical Laboratory, and BOF exclusive of ancillary facilities (i.e., warehouses, construction support facilities, and administrative offices).

(2) Separately receive and store LAW feed (defined in Specification 7, *Low-Activity Waste Envelopes Definition*) and HLW feed (defined in Specification 8, *High-Level Wastes Envelope Definition*) in appropriately designed vessels. The DOE will provide waste transfer lines to an interface point described in ICD 19. The DOE will also provide adequate pumping motive force to transfer the waste to the WTP Receipt Vessels.

(3) Treat and immobilize the low activity fraction (Envelopes A, B, and C) and provide the final waste products described in Specification 2, *Immobilized Low-Activity Waste Product*, for return to DOE.

(4) Implement the sludge treatment process steps as proposed by the Contractor, and approved by DOE in accordance with Standard 2, (a), (3), (iii), for solids washing, caustic leaching, and oxidative leaching; immobilize the HLW feed and radionuclides separated from LAW feed, and provide the final waste products described in Specification 1, *Immobilized High Level Waste Product*, for return to DOE.

(5) Disposition all secondary wastes in accordance with ICD requirements; secondary wastes are identified in Section C.9, *Interface Control Documents* and Standard 6, *Product Qualification, Characterization and Certification*.

(6) The Pretreatment Facility shall have the capability to return to the Hanford Double-Shell Tank Farm process streams in accordance with Specification 9, *Liquids or Slurries*, transferred to DOE tanks by pipeline.

(7) Provide for safeguards and security of DOE owned materials, property, and information in accordance with Standard 8, *Safeguards and Security*.

(8) Include a Radiochemical Analytical Laboratory to support the operations of the facilities, including: process control, waste form qualification testing, environmental analyses, and limited technology testing. The capacity of the Analytical Laboratory shall be sufficiently sized and scoped to support the waste treatment capacity of the facilities. The technical basis to support the definition of the Analytical Laboratory facility shall be defined in the Analytical Laboratory Design Requirements (Deliverable 3.6).

(9) Have the ability to receive and process slightly contaminated sodium hydroxide (NaOH) with trace quantities of radionuclides (Na-22, Cs-137, H-3) for use as a process chemical. This sodium (Na) will be converted to sodium hydroxide (NaOH) prior to use at the WTP. The quantity and radionuclide content of the Na is provided in ICD 29, *Waste Na*.

(10) Capability to obtain samples of ILAW and IHLW glass to support process and product control needs for WTP.

(11) Include process and facility design features to safely and efficiently facilitate deactivation, decontamination, decommissioning, and RCRA closure of the facilities.

(12) Comply with applicable Federal, State, and local requirements, including environmental permits and other regulatory approvals and authorizations. The WTP shall be designed and operated to ensure that exposure to the maximally exposed off-site individual (non-acute) is ALARA but not more than 1.5 mrem per year and hazardous organic emissions are ALARA but not more than 0.375 tons per year from components regulated under 40 CFR 265, Subpart AA.

(13) Include office space at the WTP Site sufficient for the exclusive use of eight full-time DOE personnel and temporary space for ten transient DOE personnel.

(14) Identify fifteen (15) acres on the WTP site, north of the Pretreatment Facility, to allow for the expansion of the WTP LAW vitrification capacity, by the addition of a Supplemental LAW Treatment Facility. Interface details and project impacts (including scope adjustments) will be established if a decision is made to use this space.

(15) Include process and facility design features that will efficiently minimize the use of services and utilities, as well as the generation of secondary wastes and waste products consistent with the constraints specified in the Contract. Achievement of this requirement is demonstrated through research and technology, design reviews, and DOE's design oversight:

(i) Use of services and utilities including: ICD 1, *Raw Water*; ICD 2, *Potable Water*; ICD 11, *Electricity*;

(ii) Generation of secondary wastes, including: *Radioactive Solid Wastes*, *Dangerous Wastes, Non-Radioactive, Non-Dangerous Liquid Effluents*; *Radioactive, Dangerous Liquid Effluents*; and

(iii) Primary product volumes through improved waste loading greater than the Contract minimums: Specification 1, *Immobilized High-Level Waste Product*, and Specification 2, *Immobilized Low-Activity Waste Product*.

(b) Waste Treatment Capacity Requirements: Waste treatment capacity requirements are specified below:

(1) The required WTP facility design capacity for each of the WTP facilities is defined in Table C.7-1.1. Supplemental LAW immobilization will be provided by a separate contract to support WTP treatment.

The waste treatment capacity for each major facility is defined as a product of the facility design capacity (facility nameplate design capacity) multiplied by the integrated facility availability factor.

Table C.7-1.1. WTP Facility Design Capacity

Facility	Design Capacity	Treatment Capacity
LAW Pretreatment (1)	3740 MT Na per year	2620 MT Na per year
HLW Pretreatment (2)	1225 MT as-delivered solids per year	860 MT as-delivered solids per year
LAW Vitrification	30 MT Glass per day	21 MT Glass per day
HLW Vitrification	7.5 MT Glass per day	5.25 MT Glass per day
Analytical Laboratory	Support all WTP Facilities at Design Capacity	Support all WTP Facilities at Treatment Capacity
Balance of Facilities	Support all WTP Facilities at Design Capacity	Support all WTP Facilities at Treatment Capacity

Notes:
1. The LAW waste treatment capacity is based on waste sodium (Na). Waste Na is defined as Na from the following sources: Na from the LAW Feed Envelopes in accordance with Specification 7, *Low Activity Waste Envelopes Definition* and soluble Na from the HLW Envelope in accordance with Specification 8, *High Level Waste Envelope Definition*. In addition, the chemical Na added to wash and leach the solids defined in the sludge treatment flowsheet, approved by DOE (Table C.5-1.1, Deliverable 2.1) and any Na required to maintain chemical stability of the Ultrafiltration system permeate is included in the definition of waste Na.
2. As delivered solids represents the mass of the solid cations and anions delivered in the waste feed batches provided by the TFCOUP Revision 6.0 Feed Vector.
3. Confirmation that the WTP design will achieve the listed design capacities is contained in document 24590-WTP-MRR-PET-08-002, Revision 2, WTP Contract Run - (G2) Dynamic Model Run Results Report, August 25, 2008.

The Contractor shall evaluate the design capacity of the WTP Pretreatment, LAW Vitrification, and HLW Vitrification facilities using the Standard 2, (b), (2), *WTP Tank Utilization Assessment Model*. The design capacity is determined by the estimated average processing rate when treating all waste as defined by TFCOUP, Revision 6.0.

The Standard 2, (b), (3), *Material Balance and Process Flowsheet,* shall be used to compare chemistry assumptions used in the Tank Utilization Assessment Model.

ILAW loading shall be based on Specification 2.2.2.2, *Waste Loading,* and the IHLW waste loading shall be based on Specification 1, Table TS-1, *Minimum Component Limits in High-Level Waste Glass*. For purposes of predicting Pretreatment throughput rates and total treatment times at those rates, modeling assumptions shall be used such that the Pretreatment throughput is not limited by the vitrification facilities.

The Contractor is to estimate the integrated facility availability factor from the Operations Research Assessment as defined in Standard 2 (b) (1) *Operational*

Research Assessment. The determination of integrated facility availability for the purpose of WTP facility design compliance shall be based on estimates of the total time to treat all tank wastes, with no reliability/availability/ maintainability/inspectability (RAMI) failures applied, divided by the total time to treat all tank wastes, with all RAMI failures applied. The minimum integrated facility availability and the individual facility availabilities shall be equal to or greater than 70 percent.

The integrated facility availability assessment shall be based on modeling for the expected duration of the treatment mission.

ORP approval shall be obtained on all assumptions used for waste treatment capacity determinations using the WTP Tank Utilization Assessment and Operations Research Assessment models. As example, model assumptions may change following completion of Phase I Pretreatment Engineering Platform testing. These assumptions shall be documented in the WTP Basis of Design (Deliverable 3.3(a), Table C.5-1.1)

(2) The LAW Vitrification Facility shall be designed to support a facility design capacity of 30 MTG/day.

- The LAW Vitrification Facility shall be capable of vitrifying treated LAW Envelopes A, B, and C in compliance with the waste loading specifications identified in Specification 2.2.2.2., *Waste Loading*.

(3) The HLW Vitrification Facility shall be designed with two HLW melter systems to support a combined design capacity of 6 MTG/day with the original melters and up to 7.5 MTG/day with replacement melters.

(4) The Pretreatment Facility shall have the capability to receive and store 1.5 Mgal of LAW feed. The design shall include the capability to receive without interruption 1.125 Mgal of LAW feed while processing from the remaining capacity of 0.375 Mgal of LAW feed. The tanks shall be connected to allow blending.

(5) The Pretreatment Facility shall have the feed-forward capability for a nominal 240,000 gallons of feed lag storage for HLW vitrification facility operations, based upon the facility design capacity, while being capable of receiving without interruption no less than 160,000 gallons of HLW feed per batch. HLW feed batch receipt facilities shall be designed to allow receipt without interruption to waste feed processing.

(6) The Pretreatment Facility shall have the capability to prepare at least 81,000 gallons of transferable and blended HLW feed within a single vessel for transfer to the HLW Vitrification Facility.

(7) The Pretreatment Facility shall have the established capability to conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids. The Pretreatment Facility shall include the following capabilities to permit operational flexibility for sludge washing, caustic leaching, and oxidative leaching flowsheet and treatment capacity:

(i) Provide two ultrafiltration trains to support solid-liquid separation, sludge washing, caustic leaching, and oxidative leaching. The ultrafilter surface area for each train shall be approximately 1,500 square feet, unless the Contractor demonstrates that greater average filter flux rates can be achieved with an alternative design.

(ii) Provide the capability to mix chemical reagents used in the leaching processes, in line with ultrafiltration vessel recirculation pumps, to shorten mixing times.

(iii) Perform caustic leaching between 80 and 90°C to enhance leaching kinetics.

(iv) Include the capability to remove heels from the ultrafiltration feed vessels to move treated solids forward in the process and minimize recycle.

(v) Operate filtration at 45°C or higher to increase filter flux rates and potentially reduce caustic required in leaching.

(vi) Add caustic to ultrafilter permeate vessels to minimize the potential for post-filtration precipitation of aluminum species and reduce the volume of permeate that must pass through the ultrafilters.

(vii) Increase the capacity of the cesium ion exchange system to a nominal 30 gallon/minute flowrate. This shall accommodate the increased waste volume resulting from caustic increases required to effectively conduct sludge washing, caustic leaching, and oxidative leaching on HLW sludge and entrained solids.

(viii) Provide the capability to perform caustic leaching in the ultrafiltration feed preparation vessel in addition to the ultrafiltration feed vessel.

(c) Waste Treatment and Immobilization Plant Expandability Requirements: The Contractor shall design the WTP to ensure that the plant is designed and built with features to provide increased waste treatment capacities (items (3) and (10) below), or which allow for expansion to support increased treatment capabilities (items (1), (2), and (4) through (9) below), as follows:

(1) The LAW Facility design shall not preclude the installation of a third melter, melter power and control systems, melter feed, offgas treatment, container handling, HVAC, and other systems and components not initially installed. The capacity to expand the waste treatment shall be consistent with an increase in the design capacity of 30 MTG/day to 45 MTG/day.

(2) Pretreatment can connect to a potential new facility designed to receive and treat the Hanford cesium (Cs) and strontium (Sr) capsules prior to incorporation into the HLW feed for immobilization in the HLW Vitrification Facility. The scope shall be limited to the installation of process piping between an appropriately identified HLW feed process vessel and a location adjacent to the Pretreatment Facility where connections to a potential new facility could be easily accomplished.

(3) Analytical Laboratory capabilities shall be included in the initial design to support an increase in LAW waste treatment capacity described in (b)(1) above.

(4) HLW Immobilization can connect to a potential new facility for the interim storage of IHLW canisters. Space on the facility site plan shall be provided to accommodate this additional storage capacity.

(5) Provide four piping stub-outs from the Pretreatment Facility South Tunnel to route HLW slurry feed to and from a potential future HLW slurry feed concentration facility.

(6) Tank Farm feed delivery routing capability, within the Pretreatment Facility, to connect to a potential new facility ahead of the feed receipt tanks shall be provided. This routing capability shall include the installation of piping that will allow for tie-in at a later date.

(7) Routing capability, from the Pretreatment Facility to transfer treated and concentrated LAW feed to a potential new facility shall be provided. This routing capability shall include the installation of piping exterior to the pretreatment building that will allow for tie-in at a later date.

(8) Provide the capability to install future alternative solids filtering technologies in Pretreatment Facility hot cell areas used for the ultrafiltration system (Pretreatment Areas 34 and 35). This capability shall be accomplished by the addition of spare wall penetrations and associated piping or conduit runs into accessible areas to the extent practical.

(9) The glass former feed capability shall be designed to support LAW Vitrification operations at a design capacity of 30 MTG/day, and HLW Vitrification at a design capacity of 7.5 MTG/day. The glass former facility shall be capable of being expanded to support operation at 45 MTG/day.

(10) Provide HLW facility systems and permits to support the future operation of the HLW Facility at a design capacity of 7.5 MTG/day including melter power supplies, pour cave cooling, and support for additional melter bubblers as necessary. The dangerous waste permit shall be modified to support the operation of the HLW Vitrification facility at 7.5 MTG/day. Melter demonstration trials may be limited to the design capacity of the HLW melter system available at the time of these trials. The expanded HLW vitrification capacity will be achieved by a second generation HLW melter.

(d) Waste Treatment and Immobilization Plant Unit Operation: The WTP treatment process shall include Pretreatment Unit Operations, HLW Vitrification Unit Operations, and LAW Vitrification Unit Operations.

(1) Pretreatment Unit Operations: Pretreatment shall include the following major process functions:

(i) Ultra-Filtration: This operation separates solids from supernatant. Separation is required to allow subsequent treatment of the waste fractions as IHLW and ILAW respectively.

(ii) Sr/TRU Removal: This operation removes ^{90}Sr and TRU elements to allow for production of an ILAW waste product that meets Specification 2.2.2.8, *Radionuclide Concentration Limitations*. The technology for the removal of ^{90}Sr is an isotopic dilution process that uses non-radioactive Sr as the reagent. The removal of TRU is accomplished using sodium permanganate for de-complexation and adsorption of the TRU elements.

(iii) Cs Removal: This operation removes ^{137}Cs from the filtered supernatant to allow for production of an ILAW waste product that meets the Specification 2.2.2.8, *Radionuclide Concentration Limitations*. In addition, ^{137}Cs will be further removed, to achieve a 0.3 Ci/m^3 in the ILAW product, to facilitate the maintenance concept established for the ILAW melter system. The Cs removal process shall use an elutable ion exchange resin. Resin selection shall consider technical acceptability and life cycle costs. Ion-exchange resins shall be qualified for WTP operations and may include SuperLig® SL-644 resin, spherical resorcinol formaldehyde, or other qualified resins.

(iv) Technetium (Tc) Removal: This operation removes ^{99}Tc (in the sodium [Na] pertechnetate form) from the filtered supernatant to allow for production of an ILAW waste product that meets the Specification 2.2.2.8, *Radionuclide Concentration Limitations*. The Contractor shall not design or procure equipment relating to the Technetium Ion Exchange System. However, the Contractor shall provide space within the Pretreatment Facility for such equipment should it become necessary to provide technetium removal capability in the future. Contractor shall place floor embedments and wall penetrations within the facility to ensure that the option to install the Technetium Ion Exchange System equipment is maintained. Should Tc removal be required in the future, the Tc removal process shall use the elutable SuperLig ® SL-639 resin (registered trademark of IBC Advanced Technologies, Inc.) or DOE-approved equivalent. The Contractor shall not conduct additional research on alternative resins for use in this process.

(v) Waste Concentration: This operation concentrates the main process stream (Envelope A, B, and C supernatants and envelope D solids as required) and dilute internal facility recycles recovered from the wash and leach steps that are part of the HLW sludge treatment. Radionuclides recovered from the supernatant fraction in the cesium ion exchange process are concentrated for reagent recovery and to minimize the liquid volume of feed to HLW.

(vi) Liquid Effluent Treatment: This operation collects the WTP effluent and provides for the discharge to the Hanford Site 200 East Area Effluent Treatment Facility (ETF) or allows for the re-use of liquid effluent as process water with the WTP. Treated effluent will be transferred to the Hanford Site ETF as required.

(vii) Washing, Caustic Leaching, and Oxidative Leaching of HLW Solids: The Pretreatment Facility shall have the capability to conduct washing, leaching and oxidative leaching of HLW solids. Washing, caustic leaching, and oxidative leaching shall be performed using the process steps proposed by the Contractor. The objective of the water washing process step is to remove soluble Na and sulfate so that the HLW glass waste oxide loading is not limited by Na and/or sulfate. Water washing is defined as the dilution of dissolved waste constituents either with process water or very diluted caustic solution. The objective of the caustic leaching process step is to remove aluminum from the feed to HLW Vitrification so that the HLW glass waste oxide loading is not limited by aluminum. The objective of the oxidative leaching process is to remove chromium from the feed to HLW Vitrification so that the HLW glass waste oxide loading is not limited by chromium. These objectives are not absolute requirements, but will be balanced as described in Specification 12 with other operational parameters. .For example, if the approved flowsheet or process steps (Standard 2(a)(3)(iii)) results in glass limited by aluminum (Al), chromium (Cr) sulfate, or sodium (Na) it is acceptable.

The proposed process steps for sludge treatment, developed using data from the testing described in Standard 2(a)(3)(iii), shall be submitted to DOE for review and approval (Table C.5.1-1 Deliverable 2.10).

The Contractor shall evaluate their proposed procedure for Specification 12, *Procedure to Determine Waste Feed Treatment Approach*, against the results obtained in sludge treatment testing. The procedure shall provide projections of IHLW and ILAW quantities produced consistent with the sludge treatment

testing and proposed process steps. The Contractor shall recommend the specific test procedure (e.g., testing and modeling) for Specification 12, for DOE review and approval (Table C.5.1-1, Deliverable C.7-1).

(2) High-Level Waste Vitrification Unit Operations: HLW Vitrification shall include the following major process functions:

(i) High-Level Waste Feed Preparation: HLW melter feed will be prepared from treated HLW solids, concentrates from radionuclide recovery processes, and glass forming chemicals. The HLW feeds will be prepared, sampled, and qualified prior to the HLW Vitrification operation. The qualification strategy is to be developed and documented in the IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2).

(ii) High-Level Waste Vitrification: HLW feed shall be converted to a borosilicate glass in a ceramic lined, joule heated melter. The glass product shall meet Specification 1, *Immobilized High-Level Waste Product*.

(iii) High-Level Waste Melter Offgas Treatment: Offgas treatment system shall be designed to meet environmental permitting requirements. The primary offgas treatment system consists of a submerged bed scrubber (SBS), a wet electrostatic precipitator (WESP), and high-efficiency particle absorber (HEPA) filters. Before exiting the facility, the offgas is treated by a secondary offgas treatment system consisting of activated carbon adsorbers, a sliver mordenite column, a thermal catalytic oxidizer (TCO), and a selective catalytic reducer (SCR).

(iv) High-Level Waste Canister Closure, Decontamination, and Inspection: The HLW canister is sealed via welding. The canister is decontaminated using a chemical etching process that uses [cerium] Ce (IV) as the chemical reagent. **(M047)**

(3) Low-Activity Waste Vitrification Unit Operations: LAW Vitrification shall include the following major process functions:

(i) Low-Activity Waste Feed Preparation: LAW melter feed will be prepared from the pretreated supernatant and glass forming chemicals. The qualification strategy shall be developed and documented in the ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3).

(ii) Low-Activity Waste Vitrification: LAW feed shall be converted to a glass that meets Specification 2, *Immobilized Low-Activity Waste Product.*, in a ceramic-lined, joule-heated melter.

(iii) Low-Activity Waste Melter Off-gas Treatment: The offgas treatment system shall be designed to meet environmental permitting requirements.

(iv) Low-Activity Waste Container Closure, Decontamination, and Inspection: Container closure, decontamination, and inspection shall be conducted in accordance with Specification 2, *Immobilized Low-Activity Waste Product*. The ILAW Product container is sealed, decontaminated, and then the container is weighed and checked for dimensionality. The container is decontaminated using a solid carbon dioxide abrasion process. Temperature and gamma dose rate measurements will be taken on selected containers.

(e) Plant Operator Qualification and Training Facility Design (simulator): The Contractor shall develop a "limited" full scope simulator. The simulator may be located off site.
The simulator facility will include three (3) control room replications (main Pretreatment Facility control room, LAW Vitrification Facility control room, and HLW Vitrification Facility control room), along with the associated infrastructure and offices to support the simulator facility operations.

The "limited" full scope simulator is defined as a training environment that closely models the process and associated equipment located in the actual control rooms. This simulator will provide an environment for understanding the process and control strategies to optimize plant performance and to provide training for situations that would not normally be experienced during normal plant operations.

C.8 OPERATIONAL SPECIFICATIONS

This section provides the WTP Operational Specifications including LAW and HLW feed characteristics, intermediate waste product requirements, final waste product requirements, and waste product inspection and acceptance.

Specification 1:	Immobilized High-Level Waste Product
Specification 2:	Immobilized Low-Activity Waste Product
Specification 3:	Entrained Solids
Specification 4:	Reserved
Specification 5:	Reserved
Specification 6:	Reserved
Specification 7:	Low-Activity Waste Envelopes Definition
Specification 8:	High-Level Waste Envelope Definition
Specification 9:	Liquids or Slurries Transferred to DOE Tanks by Pipeline
Specification 10:	Reserved
Specification 11:	Reserved
Specification 12:	Procedure to Determine the Waste Feed Treatment Approach
Specification 13:	Waste Product Inspection and Acceptance

Specification 1: Immobilized High-Level Waste Product

1.1 Scope: This Specification defines requirements for the IHLW product, a waste product. The IHLW product is a vitrified borosilicate glass waste form for ultimate disposal in the proposed geologic repository.

