SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) >	RATING	PAGE 1	OF	PAGES 1

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NUMBER
DE-AC27-01RV14136	DE-RP27-00RV14136	[ ] SEALED BID (IFB) [X] NEGOTIATED (RFP)	August 31, 2000	27-00RV14136.000

7. ISSUED BY CODE

U.S. Department of Energy
Office of River Protection
Office of Business Management and Administration, H6-60
2440 Stevens Drive (or P. O. Box 450)
Richland, WA 99352

8. ADDRESS OFFER TO *(If other than Item 7)*

Same as Block 7
ATTN: Michael K. Barrett, Contracting Officer

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder"

SOLICITATION

9. Sealed offers in original and _____*_____ copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if handcarried, in the depository located in ** until ** (Hour) local time ** (Date)

* See Section L Provision entitled "INSTRUCTIONS - GENERAL"

** See Section L Provision entitled "TIME, DATE AND PLACE OFFERS AND OTHER WRITTEN PROPOSAL INFORMATION ARE DUE"

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: >	A. NAME	B. TELEPHONE (NO COLLECT CALLS) AREA CODE	NUMBER	EXT.	C. E-MAIL ADDRESS
	Michael K. Barrett	509	373-4143		michael_k_barrett@rl.gov

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OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period

12. In compliance with the above, the undersigned agrees, if this offer is accepted within *** calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule

*** See Section L Provision entitled "OFFER ACCEPTANCE PERIOD"

13. DISCOUNT FOR PROMPT PAYMENT *(See Section I, Clause No. 52.232-8)* >	10 CALENDAR DAYS %	20 CALENDAR DAYS %	30 CALENDAR DAYS %	CALENDAR DAYS %

14. ACKNOWLEDGEMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:	AMENDMENT NO.	DATE	AMENDMENT NO.	DATE
	1	9/27/2000		
	2	10/6/2000		
	3	10/11/2000		

15A. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*
Bechtel National, Inc. 45 Fremont Street San Francisco, CA 94105			Ron Naventi, Senior Vice President

15B. TELEPHONE NO. AREA CODE	NUMBER	EXT.	15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE	17. SIGNATURE	18. OFFER DATE
415	768-2374		[ ]	Original Signature of R. F. Naventi on File	20-Oct-00

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION
All	See Section B.4	89X0242.91 39EW01J20

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION	23. SUBMIT INVOICES TO ADDRESS SHOWN IN *(4 copies unless otherwise specified)* >	ITEM
[ ] 10 U.S.C. 2304(c)( ) [ ] 41 U.S.C. 253(c)( )		See Section G.4

24. ADMINISTERED BY *(If other than Item 7)* CODE	25. PAYMENT WILL BE MADE BY CODE
	See Section G.4

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA	28. AWARD DATE
Harry L. Boston, Acting Manager Office of River Protection	Orignial Signature of H. L. Boston on File *(Signature of Contracting Officer)*	12/11/2000

IMPORTANT - Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

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-incentive fee (CPIF) completion Contract. The Contract provides incentive fees for cost performance, schedule performance, and operational performance.

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*.

B.2 OBLIGATION AND AVAILABILITY OF FUNDS

(a) Subject to the Section I Clause entitled, *Limitation of Funds*, the amount presently obligated under the Contract is $69,000,000 for the period estimated to end September 30, 2001.

(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.

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 TARGET COST AND FEES

(a) Target Cost, and Minimum and Maximum Fees. Table B.1, *Incentive Fee Structure*, summarizes the incentive fees for the Contract. The dollar values shown in Table B.1 are based on the Contractor's Target Cost of $3,965,000,000. The Maximum Fee that may be earned by the Contractor under this Contract may not exceed $594,750,000 (less any decrements in accordance with Clause B.8 and Clause H.3, *Key Personnel*, of this Contract). The Minimum Fee the Contractor may earn is $79,300,000 (less any decrements in accordance with Clause B.8 and Clause H.3 of this Contract).

(b) Fee-Related Milestones. This Contract includes five key milestones that are linked to fee determination: “Start of Construction” (Milestone M1); “Completion of Acceptance Testing” (Milestone M3); “Start of Hot Commissioning” (Milestone M4); “Completion of Hot Commissioning” (Milestone M5); and “Completion of Contract Requirements” (Milestone M6). The milestones are further described in Section C, *Statement of Work*, and Section F, *Deliveries or Performance*.