1.2 Requirements:

1.2.1 References:

1.2.1.1 CRD. DOE/RW-0406. Revision 8. September 12, 2007. *Civilian Radioactive Waste Management Systems Requirements Document*, ICN 1. U.S. Department of Energy, Office of Civilian Radioactive Waste Management. Washington, D.C.

1.2.1.2 DOE Manual 435.1-1 CHG-1. July 9, 1999. *Radioactive Waste Management Manual.* U.S. Department of Energy, Washington, D.C.

1.2.1.3 WASRD. DOE/RW-0351. Revision 5. May 31, 2007. *Waste Acceptance System Requirements Document (WASRD)*. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Washington, D.C. **(M047) (M114)**

1.2.1.4 WAPS. DOE/EM-0093. Revision 2. December 1996. *Waste Acceptance Product Specifications for Vitrified High-Level Waste Forms,* U.S. Department of Energy, Washington D.C. **(M047) (M114)**

1.2.1.5 IICD. DOE/RW-0511. Revision 4. March 7, 2008. Integrated Interface Control Document, Volume 1. *High-Level Radioactive Waste and U.S. Department of Energy and Naval Spent Nuclear Fuel to the Civilian Radioactive Waste Management System*. U.S. Department of Energy, Washington D.C.

1.2.1.6 MOA. Revision 2. February 2007. *Memorandum of Agreement for Acceptance of Spent Nuclear Fuel and High-Level Nuclear Waste (MOA) between Environmental Management (EM) U.S. Department of Energy (DOE), Washington, DC. and Office of Civilian Radioactive Waste Management (DOE-RW or OCRWM)*. U.S. Department of Energy, Washington, D.C. **(M114)**

1.2.1.7 QARD. DOE/RW-0333P. Revision 20. January 2008. *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program (QARD*). U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Washington, D.C.

1.2.1.8 40 CFR 268. "Land Disposal Restrictions." *Code of Federal Regulations*. U.S. Environmental Protection Agency, Washington, D.C.

1.2.1.9 WAC 173-303. "Dangerous Waste Regulations." *Washington Administrative Code*, as amended.

1.2.1.10 HWMA. *Hazardous Waste Management Act.*

1.2.1.11 RCRA. *Resource Conservation and Recovery Act*.

1.2.2 Product Requirements:

1.2.2.1 Immobilized High-Level Waste:

1.2.2.1.1 Product and Disposal Requirements: The IHLW product shall meet the requirements established in the *Waste Acceptance Product Specifications* (WAPS) and the supporting documents *Waste Acceptance Systems Requirements Document* (WASRD), and Integrated Interface Control Document (IICD). The WAPS, WASRD, and IICD identify the requirements of DOE-RW for acceptance of IHLW for disposal at a federal geologic repository. A *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Nuclear Waste*, (MOA) sets forth, specifies, and lists the programmatic protocols, technical data, specifications and requirements for producing an acceptable IHLW waste form for disposal at a federal geologic repository. The *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program* (QARD) establishes the minimum QA requirements for compliance with the US Department of Energy, Office of Civilian Radioactive Waste Management (DOE-RW, or OCRWM). These requirements must be met before the IHLW waste glass canisters will be accepted by the DOE Office of River Protection (ORP) for onsite interim storage and later formal acceptance by DOE-RW for final disposal.

1.2.2.1.2 Canister System: The reference canister system used to contain the IHLW product shall be a 4.5-meter long by 0.61-meter diameter canister system with a neck and flange design similar to that used at the West Valley Demonstration Project.

1. "Fill Height: Fill height shall be equivalent to at least 87 percent of the volume of the empty canister. The average fill height over all the canisters shall be at least 95 percent of the volume of the empty canister."
2. "Maximum Heat Generation Rate: The maximum heat generation rate for any single canister shall not exceed 1500 watts per canister when delivered to DOE."
3. "Surface Contamination Limitations: Removable contamination on the external surfaces of the package shall not exceed 3,670 Bq/m^2 for alpha and 36,700 Bq/m^2 for beta-gamma. **(M047)**

1.2.2.1.3 Condition at Delivery: At time of delivery to DOE, the HLW form shall stand upright without support on a flat horizontal surface and properly fit into a right-circular, cylindrical cavity (64-cm diameter and 4.51-m length).

1.2.2.1.4 Dangerous and Hazardous Waste Requirements: The WTP shall be designed, constructed, and operated so that the IHLW product does not designate as characteristic or criteria for dangerous waste or extremely hazardous waste pursuant to WAC 173-303-070, and is not restricted from land disposal pursuant to WAC 173-303-140 and 40 CFR 268, "Land Disposal Restrictions."

1.2.2.1.5 Product Loading: Loading of non-volatile components in Envelope D shall be achieved such that the concentration of at least one of the waste components or waste component combinations in Table TS-1.1, *Minimum Component Limits in High-Level Waste Glass*, exceeds its minimum weight percent in HLW glass as identified in Table TS-1.1 (e.g., for a high-iron waste, the waste product shall incorporate at least 12.5 weight percent [wt%] iron oxide from the waste into the glass). The product loading shall not cause the limits in any other requirement of this specification to be violated. Product waste loading shall be calculated on an average basis for each batch transfer of Waste Envelope D. The waste loading may be adjusted downward if necessary to comply with Universal Treatment Standards leaching requirements.

1.2.3 Handling Requirements:

1.2.3.1 Product Handling: The canister shall have a point of connection that allows vertical upward, vertical downward, and horizontal motion while attached to a hoist and grapple.

1.3 Quality Assurance: A QA Program (Table C.5-1.1, Deliverable 6.11) for the IHLW form development, qualification, characterization, and certification is required and shall be consistent with DOE/RW-0333P.

1.4 Inspection and Acceptance: The DOE-approved IHLW Waste Form Compliance Plan (Table C.5-1.1, Deliverable 6.2), described in Standard 6, *Product Qualification, Characterization, and Certification*, defines the content and delivery of documentation required to demonstrate compliance with the requirements of this specification. Product inspection and acceptance shall be performed in accordance with Specification 13, *Waste Product Inspection and Acceptance*, and the required IHLW QA Program.

Table TS-1.1 Minimum Component Limits in High-Level Waste Glass

Component	Weight Percent in HLW Glass
Fe_2O_3	12.5
Al_2O_3	11.0
$Na_2O + K_2O$	15.0
ZrO_2	10.0
UO_2	8.0
ThO_2	4.0
CaO	7.0
MgO	5.0
BaO	4.0
CdO	3.0
NiO	3.0
PbO	1.0
TiO_2	1.0
Bi_2O_3	2.0
P_2O_5	3.0
F	1.7
$Al_2O_3 + ZrO_2$	14.0
$Al_2O_3 + ZrO_2 + Fe_2O_3$	21.0

Component	Weight Percent in HLW Glass
MgO + CaO	8.0
Cr_2O_3	0.5
SO_3	0.5
Ag_2O	0.25
Rh_2O_3 + Ru_2O_3 +PdO	0.25
Any single waste oxide (exclusive of Si) not specifically identified in Specification 8, TS-8.1 and 8.4	0.2
Total of all other waste oxides (exclusive of Si) not specifically identified in this table.	8.0

Specification 2: Immobilized Low-Activity Waste Product

2.1 Scope: This Specification defines the requirements for the ILAW product, a final waste product. The ILAW product is a glass waste form for disposal on the Hanford Site.

2.2 Requirements:

2.2.1 References:

2.2.1.1 10 CFR 61. "Licensing Requirements for Land Disposal of Radioactive Waste." *Code of Federal Regulations*. U.S. Nuclear Regulatory Commission, Washington, D.C.

2.2.1.2 40 CFR 268. "Land Disposal Restrictions." *Code of Federal Regulations*. U.S. Environmental Protection Agency, Washington, D.C.

2.2.1.3 49 CFR 172.101. "Table 2 - Radionuclides." *Code of Federal Regulations*. U.S. Department of Transportation, Washington, D.C.

2.2.1.4 49 CFR 173. "Shippers-General Requirements for Shipments and Packaging. Subpart I - Radioactive Materials." *Code of Federal Regulations*. U.S. Department of Transportation, Washington, D.C.

2.2.1.5 ANSI Standard N14.5. February 5, 1998. *Radioactive Materials - Leakage Tests on Packages for Shipment*. American National Standards Institute, New York.

2.2.1.6 ANSI/ANS-16.1. April 14, 1986. *Measurement of the Leachability of Solidified Low-Level Radioactive Wastes by a Short Term Test Procedure.* American National Standards Institute/American Nuclear Society, La Grange Park, Illinois.

2.2.1.7 ANSI/ANS-55.1. July 28, 1992. *Solid Radioactive Waste Processing System for Light-Water-Cooled Reactor Plants; Appendix B - Testing for Free Liquids in Solidified Matrices*. American National Standards Institute/American Nuclear Society, La Grange Park, Illinois.

2.2.1.8 ASTM B553-79. May 25, 1979. *Standard Test Method for Thermocycling of Electroplated Plastics*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.9 ASTM C39/C39M-01. July 2001. *Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.10 ASTM C1285-02. October 2002. *Standard Test Methods for Determining Chemical Durability of Nuclear Waste Glasses: The Product Consistency Test (PCT)*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.11 ASTM G21-96. July 10, 1999. *Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.12 ASTM G22-76 (R1996). November 26, 1976. *Standard Practice for Determining Resistance of Plastics to Bacteria*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.13 DOE Manual 435.1-1. July 9, 1999. *Radioactive Waste Management Manual*. U.S. Department of Energy, Washington, D.C.

2.2.1.14 NRC. January 1995. *Branch Technical Position on Concentration Averaging and Encapsulation*. Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C.

2.2.1.15 NRC. January 1991. *Technical Position on Waste Form*, Revision 1, Low-Level Waste. Division Management Branch, Office of Nuclear Material Safety and Safeguards, U. S. Nuclear Regulatory Commission, Washington, D.C.

2.2.1.16 NUREG/BR-0204. July 1998. *Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest*. U.S. Nuclear Regulatory Commission, Washington, D.C.

2.2.1.17 SW-846, *Test Methods for Evaluating Solid Waste*, *Physical/Chemical Methods*. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

2.2.1.18 WA 7890008967. Revision 2. August 1995 (as modified). *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage and Disposal of Dangerous Waste at the Hanford Facility*. Washington State Department of Ecology, Olympia, Washington.

2.2.1.19 WAC 173-303. "Dangerous Waste Regulations." *Washington Administrative Code*, as amended.

2.2.1.20 Vitreous State Laboratory, 1998. *Glass Formulation and Testing with TWRS LAW Simulants*. The Catholic University of America, Washington, D.C.

2.2.2 Product Requirements:

2.2.2.1 Package Description: The ILAW product shall be in the form of a package. The constituent parts of each package are a sealed stainless-steel container enclosing a poured glass waste form and an optional filler material of sand or glass. If an optional filler is used, DOE approval on the filler composition is required.

2.2.2.2 Waste Loading: The loading of waste sodium from Envelope A in the ILAW glass shall be greater than 14 weight percent based on Na_2O. The loading of waste sodium from Envelope B in the ILAW glass shall be greater than 3.0 weight percent based on Na_2O. The loading of waste sodium from Envelope C in the ILAW glass shall be greater than 10 weight percent (wt%) based on Na_2O.

2.2.2.3 Size and Configuration: The package shall be a 304L stainless-steel right circular cylinder. The height of the package shall be 2.286 m (90"), and the diameter shall be 1.22 m (48"). At the time of acceptance, the ILAW package shall stand without support on a flat, horizontal surface.

2.2.2.4 Mass: The mass of each package shall not exceed 10,000 kilograms.

2.2.2.5 Void Space: The void space in the container shall not exceed 10 percent of the total internal volume at the time of filling, excluding void space internal to the glass waste form (e.g., small bubbles in the glass). After cooling, if necessary, the container shall be filled with suitable inert dry filler such that the void space meets the requirements of Dangerous Waste Regulation WAC 173-303-665 (12);

i.e., the container shall be at least ninety (90) percent full when placed in the landfill.

2.2.2.6 Chemical Composition Documentation: The chemical composition of the waste form, filler, and package shall be identified.

2.2.2.6.1 DELETED

2.2.2.6.2 Chemical Composition During Production: The production documentation (Table C.5-1.1, Deliverable 6.7) shall provide the chemical composition of each waste form, optional filler, and package. The reported composition shall include elements (excluding oxygen) present in concentrations greater than 0.5 percent by weight and elements and compounds required to meet regulatory or Contract requirements.

2.2.2.6.3 DELETED

2.2.2.7 Radiological Composition Documentation: The radionuclide composition of the waste form shall be documented. Radionuclides shall be identified that are significant as defined in NUREG/BR-0204 and 49 CFR 172.101 (Table 2). Technetium-99 (^{99}Tc) shall be considered to be significant at concentrations greater than 0.003 Ci/m^3 in the ILAW form. The inventories shall be indexed to December 31, 2002. The documentation shall be consistent with the radiological description format described in NUREG/BR-0204.

2.2.2.7.1 Radionuclide Composition Qualification: The ILAW Product Qualification Report (Table C.5-1.1, Deliverable 6.6) shall identify the estimated radionuclide concentration in the waste form.

2.2.2.7.2 Radionuclide Composition During Production: The ILAW production documentation (Table C.5-1.1, Deliverable 6.7) shall identify the radionuclide inventory in each ILAW package produced. The actual inventory indexed at the month of product transfer and the inventory indexed to December 31, 2002, shall be reported.

2.2.2.8 Radionuclide Concentration Limitations: The radionuclide concentration of the ILAW form shall not exceed Class C limits as defined in 10 CFR 61.55. In addition, the average glass concentrations of cesium-137 (^{137}Cs) and strontium-90 (^{90}Sr) shall be limited as follows: $^{137}Cs < 3$ Ci/m^3 and $^{90}Sr < 20$ Ci/m^3. The method used to perform concentration averaging should be identified in the ILAW Product Compliance Plan.

2.2.2.9 Surface Dose Rate Limitations: The dose rate at any point on the external surface of the package shall not exceed 500 mrem/hr.

2.2.2.10 Surface Contamination Limitations: Removable contamination on the external surfaces of the package shall not exceed 367 Bq/m^2 for alpha and 3670 Bq/m^2 for beta-gamma contamination when measured using the method described in 49 CFR 173.443(a).

2.2.2.11 Labeling: Each package shall have an identification number on the shoulder and side of the package as described in the ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3). The lettering on the label shall be at least 5.0 cm high, and characters shall have a width of at least 3.5 cm. The label shall contain a unique identification (e.g., serial number), which shall be assigned to each package and the corresponding documentation. Labels and markings shall have a predicted service life of 50 years assuming that the packages are stored in a ventilated enclosure at ambient temperatures.

2.2.2.12 Closure and Sealing: The fully loaded package shall be closed and sealed. The closure system shall be sealed to prevent the dispersal of radioactive material during the most severe conditions encountered during normal use and handling. The closure system shall be designed to ensure that the seal remains intact for a storage period of 50 years in an ambient-temperature, ventilated enclosure.

2.2.2.13 External Temperature: The temperature of the accessible external surfaces of the package shall not exceed 465°F (alternating pour) or 550°F (single pour) when returned to DOE. This temperature constraint shall assume a shaded, still air environment at an ambient temperature of 38°C.

2.2.2.14 Free Liquids: The package shall contain no detectable free liquids as defined in ANSI/ANS-55.1 or SW-846 Method 9095.

2.2.2.15 Pyrophoricity or Explosivity: The package contents shall not be pyrophoric, readily capable of detonation, or readily capable of explosive decomposition or reaction (including reaction with water) at normal pressure and temperature. The waste form and any optional filler materials shall not be ignitable or reactive as defined in WAC 173-303-090(5) and WAC 173-303-090(7).

2.2.2.16 Explosive or Toxic Gases: The package shall not contain or be capable of generating quantities of explosive (e.g., hydrogen) or toxic gases, vapors, or fumes harmful to persons handling the waste.

2.2.2.17 Waste Form Testing:

2.2.2.17.1 DELETED

2.2.2.17.2 Product Consistency Test: The normalized mass loss of sodium, silicon, and boron shall be measured using a seven day product consistency test run at 90°C as defined in ASTM C1285-98. The test shall be conducted with a glass to water ratio of 1 gram of glass (-100 +200 mesh) per 10 milliliters of water. The normalized mass loss shall be less than 2.0 grams/m^2. Qualification testing shall include glass samples subjected to representative waste form cooling curves. The product consistency test shall be conducted on waste form samples that are statistically representative of the production glass.

2.2.2.17.3 Vapor Hydration Test: The glass corrosion rate shall be measured using at least a seven (7)-day vapor hydration test run at 200°C as defined in the DOE-concurred upon ILAW Product Compliance Plan. The measured glass alteration rate shall be less than 50 grams/(m^2 day). Qualification testing shall include glass samples subjected to representative waste form cooling curves. The vapor hydration test shall be conducted on waste form samples that are representative of the production glass.

2.2.2.18 Compressive Strength: The mean compressive strength of the waste form shall be determined by testing representative non-radioactive samples.
The compressive strength shall be at least 3.45E6 Pa when tested in accordance with ASTM C39/C39M-99 or an equivalent testing method.

2.2.2.19 DELETED

2.2.2.19.1 DELETED

2.2.2.19.2 DELETED

2.2.2.19.3 DELETED

2.2.2.19.4 DELETED

2.2.2.20 Dangerous Waste Limitations: The ILAW product shall be acceptable for land disposal under the State of Washington *Dangerous Waste Regulations*, WAC 173-303, and RCRA LDR in 40 CFR 268.

2.2.2.21 Compression Testing: Each fully loaded package shall be able to withstand a compression load of five (5) times the weight of the filled container. Compliance with this specification shall be established by using the compression (stacking) test described in 49 CFR 173.465(d) or evaluated against this test by any of the methods authorized by 49 CFR 173.461(a). The integrity of the package shall be demonstrated by showing that the seal remains intact in accordance with Specification 2.2.2.12, *Closure and Sealing*.

2.2.2.22 Container Material Degradation: The container and handling appurtenances shall be designed to allow safe lifting and movement (in accordance with Specification 2.2.3.1) after a storage period of fifty (50) years.

2.2.2.23 Manifesting: A shipping manifest shall be prepared for delivery with each shipment of ILAW product. Information on the manifest shall satisfy the requirements in DOE Manual 435.1-1, Chapter IV, Section I.(2), and NUREG/BR-0204. Any package containing dangerous waste must be labeled and manifested in accordance with WAC 173-303-370 and the *Dangerous Waste Portion of the Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Wastes* (Permit No. WA 7890008967).

2.2.3 Handling Requirements:

2.2.3.1 Package Handling: The package shall be compatible with crane lifting and movement. The package shall be equipped with lifting and other handling appurtenances designed to allow safe lifting, and movement, when fully loaded. The package shall maintain its integrity during handling, and transportation.

2.3 Quality Assurance: A QA Program (Table C.5-1.1, Deliverable 7.2) for ILAW Product development, qualification, characterization, and certification is required and shall be based upon NQA-1 (2000). The QA Plan shall address the QA/quality control requirements addressed in SW-846 and WAC 173-303-806. **(M066)**

2.4 Inspection and Acceptance: The DOE-approved ILAW Product Compliance Plan (Table C.5-1.1, Deliverable 6.3), described in Standard 6, *Product Qualification, Characterization, and Certification,* defines the content and delivery of documentation required to demonstrate compliance with the requirements of this specification. Product inspection and acceptance shall be performed in accordance with Specification 13, *Waste Product Inspection and Acceptance*, and the required

ILAW QA Program. In addition to Specification 13 requirements for ILAW, the Contractor shall conform to the Contractor Certification Program as described in DOE Manual 435.1-1, Chapter IV, Section J.(1).

Specification 3: Reserved

Specification 4: Reserved

Specification 5: Reserved

Specification 6: Reserved

Specification 7: Low-Activity Waste Envelopes Definition

7.1 Scope: This Specification establishes three LAW feed envelopes, Waste Envelopes A, B, and C. Each waste envelope provides the compositional limits for chemical and radioactive constituents in the waste feed to be provided to the WTP. The WTP shall be designed to treat the waste envelopes with the limits established in this specification. Waste composition information from TFCOUP Revision 6 is used to establish overall WTP design capacity as defined in Section C.7 and is not otherwise used for design.

7.2 Requirements:

7.2.1 References:

7.2.1.1 HNF-SD-WM-SAR-067, Revision 1-I. March 2000. *Tank Waste Remediation System Final Safety Analysis Report*. CH2M HILL Hanford Group, Inc., Richland, Washington.

7.2.1.2 HNF-SD-WM-TSR-006, Revision 1-HE. March 2000. *Tank Waste Remediation System Technical Safety Requirements*, CH2M HILL Hanford Group, Inc., Richland, Washington.

7.2.1.3 OSD-T-151-00007, Revision H-22. June 14, 2000. *Operating Specification for 241-AN, AP, AW, AY, AZ, and SY Tank Farms*. CH2M HILL Hanford Group, Inc., Richland, Washington.

7.2.1.4 DOE/RL-88-21, Revision 10. December 21, 1999. *Double Shell Tank Unit Permits Application*. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

7.2.2 Envelope Requirements:

7.2.2.1 Composition: This specification lists the concentration limits for the LAW Envelopes A, B, and C feed to be transferred by DOE to the Contractor for LAW services in Tables TS-7.1, *Low-Activity Waste Chemical Composition, Soluble Fraction Only,* and TS-7.2, *Low-Activity Waste Radionuclide Content, Soluble Fraction Only*. The concentration limits apply to the soluble fraction only. The Na concentration limits for the LAW feeds are identified below.

Waste Feed	Na (mole per liter)
Envelope A, B, C	4 – 10
AZ-101 Supernatant	2 – 5
HLW Slurry and other HLW Liquids (Defined in Specification 8, *High-Level Waste Envelope Definition*)	0.1 – 10

The LAW feeds may contain up to 3.8 weight percent (wt%) solids. Solids are defined as the product of centrifuging the LAW feed, separating and drying the solids, and removing the dissolved solids contribution. The insoluble fraction characterization will include measurements of Al, Cr, Fe, Mn, Na, P, S, Si, U, TIC, TOC, ^{60}Co, ^{90}Sr, ^{99}Tc, ^{137}Cs, ^{154}Eu, $^{239/240}$Pu, ^{241}Am, and total alpha concentrations. Trace quantities of unspecified radionuclides, chemicals, and other impurities may be present in the waste feed.

All LAW feed (soluble and insoluble components) will meet the Tank Farm Operations specifications given in OSD-T-151-00007 (except for free hydroxide), the *Tank Waste Remediation System Final Safety Analysis Report*, and *Technical Safety Requirements*, as applicable.

The radiochemical inventory of the LAW feed at the time of delivery shall be compared to the specification limits to assess compliance. The specifications for ^{60}Co, and ^{154}Eu shall apply at the time of delivery for ILAW immobilization.

The LAW feed provided shall not contain a visible separate organic phase.

The LAW feed provided will generate gases, including hydrogen and ammonia, at a nearly constant rate and a nearly uniform composition. The Contractor is responsible for the management of changes in gas release rate and distribution resulting from their waste processing activities.

Dangerous waste codes are identified in the *Double-Shell Tank System Unit Permit Application* (DOE/RL-88-21, December 21, 1999). Multi-source leachate (F039) is included as a waste derived from non-specific source wastes F001 through F005.

7.2.2.2 Radioactive Material Concentration: The maximum ^{137}Cs concentration equivalent in the transferred Envelope A, Envelope B, and Envelope C wastes feeds shall not exceed 1.2 Ci/l. The maximum ^{137}Cs concentration equivalent in the liquid fraction of Tanks AZ-101 and AZ-102 feeds shall not exceed 3.0 Ci/l.

Table TS-7.1 Low-Activity Waste Chemical Composition, Soluble Fraction Only

Chemical Analyte	Maximum Ratio, analyte (mole) to sodium (mole)		
	Envelope A	Envelope B	Envelope C[3]
Al	2.5E-01	2.5E-01	2.5E-01
Ba	1.0E-04	1.0E-04	1.0E-04
Ca	4.0E-02	4.0E-02	4.0E-02
Cd	4.0E-03	4.0E-03	4.0E-03
Cl	3.7E-02	8.9E-02	3.7E-02
Cr	6.9E-03	2.0E-02	6.9E-03
F	9.1E-02	2.0E-01	9.1E-02
Fe	1.0E-02	1.0E-02	1.0E-02
Hg	1.4E-05	1.4E-05	1.4E-05
K	1.8E-01	1.8E-01	1.8E-01
La	8.3E-05	8.3E-05	8.3E-05
Ni	3.0E-03	3.0E-03	3.0E-03
NO_2	3.8E-01	3.8E-01	3.8E-01

Table TS-7.1 Low-Activity Waste Chemical Composition, Soluble Fraction Only

Chemical Analyte	Maximum Ratio, analyte (mole) to sodium (mole)		
	Envelope A	**Envelope B**	**Envelope C[3]**
NO_3	8.0E-01	8.0E-01	8.0E-01
Pb	6.8E-04	6.8E-04	6.8E-04
PO_4	3.8E-02	1.3E-01	3.8E-02
SO_4	1.0E-02	7.0E-02	2.0E-02
TIC[1]	3.0E-01	3.0E-01	3.0E-01
TOC[2]	5.0E-01	5.0E-01	5.0E-01
U	1.2E-03	1.2E-03	1.2E-03

Notes:

1. Mole of inorganic carbon atoms/mole sodium.
2. Mole of organic carbon atoms/mole sodium.
3. Envelope C LAW is limited to complexed tank wastes from Hanford tanks AN-102 and AN-107.

Table TS-7.2 Low-Activity Waste Radionuclide Content, Soluble Fraction Only
Maximum Ratio, radionuclide to sodium (mole)

Radionuclide	Envelope A		Envelope B		Envelope C	
	Bq	uCi	Bq	uCi	Bq	uCi
TRU	4.80E+05	1.30E+01	4.80E+05	1.30E+01	3.00E+06	8.11E+01
^{137}Cs	4.30E+09	1.16E+05	2.00E+10	5.41E+05	4.30E+09	1.16E+05
^{90}SR	4.40E+07	1.19E+03	4.40E+07	1.19E+03	8.00E+08	2.16E+04
^{99}Tc	7.10E+06	1.92E+02	7.10E+06	1.92E+02	7.10E+06	1.92E+02
^{60}Co	6.10E+04	1.65E+00	6.10E+04	1.65E+00	3.70E+05	1.00E+01
^{154}Eu	6.00E+05	1.62E+01	6.00E+05	1.62E+01	4.30E+06	1.16E+02

Notes:

1. The activity limit shall apply to the feed certification date.

2. TRU is defined as: Alpha-emitting radionuclides with an atomic number greater than 92 with half-life greater than 20 years.

   Some radionuclides, such as ^{90}Sr and ^{137}Cs, have daughters with relatively short half-lives. These daughters have not been listed in this table. However, they are present in concentrations associated with the normal decay chains of the radionuclides.

   1Bq = 2.703 e-5 uCi

Specification 8: High-Level Waste Envelope Definition

8.1 Scope: This Specification establishes the HLW slurry composition and the unwashed solids composition (Envelope D). This waste envelope provides the compositional limits for chemical and radioactive constituents and physical properties in the waste feed to be provided to the WTP. The WTP shall be designed to treat the feed envelope with the limits established in this specification. Waste Composition information from TFCOUP Revision 6 is used to establish overall WTP design capacity as defined in Section C.7 and is not otherwise used for design.

8.2 Requirements:

8.2.1 References:

8.2.1.1 HNF-SD-WM-SAR-067, Revision 1-I. March 2000. *Tank Waste Remediation System Final Safety Analysis Report*. CH2M HILL Hanford Group, Inc., Richland, Washington.

8.2.1.2 HNF-SD-WM-TSR-006, Revision 1-HE. March 2000. *Tank Waste Remediation System Technical Safety Requirements*, CH2M HILL Hanford Group, Inc., Richland, Washington.

8.2.1.3 OSD-T-151-00007, Revision H-22. June 14, 2000. *Operating Specification for 241-AN, AP, AW, AY, AZ, and SY Tank Farms*. CH2M HILL Hanford Group, Inc., Richland, Washington.

8.2.1.4 DOE/RL-88-21, Revision 10. December 21, 1999. *Double Shell Tank Unit Permits Application*. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

8.2.1.5 RPP-7475, Revision 0. December 7, 2000. *Criticality Safety Evaluation of Hanford Tank Farms Facility,* CH2M HILL Hanford Group, Inc., Richland, Washington.

8.2.1.6 CPS-T-149-00012, Revision A-3. March 14, 2002. *Criticality Prevention Specification - Tank Farms Operations*.

8.2.2 High-Level Waste Slurry Description and Envelope Requirements:

8.2.2.1 Composition: The HLW slurry will contain a mixture of liquids (Envelopes A, B, or C) and solids (Envelope D). The compositional range of the liquid fraction is defined in Specification 7, *Low-Activity Waste Envelopes Definition*. For liquid fractions with a sodium molarity of less than three (3), the liquid shall be treated as if 3 molar sodium were present for feed certification purposes. The *Radioactive Material Concentration* specification contained in Specification 7.2.2.2 does not apply to Envelope A, B, or C liquids. The composition range of the Envelope D unwashed solids is given in Tables TS-8.1, TS-8.2 and TS-8.3, and TS-8.4. The feed concentration will be between 10 and 200 grams of unwashed solids/liter, except for feeds from waste Tanks AZ-101 and AZ-102, where minimum-solids content does not apply.

Compositions for Envelope D unwashed solids (Tables TS-8.1, TS-8.2 and TS-8.3, and TS-8.4) are defined in terms of elemental or anion concentrations and radionuclide activities per 100 grams equivalent non-volatile waste oxides. The non-volatile waste oxides include sodium oxide and silicon oxide.

The HLW feed components identified in Tables TS-8.1, TS-8.2, and TS-8.3 are waste components important to establishing the waste oxide loading in the HLW glass. Only these components have concentration limits, which will be used to provide the basis for certification that the HLW feed is within specification limits.

The HLW feed components identified in Table TS-8.4 are also important to HLW glass production. The concentrations of these components in the waste are not expected to exceed the maximum values listed in Table TS-8.4. Information on these components will be provided to support product and process qualification but will not be used as a basis for determining if the feed meets specification requirements.

All HLW feed (soluble and insoluble components) will meet the Tank Farm Operations specifications given in OSD-T-151-00007 (except for free hydroxide), the *Tank Waste Remediation System Final Safety Analysis Report* (HNF-SD-WM-SAR-067), and *Technical Safety Requirements* (HNF-SD-WM-TSR-006, Revision 1-D) as applicable. The radiochemical inventory of the waste feed at the time of delivery shall be compared to the specification limits to assess compliance.

Trace quantities of unspecified radionuclides, chemicals, and other impurities may be present in the waste feed. Feed will be delivered by pipeline in batches. Limits apply to the total retrievable contents of waste from a feed tank. Some elements, components, and isotopes are determined by calculation and not analytic measurement.

The HLW feed provided will not contain a visible separate organic layer.

The HLW waste provided will generate gases due to radiolysis including hydrogen and ammonia at a nearly constant rate and nearly uniform composition. The Contractor is responsible for the management of changes in gas release rate and distribution resulting from their waste processing activities.

Applicable dangerous waste codes are identified in the *Double-Shell Tank System Unit Permit Application* (DOE/RL-88-21, December 21, 1999). Multi-source leachate (F039) is included as a waste derived from non-specific source wastes F001 through F005.

Table TS-8.1 High-Level Waste Feed Unwashed Solids Maximum Non-Volatile Component Composition (grams per 100 grams non-volatile waste oxides)

Non-Volatile Element	Maximum (grams / 100 grams waste oxides)	Non-Volatile Element	Maximum (grams / 100 grams waste oxides)
As	0.16	Pu	0.054
B	1.3	Rb	0.19
Be	0.065	Sb	0.84
Ce	0.81	Se	0.52
Co	0.45	Sr	0.52
Cs	0.58	Ta	0.03
Cu	0.48	Tc	0.26
Hg	0.1	Te	0.13
La	2.6	Tl	0.45
Li	0.14	V	0.032
Mn	6.5	W	0.24
Mo	0.65	Y	0.16
Nd	1.7	Zn	0.42
Pr	0.35		

Table TS-8.2 High-Level Waste Feed Unwashed Solids Maximum Volatile Component Composition (grams per 100 grams non-volatile waste oxides)

Volatile Components	Maximum (grams / 100 grams waste oxides)
Cl	0.33
CO_3^{-2}	30
NO_2	36 (total NO_2/NO_3) as NO_3
NO_3	
TOC	11
CN	1.6
NH_3	1.6

Table TS-8.3 High-Level Waste Feed Unwashed Solids Maximum Radionuclide Composition (Curies per 100 grams non-volatile waste oxides)

Isotope	Maximum (Ci / 100 grams waste oxides)	Isotope	Maximum (Ci / 100 grams waste oxides)	Isotope	Maximum (Ci / 100 grams waste oxides)
^{3}H	6.5E-05	^{129}I	2.9E-07	^{237}Np	7.4E-05
^{14}C	6.5E-06	^{137}Cs	1.5E00	^{238}Pu	3.5E-04
^{60}Co	1E-02	^{152}Eu	4.8E-04	^{239}Pu	3.1E-03
^{90}Sr	1E+01	^{154}Eu	5.2E-02	^{241}Pu	2.2E-02
^{99}Tc	1.5E-02			^{241}Am	9.0E-02
^{125}Sb	3.2E-02	^{233}U	4.5E-06 (all tanks except AY-101/C-104)(2.0E-04 for AY-101/C-104 only)	$^{243+244}Cm$	3.0E-03
^{126}Sn	1.5E-04	^{235}U	2.5E-07		

Table TS-8.4 Additional High-Level Waste Feed Unwashed Composition for Non-Volatile Components (grams per 100 grams non-volatile waste oxides)

Non-Volatile Element	Maximum (grams / 100 grams waste oxides)	Non-Volatile Element	Maximum (grams / 100 grams waste oxides)
Ag	0.55	Ni	2.4
Al	14	P	1.7
Ba	4.5	Pb	1.1
Bi	2.8	Pd	0.13
Ca	7.1	Rh	0.13
Cd	4.5	Ru	0.35
Cr	0.68	S	0.65
F	3.5	Si	19
Fe	29	Ti	1.3
K	1.3	U	14
Mg	2.1	Zr	15
Na	19		
Th	5.0		

Specification 9: Liquids or Slurries Transferred to DOE Tanks by Pipeline

9.1 Scope: This Specification defines the requirements for the return of any feed material to the Hanford tanks.

9.2 Requirements:

9.2.1 References:

9.2.1.1 Greenburg, A.E., L.S. Clesceri, and A.D. Eaton, eds. *Standard Methods for the Examination of Water and Wastewater*. 19th edition 1995, American Public Health Association, Washington, D.C.

9.2.2 Product Requirements:

9.2.2.1 Product Composition: The elemental composition of the product shall be provided: (1) for all elements (excluding oxygen) constituting more than 0.5 weight percent (wt%) of the product on a dry basis; (2) for all radionuclides present in concentrations greater than five percent of the total activity; and (3) for all elements and compounds required to meet regulatory or Contract requirements.

9.2.2.2 Composition Limits and Transport Properties: The composition and transport properties shall comply with all applicable Hanford Site tank farms waste acceptance criteria.

9.2.2.3 Criticality: The plutonium (Pu) concentration in the returned material shall meet all applicable Hanford Site tank farm criteria. The isotopic concentration of the fissile materials in the returned product shall be provided to DOE prior to transfer.

9.2.2.4 Storage: A visible separate organic phase shall not develop during prolonged storage of the product materials in the Double-Shell Tank System.

9.2.2.5 Heat Generation: The Contractor shall determine and report the heat generation rate for product in the Secondary Wastes Compliance Plan (Table C.5-1.1, Deliverable 6.1).

9.2.2.6 Physical Parameters: The Contractor shall determine and report the specific gravity, viscosity, solids content, particle size distribution and particle density, pH, and temperature of the product at the time of transfer to DOE. Procedure 2540F, *Settled Solids*, from *Standard Methods for the Examination of Water and Wastewater*, or an equivalent methodology shall be used to determine the volume of solids in the liquid or slurry.

9.2.2.7 Radioactive Material Concentration: The returned intermediate product shall not contain more than 6 curies per liter (Ci/l) equivalent of ^{137}Cs. The Contractor shall dilute the returned product, if necessary, to achieve this concentration limit.

9.2.2.8 Prevention of Exothermic Reaction: The returned intermediate product shall not have the potential for an exothermic reaction.

9.2.3 Handling Requirements: None

9.3 Inspection and Acceptance: The Secondary Wastes Compliance Plan, described in Standard 6, *Product Qualification, Characterization, and Certification,* defines the content and delivery documentation required to demonstrate compliance with the requirements of this specification. Product inspection and acceptance shall be performed in accordance with Specification 13, *Waste Product Inspection and Acceptance.*

Specification 10: Reserved

Specification 11: Reserved

Specification 12: Procedure to Determine the Waste Feed Treatment Approach

12.1 Scope: This Specification defines requirements to develop a procedure to determine the waste feed treatment approach for a batch of feed slurry. Waste feed treatment requirements to caustic leach, or oxidative leach shall be established based on results of this testing.

12.2 Requirements:

12.2.1 References: None.

12.2.2 Waste Treatment Flowsheet: The process flowsheet for waste feed caustic leaching, and oxidative leaching shall be approved by DOE as required by Standard 2 (a)(3)(iii). The Contractor shall implement the approved process flowsheet during facility operations.

12.2.3 Procedure:

12.2.3.1 Procedure Objective: During WTP operations, including hot commissioning, testing shall be performed to predict the quantity of IHLW and ILAW product produced in WTP as a result of (1) solids washing; (2) caustic leaching and washing; and (3) caustic leaching, washing, and oxidative leaching.

12.2.3.2 Procedure Definition: The Contractor shall establish a laboratory test procedure to prescribe waste treatment within the given design and operating capabilities of the WTP. The procedure shall take a representative sample of slurry, characterize the initial sample, characterize the sample after treatment, forecast the quantity of IHLW product and ILAW product produced as a result of the plant process, and prescribe the process conditions for optimizing facility performance during the treatment process. The prescribed process shall consider all reagents, process parameters, and recycle impacts associated with waste treatment. The Contractor shall define the process location from where the representative sample of slurry is taken. Definition of this point shall consider representativeness of the sample, heel blending, recycle, and requirements for process control. The procedure shall be submitted to DOE for review and approval.

12.2.4 Criteria: The Contractor shall propose specific criteria to determine the required waste treatment approach for DOE's approval. These criteria will be based on objectives to reduce the number of IHLW canisters, shorten WTP processing mission duration, and reduce WTP operations cost. Minimization of IHLW produced will have greater importance than minimization of ILAW produced.

12.3 Quality Assurance: A QA Program (Table C.5-1.1, Deliverable 7.2) for the work to be performed is required. The QA Program shall be based upon NQA-1. **(M066)**

Specification 13: Waste Product Inspection and Acceptance

13.1 Scope: This Specification defines the protocol for acceptance and transfer of waste products (ILAW product and IHLW product) to DOE and defines the contents of Deliverable 5.13 (Resultant Products from Hot Commissioning), per requirements in Standard 5.

13.2 ILAW Product and Production Acceptance Requirements:

13.2.1 Acceptance of ILAW Product for On-Site Disposal

Acceptance of ILAW product shall be based on certification by the Contractor that the ILAW product (i.e., containerized waste form) has been provided in compliance with the requirements of Standard 6, *Product Qualification, Characterization, and Certification*, and Specification 2, *Immobilized Low Activity Waste*. The certification and acceptance of ILAW product shall be done on a lot basis. The lot size shall be proposed by the Contractor, and agreed to by DOE. The lot size shall consider the compliance strategy for process/product control of the ILAW product to comply with applicable Specification 2 requirements, capacity for lag storage, and requirements for the interface with the on-site transportation and disposal operations.

Physical transfer of the ILAW product shall be conducted in accordance with ICD 15.

13.2.2 Compliance of ILAW Product with Hot Commissioning Capacity Testing Criteria

The Contractor shall submit the production records to comply with Deliverable 5.13 (Resultant Products for Hot Commissioning) to certify that the ILAW product complies with the requirements for the Hot Commissioning Capacity Testing identified in Standard 5 (*Hot Commissioning Capacity Tests*). The content of the ILAW production documentation shall include, but not be limited to, the following information:

- Number of ILAW glass-filled product containers produced (lot basis).
- Number of ILAW glass-filled product containers transferred to on-site disposal.
- Certification of compliance for each ILAW glass-filled product container (lot basis).
- Summaries of the following information for each ILAW product unit produced during commissioning (lot basis):
    - Sodium waste loading
    - Radionuclide content
    - Non-Radionuclide chemical composition
    - Glass weight and percent fill per container

In the event the ILAW glass-filled product is identified as not meeting all requirements of Specification 2, the ILAW product will be classified as non-conforming. The Contracting Officer shall be notified within twenty-four (24) hours after the Contractor has determined that a non-conforming product has been produced.

A corrective action plan shall be prepared that describes how to convert the non-conforming condition to a non-standard condition, with the latter condition enabling the product to be acceptable for on-site disposal.

The corrective action plan shall also describe how to prevent recurrence of the non-conforming condition.

DOE acknowledges that during the transition between Cold Commissioning and Hot Commissioning that a limited number of ILAW containers will be produced that do not meet the waste loading requirements as identified in Specification 2.2.2.2. DOE will accept these containers and provide credit for these containers in the Hot Commissioning Capacity Test. The Contractor shall describe the approach to minimize the number of containers that do not meet waste loading requirements in the commissioning plan.

Non-conforming ILAW product other than as noted above will not be credited for determination of the WTP plant production capability, per the Hot Commissioning Capacity Testing.

13.2.3 DOE Acceptance of Production Documentation

The DOE Contracting Officer will be responsible for reviewing the submitted production documentation for compliance with Specification 2, and notifying the Contractor, within thirty (30) days, as to whether compliance was achieved.

13.3 IHLW Product and Production Acceptance Requirements:

13.3.1 Acceptance of IHLW Product for On-Site Interim Storage

Acceptance of IHLW product for on-site interim storage shall be based on certification by the Contractor that the subject IHLW product (i.e., containerized waste form) has been provided in compliance with the requirements of Standard 6, *Product Qualification, Characterization, and Certification*, and Specification 1, Immobilized *High Level Waste*. The certification and acceptance of IHLW product shall be done on a lot basis. The lot size shall be proposed by the Contractor and agreed to by DOE. The lot size shall consider the compliance strategy for process/product control of the IHLW product to comply with applicable Specification 1 requirements, capacity for lag storage, and requirements for the interface with the on-site transportation and on-site interim storage operations.

Physical transfer of the IHLW product shall be conducted in accordance with ICD 14.