Table B.1 Incentive Fee Structure

Cost Performance Fee		
Target Cost (excluding fee)	$3,965,000,000	Target Cost for "Completion of Contract Requirements" (as specified in Section C).
Target Fee (Cost Performance)	$275,567,500	Target Fee (Cost Performance) that can be earned if the Actual Cost at Contract Completion falls within the Target Cost Range.
Target Cost Range Lower Value Upper Value	 $3,766,750,000 $4,163,250,000	Lower Value to Upper Value of the Target Cost Range.
Minimum Cost Performance Fee	$128,862,500	
Cost Share Ratio	80/20	Government/Contractor Share Ratio. For each $1 of cost underrun/overrun, the Contractor's Cost Performance Fee would be increased/decreased by $0.20
Schedule Performance Fees		
Start of Hot Commissioning Fee	$19,825,000	Fee earned for achievement of "Start of Hot Commissioning" on or before scheduled date (as specified in Sections C and F). No fee is earned for achievement after the scheduled date.
Completion of Hot Commissioning Fee	$49,562,500 to $(49,562,500)	The minimum and maximum fee range for "Completion of Hot Commissioning" (as specified in Section C).
	$135,788 per day	Fee will be reduced for each day of delay beyond the date of "Completion of Hot Commissioning" specified in Section F. Fee will be increased for each day the milestone is met prior to the date of "Completion of Hot Commissioning" specified in Section F.
Operational Performance Fee		
Operational Performance Fee	$39,650,000	May be earned as specified in Clause B.5.(c).
Maximum/Minimum Fee		
Maximum Fee	$594,750,000	
Minimum Fee	$79,300,000	

(c) Relationship Between Commissioning and Fee. A condition precedent to earning fee in an amount greater than the Minimum Fee is successful "Completion of Hot Commissioning" of the WTP, as specified in Section C, Standard 5, *Commissioning*. This Section will not impact the Contractor's ability to receive Provisional Fee payments in accordance with Clause B.7 of the Contract. However, if "Completion of Hot Commissioning" is not successfully achieved, any previously paid fee, including Provisional Fee and Schedule Performance Fee in excess of the Minimum Fee shall be repaid to DOE in accordance with Clause B.9.

(d) Actual Cost at Contract Completion means total allowable cost to achieve "Completion of Contract Requirements."

B.5 FEE DESCRIPTIONS AND CALCULATIONS

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 DOE goals for project cost, schedule, and operational performance. The Contractor's fee is held largely at risk subject to the successful "Completion of Hot Commissioning" and "Completion of Contract Requirements" for the WTP.

The Cost Performance incentive, Schedule Performance incentive, and Operational Performance incentive are calculated independently. The earned fee will be calculated as follows:

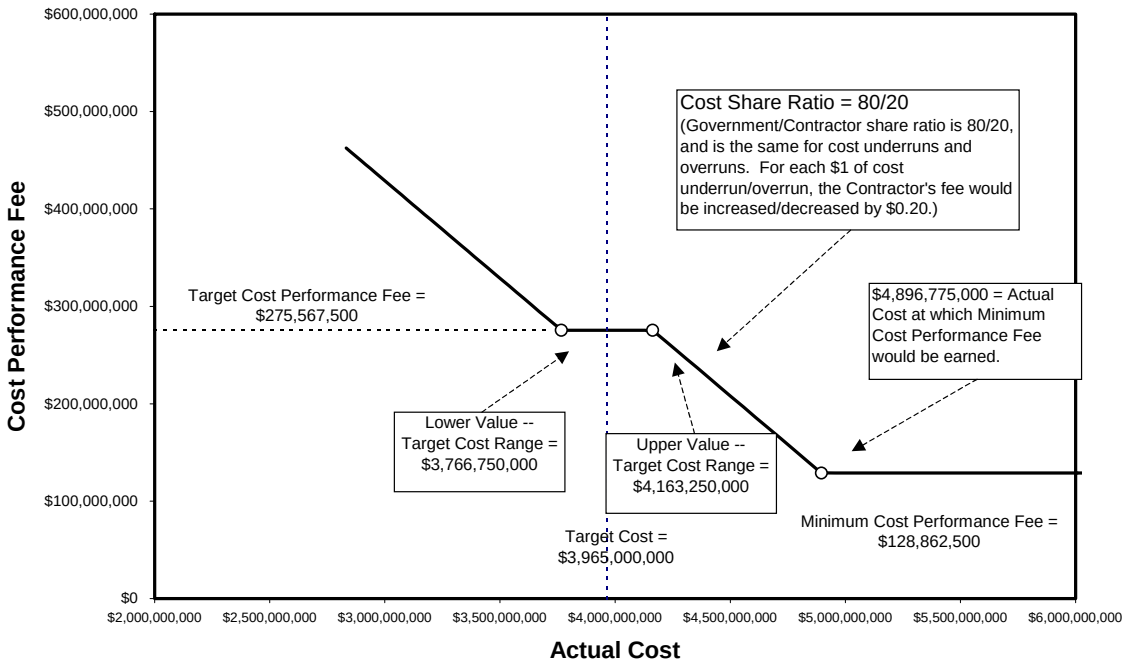
The total earned fee	=		Cost Performance Fee (B.5(a))
		±	Schedule Performance Fees (B.5(b))
		+	Operational Performance Fee (B.5(c))
		–	Fee Reductions from Clause B.8 and Clause H.3.

The Cost Performance, Schedule Performance, and Operational Performance incentives are described in detail below.

(a) Cost Performance Fee

The Cost Performance incentive is structured to assure that DOE and the Contractor share in the cost underruns or overruns from the Target Cost Range, as shown in Figure B.1, *Fee for Cost Performance*. The Target Fee (Cost Performance) of $275,567,500 can be earned if the Contractor's Actual Cost at Contract Completion falls within the Target Cost Range. If the Actual Cost at Contract Completion is greater than the Target Cost Range, the earned Cost Performance Fee will be reduced in accordance with the cost share ratio in Figure B.1, but in no event will the Cost Performance Fee be less than the Minimum Cost Performance Fee. If the Actual Cost at Contract Completion falls below the Target Cost Range, the Contractor will earn additional fee in accordance with the cost share ratio in Figure B.1.

Figure B.1 Fee for Cost Performance



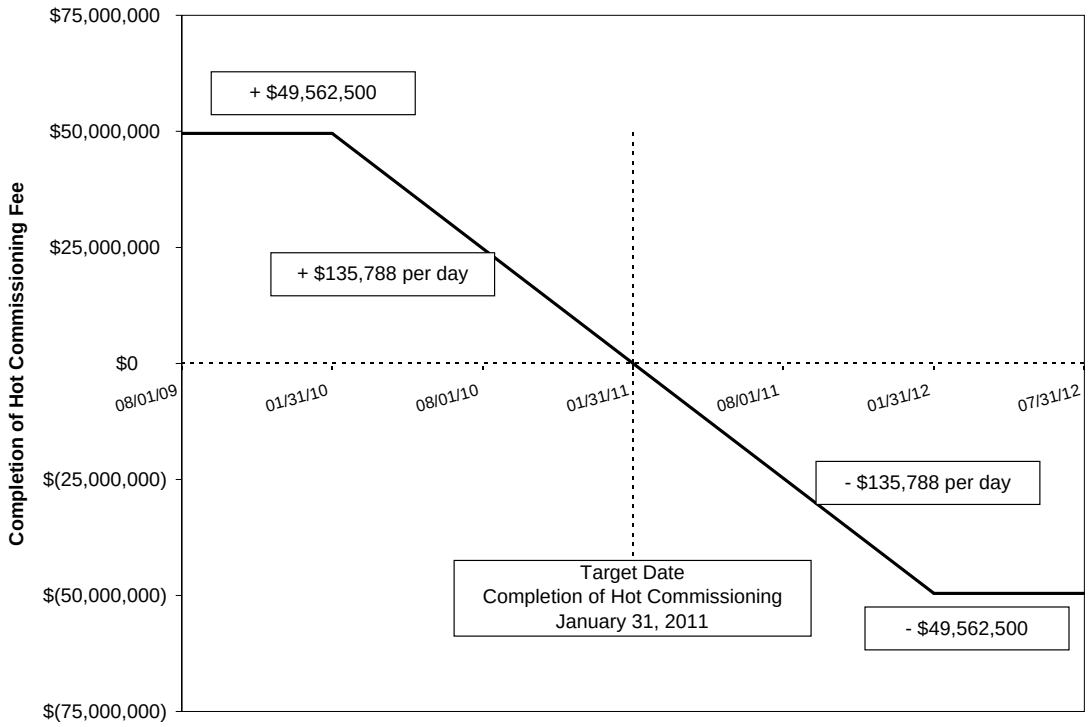
(b) Schedule Performance Fees

The schedule performance incentives indicate DOE's desire to accelerate completion of critical milestones. There are two incentives connected to critical activities, "Start of Hot Commissioning" and "Completion of Hot Commissioning."

(1) An amount of $19,825,000 may be earned and paid for commencing "Start of Hot Commissioning" on or before the target date for this critical milestone. This schedule performance fee will not be paid if the milestone is achieved after the date specified in Section F. The payment is provisional based on conditions specified in Clause B.4.

(2) A schedule performance fee will be earned and paid for achievement of "Completion of Hot Commissioning" before the date specified in Section F. The Contractor will not earn any additional fee for achieving "Completion of Hot Commissioning" on the date specified in Section F. However, if the Contractor achieves "Completion of Hot Commissioning" earlier than the date specified in Section F, the Contractor will earn an additional $135,788 per day for each day before the date specified in Section F up to the maximum of $49,562,500, as illustrated in Figure B.2, *Fee for Completion of Hot Commissioning*. Total fee earned will be reduced by $135,788 per day for each day of delay to "Completion of Hot Commissioning" beyond the date specified in Section F, but such fee reductions will not exceed $49,562,500.