13.3.2 Compliance of IHLW Product with Hot Commissioning Capacity Testing Requirements

The Contractor shall submit the production records to comply with Deliverable 5.13 (Resultant Products for Hot Commissioning) to certify that the IHLW product complies with the requirements for the Hot Commissioning Capacity Testing, identified in Standard 5(*Hot Commissioning Capacity Tests*). The content of the IHLW production documentation shall be consistent with the IHLW Waste Form Compliance Plan (Deliverable 6.2, Table C.5-1.1) and include, but not be limited to the following information:

- Number of IHLW glass-filled product canisters produced (lot basis).
- Number of IHLW glass-filled product containers transferred to on-site disposal.
- Certification of compliance for each IHLW glass-filled product container (lot basis).
- Summaries of the following information for each IHLW product unit produced during commissioning (lot basis):

- Waste loading
- Radionuclide content
- Non-Radionuclide chemical composition
- Glass weight and percent fill per container

In the event the IHLW glass-filled product is identified as not meeting all requirements of Specification 1, the IHLW product will be classified as non-conforming. The Contracting Officer shall be notified within twenty-four (24) hours after the Contractor has determined that a non-conforming product has been produced.

The non-conforming IHLW product shall be clearly identified. A corrective action plan shall be prepared that describes how to convert the non-conforming condition to a non-standard condition, with the latter condition enabling the product to be acceptable for on-site interim storage.

The corrective action plan shall also describe how to prevent recurrence of the non-conforming condition.

DOE acknowledges that during the transition between Cold Commissioning and Hot Commissioning that a limited number of IHLW product canisters will be produced that do not meet the waste loading limits as identified in Specification 1. DOE will accept these canisters and provide credit for these canisters in the Hot Commissioning Capacity Test. The Contractor shall describe the approach to minimize the number of canisters that do not meet waste loading requirements in the commissioning plan.

Non-conforming IHLW product other than noted above will not be credited for determination of the WTP plant production capability, per the Hot Commissioning performance testing.

13.3.3 DOE Acceptance of Production Documentation

The DOE Contracting Officer will be responsible for reviewing the submitted production documentation for compliance with Specification 2, and notifying the Contractor, within thirty (30) days, as to whether compliance was achieved.

C.9 INTERFACE CONTROL DOCUMENTS

This Section provides the requirements for ICDs that describe the physical and administrative interfaces among DOE, ORP, the Tank Farm Contractor, and other Hanford Site contractors.

The RPP involves two or more contractors, under contract to ORP that carry out the functions necessary to achieve the RPP mission. The WTP facilities are located on the Hanford Site and will rely upon other organizations to provide support services. In order to assure that the efforts and facilities are coordinated, a formal system of interface management was developed by RPP. The objective of the interface management system is to assure documentation and management of shared responsibilities for: (1) transfer of energy, data, or materials; and (2) development, operation, and maintenance of physically compatible facilities and subsystems.

The approach to managing the interfaces is based upon development of ICDs that identify the requirements, roles, and responsibilities for all parties to the interface.

(a) (1) An initial set of ICDs was prepared as part of the WTP Conceptual Design:

ICD 1: Raw Water
ICD 2: Potable Water
ICD 3: Radioactive Solid Wastes
ICD 4: Reserved
ICD 5: Non-Radioactive, Non-Dangerous Liquid Effluents
ICD 6: Radioactive, Dangerous Liquid Effluents
ICD 7: Reserved
ICD 8: Reserved
ICD 9: Land for Siting
ICD 10: Reserved
ICD 11: Electricity
ICD 12: Roads
ICD 13: Reserved
ICD 14: Immobilized High-Level Waste
ICD 15: Immobilized Low-Activity Waste
ICD 16 Reserved
ICD 17: Reserved
ICD 18: Reserved
ICD 19: Waste Feed
ICD 20: Reserved
ICD 21: Reserved
ICD 22: Reserved
ICD 23: Waste Treatability Samples
ICD 24: Reserved
ICD 25: Inactive
ICD 26: Reserved
ICD 27: Inactive

(2) Post-award ICDs:

ICD 28: Pit 30 Aggregate Supply for Construction
ICD-29 Waste Na

(b) The Contractor shall update the ICDs as required throughout the period of Contract performance. ICDs shall reflect all interfaces and services needed in the construction and performance testing phases, and projected interface and services needed for the future commissioning and operating phases. The ICDs shall be managed in accordance with the Interface Management Plan (Table C.5-1.1, Deliverable 1.4).

(c) The Contractor shall ensure that the ICDs include, at a minimum, details on the following areas consistent with the maturity of the project:

(1) Physical Interfaces:

(i) Location and description of each hand-off point;

(ii) Interface block diagrams and schematics that clearly define organizational responsibilities for each interface (e.g., ownership, construction, and maintenance);

(iii) Type, quantity, and composition of material;

(iv) Packaging requirements;

(v) Design drawings (as appropriate); and

(vi) Operations and maintenance requirements.

(2) Administrative Interfaces:

(i) Procedures that define the administrative transfer of interface items (e.g., who, what, when, where, and how).

(ii) Linkage to the integrated RPP and individual Contractor project baseline. These schedules and logic must contain detail that demonstrates that the key ICD events or milestones are achievable.

(iii) Documentation necessary for official hand-off of interface items.

(iv) Authorization basis and permitting integration.

(3) Acceptance Criteria shall be developed for every hand-off item.

(d) Changes to ICDs will be made in accordance with Standard 1, *Management Products and Controls*.

SECTION F

DELIVERIES OR PERFORMANCE

SECTION F

DELIVERIES OR PERFORMANCE

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SECTION F

DELIVERIES OR PERFORMANCE

F.1 PERIOD OF PERFORMANCE AND DELIVERY DATES

The period of performance for this Contract shall extend from the date of Contract award in SF-33, *Solicitation, Offer, and Award* until August 15, 2019.

F.2 PRINCIPAL PLACE OF PERFORMANCE

The principal location of performance for construction management, procurement, acceptance testing, and commissioning under the Contract will be land on the Government's Hanford Site near Richland, Washington, as described in Interface Control Document (ICD) 9, *Land for Siting*.

F.3 FAR 52.242-15 STOP-WORK ORDER (AUG 1989) -- ALTERNATE I (APR 1984)

(a) The Contracting Officer may, at any time, by written order to the Contractor, require the Contractor to stop all, or any part, of the work called for by this Contract for a period of 90 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop-work order issued under this Clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allowable to the work covered by the order during the period of work stoppage. Within a period of 90 days after a stop-work order is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, the Contracting Officer shall either-

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Termination clause of this Contract.

(b) If a stop-work order issued under this clause is canceled or the period of the order or any extension thereof expires, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule, the estimated cost, the fee, or a combination thereof, and in any other terms of the contract that may be affected and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allowable to, the performance of any part of this contract; and

(2) The Contractor asserts a claim for the adjustment within 30 days after the end of the period of work stoppage; provided, that, if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon the claim asserted at any time before final payment under this Contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT I – FUNDING PROFILE

Fiscal Year (FY)	Budget Authority ($1M)*
2001	$ 348**
2002	$ 671**
2003	$ 676**
2004	$ 682**
2005	$ 695**
2006	$ 487**
2007	$ 614**
2008	$ 741**
2009	$ 690
2010	$ 690
2011	$ 690
2012	$ 690
2013	$ 690
2014	$ 690
2015	$ 690
2016	$ 690
2017	$ 690
2018	$ 690
2019	$ 690

*Includes Contractor Fee
** Actual Funding Amounts As of Modification No. A143

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT J
ADVANCE UNDERSTANDING ON COSTS

1. Allowable costs for WTP project-specific travel and relocation shall be in accordance with the Bechtel Systems & Infrastructure, Inc. (BSII) policy dated July 3, 2008 (Revision 14), effective April 01, 2008, submitted under BNI letter CCN 162481 dated April 07, 2008. However, payments made under 2.7 d) [previously 3.7 d) under Revision 3] and 3.17 c) therein for tax assistance "gross up" shall be an unallowable cost prior to July 29, 2002, and an allowable cost thereafter. **(M134)**

2. Allowable costs for WTP project-specific BNI employee permanent assignment compensation benefit shall be in accordance with the BNI Project Assignment Incentive (PAI), Revision 10 (dated February 2008), effective April 01, 2008.

   Historical Notes:
   - The tax assistance portion "gross-up" of the PAI, in effect until February 26, 2007, shall be an unallowable cost. This "gross up" was eliminated with the issuance of PAI, Revision 9.
   - The minimum 150-mile limit for recruited college students from Washington State University (Pullman Campus only) and Eastern Washington University (Cheney campus only) is waived and PAI payments for such eligible recruited employees shall be allowable, subject to other allowability tests required under the contract, until April 01, 2008, at which time the limit was eliminated with PAI, Revision 10. **(M126)**

3. During 2001, BNI implemented an internal Six Sigma Program to provide a clear means of work process measurement and continuous process improvement that is expected to result in a net overall reduction in incurred costs under the Contract. Costs to implement the BNI Six Sigma Program are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy Acquisition Regulation.

4. Costs to implement the BNI Sharing For Success Program to enhance craft productivity and reduce overall project costs are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy Acquisition Regulation.

5. Effective from the date of Contract award, facilities capital cost of money shall be an allowable cost under the Contract, provided the criteria for allowability in FAR 31.205-10 are met.

6. Costs to implement the BNI Employee Recognition Program to support individual and team accomplishments and encourage the achievement of Project goals are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy Acquisition Regulation.

7. Costs incurred in connection with hedging contracts entered into in connection with foreign currency purchases, including but not limited to the purchase cost, rollover costs to adjust a hedging contract to a new date in the event the payment date is delayed, and closure costs in the event a procurement is canceled, are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy Acquisition Regulation.

8. Costs to implement the BNI Vanpool Program to encourage project craft and nonmanual vanpooling are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy

Acquisition Regulation.

9. Costs incurred in connection with the Washington State Retrospective Rating Program connected with Workers Compensation, including but not limited to surcharges, are considered allowable costs under the Contract, subject to other required tests of allowability under the Contract, the Federal Acquisition Regulation, and the Department of Energy Acquisition Regulation.

10. Multiple Employer Pension Plan (MEPP)

    a. The costs and expenses of the Contractor's participation in the Multiple Employer Pension Plan (MEPP) are allowable contract costs to the same extent as those costs are allowable under Contract No. DE-AC06-96RL13200.

    b. In the event that the Contractor withdraws from the MEPP, in accordance with the terms of the MEPP, the Contractor's withdrawal liability, if any, shall be an allowable cost of the Contract subject to availability of funds under the contract.

    c. In the event that the MEPP is overfunded at the time of the Contractor's withdrawal and the Contractor does not receive a cash disbursement of its share of such overfunding, ORP hereby waives the Contractor's obligations, if any, under FAR 52.215-15(b) to make payments to DOE, or otherwise adjust the Contractor's allowable costs, with respect to any amounts otherwise assessed in accordance with CAS 413-50(c)(12).

    d. In the event that the Contractor becomes the last sponsoring employer of the MEPP, the Parties shall modify this agreement to address appropriate termination provisions and funding requirements.

    e. This Advance Understanding shall be revised from time to time to incorporate any changes in the those policies, practices, and procedures the related costs and expenses related to the MEPP.

11. The following Pending Items and Trends are incorporated by reference in Modification A029.

Case No.	Title
	Issued to ORP
4	PI-24590-01-00065 Additional Security Badging Requirements
18	PI-24590-01-00093 Model Recovery, Maintainability, and RAMI Development
6	PI-24590-01-00099 Construction Emergency Response Plan (Addendum for FH site emergency preparedness program)
21	PI-24590-01-00112 Addition of C2 Filtration (HEPA) to Pretreatment, LAW and HLW Facilities
	PI-24590-01-00117 Commissioning Maintenance Requirements
17	PI-24590-01-00118 Plant Operator Qualification & Training Facility
	PI-24590-01-00119 Commissioning Materials & Vendor Support
	PI-24590-01-00120 Commissioning Testing and Operations Requirements
	PI-24590-01-00121 Risk Assessment and Reporting
19	PI-24590-01-00122 Analytical Laboratory and Temporary Laboratory Facilities
	PI-24590-01-00131 Hazards/Accident Analysis Post PSAR Submittal
	PI-24590-01-00133 Commissioning Procedure Writers
	PI-24590-01-00135 QC Support to Commissioning
	PI-24590-01-00136 Commissioning Training
	PI-24590-01-00138 Environmental Interface
	PI-24590-01-00140 Operation Authorization Request (OAR) Development and Authorization Basis Maintenance
	PI-24590-01-00142 Compliance with ISMS DEAR Clause, Safeguards and Security

Case No.	Title
	PI-24590-01-00143 Pilot Scale Facility
10	PI-24590-01-00147 Pulsed Jet Mixer Testing
16	PI-24590-01-00150 LAW Canister Level Control
	PI-24590-01-00153 A1-Incomplete WTP Conceptual Design - NOC & Sanitary Sewer
	PI-24590-01-00153 A2 - Incomplete WTP Conceptual Design - SAP & CAR
	PI-24590-01-00153 B - Incomplete R&T WTP Conceptual Design work (5 PIs)
19	PI-24590-01-00154 HLW Melter Cell Reconfiguration Due to LAB Reconfiguration
13	PI-24590-01-00165 Vitrification, Rheology & Regulatory Analysis for the Rework of AZ-102 (Envelope B)
2	PI-24590-01-00170 LAW Annex Modifications
23	PI-24590-01-00181 Operations & Maintenance C3 Area Temperatures
23	PI-24590-01-00194 Study Associated with C3 Temperatures
	PI-24590-01-00197 Technical Integration Baseline Development Team
	PI-24590-01-00201 LAW Throughput Increase to 45 MTG
	PI-24590-01-00246 ES&H Fire Protection Support Program
27	PI-24590-01-00278 Change in LAW Concrete and Structural Steel Quality Class
	PI-24590-01-00309 Revised Scale-Up Ion Exchange Resin Quantities
	PI-24590-01-00311 Radiological Safety Support
3	PI-24590-02-00335 LAW Bubbler Failures Below the Melt Line
	2001 Approved Trends
1	PI-24590-01-00173 Detailed Study & Process Plan for Resolving Mercury Issues in Waste Feed
14	PI-24590-01-00174 Maximum Achievable Control Technology
14	PI-24590-01-00316 Mercury mitigation for LAW Melter & Offgas
14	PI-24590-01-00327 Incorporate Activated Carbon Column in HLW Melter Offgas
	PI-24590-01-00143 PT Integrated Pilot Facility - Infrastructure & Testing IX Processes
	2002 Approved Trends
12	PI-24590-02-00341 Radiological Monitoring Standards Change from ANSI-N13.1-1969 to 1999
7	PI-24590-02-00356 Critical Decision 3 - Extended Independent Review
22	PI-24590-02-00358 Steam Reformer Technology Demonstration Acquisition
20	PI-24590-02-00382 Evaluate and Test CS & TC Exchange Resins
15	PI-24590-02-00395 DOE Order 420.1 Fire Safety Impact Assessment Study
	PI-24590-02-00396 Melt Pool Corrosion of LAW Bubblers (Part 2)
	PI-24590-02-00398 Evaluation of Seismic Safety DOE 420.1 Impact
	PI-24590-02-00405 LAB - Cost Reductions
	PI-24590-02-00415 Initial Testing of Steam Reforming Waste Product
	PI-24590-02-00431 DWPA Phased Approach
	PI-24590-02-00447 Pour Tunnel Catch Tank
	PI-24590-02-00453 Increase Pour Cave Cooling
	PI-24590-02-00508 Sales and Use Tax
25	PI-24590-02-00516 Regulatory Compliance Matrix
	PI-24590-02-00539 Lab Rad Effluent Line
	PI-24590-02-00550 Develop Implementation Plan & Start Testing of Alt. Resins
	PI-24590-02-00581 Mixing Tests and Computational Fluid Dynamic Modeling by R&T for PT and HLW
	PI-24590-02-00586 Delete BOF Encapsulation Facility from WTP

Case No.	Title
	PI-24590-02-00587 Modify BOF Spent Melter Staging Facility
	PI-24590-02-00589 Eliminate BOF Melter Assembly Building
	PI-24590-02-00590 Delete BOF Central Waste Storage Facility
	PI-24590-02-00591 Eliminate BOF Administration Building from WTP Site
	PI-24590-02-00601 Modification to HLW Melter Cave Support Handling System Shielding/Containment and Decontamination
	PI-24590-02-00635 Mercury - Sulfur Impregnation Carbon Tests
	PI-24590-02-00637 Mercury R&T Studies
	PI-24590-02-00665 Replace Welded Sealing of LAW Containers with Mechanical Sealing
	PI-24590-02-00666 Eliminate Tc Ion Exchange System (pending approval)
	PI-24590-02-00688 Stage 1 Cs Alternative Resin Testing
	PI-24590-02-00700 Develop Estimate for Implementing DOE Order 435.1
	PI-24590-02-00706 2 + 2 Melter Option
	PI-24590-02-00723 Commissioning and Training Cost Savings Initiatives
	PI-24590-02-00725 Schedule Impact of Cumulative Changes
	PI-24590-02-00728 Alternate Cesium Ion Exchange Resin Testing: Stages II & III
	PI-24590-02-00742 Develop Supplemental EIS Data Package
	PI-24590-02-00744 Include Battelle R&T Sample Residue Handling & Disposal
	PI-24590-02-00754 Foreign Travel Coordinator DEAR 952-247-70
	PI-24590-02-00758 Replace Uniform Building Code with International Building Code for Fire Proofing Design
	PI-24590-02-00779 Trend Implementation Variance vs. Approved ROM
	PI-24590-02-00782 R&T Testing of Ion Exchange Pressure Drop Issue

All items above may have subsequent update revisions, interpretations, or other clarifications that are agreed to by letter. Such updates shall be deemed to be incorporated by reference where stated.

12. The Contractor's Employee Referral Bonus Program is an allowable cost for a period of two years, from March 26, 2007 to March 25, 2009, with a not-to-exceed total cost of $150,000. The policies establishing the program, and the applicable time periods are:

    - Program as contained in contractor letter, CNN 146882, dated March 13, 2007, applies to the period March 26, 2007 through March 25, 2008.
    - Program as contained in contractor letter CCN 162480, dated April 1, 2008, applies to the period March 26, 2008 through March 25, 2009. **(M086, M123)**

13. The following requirements are incorporated into and made a part of this contract. Not-To-Exceed amounts for these items have been authorized. Certain elements of these modifications were definitized by Modification No. A143. **(M101) (M130) (M136) (A143)**

DOCUMENT ID.	TITLE
TN 24590-03-01341	Seismic Attenuation Study to Support ORP **(M101)**
TN 24590-03-01071	Maximum Achievable Control Technology/ Destructive and Removal Efficiency Testing **(M101)**
TN 24590-03-01318	Supplemental LAW Treatment Study **(M101)**
TN 24590-03-01317	QA Testing of HEPA Filters at DOE Filter Test Facility (FTF) **(M101)**
TN 24590-03-01482	Earned Value Management System (EVMS) Criteria Crosswalk **(M101)**
TN 24590-03-01315	PTF Black Cell Access Trend **(M101)**
TN 24590-03-01213	Concentrate Receipt Vessels (CRV) Deletion **(M102)**
TN 24590-05-01906	PNNL Seismic Borehole Drilling Support **(M102)**
BCP-24590-06-02279	Expansion of DWP Requirements (Permit Modifications) **(M122) (M130)**
TN 24590-06-01930	Technical Feasibility Study of WTP Startup Sequencing **(M098) (M130)**
TN 24590-06-02430	Perform Impact Assessment of Borehole Data **(M098) (M130)**
BCP-24590-06-03419	Implementation of ASME NQA-1 2000 and QARD Revision 18 for performance by BNI subcontractor Duratek, Inc. **(M135)**
ORP 08-NSD-011 (05/20/08) (CCN 179512)	ORP Direction to Implement New Preliminary Safety Analysis Report (PSAR) Updates **(M136)**
ORP 08-AMD-213 (10/06/08) (CCN 187713)	DOE ORP Direction to Cancel the Temporary Low Activity Waste (LAW) Melter Assembly Building Procurement **(M141)**
ORP 08-NSD-057 (10/09/08) (CCN 188218)	Direction to Implement New Safety Classification Process for the Waste Treatment and Immobilization Plant (WTP) **(M141)**

14. (Reserved)

15. (Reserved)

16. The following Advance Agreements are incorporated and made a part of this contract. **(M130)**

TITLE	REFERENCES
Offsite Beryllium Medical Exam Costs **(M130)**	CCN 150302 (06-ESQ-166; 28DEC06)
Relocation Costs Associated with Establishing a Frederick, MD WTP Project Office **(M130)**	Advance Agreement signed by J. J. Short/C. E. Rogers 20JUL06; CCN 143197

Steps to Bring BNI Billings and DOE Financial System into Agreement **(M130)**	Advance Agreement signed by J. J. Short/C. E. Rogers 24JUL06; CCN 143195
Costs Related to Safety Award to WTP Construction Site Employees **(M130)**	Advance Agreement signed by T. M. Williams/N. F. Grover 28NOV07; CCN 169002
Costs Related to WTP College Hire Conference **(M130)**	Advance Agreement signed by T. M. Williams/N. F. Grover 08AUG07; CCN 169228
Costs Related to Per Diem Expenses for Certain Employees **(M130)**	Advance Agreement signed by T. M. Williams/N. F. Grover 03JUL07; CCN 169230
Costs Related to Living Away From Home Option (LAFHO) **(M130)**	Advance Agreement signed by T. M. Williams/N. F. Grover 12DEC07; CCN 169233
Costs Related to Voluntary Protection Program (VPP) **(M133)**	Advance Agreement signed by T. M. Williams/N. F. Grover 20JUN08; CCN 181338
Costs Related to Per Diem Expenses for Specific Employees July 2008 **(M134)**	Advance Agreement signed by T. M. Williams/N. F. Grover 18JULY08; CCN 184046