Figure B.2 Fee for Completion of Hot Commissioning



(c) Operational Performance Fee

The Contractor may earn up to a maximum of $39,650,000 in fee for operational performance improvements proposed by the Contractor during Contract performance. Operational performance improvements include, but are not limited to, improvements that exceed the minimum Contract requirements related to operability, reliability, maintainability, throughput, life-cycle performance, system interfaces; and improvements related to waste minimization and energy efficiency. If DOE accepts the proposal, the Contracting Officer will unilaterally determine the portion of the fee allocated to a specific proposal. Fee will only be paid upon the Contractor's demonstration that the proposed operational improvement(s) is evidenced in system performance. Operational performance fee determination and payment will be made no later than the time of Final Fee Determination (Clause B.9).

B.6 CHANGES TO TARGET COST, SCHEDULE, AND FEE

(a) Changes to Target Cost, Schedule and Fees will be made in accordance with the Section I Clause entitled, *Changes – Cost Reimbursement - Alternate III.*

(b) It is the DOE intention that the funding available for this Contract will be consistent with the funding profile set forth in Section J, Attachment I, *Funding 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 proposed changes to the Target Cost, Target Fee, and/or Section F milestone dates.

(c) Contractor proposed changes to the Target Cost and/or Target Schedule will be reviewed for impact(s) to the WTP and RPP. DOE reserves the unilateral right to approve or reject any proposed change.

B.7 PROVISIONAL PAYMENT OF COST PERFORMANCE FEE

The Contractor will be paid fee provisionally during the period of performance of the Contract. The amount to be paid will be determined quarterly and will be based on the Contractor's cumulative cost and schedule performance. A portion of the Provisional Fee will be paid quarterly and the remainder will be withheld pending successful completion of the Contract.

Notwithstanding any other contractual provision, nothing in Clause B.7 limits the rights of the Contracting Officer set forth in Section I Clause entitled, *Incentive Fee*.

(a) Definition of Terms

(1) *WTP Project Baseline* is the WTP Project scope, schedule and cost definition, and is formally documented and controlled as specified in Section C, *Statement of Work*. The WTP Project Baseline provides the basis for tracking cost and schedule performance and computing the measures of project earned value.

(2) *Provisional Fee* is a prorated share of the Cost Performance Fee based on interim cost and schedule performance subject to Clause B.7(d). *Provisional Fee* is paid to the Contractor quarterly subject to Clause B.7(e). These payments are provisional pending successful "Completion of Hot Commissioning" and "Completion of Contract Requirements."

(3) *Number of Quarters to Contract Completion* is the number of quarters from the start of the Contract to scheduled date of "Completion of Contract Requirements." The number of quarters for this Contract is 42 for purposes of Provisional Fee calculations as described in this Clause.

(4) *Budgeted Cost of Work Scheduled (BCWS)* is the sum of the Target Cost elements for work planned, measured by quarter and cumulative to date.

(5) *Budgeted Cost of Work Performed (BCWP)* is the sum of the Target Cost elements for work completed, measured by quarter and cumulative to date, that relates directly to the BCWS.

(6) *Actual Cost of Work Performed (ACWP)* is the sum of allowable costs for work completed, measured by quarter and cumulative to date, that relates directly to the BCWP.

(7) *Schedule Performance Index* (SPI) is BCWP divided by BCWS.

(8) *Cost Performance Index* (CPI) is BCWP divided by ACWP.

(9) *Cost and Schedule Performance Index (CSPI)* is ½ x (CPI + SPI), measured by quarter and cumulative to date.

(b) Invoices for Provisional Fee Payments. The Contractor may submit invoices for Provisional Fee payments following the submittal of the Quarterly Critical Analysis required by Section C, Standard 1, *Management Products and Controls*. Upon receipt of an acceptable invoice for Provisional Fee payment, the Contracting Officer will assess the need for adjustments based on the factors discussed later in this Clause. The process for determining the Provisional Fee payment is:

(1) Determination of Provisional Fee, as set forth in paragraph (d), below.

(2) Adjustments as set forth in paragraphs (e) through (h), below.

(c) The Contractor may elect not to submit an invoice for a Provisional Fee payment. In the event the Contractor elects not to submit an invoice for a Provisional Fee payment, the Contractor shall affirm its election in writing to the Contracting Officer. When the Contractor elects not to submit an invoice, pursuant to this subparagraph, the fee amount not invoiced will be due and payable in accordance with Clause B.9.

(d) Determination of Provisional Fee. The Contracting Officer will use Table B.2, *Provisional Fee Determination*, to determine the Provisional Fee for each quarter. Table B.2 contains a range of possible values for the CSPI and corresponding Provisional Fee values. For any given level of performance (CSPI), Table B.2 defines Provisional Fee that is in proportion to projected final fee earnings.

(e) Determination of Provisional Fee Payment.

(1) Initiation of Provisional Fee Payments. DOE will start making Provisional Fee payments to the Contractor at the end of the first quarter after DOE concurrence with the WTP Project Baseline Description, required by Section C, Standard 1, *Management Products and Controls*.

(2) For quarters before "Start of Construction," the Contractor will be paid an amount equal to 25% of the Provisional Fee (Clause B.7(d)). The Contracting Officer will assess the need for adjustments based on the factors discussed in Clause B.7(f).

(3) For quarters after "Start of Construction" and before "Completion of Acceptance Testing," the Contractor will be paid an amount equal to 50% of the Provisional Fee (Clause B.7(d)). The Contracting Officer will assess the need for adjustments based on the factors discussed in Clause B.7(f).

(4) For those quarters following "Completion of Acceptance Testing," the Contractor will be paid an amount equal to 75% of the Provisional Fee (Clause B.7(d)). The Contracting Officer will assess the need for adjustments based on the factors discussed in Clause B.7(f).

(5) Unless the Contracting Officer determines otherwise, Provisional Fee payments will cease after the end of the quarter that the "Completion of Contract Requirements" is scheduled to occur. Provisional Fee payments will be made for a maximum of 42 quarters.

(f) Adjustments to Provisional Fee Payments.

(1) Withholding of Provisional Fee Payments. In the event that the Contractor demonstrates unacceptable performance, the Contracting Officer reserves the right to withhold Provisional Fee payments. The Contracting Officer may also apply appropriate fee reductions or withholdings to subsequent Provisional Fee payments, provided such fee adjustments are identified in writing to the Contractor within 6-months of the date of the event or incident occurrence.

(2) Release of Withheld Provisional Fee Payments. The Contracting Officer may release withheld Provisional Fee pursuant to subparagraph (f)(1) when the Contractor demonstrates that the condition leading to the withholding was corrected. For example, a withheld fee resulting from unacceptable cost or schedule performance may be paid to the Contractor when the Contractor recovers, meaning that the cost and/or schedule performance was acceptable at the end of two consecutive quarters.

Table B.2 Provisional Fee Determination

CSPI	PROVISIONAL FEE	NOTES
		Provisional Fee = Cost Performance Fee @ Actual Cost / (42 Quarters to Contract Completion)
<=0.900	$ 3,068,155	Minimum Cost Performance Fee (Table B.1) / (42 Quarters to Contract Completion)
0.905	$ 3,076,313	
0.910	$ 3,360,579	
0.915	$ 3,637,996	
0.920	$ 3,908,807	
0.925	$ 4,173,246	
0.930	$ 4,431,535	
0.935	$ 4,683,887	
0.940	$ 4,930,503	
0.945	$ 5,171,578	
0.950	$ 5,407,295	
0.955	$ 5,637,832	
0.960	$ 5,863,357	
0.965	$ 6,084,032	
0.970	$ 6,300,011	
0.975	$ 6,511,444	CSPI = 0.9762 at "Upper Value -- Target Cost Range," i.e., $3,965M / $4,163.25M, CPI = 0.9524, and SPI = 1.0.
0.980	$ 6,561,131	
0.985	$ 6,561,131	
0.990	$ 6,561,131	
0.995	$ 6,561,131	
1.000	$ 6,561,131	Target Fee (Cost Performance) (Table B.1) / (42 Quarters to Contract Completion)
1.005	$ 6,561,131	
1.010	$ 6,561,131	
1.015	$ 6,561,131	
1.020	$ 6,561,131	
1.025	$ 6,561,131	CSPI = 1.2632 at "Lower Value -- Target Cost Range," i.e., $3,965M / $3776.75M, CPI = 1.0526, and SPI = 1.0.
1.030	$ 6,685,816	
1.035	$ 6,852,286	
1.040	$ 7,015,672	
1.045	$ 7,176,061	
1.050	$ 7,333,534	
1.055	$ 7,488,169	
1.060	$ 7,640,043	
1.065	$ 7,789,228	
1.070	$ 7,935,797	
1.075	$ 8,079,816	
1.080	$ 8,221,353	
1.085	$ 8,360,470	
1.090	$ 8,497,229	
1.095	$ 8,631,689	
1.100	$ 8,763,909	
1.105	$ 8,893,943	
1.110	$ 9,021,845	
1.115	$ 9,147,668	
1.120	$ 9,271,461	
1.125	$ 9,393,274	
1.130	$ 9,513,153	
1.135	$ 9,631,144	
1.140	$ 9,747,292	
1.145	$ 9,861,639	
1.150	$ 9,974,226	
1.155	$ 10,085,095	
1.160	$ 10,194,284	
1.165	$ 10,301,831	
1.170	$ 10,407,773	
1.175	$ 10,512,145	
1.180	$ 10,614,982	
1.185	$ 10,716,319	
1.190	$ 10,816,186	
1.195	$ 10,914,617	
1.200	$ 11,011,641	
...	...	Additional Provisional Fee values can be calculated, as necessary.

(3) Discontinuation of Provisional Fee Payments for Missed Milestones. In the event that the Contractor fails to meet the milestone due dates specified in Section F, *Deliveries or Performance,* the Contracting Officer reserves the right to discontinue Provisional Fee payments for the quarter in which a milestone was missed. Provisional Fee payments will be resumed during the quarter in which the milestone is completed.