17. Dollar thresholds for obtaining Contracting Officer approval prior to BNI incurring costs for repair or replacement of Government Property resulting from damage, and/or the need for unscheduled non-routine corrective maintenance/rehabilitation – are specified in CCN 179128, Letter from N.F. Grover, BNI to T.M. Williams, ORP, "Repairs Incidental to Corrective Maintenance or Damage," dated August 28, 2008, and are incorporated into this contract." **(M136)**

18. Inclusions from Equitable Adjustment Settlement. The Trends and Baseline Change Proposals listed on Attachment J, Sub-attachment A are specifically included in the Statement of Release with Modification No. A143, and are released from any further equitable adjustment. **(A143)**

19. Exclusions from Equitable Adjustment Settlement. The Modifications, Trends and Baseline Change Proposals listed on Attachment J, Sub-attachment B are specifically excluded from the Statement of Release with Modification No. A143, and may be eligible for equitable adjustment provided all Contract change requirements are met. **(A143)**

TREND #	TREND DESCRIPTION
TN-24590-05-01906	PNNL Seismic Borehole Drilling Support
TN-24590-05-02086	Hexavalent Chromium Standards
TN-24590-05-02109	Construction Late Adjustments Transfer
TN-24590-06-02119	C&I Lab Safety Program Implementation
TN-24590-06-02121	Ejector Addition to PWD-SUMP-00004
TN-24590-06-02122	BNI Analysis of NWC Vessels
TN-24590-06-02124	Add Under Flange Swab for LAW Swabbing System
TN-24590-06-02125	Revised Ground Motion Criteria for SC-III
TN-24590-06-02126	Elimination of LAW PPJ Annunciator Panels
TN-24590-06-02127	Unanticipated Growth in MET Support and Noise Assess
TN-24590-06-02130	NAR/SHR Tank Separation Berm
TN-24590-06-02131	C&I Datasheet EPPR Restructure
TN-24590-06-02132	Laser Ablation Procurement Budget Reallocation
TN-24590-06-02133	PJV Creep Additional Testing to Eliminate ALARA Concerns
TN-24590-06-02134	Humphries & Assoc. Contract Modification
TN-24590-06-02135	Funding for 12 Each PVP and PJV Valves
TN-24590-06-02136	Add Stack Discharge Sample/Monitor Piping to 3D Models
TN-24590-06-02138	Procedure Compliance Checklists and Isometric Second Checking
TN-24590-06-02139	Impacts due to Unidynamics Bankruptcy
TN-24590-06-02140	WTP Activated Carbon Temperature Modeling and Detection Limit Development
TN-24590-06-02141	Improvement of PWD-SUMP-00040 Leak Detection Capability
TN-24590-06-02142	Redistribution of LBL Production Hours
TN-24590-06-02143	PTF Committed Phase Design for System CXP & HLW Dryer and Melter Flush Lines
TN-24590-06-02144	Increased Effort for MH Packaged Equipment Integrated Testing & Drawing Review
TN-24590-06-02147	LAW Off-Gas Ancillary SCIV Piping
TN-24590-06-02149	Update Documents for HLW Joggles
TN-24590-06-02151	Large Piping Loads to PTF at Elevation 67' - 4
TN-24590-06-02152	C&I Bulk Analysis
TN-24590-06-02153	Establish Planning Packages in Current OTB
TN-24590-06-02154	Termination Settlement for Trentec PO# 24590-QL-POA-ADDH-00005
TN-24590-06-02155	FNM Budget Hours Transfer from Plant Wide to Facilities
TN-24590-06-02156	Plant Design Re-plan
TN-24590-06-02157	Large Bore Pipe Support Jobhour Adjustment
TN-24590-06-02164	HEPA Filter Equipment & Flow Meter Line Changes
TN-24590-06-02166	Remote Operated Damper Alternate Supplier
TN-24590-06-02167	C&I Hours for PJM Testing Not Implemented in TN-24590-05-01957
TN-24590-06-02168	BOF Glass Former Facility Additional Formwork & Concrete
TN-24590-06-02170	SRNL-XRF
TN-24590-06-02174	Increase Scope of EFRT M4, Commissioning Waste vs. Mission Needs
TN-24590-06-02176	Systematic Approach to Training (SAT)
TN-24590-06-02177	Plant Design Impacts Associated with Engineering of LBL Facility
TN-24590-06-02178	Plant Design Impacts Associated with Engineering of BOF Facility
TN-24590-06-02179	Plant Design Impacts Associated with Engineering of LAB Facility
TN-24590-06-02180	Coupled Analysis of Two Typical Breakpots
TN-24590-06-02181	Add Additional Hours to PT Process Calcs
TN-24590-06-02182	Accelerated Data Reconciliation
TN-24590-06-02183	Process Operations Actions to Close DOE Oversight Open Items
TN-24590-06-02184	IT 14 Implementation
TN-24590-06-02186	LAW Line List Development & CIS List Comparison Macro
TN-24590-06-02187	Equipment Group Increased Deliverable Quantities
TN-24590-06-02189	Modification of MV Switchgears and Load Centers
TN-24590-06-02190	Environmental Performance Test Plan, Process Engineering Calculations
TN-24590-06-02191	Change Offgas Pipe from CM to Q Classification
TN-24590-06-02192	Review of Existing and Future Awarded Commercial Grade Dedication (CGD)-related Procurements
TN-24590-06-02193	Reduction of LAW Cable Tray Baseline based on Qty Awareness
TN-24590-06-02194	Mechanical Handling Diagrams (MHD's)/Mechanical Sequence Diagrams (MSD's) Hour Adjustment
TN-24590-06-02195	CFD Analysis - LAW & HLW for HVAC, CSA, MH - Phase 2
TN-24590-06-02197	Multi-Discipline EN&S Support (for ISM Reviews) - 101F Accounts

TREND #	TREND DESCRIPTION
TN-24590-06-02199	DOE ORDER 413.3A - Estimate to Perform Impact Analysis
TN-24590-06-02201	Overblow (OB) Equipment Modifications to Support Revised Design Requirements
TN-24590-06-02202	Chiller Compressor Building Fire Protection
TN-24590-06-02204	Conversion of PP to WP for Stairway Installation at PT
TN-24590-06-02205	Late Adjustments Planning Package to Equipment Package Budget Reallocation 24590-QL-MEEM-00001 & 2
TN-24590-06-02206	Increase Cost of LAW C3V-ACU-00001, 00002, 00003
TN-24590-06-02208	Revise Criticality Safety Evaluation Report & Supporting Analysis
TN-24590-06-02211	Late Adjustment Planning Package to Equipment Package Budget Re-allocation PO 24590-QL-POA-MJKG-00004
TN-24590-06-02212	Accelerate CHAMPS Software Purchase. Transfer Budget from Planning Pkg to Work Pkg
TN-24590-06-02213	Conversion of REA Preparation Planning Package to Work Package
TN-24590-06-02215	HPAV Support Contracts for Detonation Analysis and Configuration Management
TN-24590-06-02217	BOF Construction Hours to Support Piping Design Changes
TN-24590-06-02218	Late Adjustments Planning Package to Equipment Package Budget Reallocation for Flowserve Bulge Valves
TN-24590-06-02219	LAPP to Equipment Package Budget Reallocation for Framatome Delay Claim
TN-24590-06-02220	Conversion of DOE Order 226.1 Implementation of DOE Oversight Policy Planning Pkg to Work Pkg
TN-24590-06-02221	Forward Pricing Rates (FPR) (Aug-2006)
TN-24590-06-02222	Cost Increase to M-12 Original Scope, Undemonstrated Leaching Processes
TN-24590-06-02224	10 CFR 851 Implement Worker Health and Safety Rule PP to WP
TN-24590-06-02225	Conversion of DOE Order 414.1C & NQA-1 Rev 2000
TN-24590-06-02226	Perform Qualification of Vendor Supplied Leak Detection Box - PT
TN-24590-06-02227	Removal of Sealing Tapes from Pipe Ends and Flanges - PT
TN-24590-06-02228	Removal of Sealing Tapes from Pipe Ends and Flanges - HLW
TN-24590-06-02229	LAW Quantity Adjustment per the Latest Qty Takeoff
TN-24590-06-02230	Removal of Sealing Tapes from Pipe Ends and Flanges - LAW
TN-24590-06-02231	Direct Hire Craft Support for LAW Coatings Subcontract
TN-24590-06-02232	LAB Hotcell Surface Preparation
TN-24590-06-02233	Removal of Sealing Tapes from Pipe Ends and Flanges - LAB
TN-24590-06-02234	Removal of Sealing Tapes from Pipe Ends and Flanges - BOF
TN-24590-06-02235	Increased Attenuation for Six HLW Shield Windows
TN-24590-06-02239	414.1C QA Implementation Estimate Reduction
TN-24590-06-02241	BOF Quantity Adjustment per the Latest Drawings IFC
TN-24590-06-02242	LAB Quantity Adjustment per the Latest Drawings IFC
TN-24590-06-02243	Plant Wide EPCC: FNM Work Package/Planning Package Allocation
TN-24590-06-02244	Alignment of COBRA end-dates with P3 Schedule
TN-24590-06-02245	Moving Budget Out of LAPP into WP for ASX System Re-evaluation
TN-24590-06-02247	Support for DWP Public Comment Period
TN-24590-06-02248	Re-allocation of Remaining FY 2006 PEM Late Adjustments Planning Package Budget
TN-24590-06-02249	Bechtel Internal Cost due to Hirschfeld Request for Equitable Adjustment
TN-24590-06-02250	Re-alignment of Plant Equipment Spend Profile - Critical 7
TN-24590-06-02251	LAW Summary Work Package/Planning Package Re-alignment
TN-24590-06-02252	BOF Summary Work Package/Planning Package Re-alignment
TN-24590-06-02253	LAB Summary Work Package/Planning Package Re-alignment
TN-24590-06-02256	Move Late Adjustment Planning Packages (PP) and Transition PP to Work Packages
TN-24590-06-02257	Mechanical Systems HPAV Calculations
TN-24590-06-02261	Increase Size of Viewing Windows in Select Doors
TN-24590-06-02265	Revision of Procedures and Guides for Nuclear Safety and Quality Initiative
TN-24590-06-02266	Subcontractor EAC Adjustment due to Schedule Delay
TN-24590-06-02267	AFA Antifoam Effect on Gas Retention/Release
TN-24590-06-02269	PTF Hot Cell Fire Analysis
TN-24590-06-02270	HLW C2/C5 Confinement
TN-24590-06-02271	PTF Addition of Safety Class Differential Pressure Alarms
TN-24590-06-02272	Complete SFA with Subcontractor Support
TN-24590-06-02276	Freight BCWS Adjustment
TN-24590-06-02285	Implementation of Sunflower Software System for Property Mgt
TN-24590-06-02288	Additional Vendor Package Interconnection Diagrams
TN-24590-06-02289	PT Modifications to Provide Access for Routine Maintenance of Shield Door
TN-24590-06-02291	Vessel Design Changes - MOB, HPAV, Committed Design Evolution
TN-24590-06-02292	Subcontractor EAC Adjustment to Comply with ASCE 97-8 Classification

TREND #	TREND DESCRIPTION
TN-24590-06-02299	Re-allocation of Fiscal Years 2008 and 2009 PEM Late Adjustments Planning Package Budget
TN-24590-06-02300	Functional Verification of Crane Mounted Manipulator Dexterity
TN-24590-06-02303	Re-alignment of Plant Equipment Spend Profile - Critical 4
TN-24590-06-02306	LBL Re-Sequencing
TN-24590-06-02307	Capacity Modifications - 4 Month Earnable Hours
TN-24590-06-02308	Support Steel for Fire Risers in HLW Stairwells
TN-24590-06-02310	Modification of RWH-CRN-00013 to Eliminate Interferences with Monorail Airlocks
TN-24590-06-02311	Plant Equipment to Management Reserve Budget Reallocation
TN-24590-06-02312	LAW Export Bay-Individual Wall Form Installation/Removal
TN-24590-06-02313	LAW Field Rebar Support Frame Fabrication
TN-24590-06-02314	LAW Decontamination Unit and Glove Box - On Site Assembly
TN-24590-06-02315	LAW AHU Installation Delay due to Late Implementation of Transition Frames Design
TN-24590-06-02317	Post IFC Document Revision Activities
TN-24590-06-02318	System HSH Decontamination Tanks
TN-24590-06-02319	Labor to ODC Conversion (Process Operations)
TN-24590-06-02320	Re-align E4 Labor Distribution and ODC Travel Allocation
TN-24590-06-02322	Additional Engineering and E&NS Training
TN-24590-06-02324	Estimate to Implement DOE Order 210.2 Corporate Operating Experience Program
TN-24590-06-02326	LAB Steel Quantity Mix
TN-24590-06-02328	Professional Services of SAIC
TN-24590-06-02334	Hirschfeld Steel REA's-May 2006 HLW LAPP Budget to LAW Working Package
TN-24590-06-02335	Vent Stack Restraints Field Modification
TN-24590-06-02338	Process Engineering Support for the WTP Project
TN-24590-06-02339	LAB Structural Steel Field Modification required from ORP Peer Review
TN-24590-06-02341	CM-MRA-EK00-00001 - 480V Load Centers - Add Equipment Budget and Re-Align Schedules
TN-24590-06-02342	Modification to LBL Resequencing BCP that will Correct End Dates for Project Controls
TN-24590-06-02343	HLW Annex Roof SC-1 Equipment Hardening and Screening
TN-24590-06-02344	Engineering Discipline Support for Component Identification System (CIS)
TN-24590-06-02346	Elimination of SLATE Software Maintenance (PIP E160)
TN-24590-06-02348	SQ Addition of Welding and Electrical Technical Specialists
TN-24590-06-02349	Budget Shortfall for HLW ISA Vessels
TN-24590-06-02350	LAB 480V MCC's Upsize Cable Lugs for (4) MCC's in Fabrication
TN-24590-06-02352	Convert $1.5M from QA PP to QA WP
TN-24590-06-02353	LAW Additional Field Rebar Fabrication Quantity
TN-24590-06-02354	Redistribute Radiological Safety ODC Support Budget
TN-24590-06-02356	C/CP Bldg 82 Electrical Safety Upgrade from NEMA 1 to NEMA 12 Enclosures
TN-24590-06-02359	Reallocation of Plant Material Budgets due to Implementation of To-Date Quantities Received Earning Basis
TN-24590-06-02361	BOF Pump House Sidewalks Installation
TN-24590-06-02362	LAB Monorail and Recovery System
TN-24590-06-02363	LAW Planning Package Definitization
TN-24590-06-02365	LAB in Slab, Below Slab & In-Cell Pipe Installation
TN-24590-06-02366	Emergency Diesel Generator Re-design
TN-24590-06-02367	Additional PJM Testing - Multiple Overblows and I&C Equipment Testing
TN-24590-06-02368	Melter Feed Studies - Additional Tank
TN-24590-06-02369	LAW Bogie Rail Trend due to New Grouting Requirement-Epoxy Grout
TN-24590-06-02370	Remove Budget for ABB Technical Services Subcontract from Equipment Work Packages
TN-24590-06-02371	BOF Planning Package Definitization
TN-24590-06-02372	LAB Planning Package Definitization
TN-24590-06-02373	Consulting Agreement for Fire Protection of HEPA Filters
TN-24590-06-02374	Alignment of Cobra Dates with LBL Resequencing OTB Schedule
TN-24590-06-02376	Align PO Value Due to Escalation, Schedule Extension, & New Scope
TN-24590-06-02379	Phase 2 - Large Scale Gas Retention / Release (in the presence of anti-foam)
TN-24590-06-02380	LAW Shield Door Additional Coating
TN-24590-06-02384	Seismic Qualification of SC-I/II/III Equipment
TN-24590-06-02385	Underground Cable Size Increases
TN-24590-06-02386	RGM and Other Steel Changes Requiring New SASSI Run
TN-24590-06-02387	LAW Coatings Budget
TN-24590-06-02388	Technology Readiness Level Assessment/CRESP (Misc ORP Driven Reviews)

TREND #	TREND DESCRIPTION
TN-24590-06-02391	RF Resin Stage 2 and 3 Testing Budget Re-alignment
TN-24590-06-02392	Safeguards and Security Budget
TN-24590-06-02393	HPAV Design Confirmation Studies
TN-24590-06-02394	LAW Monorail Alignment and Pour Cave Radiation Shielding Installation
TN-24590-06-02395	New C2 Duct added to BSA in LAW
TN-24590-06-02396	Continue Procurement of Concrete Related Items due to Schedule Extension
TN-24590-06-02397	Storage of Shield Windows (PT, LAW, HLW, and LAB)
TN-24590-06-02398	Jib Crane Design Evolution
TN-24590-06-02399	MH014 - Change of Design Scope for HSH Slewing JIB Coverage
TN-24590-06-02400	Addition of Eight 10.5 inch Shielding Plugs for Black Cell Access Penetrations
TN-24590-06-02401	STR Support of Fireproofing of Structural Steel
TN-24590-06-02402	PTF Internal Replanning
TN-24590-06-02404	LAB Roofing and Siding Subcontractor Delay and Acceleration
TN-24590-06-02405	LAW Schedule Delay of Roofing and Siding Subcontractor
TN-24590-06-02406	Conversion of Sprinkler System to Dry Pipe/Nitrogen in LAB Hot Cell
TN-24590-06-02407	Government Property Organization Staffing Trend
TN-24590-06-02410	LAB Subcontractor Support Job Hour
TN-24590-06-02411	Fireproofing Structural Steel Design Changes
TN-24590-06-02417	HLW HVAC Subcontract Replanning
TN-24590-06-02421	Support to DNFSB
TN-24590-06-02422	Operational Readiness - Late Adjustment Detailed Estimate
TN-24590-06-02424	LBL Resequence Estimating Corrections - Transfer to MR
TN-24590-06-02426	2007 Execution Revision
TN-24590-06-02428	LAB Design Quantity Changes from Budget for Elevated Slab
TN-24590-06-02429	QL-POA-ADDH-00007 Change Requirements to Awarded Contract
TN-24590-06-02430	WTP Assessment of Latest Seismic Boring Data
TN-24590-06-02432	MH Equipment Supplier RGM Scope Reduction
TN-24590-06-02433	PTF Floor Penetration Modules
TN-24590-06-02434	PT Room P-0332B Shield Wall Changes
TN-24590-06-02435	HLW Crane Configuration Changes
TN-24590-06-02436	Partition Wall Structural Calculations for HVAC Transfer Ducts
TN-24590-06-02438	Plant Design Support to RGM Workscope
TN-24590-06-02439	Addition of Pretreatment Hot Cell Crane
TN-24590-06-02440	HEH Cask Lidding Configuration
TN-24590-06-02441	Rebar Detailing Continuation of Services
TN-24590-06-02442	Align PO Value for Vessel Vent Caustic Scrubber - New Scope
TN-24590-06-02443	Convert CS&A Hours ODC for TSC
TN-24590-06-02445	Construction Subcontract Data Trace Resolution
TN-24590-06-02447	Concrete Bulks Estimate Adjustment for Central Pre-Mix (CPM) Schedule Extension
TN-24590-06-02448	LAW Fireproofing Repairs
TN-24590-06-02450	Moving Approved Sunflower Hours From B0 to B1
TN-24590-06-02452	Addt'l Coating Requirements for LVP & HOP Carbon Bed Adsorbers
TN-24590-06-02456	Instrument Tubing Clamps
TN-24590-06-02460	Establish Process Engineering & Technology Organization
TN-24590-06-02463	Early LBL - Hot Commissioning
TN-24590-06-02464	HPAV Design Authority Revision
TN-24590-06-02465	PJM Mixing and Multiple Overblow Control
TN-24590-06-02466	Distribution of Auto-Sampler System (ASX) LAPP, including Change to Bi-Directional Carrier System
TN-24590-06-02467	Capacity Mods [1] [BCP-2307-Must Take Out 13,162]
TN-24590-06-02468	PTF Capacity Mods Undemonstrated Leaching [2 - 8]
TN-24590-06-02469	PTF Capacity Mod Utilities
TN-24590-06-02470	HLW Mod 1 Modifications to Support 7.5 MTG/Day Increased Capacity Throughput
TN-24590-06-02471	EFRT (M1 & M6) Implementation of Design Changes to Prevent Line Plugging
TN-24590-06-02472	EFRT (M3) Inadequate Vessel Mixing
TN-24590-06-02473	Materials Management Organization Startup
TN-24590-06-02475	Allocate ODC Budget for Testing of Grouted Rebars & Anchors
TN-24590-06-02476	LAW Architectural Post-IFC Budget
TN-24590-06-02477	EFRT M14 IX Resin and Related IX EFRT Activities