(4) Reductions in Provisional Fee Payments. Provisional Fee payments may be reduced in accordance with the provisions in Clause B.8 and Clause H.3, of this Contract.

(g) Bankruptcy or Other Issues with Guarantor Company(ies). In order to assure the Contractor's ability to repay any Provisional Fee payments that are determined to be in excess of the actual fee earned at the completion of the Contract, the Contracting Officer reserves the right to discontinue Provisional Fee payments, in the event that a guarantor company files bankruptcy or is acquired by other owners, or other events arise with the Contractor's guarantor company(ies) that jeopardizes DOE ability to recover unearned Provisional Fee payments.

(h) Repayment of Bankruptcy Reserve. In the event of a bankruptcy, acquisition by other owner, or other event (Clause B.7(g)), the Contractor shall within 60 days after the event, provide evidence satisfactory to the Contracting Officer that the bankruptcy, change in ownership, or other event does not affect the ability of the Contractor to continue to perform the obligations under the Contract, or affect a material Governmental or DOE interest. Upon receipt of such evidence, the Contracting Officer shall resume making payments of fee unreduced because of the events in Clause B.7(g), and shall release all fee payments withheld due to events described in Clause B.7(g) during the preceding 60 days.

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 Manager, U.S. Department of Energy, Office of River Protection (ORP) or designee, may make a unilateral determination to reduce the Provisional Fee payments, Minimum Fee, any or all of the incentive fees, and/or the Maximum Fee 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 Manager, ORP or designee, at his/her sole discretion, may reduce the Provisional Fee payments, Minimum Fee, any or all of the incentive fees, and/or the Maximum Fee by an amount up to the Provisional Fee for the then current and three prior quarters.

(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 Manager, ORP or designee may reduce the Provisional Fee payments, Minimum Fee, any or all of the incentive fees, and/or the Maximum Fee by an amount up to the Provisional Fee for the then current and three prior quarters. In determining any diminution of fee resulting from a catastrophic event, the Manager, ORP or designee 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 FINAL FEE DETERMINATION

Upon successful "Completion of Contract Requirements," the Contracting Officer shall determine the total fee earned by the Contractor consistent with Section I Clause entitled, *Incentive Fee*, Clause B.5, Clause B.8, and Clause H.3, of the Contract. If the amount of the total fee earned is less than the total amount of all fee payments to date (including Provisional Fee, Schedule Performance, and Operational Performance payments) previously made to the Contractor, the Contractor shall reimburse DOE the difference. If the amount of total fee earned is more than the total amount of all prior payments (including Provisional Fee, Schedule Performance, and Operational Performance payments) previously made to the Contractor, DOE shall pay the Contractor the difference.

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 54 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 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, technetium, strontium, and transuranics) 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.

The second fraction, HLW, is comprised of the long half-life radioactive tank waste 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.

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 a new Waste Treatment and Immobilization Plant (WTP) that will treat and immobilize the waste for ultimate disposal. The WTP is comprised of four major elements, pretreatment, LAW immobilization, HLW immobilization, and balance of plant facilities.

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, storage and disposal of the immobilized waste, decontamination and decommissioning, and initiation of post closure monitoring of the tank farms. The second includes a Contractor responsible for designing, constructing, commissioning, and supporting the transition of the WTP.

The WTP Contractor (hereinafter referred to as the "Contractor") has full responsibility for the WTP from the transition of an existing Conceptual Design through the completion of transition, to a future operations contractor. The WTP Contract will focus on an initial Contract award for design and construction of the WTP. Following Contract award, the WTP Contractor will subcontract for operability and commissioning support.

Schedule performance is an important consideration for RPP, and, specifically, the WTP. After commissioning, DOE will, under a separate contract, operate the WTP and treat and immobilize a minimum of 10 percent of the Hanford tank waste by mass and 25 percent of the Hanford tank waste by activity by 2018.

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 and the Tank Farm Contractor have specific responsibilities and defined interactions with the Contractor. DOE will use a partnering approach to manage interactions between DOE, the 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) Eliminate barriers to an efficient and more cost-effective project;

(4) Promote innovation;

(5) Improve communication and understanding;

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

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

(8) Reinforce the partnered relationship through honest feedback and continual improvement.

The Contractor shall provide resources necessary to establish and implement the partnering approach, including the requirements of Section H Clause entitled, *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;

(iii) Approve all changes to the system-level flowsheet, interface control documents (physical system interface definition), feed characteristics, and product specifications and future operations baseline;

(iv) Perform design, construction and operability oversight of the WTP, and, where required, engage other contractors to provide design and construction 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) Inspect and accept the WTP;

(vii) Manage project progression through the critical decision process (DOE Order 430.1A, *Life Cycle Asset Management*);

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

(ix) Require compatibility of reporting and management systems.