TREND #	TREND DESCRIPTION
TN-24590-06-02478	M-12, Mod 3: Front End Leach Capacity, with Option 1
TN-24590-06-02479	LAW Partition Wall Changes
TN-24590-06-02480	Design Change to LMP System for LAW Facility
TN-24590-06-02482	Review of Intools LBL Process Data
TN-24590-06-02483	Extra storage cost NW Copper vessels thru Sept 07
TN-24590-06-02488	FY07 Budget Alignment for Duratek Tasks 1 through 7
TN-24590-06-02490	Increased Work Scope for the LOP System in LAW
TN-24590-06-02491	BOF Coating Subcontractor Support Job Hour
TN-24590-06-02493	PT and HLW Coating Subcontractor Support Job Hour
TN-24590-06-02494	Chiller Compressor Building Pipe Rack Coatings Budget
TN-24590-06-02495	Consolidation of N102A Remaining Hrs
TN-24590-06-02496	Crane Rail Splice Welding
TN-24590-06-02498	EFRT Issue M3 Program to Determine Adequacy of WTP Pulse Jet Mixer Design
TN-24590-06-02499	Line Plugging (M1)
TN-24590-06-02501	Closeout of QL-POA-ADDH-00002 Due to Unidynamics Bankruptcy
TN-24590-06-02502	Commissioning Simulants - Revision to Schedule
TN-24590-06-02503	Mixing Vessel Erosion (M2)
TN-24590-06-02504	Revise Environmental Risk Assessment per EPA Guidance & Obtain 1 Yr Air Model Data
TN-24590-06-02505	Fire Protection T-52 Warehouse Redesign
TN-24590-06-02506	Develop Dynamic Analysis Program for PTF HVAC Design
TN-24590-06-02509	Project Controls Increased Support Requirements
TN-24590-06-02510	EVMS Certification / CAR Resolution Impacts to Project Controls
TN-24590-06-02512	Additional HLW ITS Cooling for Fan Rooms
TN-24590-06-02513	HVAC Piping and Valve P&ID
TN-24590-06-02515	Plant Design Miscellaneous Conceptual Design Studies
TN-24590-06-02517	BOF Miscellaneous Piping Field Modifications
TN-24590-06-02521	Thermal Catalytic Oxidizer and Silver Mordenite Preheater Work Scope Change
TN-24590-06-02525	Refrigerant Lines for Remote Condensors
TN-24590-06-02526	LAW Carbon Dioxide Storage Vessel Quality Change
TN-24590-06-02530	Mitigate Water Droplet Formation at LAW LVP Stack
TN-24590-06-02531	BOF Safety Shower Water Temperature
TN-24590-06-02532	Safety Control Instrumentation / SSRS Additional Work and Unit Rates
TN-24590-06-02534	Early Energization of Cathodic Protection Systems
TN-24590-06-02535	Environmental Qualification Manhours for all Facilities
TN-24590-06-02540	DOW Booster Pump Removal in PTF and LAW
TN-24590-06-02543	PTF Evaporators - AREVA
TN-24590-06-02547	Reconciliation of PNNL Stack Qualification Budget
TN-24590-06-02550	CM-MRA-EL00-00009, LAW Lighting Fixtures
TN-24590-06-02551	HLW Melter Pour Spout Design
TN-24590-06-02555	Additional Engineering Hours for HVAC Environmental Qualification
TN-24590-06-02556	Re-bid of Ammonia MR #24590-QL-MS00-00008
TN-24590-06-02557	Changes to PTF Bulges / Cabinets and Bulk Valve Order
TN-24590-06-02558	Addition of Steam Traps and Strainers to BOF SCW P&IDs
TN-24590-06-02559	Generate Equipment Loads for Near-Term PTF/HLW Concrete Design
TN-24590-06-02560	New MR for Blanket Order of Distribution Panelboards and Transformers
TN-24590-06-02565	Startup LAW RWH-CRN-00008 for Beneficial Use by Construction
TN-24590-06-02567	SS Resequence Corrections and Additional Staffing Needs
TN-24590-06-02575	HLW Floor Preparation for Special Coatings
TN-24590-06-02579	LAW Process and Effluent Cell Vessel Shims/Plates/Bars
TN-24590-06-02582	LAW First Conceptual Design Report, Revised Basis of Design, & Negotiate ICD Agreement
TN-24590-06-02584	CM-MRA-AELE-00009 / QL-MRA-AELE-00009 Material Requisition Schedule Activities PREF Codes Correction
TN-24590-06-02586	Additional Coatings for WTP Equipment
TN-24590-06-02588	Six Sigma PIP - Reviewing FCR/FCNs and NCR/CDRs
TN-24590-06-02589	Calculations Resulting from CAR-06-250 Action # CAR-25-5
TN-24590-06-02590	Increase in Design Review Notice and Design Verification Activities
TN-24590-06-02591	Budget Realignment for Duratek Melter Feed Studies
TN-24590-06-02593	LAW Miscellaneous Structural Steel Modification
TN-24590-06-02595	Additional Staffing for Acquisition Services B1

TREND #	TREND DESCRIPTION
TN-24590-06-02597	Consolidation of MS Equipment EPPR Accounts
TN-24590-06-02599	B7 Subcontracts - Increased Staff
TN-24590-06-02600	HLW El. 14' Steel Changes
TN-24590-06-02603	BOF Shrink Sleeve Replacement
TN-24590-06-02606	Additional C3V HEPA Housing
TN-24590-06-02607	Permanent Cranes - Radio Frequency Allocation
TN-24590-06-02609	Budget for New & Existing Material Requisitions for C&I
TN-24590-06-02610	Transfer of HLW and LAW Spare Melter Budget from Commissioning to Engineering
TN-24590-06-02612	Battelle/PNNL Contract Conversion
TN-24590-06-02614	BCP HLW Film Cooler (M17)
TN-24590-06-02618	Steam Sys. & High Energy Line Study-CRPT-QA-06-218 Actions
TN-24590-06-02619	EVMS Compliant Control Account Structure
TN-24590-06-02621	Definitization of DOE Order 226.1, Implementation of DOE Oversight Policy
TN-24590-06-02624	Process Limits Definition (M6) R&T Activities
TN-24590-06-02625	Radar Polypropylene Window Additions
TN-24590-06-02630	Sanitary Sewer O&M Manual Revision
TN-24590-06-02631	Modify Leak Detection System for LMP-LDB-00001 & 00002
TN-24590-06-02633	CAR 2 Corrective Action Phase I - Reverse Implemented PEM Claims Budget WPs to MR
TN-24590-06-02634	CAR 2 Corrective Action Phase II - Reallocate PEM Remaining Claims Budget LAPP to MR
TN-24590-06-02636	Bus Duct Related Rework and Inefficiencies
TN-24590-06-02637	SQ Shift-Transfer of ODC 89 into Direct Hire 1313
TN-24590-06-02639	Humphreys & Assoc. Increase
TN-24590-06-02641	Automated Flush to Bubbler Racks for LAW and HLW Facilities
TN-24590-06-02643	Transfer of Remaining Budget in 1.08 EQ to Other Accounts
TN-24590-06-02644	LAW Miscellaneous Piping Changes
TN-24590-06-02646	Review of DOE Order 420.1B for Impacts to WTP
TN-24590-06-02648	LAW Removal of Fireproofing and Rework due to NLD Dwg Changes
TN-24590-06-02649	BCP Transfer Budget from PP to WP
TN-24590-06-02650	Transfer of Process Engineering & Flowsheet Modeling Scope from Engineering Mgt Account
TN-24590-06-02652	BCP EFRT Budget Re-distribution
TN-24590-06-02654	Develop Standard CM Cable Tray/Conduit Support Detail Dwgs and Model Raceway Supports in PTF 3D Model
TN-24590-06-02655	4-Month DOE ORR to 2-Month DOE ORR
TN-24590-06-02658	LAW/LAB Fabrication Isometrics
TN-24590-06-02660	Fabricated Panel Order - New Material Requisition
TN-24590-06-02662	Align Work Packages with the Correct Control Accounts
TN-24590-06-02664	Transfer E&NS Budget from Planning Packages to Work Packages
TN-24590-06-02665	Create 1.08.HH-PW LOE Control Acct & Req'd OBS Change E&NS
TN-24590-06-02666	BCP-Create 1.08 DL PW LOE Control Acct for Eng
TN-24590-06-02670	HVAC PP to WP Conversion
TN-24590-06-02671	BCP CAR 05 (BCP not taken the same manner as BCWS) Closure
TN-24590-06-02672	Coupled Analysis of PTF and HLW Filter Caves
TN-24590-06-02673	Modifications to LAW as a Result of Environmental Qualification
TN-24590-06-02675	Change to PSA System & Addt'l Piping for LAW Steam Systems
TN-24590-06-02677	Time Related Costs for Execution Strategy Revision
TN-24590-06-02680	Resolution of Process Engineering Confirmed Calculation Budget
TN-24590-06-02682	Revise Panel to Implement 3 Pole Breakers Multi-Wire Branch Circuits
TN-24590-06-02683	Upgrade of Plant Fiber Optic Cable for Distance and Bandwidth
TN-24590-06-02684	Implementation of Pipe Support ABAR into Criteria, Guides, and Standard Calculations
TN-24590-06-02685	Stelite Cone and Ring Beam NDE N690 Redesign
TN-24590-06-02686	Review of Vendor and Other Discipline Documents
TN-24590-06-02687	Overflow Calculations Resulting From CRPT-05-140
TN-24590-06-02688	AEA Manipulator Tool Power/Removal Changes
TN-24590-06-02689	490 Curtailment Cost/Schedule Delays for Power Manipulators Remobilization
TN-24590-06-02690	PVP Header Pressure
TN-24590-06-02691	LVP-SCB-00001 Design Scope Change
TN-24590-06-02693	HLW Decon Pit Shield Limits
TN-24590-06-02696	24590-QL-POA-MEEM-00001 Schedule Change Melter 1 - LAW
TN-24590-06-02697	BCP Budget Trans Matl PP 4MT-081960-PP to GE-Ionics

TREND #	TREND DESCRIPTION
TN-24590-06-02698	HLW Mod 2 - Plant Components for Potential Future HLW Concentration Annex
TN-24590-06-02699	PTF AB Design Review Support
TN-24590-06-02700	Engineering Support to Melter Fabrication
TN-24590-06-02701	P&ID Enhancement Program
TN-24590-06-02702	DOE Order 413.3 LAPP Savings and Configuration Mgt of Vendor P&I's
TN-24590-06-02703	BCP - LAW Hydrogen LAPP to PP
TN-24590-06-02707	LAW Container Overpack/Elevator Cooling Modifications
TN-24590-06-02709	CSA Support to WTB Pipe & Cable Tray Supports
TN-24590-06-02710	Ultrafilter Drain Cleanout Demonstration Testing
TN-24590-06-02711	LAW Piping Commodities Forecast Revision
TN-24590-06-02713	Incorporation of Revised Standard 1 - Cost Estimate
TN-24590-06-02715	Equipment PP Transfer from MAR 07 to MAY 07
TN-24590-06-02717	Commissioning PP Transfer from MAR 07 to APR 07
TN-24590-06-02718	LAB Structural Steel Pricing Revisions
TN-24590-06-02719	LAW Pour Cave Cooling Panel Installation
TN-24590-06-02721	Support Services Additional Lease Space
TN-24590-06-02723	Increased CDF Backfill Quantities / Melter Assembly Pad Electrical Changes
TN-24590-06-02724	Additional HVAC Subcontract Support Craft Hours
TN-24590-06-02725	Replace Installed Unscheduled Cable/Welding Receptacle Insta
TN-24590-06-02726	SS Resequencing Correction- Support Services Labor
TN-24590-06-02727	Create Additional Control Accounts for PT & HLW
TN-24590-06-02729	LAB Steel Quantity Mix (New changes from OCT 2006 QDP)
TN-24590-06-02730	Air Inbleed for LAW LOP Film Coolers
TN-24590-06-02731	Rad Transfer Lines Shrink Wrap Analysis
TN-24590-06-02732	Increased Receiving Inspection Work Load (B6)
TN-24590-06-02735	Melter Feed Studies Task 8 - Schedule Re-baselining and Additional EFRT Scope
TN-24590-06-02736	Lease Rate and Co-Location impacts to Support Services
TN-24590-06-02737	Fire Modeling of Selected Areas of WTP Facilities
TN-24590-06-02738	Miscellaneous Steel Detailing Services
TN-24590-06-02739	Transfer Of Scope From Plant Equipment Group
TN-24590-06-02740	HLW Electrical Joggle Purchase Strategy Change
TN-24590-06-02741	BCP Changes to C&I ID for Work Packages
TN-24590-06-02742	PTF Jumper Material Re-estimate
TN-24590-06-02743	BOF Excavation Unit Rate Adjustment
TN-24590-06-02748	LAW - Additional Transition Frames for AHUs and FCUs
TN-24590-06-02749	Reversal of Plant Equipment Budget from Management Reserve
TN-24590-06-02753	WTP Rebar Density Savings
TN-24590-06-02754	CFD Design Evolution and Delay
TN-24590-06-02755	HDH Decon Vessel Heating System
TN-24590-06-02757	Negotiated Savings - Six Sigma PIP 012
TN-24590-06-02758	LAW Piping Unit Rate Forecast
TN-24590-06-02759	BCP Alignment of Equip Mang System to Baseline Schedule
TN-24590-06-02762	BCP Reallocation of Plant Equipment Scope
TN-24590-06-02763	Physical Configuration Audit for HLW Shield Doors Melter Cave
TN-24590-06-02764	490 Curtailment Suspension Cost Wall Mounted Light/Socket Assemblies
TN-24590-06-02767	Implement ABB Process Control Device Library for ICN Software
TN-24590-06-02768	ISARD Revision 4 Delayed Start
TN-24590-06-02769	Additional Engineering Training
TN-24590-06-02770	Criticality Safety HAZOP
TN-24590-06-02771	Convert PP to WP
TN-24590-06-02773	Convert HVAC PP to WP
TN-24590-06-02775	Reversal of Plant Material Budget from Management Reserve
TN-24590-06-02777	Process Engineering and Flowsheet Modeling COBRA Reload
TN-24590-06-02779	HFP Vessles Hydrogen Generation Mitigation Study
TN-24590-06-02781	Distribution of Auto-Sampler (ASX) Phase II
TN-24590-06-02784	LAW PP to WP Conversion
TN-24590-06-02786	Forward Pricing Rates (FPR) (May-2007)
TN-24590-06-02787	Excess Government Property Disposal

TREND #	TREND DESCRIPTION
TN-24590-06-02790	Removing Freight Budget (B4)
TN-24590-06-02791	Savings LAW Equipment award less than budget
TN-24590-06-02793	Savings Reduction in planned revisions
TN-24590-06-02794	Savings LAW & BOF Elec Bulk Commodity Quantity Reduction
TN-24590-06-02795	Savings Potential reduction in RGM EAC
TN-24590-06-02796	Convert Planning Pkg Work Pkg for DOE Order 414.1C
TN-24590-06-02798	BOF Long Term Storage anf Setting Chillers
TN-24590-06-02799	BOF Glass Former Slab - Silos and other Equipment
TN-24590-06-02800	Commercial Grade Dedication Activities
TN-24590-06-02801	BCWS Point Adjustment Control Point Repair
TN-24590-06-02802	PATS 618,974,2545,2696,2839 Budget Redist-Follow BCP-02749
TN-24590-06-02803	BSA Compressors - Increase in Chill Water Pressure Rating
TN-24590-06-02804	CM Receipt Inspection Work Scope Shift from Materials Manage
TN-24590-06-02807	EFRT M-17 Film Cooler Redesign and Testing
TN-24590-06-02809	490 Curtailment Suspension Cost for Through Wall Manipulators
TN-24590-06-02810	490 Curtailment Suspension Cost for 13.8 KV Switchgear
TN-24590-06-02811	Change in Contracting Strategy for Penetration Seals
TN-24590-06-02812	Reversal of Budget for DOE M 205.1-2 (IS&T)
TN-24590-06-02813	Referral Bonus Program
TN-24590-06-02815	LAB Additional Activity to Support Deck Slab
TN-24590-06-02816	Extension of Process Engineering Support
TN-24590-06-02817	BOF - S/C Insulation and Heat Trace Reschedule
TN-24590-06-02818	Transfer DOE Order 226.1 from PP to Management Reserve
TN-24590-06-02819	HLW El 14 ft to 37 ft Gatepost Milestone Reschedule
TN-24590-06-02820	Procurement of Bulk Plate Material
TN-24590-06-02822	BOF setting of Dryers
TN-24590-06-02823	Design Changes to Conduit Requires an Increase to Direct Hire Job Hours
TN-24590-06-02825	LAW - Pour Cave Cooling Panel Support
TN-24590-06-02830	Compliance with DOE/WTP Security Requirements at WTP Satellite Offices
TN-24590-06-02831	LAW Remove Intumescent FP on 14X90 Columns & Reapply with Cementitious
TN-24590-06-02833	Transfer of LAB Equipment Level 4 Schedule Responsibilities
TN-24590-06-02836	LAW Melter Slab
TN-24590-06-02838	LAW Special Coatings PP to WP Conversion
TN-24590-06-02839	Implementation of 10 CFR 851-Worker Safety and Health Program
TN-24590-06-02843	Implementation of Official Use Only (DOE Order 471.3 and DOE M 471.3-1)
TN-24590-06-02844	LAW Melter Lid Calculation Subcontract
TN-24590-06-02848	Degraded Anti-Foam and Impacts on Gas Retention/Release
TN-24590-06-02850	In-House Rack Design Schedule Alignment
TN-24590-06-02851	Alignment of PP within the EMS to overall completion dates for the facilities
TN-24590-06-02852	LAW Planning Pkg to Work Pkg Conversion
TN-24590-06-02853	Schedule Changes LBL HVAC Design Support Activities
TN-24590-06-02854	Construction Distribs Budget Increase (June 06 - Mar 07) due to Direct Craft Labor BCPs
TN-24590-06-02855	LAB PP to WP
TN-24590-06-02857	PT Favorable Cost Variance Scope Completion
TN-24590-06-02859	Add Column Splice at El. 81'
TN-24590-06-02860	Align BCWS to post ESR Baseline Schedule
TN-24590-06-02863	Transfer of Operational Risk Assessment Budget
TN-24590-06-02866	Deferral of CY 2007 Early LAW Conceptual Design Report and Early LAW Commissioning Activities
TN-24590-06-02867	E&NS Support to DNFSB Meetings
TN-24590-06-02868	LAB Communication Data Drop Additions
TN-24590-06-02870	New Material Handling Facility and Relocation of Marshaling Yard
TN-24590-06-02871	HLW Transfer Part of Curtailment Construction Scope to Marshalling Yard
TN-24590-06-02872	ASCE-4 Modal Combination Piping Reanalysis
TN-24590-06-02876	Phase II Pre Eng Type A Bldgs (affected facilities BOF, LAW)
TN-24590-06-02878	LAW Planning Package to Work Package
TN-24590-06-02879	LAB Convert Sub-Contract Planning Packages to Work Packages
TN-24590-06-02882	ICD-19 Reconciliation Trend Study
TN-24590-06-02883	PP Replan for R&T for PW and PT

TREND #	TREND DESCRIPTION
TN-24590-06-02887	Sub-Contracts Planning Package to Work Package Conversion
TN-24590-06-02888	BOF Motor Starter Planning Package to Work Package Conversion
TN-24590-06-02889	PT Facility Planning Package to Work Package Conversion
TN-24590-06-02891	Descoping of Remote Clamp Connector MR
TN-24590-06-02892	PT Sub-Contract Planning Package to Work Package Conversion
TN-24590-06-02894	Staff Reduction for LA-ICP-AES
TN-24590-06-02897	LAW FY07 Gatepost Milestones
TN-24590-06-02898	RF Testing Cost Under Run
TN-24590-06-02901	Relay Setpoints and Setting Reports
TN-24590-06-02902	Movement of LAW Non-Camera Equipment from one L4 Schedule Activity to another
TN-24590-06-02903	BOF Planning Package to Work Package Conversion
TN-24590-06-02906	BOF RAD Lines, Insulation of DOE and RAD Lines
TN-24590-06-02907	Hirschfeld Steel Company Request for Equitable Adjustment - Negotiated Settlement
TN-24590-06-02908	BOF EFRT Scope Allowance Removal
TN-24590-06-02909	LAB Hot Cell Trolley System
TN-24590-06-02911	LAB Concrete Favorable Performance
TN-24590-06-02912	EMS Level 5 Alignment to Level 4 Baseline Schedule
TN-24590-06-02914	Postponment of Deisel Generator Tank Coating Activities
TN-24590-06-02915	Transfer of Hours to ODCs to Fund BOA Contract
TN-24590-06-02916	CSA HLW Schedule Revision
TN-24590-06-02917	NDE Reduction for Welds on Pipework in Hard to Reach Areas
TN-24590-06-02918	PP Replan for R&T for HLW & LAW
TN-24590-06-02919	LAW Embed Quantity Reduction
TN-24590-06-02921	C&I Control Strategy Design Review
TN-24590-06-02922	Three Part Schedule Logic Correction
TN-24590-06-02924	Impact of Revised CGD Requirements for the HOP and LVP Carbon Bed Absorbers
TN-24590-06-02929	M3/M2-Inadequate Vessel Mixing/Erosion
TN-24590-06-02930	HLW MOD-1 Support for 7.5MTG/day Next Generation Melter Throughput
TN-24590-06-02932	PTF Capacity Mods Utilities
TN-24590-06-02936	LAB Installation of Floor Mounted Jib Crane
TN-24590-06-02937	HLW HVAC Restart
TN-24590-06-02938	Claim for 222S LA ICP-AES Instrument
TN-24590-06-02940	Budget to Provide Large Scale for Effects of AFA on Gas Retention/Release
TN-24590-06-02941	Technology Maturation Plan IRPs & VE Study Prep
TN-24590-06-02943	M5 and M9 Late Adjustment PP to PP transfer within Commissioning Budgets
TN-24590-06-02946	Convertion of PP to WP Canister Racks QL-POA-SY00-00003
TN-24590-06-02949	Seismic Calc for SC-1 & SC-2 Gypsum Board Walls in PT & HLW
TN-24590-06-02950	Generate Equip Loads for PTF/HLW Concrete Design to Support L4 Schedule
TN-24590-06-02953	Partial Commissioning Distribution of the 1.08 WBS
TN-24590-06-02954	Backflow Preventers
TN-24590-06-02955	LAW Swab Manipulator Container Height Adjustment
TN-24590-06-02956	Replan Subcontract Support for Safety Document Maintenance□□□□□□□□□□□□
TN-24590-06-02957	BOF & LAB Equipment Favorable Savings
TN-24590-06-02959	Plant Equipment Non-Negotiated Claim Return to Management Reserve
TN-24590-06-02961	Study for Steam Heating UFP Vessels - EFRT PT M12 changes
TN-24590-06-02962	Cesium Nitric Acid Neutralization
TN-24590-06-02963	ODC's to support E&NS HPAV activities
TN-24590-06-02965	Savings on Silver Mordenite Columns
TN-24590-06-02967	Alignment of LAW Melter Budgeted Cost for Work Scheduled (BCWS) with the existing Purchase Order
TN-24590-06-02968	Implementation of M095 - Add DOE M 442.1-1 (DPO)
TN-24590-06-02972	LAW: Recovery from Unidynamics Bankruptcy and Arch - Roofing and Siding
TN-24590-06-02973	LAW 1) Bulk Installation Package 2) Annex Roof Decking 3) Vent Stack Piping
TN-24590-06-02974	LAW CGD Requirements for the LVP Carbon Bed Absorber
TN-24590-06-02976	Fluidic Devices Jet Pulse Mixers ECAR for QL-POA-MPE0-00002
TN-24590-06-02981	Descoping of Undefined Plant Equipment Planning Packages
TN-24590-06-02982	Startup Impacts Due to Fire Service Water PP to WP conversion
TN-24590-06-02983	Commissioning Impacts Due to Fire Service Water PP to WP Turnover
TN-24590-06-02984	LAW Transition Frames