(2) As the Regulator, DOE will regulate radiological, nuclear, and process safety, and 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 WTP Contractor shall:

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

(2) 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.

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

(4) Transition the commissioned WTP to a future operations contractor.

(5) Provide DOE or its designee(s) access to and the right to conduct assessments, audits, and/or surveillance of the Contractor 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.

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; and 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 all 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 Standard 7.

(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 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), State of Washington Department of Ecology (Ecology), and/or the State of Washington 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 the *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 140.1-1A, *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, 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 concurrence. 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 a single location to achieve a systematic approach to design.

(3) Design Documents: The Contractor shall design the WTP (Pretreatment, HLW Vitrification, LAW Vitrification, and balance of plant facilities) 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 concurrence.

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 future operations contractor(s).

Additional requirements are provided in Standard 5, *Commissioning*.

(f) Limitations on 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*, summarize 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 the 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

Solicitation Note: Contract due dates shown assume a Contract award of 1/15/2001 or earlier.

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	A	D	CO	4/15/01
1.1	Plan for Transition	Standard 1	K	D	CO	2/15/2001
1.2	Project Execution Plan	Standard 1	K	D	CO	4/15/2001 and update annually thereafter
1.3	Project Control System Description	Standard 1	K	D	CO	4/15/2001 with updates as required
1.4	Interface Management Procedure	Standard 1	K	D	CO	5/15/2001 with updates as required
1.5	WTP Project Baseline	Standard 1	K	D	CO	4/15/2001 with annual update on 4/15
1.6	WTP Risk Assessment	Standard 1	K	D	CO	7/1/2001 with quarterly update
1.7	Monthly Status Report	Standard 1	I	D	CO	15th day of each calendar month
1.8	Occurrence Reporting	Standard 1	K	D	CO	as required
1.9	ES&H Reporting	Standard 1	K	D	CO	as required
1.10	Quarterly Critical Analysis	Standard 1	K	D	CO	quarterly
2.1	Updated Research and Technology Program Plan	Standard 2	K	D	CO	4/15/2001 and update annually thereafter
2.2	R&T Test Plans	Standard 2	I	D	CO	as required
2.3	R&T Test Reports	Standard 2	C	D	CO	as required
2.4	Regulatory Data Quality Objective (DQO)	Standard 2	K	D	CO	as negotiated
2.5	Operational Research Assessment	Standard 2	C	D	CO	8/15/2001 and update annually thereafter
2.6	WTP Tank Utilization Assessment	Standard 2	C	D	CO	8/15/2001 and update annually thereafter
2.7	Material Balance and Process Flowsheet	Standard 2	C	D	CO	8/15/2001 and update annually thereafter
3.1	Design Process	Standard 3	C	D	CO	2/15/2001
3.2	Functional Specification	Standard 3	K	D	CO	5/15/2001 and update as required
3.3	Basis of Design/Design Criteria Database	Standard 3	K	D	CO	5/15/2001 and update as required
3.4	Operations Requirements Document	Standard 3	K	D	CO	7/15/2001
3.5	Design Products	Standard 3	M	D	CO	ongoing

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
3.6	Analytical Laboratory Design Requirements	Standard 3	C	D	CO	9/15/2001
3.7	Site Layout Drawings	Standard 3	K	D	CO	4/15/2001
3.8	Optimization Study	Standard 3	K	D	CO	3/15/2001
3.9	Design Overviews	Standard 3	M	D	CO	ongoing
3.10	Design Overviews	Standard 3	C	D	CO	quarterly
4.1	Construction, Procurement, and Acceptance Testing Plan	Standard 4	K	D	CO	5/15/2001 and update annually thereafter
4.2	Purchasing System	Standard 4	A	D	CO	as required
4.3	Construction Bid and Work Packages	Standard 4	I	D	CO	as required
4.4	Construction and Acceptance Testing Program	Standard 4	K	D	CO	prior to start of construction
4.5	Construction Overviews	Standard 4	M	D	CO	ongoing
5.1	Commissioning Plan	Standard 5	K	D	CO	24 months prior to start of commissioning, annually thereafter
5.2	Commissioning Review	Standard 5	M	D	CO	ongoing
5.3	Waste Form Qualification Tests	Standard 5	P	D	CO	during cold commissioning
5.4	Design Capacity Performance Tests	Standard 5	K	D	CO	during cold commissioning
5.5	Off-standard Operational Testing	Standard 5	C	D	CO	during cold commissioning
5.6	Resultant Products from Cold Commissioning	Standard 5	P	D	CO	during cold commissioning
5.7	Environmental Performance Test	Standard 5	K	D	CO	during cold commissioning
5.8	Cold Commissioning Results	Standard 5	K	D	CO	prior to hot commissioning
5.9	Certification of Completion of Cold Commissioning	Standard 5	K	D	CO	when complete
5.10	Certification of Readiness for Hot Operations	Standard 5	K	D	CO	3 months prior to hot commissioning
5.11	Certification of Hot Commissioning Start	Standard 5	K	D	CO	when complete
5.12	Hot Commissioning Performance Tests	Standard 5	K	D	CO	during hot commissioning