TREND #	TREND DESCRIPTION
TN-24590-06-02985	LAW Planning Pkg to Work Pkg Conversion
TN-24590-06-02986	LBL Subcontracts PP to WP Conversions
TN-24590-06-02990	Alignment of HLW Melter BCWS with existing PO QL-POA-MEEM-00002
TN-24590-06-02993	PP Start Date Correction - ER-BCP-03-PP
TN-24590-06-02994	PP Start Date Correction - ER-BCP-05-PP
TN-24590-06-02996	LAW Melter Feed Simulant Replacement
TN-24590-06-02998	HLW Convert PP to WP
TN-24590-06-03001	Commercial Grade Dedication Schedule
TN-24590-06-03002	Subcontract Planning Package to Work Package Conversion
TN-24590-06-03003	CO2 Pelletizers System Design Changes
TN-24590-06-03004	Acquisition Services into Three Control Accounts
TN-24590-06-03008	North Lay Down Yard Relocation
TN-24590-06-03010	IHLW Rescreening of WAI Items and Canister Calculations
TN-24590-06-03012	Engineering Automation Staffing & Training Increase
TN-24590-06-03015	Added 8 Start-Up Flanges for FSW
TN-24590-06-03016	LAW Annex Roofing and Siding Budget
TN-24590-06-03017	Marshalling Yard Consolidation - Labor Savings
TN-24590-06-03019	Commissioning Task Replan
TN-24590-06-03020	LBL Replan
TN-24590-06-03025	Startup Instrument Calibration budget transfer to C&T Maintenance
TN-24590-06-03027	Change logics for Hammock activities for transition to P5
TN-24590-06-03029	M-12 Pretreatment Engineering Platform Utility Increase for Vertical Filters
TN-24590-06-03030	M-2 Additional Testing
TN-24590-06-03032	Savings on West Metals
TN-24590-06-03033	Collection of PJM test Results
TN-24590-06-03035	WTP Project Selective use of WSGM
TN-24590-06-03038	Permit/Risk Assessment Schedule for EFRT/Capacity Modifications
TN-24590-06-03039	490 Curtailment Costs & Schedule delays for Weir Hazleton Feed Vessel Pump
TN-24590-06-03040	Additional REAs to HLW Melter Fabrication
TN-24590-06-03043	Addition of Facility DOW Expansion Tanks
TN-24590-06-03046	PP to WP Conversion - Plant Equip Exec Rev Impacts
TN-24590-06-03047	Transfer of Budget and Schedule for ASD Procurement
TN-24590-06-03048	Unsolicited Vendor REA - LAW Melter Spool Connections
TN-24590-06-03050	1.08-HH Staffing Variance
TN-24590-06-03051	EFRT Major Issues M15 - Availability, Operability and Maintainability
TN-24590-06-03052	Subcontract PP to WP Conversion
TN-24590-06-03053	Moving PW Warehousing & 2nd waste tracking from PT equipment
TN-24590-06-03056	Savings on Condensate Collection Vessels
TN-24590-06-03057	Startup Impacts Due to Early Energization of Cathodic Protection System - PP to WP Conversion
TN-24590-06-03067	Addition of Process Regulator Scope for LAW & HLW Erroneously Omitted in Bulk Transfer
TN-24590-06-03068	Reallocation of Budget for Elec Work PP in Equip Mang Sys
TN-24590-06-03069	LAW 5-Part Rework
TN-24590-06-03070	HLW Baseline Schedule Logic Corrections
TN-24590-06-03075	PT & HLW Mixing Design Evaluations
TN-24590-06-03076	Material Management Staffing Increase - Non Manual
TN-24590-06-03078	BOF PP to WP and Replan
TN-24590-06-03079	Allocating budget into correct WP
TN-24590-06-03080	LAW Convert PP to WP
TN-24590-06-03081	Increased Field Non Manual Requirements for CY08
TN-24590-06-03082	Transfer of CSA Hours to ODCs for ESQ Subcontract
TN-24590-06-03084	BOF - Coating of Pipe Rack Connections
TN-24590-06-03085	LAW Caulking
TN-24590-06-03086	Additional Scope for EFRT Issue M-2 Vessel Erosion
TN-24590-06-03087	LAW Freight Elevator Schedule Delay
TN-24590-06-03091	LAB Change logics for Hammock activities for transition to P5
TN-24590-06-03092	Additional Manhours for Construction Equipment Inspection/Spotters
TN-24590-06-03096	LAB Stack Internal replan
TN-24590-06-03097	Plant Design HPAV Schedule Update

TREND #	TREND DESCRIPTION
TN-24590-06-03098	Concrete Pump Truck Increased Efficiency PT & HLW Commodity Installs
TN-24590-06-03105	Intools Input Effort - Schedule Correction
TN-24590-06-03111	HFP Overflow Flapper Valves
TN-24590-06-03112	PTF Bulge CRPT-06-219 Issue Resolution
TN-24590-06-03113	OSHA 2 Inch Running Clearance for HLW Maintenance Cranes
TN-24590-06-03114	REA Settlement for Still-Water QL-POA-PF00-00002
TN-24590-06-03116	Adding schedule activities for QL-MRA-MJW0-00003
TN-24590-06-03119	Property Management Scope and Budget Transfer from Acquisition Services to Material Management
TN-24590-06-03120	UFP and PWD Vessel Ring Beams Refabrication
TN-24590-06-03121	80% Bulk Material and Equipment Reforecast
TN-24590-06-03122	Assess Impact of Implementing DOE M 470.4-1 and DOE M 470.4-2
TN-24590-06-03128	HLW Schedule Logic Corrections to Construction Schedule
TN-24590-06-03129	Cylinder Bottle Pressurized PP to WP Conversion
TN-24590-06-03133	Create Material Milestones in Primavera
TN-24590-06-03134	PP Replan for HLW and LAW
TN-24590-06-03137	LAB Communications Change to Cable Tray
TN-24590-06-03138	Lifting Beam Specification Revision and Capacity Increase
TN-24590-06-03139	Crane Combustible Inventory Reduction
TN-24590-06-03140	Capacity Mod Impacts to HLW Canister Racks
TN-24590-06-03141	Change HLW HEME Internal Components to Q
TN-24590-06-03142	Potential Reduction in HLW ODC's
TN-24590-06-03144	BOF Maintenance and Janitorial Services for the Simulator Building
TN-24590-06-03145	Replan of To-Go Hours for Developing Testing Admin Procedures
TN-24590-06-03149	Realign MS Schedule for Field Change Documents
TN-24590-06-03150	BOF Glass Former Storage Resequence
TN-24590-06-03152	BOF Site wide Cathodic Protection
TN-24590-06-03153	LAB - PP to WP
TN-24590-06-03154	Positive Cost Variance in H3 Accounts
TN-24590-06-03155	Additional Construction Safety Program Costs CY08/09
TN-24590-06-03156	Transfer Budget from Construction Bulks to Subcontractor Fireproofing
TN-24590-06-03157	BOF Subcontractor Cable Identification
TN-24590-06-03158	Flooding Trend (Study Only)
TN-24590-06-03160	Redesign of Cooling System for LAW Melter Lid
TN-24590-06-03161	Pre Eng Type A Bldgs Phase II Cost Increase
TN-24590-06-03162	Transfer Testing of Grayloc's from Equipment to ENG ODC
TN-24590-06-03164	LAW - Revised Bolt Tightening Requirments
TN-24590-06-03166	PT Vessel Subcontract to Direct Hour Conversion
TN-24590-06-03167	New Warehouse Lease Cost
TN-24590-06-03171	HLW Planning Package to Work Package Conversion
TN-24590-06-03173	Purge Air for Hydrogen Mitigation in LAW Vessels
TN-24590-06-03174	Additional Funding for RIO MR# 24590-CM-MRA-JC00-00006
TN-24590-06-03175	Cost Increase & Schedule Delays for HLW CCTV Due to 490 Funding Limitations/Design Evolution
TN-24590-06-03177	Schedule Logic Correction for C&I LAW Confirmed Calculation
TN-24590-06-03178	Down-Trend for HLW Spooled Pipe
TN-24590-06-03179	Implementation of Equipment Qualification Program
TN-24590-06-03180	Broad-Based Review
TN-24590-06-03181	QL-POA-MEEM-00001 Approved ECAR's
TN-24590-06-03183	LAW - Pour Cave Cooling Panels - Monorail Modification
TN-24590-06-03184	LAW Scaffolding Support for Partition Walls
TN-24590-06-03186	QL-POA-MEEM-00002 Approved ECAR's
TN-24590-06-03188	Jumper Data Sheet Schedule Alignment
TN-24590-06-03189	Piping Joggle Transfer of Budget from Concrete Embedments to Plant Material and Pricing Reconciliation
TN-24590-06-03193	Deferral of CY 2008 Early LAW Activities to CY 2009
TN-24590-06-03195	REA Settlements for PaR Systems, Inc.
TN-24590-06-03196	Sub-Contracts Planning Package to Work Package Conversion
TN-24590-06-03198	Engineering Management Staffing Alignment
TN-24590-06-03201	HLW Mods HVAC Design Mitigating Loss of Cooling/Heating Accidents
TN-24590-06-03202	Heavy Lift Crane Mats

TREND #	TREND DESCRIPTION
TN-24590-06-03206	PTF PP to WP and Clarifition of Work Scope
TN-24590-06-03207	Correct ommission / error from BCP 06-3004 3 Control Accounts
TN-24590-06-03208	Increase Cost for Severe Weather Doors
TN-24590-06-03209	Impacts to LAW and LAB Coiling Door Subcontract
TN-24590-06-03210	HLW Engineering Impacts from In-Structure Response Spectra (ISRS) Changes
TN-24590-06-03212	LAB Steel Quantities
TN-24590-06-03214	PT Hot Cell Crane Rail Beam Addt'l NDE/Weld Rqmts Vendor Supplied Crane Rails
TN-24590-06-03216	Transfer of Production and Added Scope for Software Life Cycle Documents
TN-24590-06-03217	Correction of BCWS in two of PT Equipment Pos
TN-24590-06-03218	Extension of the Material Requisition BEA Cycle
TN-24590-06-03219	Additional Budget Required to Support Evaluation of DOE-STD-1066 Impact on WTP HEPA Systems
TN-24590-06-03220	Glovebox and Posting Machine Schedule Revision due to 490 Funding Limitations
TN-24590-06-03228	Forward Pricing Rates (FPR) (Dec-2007)
TN-24590-06-03229	BOF Site Wide Vacuum Truck
TN-24590-06-03230	PTF Internal Replan Concrete
TN-24590-06-03231	BOF Pipe/Water Treatment Bldg. Concrete Trend
TN-24590-06-03233	LAW Fire Protection Obstruction Corrections
TN-24590-06-03234	BOF PP to WP conversion
TN-24590-06-03236	PT - Enclosure of stairwells & North Side for Weatherization
TN-24590-06-03237	Removal of Parasitic Loads from the Fire Service Water System
TN-24590-06-03239	Actuated Jumper Valves - Specification and Procurement by C&I
TN-24590-06-03241	Revisions to HLW Cranes and Cable Reels
TN-24590-06-03243	Non-Logic Driven Activities Re-Plan for Plant Design
TN-24590-06-03244	Addition of Fire Barrier Drawings to CSA Scope
TN-24590-06-03245	Safeguards and Security Budget Transfer
TN-24590-06-03247	Addition of Humidification to HLW C2 AHUs
TN-24590-06-03251	LBL Near Term Title III Engineering Hours
TN-24590-06-03253	PT Internal Replan of HVAC PMB
TN-24590-06-03254	Engineering Procedures and Processes Staff Increase
TN-24590-06-03260	Align Equipment, Budget & Schedule for MH MRs
TN-24590-06-03262	Additional Criticality Support
TN-24590-06-03264	Construction Subcontracts Planning Packages to Work Packages.
TN-24590-06-03265	LA-ICP-AES Installation Site Testing
TN-24590-06-03266	Remove Construction Escalation Activities
TN-24590-06-03268	LAW, Convert Eight Planning Package to Work Packages
TN-24590-06-03269	Correction of Time Phasing for PT Equipment BCWS previously incorrectly statused as Complete
TN-24590-06-03270	Reconcillitation of Execution Revision Equipment Budget
TN-24590-06-03271	PTF Committed System To Go Unit Rate Alignment
TN-24590-06-03272	Revision of the PTF Preliminary ISM Schedule to Reflect Revised Design Schedule
TN-24590-06-03273	Early LAW 2014 Commissioning Conceptual Design Study and Report
TN-24590-06-03275	Storage Costs for Suspended Pressure Vessels
TN-24590-06-03278	Emergency Diesel Generator Alternatives Study
TN-24590-06-03279	Revision To Startup Generic Logic In The Baseline Schedule
TN-24590-06-03280	Ultrafilter Tube Failure Investigation
TN-24590-06-03283	UFP Vessel Modifications Due to Capacity Mods
TN-24590-06-03284	OBS HB Plant Wide Favorable Variance
TN-24590-06-03285	Mentoring EPCON -Supplier Quality & Quality Assurance
TN-24590-06-03287	Transfer of Six Sigma from Proj Bus Mgmt to Quality and Performance Assurance
TN-24590-06-03289	Planning Package to Work Package Conversion for C&I Plant Equip
TN-24590-06-03292	Implement Pipe Spt ABAR in Criteria, Guides, & Std Calcs - Phase II
TN-24590-06-03294	LAW Elevator Guide Rail
TN-24590-06-03295	LAW - Elevation +48 Adsorber 1A and 1B
TN-24590-06-03296	Modification to Sodium Hydroxide Reagent Piping & Controls
TN-24590-06-03297	Shield Door Recovery Device Receiver Add to Crane Maint Shield Door Scope
TN-24590-06-03299	M&PE Engineering EQ Implementation
TN-24590-06-03301	LAW Pour Cave Cooling Panel Emmissivity Requirements
TN-24590-06-03304	Favorable Trend for PTF Crane Maintenance Shield Door
TN-24590-06-03306	BOF Internal Replan

TREND #	TREND DESCRIPTION
TN-24590-06-03307	HLW Delete BCP Budget Place Holder Activities
TN-24590-06-03308	Realignment of HLW Steel Budget and Quantities per Hirschfeld Steel Contract
TN-24590-06-03309	LAW Combined Trend
TN-24590-06-03310	Place PT PVV Fans on Emergency Diesel Generator Power
TN-24590-06-03312	HLW Electrical Joggle Purchase Strategy Change
TN-24590-06-03313	LAW Pour Cave Panel and Hanger Installation; LFH Shard Samplers; Vessels 2 & 4; & Pipe Interference w/Lug
TN-24590-06-03314	LAW - Finish Line Hoists Monorail Lidding/ Dual Rail Hoists/ JIB Cranes
TN-24590-06-03315	Transportation and Refurbishment of ACECO cranes
TN-24590-06-03316	LAW Piping Planning Package to Work Package
TN-24590-06-03318	Impact of Preparation Guide for US DOE Nonreactor Nuclear Facility Safety Analyses
TN-24590-06-03319	Assess Impact to Preparation for Cost & Schedule Estimate for Installing Third Melter
TN-24590-06-03320	C&T Laboratory Labor Underrun
TN-24590-06-03321	Emergency Diesel Generator Evaluation - Schedule Logic Changes
TN-24590-06-03322	REA for Oregon Iron Works (24590-QL-POA-ADDH-00007)
TN-24590-06-03323	PP Replan for M-6 Process Limits Definition
TN-24590-06-03324	PP Replan for Alt Resin Stage III Testing
TN-24590-06-03325	Construction Distribs Budget Increase (April '07 - Sept '07) due to Direct Craft Labor BCPs
TN-24590-06-03326	LAW Melter Lid Modifications
TN-24590-06-03327	LAB Planning Package to Work Package
TN-24590-06-03328	LAW Planning Package to Work Package Conversion
TN-24590-06-03330	Delete R&T Testing of Antifoam Impact on Filter Flux
TN-24590-06-03332	Analysis of Concrete Temperature Around Hot Pipe Penetrations
TN-24590-06-03333	HLW Melter Seismic Calculation
TN-24590-06-03335	LAB Construction Mechanical Equip Schedule Correction
TN-24590-06-03336	HLW Carbon Bed Adsorbers (CBA) Fabrication & Delivery Delay
TN-24590-06-03341	BOF/Lab Rod Room Attendant
TN-24590-06-03344	LAW - Install steel supports for LSH-CRN-00011 and LSH-CRN-00012 bus bars
TN-24590-06-03347	HLW Construction PP to WP
TN-24590-06-03350	HLW Radar Level Test Foaming Issues when Agitation is Stopped
TN-24590-06-03351	Subcontracts Converting PP to WP
TN-24590-06-03354	Jumper - Frame Vendor Proof of Performance Program
TN-24590-06-03356	ITS Valves for LAW Water Shutoff
TN-24590-06-03357	TLP Reboiler Modification
TN-24590-06-03358	Updated Quantities and Unit Rates for HLW MS Post-Committed Work
TN-24590-06-03359	Correction of Overstated PT Jumper Budget
TN-24590-06-03360	Transfer Safety Assurance Scope and Budget from PBM to Quality Assurance
TN-24590-06-03362	Flowdown of Non-Destructive Examination Requirements to Piping
TN-24590-06-03363	PE&T Functional Manager
TN-24590-06-03364	Electrical Bulk Material Quantity & Pricing Uupdate for LAW
TN-24590-06-03366	LAW 2014 Cost & Schedule Evaluation
TN-24590-06-03367	BOF - Pipe Rack 5C/5B, PT/HLW Interference
TN-24590-06-03368	Schedule Logic Correction for EPPR activity 01-J1123-002 PJM Design Activities
TN-24590-06-03370	Property Management Budget Transfer from Acquisition Services (WP 1.08-B0) to Material Mgmt
TN-24590-06-03371	BOF Steam Plant PP to WP
TN-24590-06-03374	Engineering Training Forecast FY08/09
TN-24590-06-03375	Adjust BCWS for Pipe Spools due to Engineering Holds on Pipe Spool Releases
TN-24590-06-03377	PTF Plant Design Utility Rack EPPR Code Ties
TN-24590-06-03378	PTF Plant Design RGM EPPR Code Ties & Schedule Realignment
TN-24590-06-03379	Budget for a Full Time Electrical Authority Having Jurisdiction (AHJ) Position
TN-24590-06-03381	Allyl Alcohol Method Regulatory Requirements
TN-24590-06-03383	Forward Pricing Rates (FPR) (Mar-2008)
TN-24590-06-03385	Planning Element Clean-up
TN-24590-06-03386	Correction of overstated bud, for PO 24590-QL-POA-MJKG-00004
TN-24590-06-03387	Propane Line Failure Testing/ DFO Coating Repairs
TN-24590-06-03390	BOF NLD/DFO Electrical Underwriters Laboratories Inspections/Modifications.
TN-24590-06-03392	Postive Cost Variance in Plant Wide Design ODC's
TN-24590-06-03395	Correction of Overstated Budget CM-MRA-MEEM-00001
TN-24590-06-03396	Correction of Overstated Budget QL-POB-MVA0-00010

TREND #	TREND DESCRIPTION
TN-24590-06-03397	Implementation of Topography Reviews
TN-24590-06-03398	LAW PP to WP
TN-24590-06-03399	LAB Construction Electrical Equipment Schedule Activity Definitization
TN-24590-06-03400	PJM Overblow Testing (Favorable)
TN-24590-06-03401	Review of the CGD Program
TN-24590-06-03407	EFRT M3 - IRP Revision and Additional Test Planning Scope
TN-24590-06-03408	Positive Cost Variance in E&NS Regulatory Safety Management Account
TN-24590-06-03410	Assess the Impact of Adding DOE/RW-0333P, QARD Rev 20
TN-24590-06-03411	Vendor REA for Revised Melter Material Quantities
TN-24590-06-03412	ASX Sampler Tests Replan
TN-24590-06-03413	Distribs Scaffolding PP to WP
TN-24590-06-03414	PT & HLW Upgrade Temp. Power to Construction Power
TN-24590-06-03415	Temporary Construction Utilities - Propane System
TN-24590-06-03416	Additional Architectural Sections and Details for HLW and PTF
TN-24590-06-03417	LAW - LFH Shard Samplers
TN-24590-06-03418	LAW Tools and Equipment for Removal of Silica Containing Coatings
TN-24590-06-03419	Implementation of ASME NQA-1 2000 and QARD 18 for Duratek, Inc.
TN-24590-06-03422	BOF 90 Day Window PP to WP
TN-24590-06-03425	C&T CY08 PP Replan
TN-24590-06-03426	BOF/Lab - Piping/Hanger Rework
TN-24590-06-03427	LAW - Melter Rail Grout
TN-24590-06-03428	PTF, PP to WP, Clarification of Electrical work.
TN-24590-06-03429	LAW Stair Nosing
TN-24590-06-03431	Pretreatment PP to WP Conversion
TN-24590-06-03432	Pretreatment Selected Wall & Slab Consolidation & PP to WP
TN-24590-06-03433	BOF ITS Switchgear Craft Labor Giveback
TN-24590-06-03435	ASX Design Completion, Trouble Shooting, and Fabrication
TN-24590-06-03437	Knowledge Relay LLC Support for Migration of P3-to-P6
TN-24590-06-03439	Additional LAW Melter bubblers
TN-24590-06-03443	Material Services & Procurement Engineering Startup
TN-24590-06-03444	BOF WTB Pipe/Electrical/Civil Design Evolution/Rework
TN-24590-06-03446	BOF CCP Eletrical Conduit Installation Supports Redesign/Rework
TN-24590-06-03447	PSI ENG Spec Change for Panel Indicator Lighting Colors and Supplier Document Submittal Requirements
TN-24590-06-03450	Re-Bid of API-610 Seal-less pumps due to requirements changes
TN-24590-06-03451	Correction of Time Phasing for HLW Equipment BCWS incorrectly statused as Complete
TN-24590-06-03453	PTF - Definitization of Drain Piping Work Packages
TN-24590-06-03455	LAW North Annex Inc Fireproof Quantity & Change Fireproof Material Type/Finish
TN-24590-06-03456	PW Vactor (VAC) Hydro Excavator Trucks
TN-24590-06-03457	PW - Installation of Repeater Antennas
TN-24590-06-03459	PW - T-52 Building - Add air intake dampers and seal louver/duct interfaces
TN-24590-06-03461	Elimination of the WBS 1.08 Plant Wide
TN-24590-06-03462	Conversion of PP to WP and Addition of 5 Enclosures for LAB
TN-24590-06-03463	Material Services & Procurement Engineering Team Implementation
TN-24590-06-03464	Subcontracts, Chicago Bridge & Iron Overhead Adjustment from 1.08 Account.
TN-24590-06-03465	Mentoring EPCON Supplier Quality
TN-24590-06-03467	Utility Service Schedule Updates
TN-24590-06-03468	BOF - T-52 Construction Warehouse Fire Detection System Upgrade
TN-24590-06-03470	Response to CRPTs: Pressure Safety Valves (PSVs)
TN-24590-06-03471	Ultrafilter Drain Testing (Favorable)
TN-24590-06-03472	CGD Impacts on Procurement of PTF Remote Clamp Connectors
TN-24590-06-03473	Additional E&NS Resources for Fire Safety Support
TN-24590-06-03475	PW Preventative Maintenance Material for Permanent Plant Equipment FY08/FY09
TN-24590-06-03476	PTF Leak Detection Boxes
TN-24590-06-03480	LAB, Planning Package to Work Package
TN-24590-06-03482	MH Engineering Tasks To Support Other Disciplines And Management
TN-24590-06-03483	Modifications to PTF HVAC Design for Mitigation of Loss of Cooling & Loss of Heating Accidents
TN-24590-06-03484	Vessel Code Evaluation Subcontract
TN-24590-06-03485	M&PE Equipment Group Engineering Budget

TREND #	TREND DESCRIPTION
TN-24590-06-03486	Transfer PP CSA Hrs for Design of Jumper Steel Grouted Pads/Embeds to WPs in PTF Hot Cell
TN-24590-06-03487	Implement Directed PSAR Update Process
TN-24590-06-03489	HVAC Alternate Fire Barrier Analysis
TN-24590-06-03490	Transfer of Vessel Analysis Scope to WTP Engineering
TN-24590-06-03492	M12 PDL-W Modification Overrun
TN-24590-06-03494	ENS Training Forecast FY08 through FY16
TN-24590-06-03495	HLW - Unit Rate revision for pipe and electrical sleeves
TN-24590-06-03496	PT - Removal & Reinstallation of Embedded Conduit, +56' el
TN-24590-06-03497	NOx Gas, Rearrangement of instruments due to potential exposure to NOx gas
TN-24590-06-03499	PT PP to WP Converison and Internal Replanning thru FY09
TN-24590-06-03500	C&I and Electrical Equipment List for Facilities
TN-24590-06-03501	Engineer, Procure & Install Guradrails on Pre-Engineered Metal Buildings (ENG 1069)
TN-24590-06-03502	EFRT Issue M3 Completion
TN-24590-06-03505	LAW, Planning Package to Work Package, Replan
TN-24590-06-03506	LAW, Planning Package to Work Package, Replan
TN-24590-06-03508	HLW Drum Transfer Rails
TN-24590-06-03509	BOF FSW Battery Rack Modifications
TN-24590-06-03512	Compensation For QL-POA-MEEM-00001 REA Vendor Cost
TN-24590-06-03514	LAW - Melter Winch, Pulley Systems
TN-24590-06-03516	HLW - Completed Scope Summary (Favorable)
TN-24590-06-03517	HLW, PP to WP, FY08 & FY10
TN-24590-06-03518	PTF Building 12 Re-Design
TN-24590-06-03520	HLW - P3 to COBRA Alignment
TN-24590-06-03521	LAW - COBRA to P3 Alignment (Favorable)
TN-24590-06-03524	Convert Planning Package to Work Package for 24590-CM-MRE-MVA0-00003
TN-24590-06-03528	ISM Changes for HOP Preheaters
TN-24590-06-03529	Material Corrosion Evaluation
TN-24590-06-03531	Downtrend for Late Adjustments related to EFRT & Misc Ops in 1.08MT Plant Material
TN-24590-06-03535	Steam Conditioning Skid Scope Reduction
TN-24590-06-03539	Support for Revisions to Unique, One-of-a-Kind MH Equip
TN-24590-06-03540	Seismic Monitoring System
TN-24590-06-03544	SRNL Project Management Extension
TN-24590-06-03545	LAW PP to WP Conversion, Bulges and Pumps
TN-24590-06-03548	Implement ILAW/IHLW Glass Formulation Algorithms in Plant Control and Waste Form Compliance Software
TN-24590-06-03553	BOF-FSW, Pump House Foundation to Increase scope for DH craft
TN-24590-06-03556	False Claims Act Suit (Rille Litigation)
TN-24590-06-03557	Construction Support for Black Cell Piping Pilot Program
TN-24590-06-03558	Implementation and Execution of Revised Architectural AHJ Process
TN-24590-06-03560	Upgrade Lenel Security Software
TN-24590-06-03561	ACECO Crane Refurbishment
TN-24590-06-03565	Remote Fastener Qualification for FEP & TLP Systems
TN-24590-06-03568	LAB Jib Crane support; Hot Cell Maint. Room
TN-24590-06-03569	Engineering Support for Construction Subcontracts and Schedule Alignment
TN-24590-06-03570	LAW - Add HVAC Fire Dampers on Fire Rated Walls
TN-24590-06-03573	Omitted Equip. Mounting Interfaces - Transition Frames/Equip. Pads
TN-24590-06-03577	PTF Additional activates to complete 4th Lift Walls
TN-24590-06-03578	Pipe Deemed Deleted Reusable Material (DRM) for All Facilities
TN-24590-06-03579	Piping Joggles/Process Improvements
TN-24590-06-03580	BOF Additional Fire Alarm Panels FSW
TN-24590-06-03583	M12 - Pretreatment Engineering Platform Transportation Costs
TN-24590-06-03584	Vendor Rebid for RLD-VSL-00002 Fabrication
TN-24590-06-03585	Favorable Trend for P5 (IX Process Development)
TN-24590-06-03586	Fire Protection Resident Engineer
TN-24590-06-03587	PTF & HLW Bogie Shield Doors Seismic Analysis Qualification
TN-24590-06-03588	Material Handling Facility Furniture/Fiber Installation
TN-24590-06-03591	HLW Formwork Shoring 0' through 37'
TN-24590-06-03593	LAW - Compound Tolerances Civil/Structural/Mechanical
TN-24590-06-03594	BOF - Vac Truck Trend

TREND #	TREND DESCRIPTION
TN-24590-06-03595	LAW - Penthouse Siding Support Steel
TN-24590-06-03596	LAB PP to WP and Internal Replan
TN-24590-06-03598	Plant Design Unit Rates for Modeling and Isometric Unit Rates
TN-24590-06-03600	DOE O 430.2B Transportation/Fleet Maintenance (Assesement)
TN-24590-06-03601	Thermal Catalytic Oxidizer Procurement Strategy Update
TN-24590-06-03603	HLW Task Order Restart
TN-24590-06-03604	Additional scope for resolution of 24590-WTP-CRPT-QA-07-170
TN-24590-06-03606	HLW N690 Weld Inspections
TN-24590-06-03607	PW Electrical Q Stainless Steel Fasteners to Replace CM Stainless Steel Fasteners
TN-24590-06-03614	Changes to PT and HLW Steam Systems Quality and Seismic Categories
TN-24590-06-03615	LAB - Stack Steel Restraint Lugs
TN-24590-06-03617	PW Implementation Of 10CFR851 Budget into Correct Control Accounts
TN-24590-06-03619	Deletion of PJV Bulge and Vessel
TN-24590-06-03620	HLW Establishing a Unit Rate for HLW Joggle Installation
TN-24590-06-03621	Transfer Remaining Budget for Load Path from PWM to CS&A
TN-24590-06-03622	Engr Recovery Plan 2008 Office Moves
TN-24590-06-03624	LAW - Concrete planning package to work package replan
TN-24590-06-03627	LAW - LMH-RAIL-00001,2,3,4
TN-24590-06-03628	Development of Alternatives for Permanent Melter Assembly Building
TN-24590-06-03629	Correction of Coding Errors on PO CM-POA-MAH0-00001and QL-POA-MACS-00002
TN-24590-06-03631	PTF Installation of Cell Top Steel & Platforms PP to WP Conversion
TN-24590-06-03632	PTF Rod Room Attendant
TN-24590-06-03634	Startup/Commissioning Milestone & Logic Cleanup
TN-24590-06-03636	LAW Melter End Trucks Petersen REA
TN-24590-06-03637	LAW Inert Fill Pipe and Support Structure
TN-24590-06-03638	Establishment of Management Budget for New Plant Equipment Group
TN-24590-06-03639	Deletion of Two (2) Redundant P3 LAW Piping Activities
TN-24590-06-03641	ACGIH Physical Agent TLV Implementation
TN-24590-06-03642	HLW Field Modification of Fabricated Steel to Accommodate Installation of Multi Discipline Rack Steel
TN-24590-06-03643	Installation of Pipe for Vessel 904
TN-24590-06-03644	LAW - SHIM PLATES FOR BULGES ON +28 ELEVATION
TN-24590-06-03646	Independent Verification of Melter Calculations (CRPT-QA-07-325)
TN-24590-06-03647	EFRT M-1 Test Acception PNNL Descope
TN-24590-06-03649	LAW - Combined Electrical Trend
TN-24590-06-03650	Knowledge Relay P3-P6 Stage 4
TN-24590-06-03654	Transfer Constr FNM Project S/C Mgmt Scope/Budget from Const to Acq Srvs
TN-24590-06-03655	CHW Circuit Balancing Valves for LAW and PT
TN-24590-06-03657	Baseline T560 Migration to P6
TN-24590-06-03658	HLW SBS and HEME Modifications
TN-24590-06-03659	Cathodic Electrical Equipment Estimate Error
TN-24590-06-03661	Construction Distributable Shuttle Van for Site to Town Transportaton
TN-24590-06-03662	Transfer of Craft Training Hours from PT/HLW Remobilization to Construction Distributables
TN-24590-06-03663	BOF Preventative Maintenance
TN-24590-06-03664	PW Additional M&TE Budget for Construction Distributables
TN-24590-06-03670	Increase in BOF Grounding Cable Quantities
TN-24590-06-03672	Emergency Diesel Generator Design
TN-24590-06-03673	PT & LAW - Steel Price Increase for American Fabricator Pressure Vessels
TN-24590-06-03676	PTF/HLW - Add HVAC Fire Dampers on Fire Rated Walls
TN-24590-06-03678	Re-align Planning Package BCWS With The Baseline Schedule
TN-24590-06-03681	LAW Carbon Bed Adsorber EQ & ISM Driven Changes
TN-24590-06-03682	PW Replacement of Flooring in Site Restrooms
TN-24590-06-03683	PTF - Design Changes to Completed Work for Walls 4-30 & 4-31
TN-24590-06-03684	Lab Stack Grating Rework
TN-24590-06-03686	System LFH Decontamination Robotic Arm Modifications
TN-24590-06-03689	LAW-R&T PP to WP Commissioning Simulant
TN-24590-06-03690	R&T Duratek (ES) Closeout
TN-24590-06-03691	LAW - Painting & Wall Covering Scope Transfer Between Control Accounts
TN-24590-06-03692	HLW - Correcting Omission in MAY 06 EAC of 4 sets of -21' Rails

TREND #	TREND DESCRIPTION
TN-24590-06-03693	PTF: PIH-CRN-00004 Crane Rail Install/Align
TN-24590-06-03695	PW - PTF Temporary Work Platforms - Labor
TN-24590-06-03696	BOF PSA in DOE Line Rework Excavation/Backfill
TN-24590-06-03697	PTF 10-MHAN-00004 Decontamination Booth Assembly
TN-24590-06-03700	PNNL LAW Statistical Support PP to WP Conversion
TN-24590-06-03703	Corrosion Testing for UFP Vessels
TN-24590-06-03704	Craft Support for First Drop of Material at Construction Site
TN-24590-06-03709	Add Paint Booth and Abrasive Blast Booth in Building T-47
TN-24590-06-03710	Additional Maintenance Platforms for Crane LEH-CRN-00003
TN-24590-06-03714	BOF Electrical/Instrumentation Redesign
TN-24590-06-03715	Change of Procurement Strategy of LAW TCO Components
TN-24590-06-03716	Impact of assessment: DOE M 470.4-4, Information Security, Change 1
TN-24590-06-03717	PTF Concrete Chipping to Support Installation of Secondary Containments
TN-24590-06-03718	PTF Installation of RWH-DOOR-000007 and DOOR-00023
TN-24590-06-03722	BOF CCP/NLD 2
TN-24590-06-03725	LAW - Additional Hours for Installation of Large Vessel Pumps
TN-24590-06-03726	Combo Shop Modifications to Support Black Cell Pipe Repairs
TN-24590-06-03727	BOF DOE Pipe Work Pause/Cold Weather Work
TN-24590-06-03728	LAW Hoist Upgrades Concurrent to Refurbishment
TN-24590-06-03729	Acquisition Services Negotiated Savings - PIP No. P012
TN-24590-06-03732	CM HVAC S/C Schedule Impacts of Project Re-Sequence Plan & Execution Strategy
TN-24590-06-03733	LAB Stack Stair Handrail Modification
TN-24590-06-03735	M3 Phase I Cohesive Simulant Descope
TN-24590-06-03738	Tepid Water Heaters for BOF, LAW, LAB, and HLW
TN-24590-06-03739	HFH Crane Modifications, Spares, and Recovery System
TN-24590-06-03742	Convert LAW Engineering Subcontact PP to WP
TN-24590-06-03743	LAW - Shard Table Support; Embed Interference; Painting of Black Iron
TN-24590-06-03750	HLW Melter Seismic Analysis Scope Increase
TN-24590-06-03751	FEA Calculation for 6 LAW and 2 PTF Bulges
TN-24590-06-03755	Equipment Anti-Sweat and Personnel Protection Insulation
TN-24590-06-03757	LAB - Cable Tray Supports
TN-24590-06-03762	Construction Distribs Budget Increase in Support of Approved BCP's from Oct 07 - Aug08
TN-24590-06-03765	Additional Budge for HOP Manual Valves
TN-24590-06-03766	T43 & 47, Area 41 & Parking Lot Fencing
TN-24590-06-03768	Engineering Support of DOE Audit Team
TN-24590-06-03769	BOF - Disassembly / Reassembly of the CCP Motor Starter Cabinets
TN-24590-06-03771	LAW - Primavera BCWS and BCWP Electrical Commodity Alignment to TEAMWorks, Setroute, and QURR
TN-24590-06-03774	LAW Additional Hrs for Installion of LFM-PMP 00007,8,9,10,11,12,13,14,15,16,17,18
TN-24590-06-03775	Melter Feed Studies - Agitator Design Change
TN-24590-06-03776	BOF - Switchgear Drip Shield Intall (Bldg. 87 & 91)
TN-24590-06-03780	Schedule Change to Planning Package for Jumper Materials
TN-24590-06-03782	Anhydrous Ammonia Storage Facility
TN-24590-06-03783	LAW Electrical Unit Rate Forecast
TN-24590-06-03785	LAW - MECHANICAL REWORK FORECAST
TN-24590-06-03786	PT - IX / Alt Resin III PP Partial Return to MR
TN-24590-06-03788	Reallocate HVAC Procurement from Existing Purchase Order (PO) to new PO
TN-24590-06-03793	PE&FM System Leads Tasks
TN-24590-06-03794	Lab Pipe Unit Rates
TN-24590-06-03800	PTF Girt Clip Modifications
TN-24590-06-03801	PTF Chipping Concrete Top of Existing Wall
TN-24590-06-03804	Recovery Plan Optimization - Electrical (Concession)
TN-24590-06-03805	Recovery Plan Optimization - Mechanical Systems (Concession)
TN-24590-06-03806	Recovery Plan Optimization - C&I Estimate Reductions (Concession)
TN-24590-06-03807	Recovery Plan Optimization - Plant Design (Concession)
TN-24590-06-03808	Recovery Plan Optimization - Civil/Structural/Architectural (Concession)
TN-24590-06-03809	Recovery Plan Optimization - Mechanical Handling (Concession)
TN-24590-06-03810	Recovery Plan Optimization - Engineering Management (Concession)
TN-24590-06-03811	Recovery Plan Optimization - PEQ (Concession)

TREND #	TREND DESCRIPTION
TN-24590-06-03851	Changes to PT and HLW Steam Systems Quality and Seismic Categories
TN-24590-06-03756	Change to PT Rack Procurement Strategy and Risk Realization
TN-24590-06-03798	PW Replacement of Spiral Wound and Flat Sheet Graphite Gaskets
TN-24590-06-03815	HLW - Safety Wire Mesh for Elevated Slabs
TN-24590-06-03816	HLW Extra Concrete Floor Finishing for Liner Plates
TN-24590-06-03817	HLW Establishing an Embeds & Steel Field Fabrication Account
TN-24590-06-03818	HLW - Piping/Hanger Rework

List of Exclusions from Equitable Adjustment Settlement

Trend #	Trend Description
TN-24590-06-02279	Expansion of DWP Requirements (Permit Modifications)
TN-24590-06-02381	DOE Order 205-1A Cyber Security Managment Program
TN-24590-06-02728	M-12 Engineering Scale Pretreatment System (Design, Procure, Install)
TN-24590-06-02778	Reduction of Core Bores for HPAV Active Controls
TN-24590-06-02874	Increased Cost of LAW/LAB Partition Walls Subcontract
TN-24590-06-03109	Plant Material Bulk Steel EAC Increase
TN-24590-06-03123	EPD Funding to Support EFRT M12 PT Engineering Platform Completion
TN-24590-06-03146	EPD Funding to Support EFRT M12 PT Engineering Platform
TN-24590-06-03204	EPD Funding to Support EFRT M12 PTF Engineering Platform Completion, Part 3
TN-24590-06-03242	PEP Install, Plan Site Integrated and Shakedown Testing, & Oversight
TN-24590-06-03282	Additional HPAV Active Controls
TN-24590-06-03317	BNI and DOE HPAV Test Program
TN-24590-06-03329	Increased Cost of Carbon Media Testing
TN-24590-06-03394	ABAR to Implement DOE S 1066 Chpt 14 for Nuclear Filter Plenum Fire Protection
TN-24590-06-03405	PEP Site Integrated Testing and Shakedown
TN-24590-06-03487	Implement Directed PSAR Update Process
TN-24590-06-03503	PEP Phase 1 Testing, Trend 1
TN-24590-06-03527	Engineering Study and Support Scope for Standard 1066
TN-24590-06-03533	Quantity and Material Escalation for Pipe Supports Impacting Control Account 1.08 MT
TN-24590-06-03537	Increase Fuel Surcharge
TN-24590-06-03563	IHLW Analysis Program Implementation Phase I
TN-24590-06-03708	Implementation of Features Equivalent to DOE-STD-1066
TN-24590-06-03752	Safety Classification Process for the Waste Treatment and Immobilization Plant
TN-24590-06-03753	Justification for Continued Design, Procurement, and Installation
TN-24590-06-03754	Increased Cost for HPAV Test Program
TN-24590-06-03781	Evaluation and Interim Report on Updated Radioactive Source Term
TN-24590-06-03820	Re-Evaluation Of HPAV Design Strain Criteria
TN-24590-06-03823	Pretreatment Engineering Platform Shakedown Testing Extension
TN-24590-06-03827	Additional Support for Material at Risk Design Basis
TN-24590-06-03859	Additional Impacts Associated with 10 CFR 851
TN-24590-06-03860	Additional Escalation Impacts Beyond May 2006 EAC Rates Through Jan 2009
TN-24590-06-03861	Received Vendor & Subcontractor Claims Due to DOE Impacts

Modification #	Modification Description
M090	Implement DOE O 205.1A, Department of Energy Cyber Security Management
M101	Maximum Available Control Technology and Destructive & Removal Efficiency Testing
M122	Process Changes for Revised Dangerous Waste Permit
M136 Item 3c	Implement New Preliminary Safety Analysis Report (PSAR) Updates
M141 Item c	Implement New Safety Classification Process