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
5.13	Resultant Products from Hot Commissioning	Standard 5	P	D	CO	during hot commissioning
5.14	Hot Commissioning Results	Standard 5	K	D	CO	upon completion of hot commissioning
5.15	Certification of Completion of Hot Commissioning	Standard 5	K	D	CO	when complete
5.16	Facility Turnover	Standard 5	K	D	CO	after successful commissioning
6.1	Products and Secondary Wastes Plan	Standard 6	K	D	CO	4/15/2001 and update annually thereafter
6.2	Waste Form Compliance Plan	Standard 6	K	D	CO	7/15/2001 and update annually thereafter
6.3	IHLW Qualification Documentation	Standard 6	C/K	D	CO	8/1/2002 and update annually
6.4	Waste Form Qualification Report	Standard 6	C/K	D	CO	9/1/2002 and update annually thereafter
6.5	IHLW Production Documentation	Standard 6	K	D	CO	at time of production
6.6	ILAW Qualification Documentation	Standard 6	C/K	D	CO	2/1/2002 and update annually thereafter
6.7	ILAW Production Documentation	Standard 6	C/K	D	CO	at time of production
6.8	Entrained Solids Qualifications Documentation	Standard 6	C/K	D	CO	10/1/2002 and update annually thereafter
6.9	Entrained Solids Production Documentation	Standard 6	C/K	D	CO	at time of production
6.10	Secondary Wastes Production Documentation	Standard 6	C/K	D	CO	at time of production
6.11	QA Provisions Document	Standard 6	K	D	CO	3/1/2001 and update annually thereafter
7.0	Non-radiological Worker Safety and Health	Standard 7	R	D	CO	per Standard 7.a(1)
7.1	Radiological, Nuclear and Process Safety	Standard 7	R	D	CO	per Table S7-1
7.2	Quality Assurance	Standard 7	A/R	D	CO	4/15/01
7.3	Environmental Plan	Standard 7	K	D	CO	3/15/2001 and update annually thereafter
7.4	Dangerous Waste Permit Application Implementation Plan	Standard 7	K	D	CO	3/15/2001
7.5	Dangerous Waste Permit Application	Standard 7	K	D	CO	as required
7.6	Risk Assessment Work Plan	Standard 7	K	D	CO	as required

Item No.	Deliverable	Reference	Action Required	DOE Action Party	Point of Delivery	Contract Due Date
7.7	Notice(s) of Construction	Standard 7	K	D	CO	150 days prior to submission to the regulators
7.8	Prevention of Significant Deterioration (PSD) Permit Application	Standard 7	K	D	CO	150 days prior to submission to the regulators
7.9	Petition for Exemption or Exclusion for IHLW	Standard 7	K	D	CO	12/2003
7.10	Petition for a New Treatment Standard	Standard 7	K	D	CO	8/2003
8.0	Safeguards and Security	Standard 8	K	D	CO	see Table S8-1
C.9.1	Interface Control Documents	Section C.9	J	D	CO	every 6 months
H.1	Environmental Permit Applications	Clause H.26	K	D	CO	ongoing
H.2	Litigation Management Plan	Clause H.33	A	D	CO	4/15/01
H.3	Plan for Transition to Operations	Clause H.36	K	D	CO	start of commissioning

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 upon by DOE, it shall be placed under change control and no changes to that document shall be made, without DOE approval.

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.

CO Contracting Officer.

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

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 — The ICDs shall be jointly developed with DOE, the Tank Farm Contractor, and Hanford Site contractors, and provided to DOE for the DOE Contracting Officer's Representative to issue as the operative ICDs.

K Concurrence — The deliverable shall be provided to DOE for review and concurrence. 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 concurred upon by DOE, it shall be placed under change control and no changes to that document shall be made, without DOE concurrence.

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, 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

Standard 1: Management Products and Controls

This Standard describes the management products and controls required during the Contract period. DOE intends that RPP activities will be managed as a single project by ORP, while still allowing the Contractor autonomy to accomplish the work scope defined in the Contract. The *RPP Project Management Plan* (DOE/ORP-2000-06) provides the overall direction for DOE and Contractor project management activities, including baseline management, life-cycle planning, requirements management, and technical integration. The Contractor is encouraged to use an existing corporate-level project management system that meets the requirements of this Standard and the *RPP Project Management Plan*.

(a) Transition Plan: The Contractor shall provide for DOE review and concurrence (Table C.5-1.1, Deliverable 1.1) an overall plan and schedule for achieving a smooth and expeditious transition of WTP activities and design assets/products. Emphasis should be placed on minimizing impacts on WTP milestones and rapidly performing due-diligence reviews of technical information. This plan shall include, at a minimum, the approach and schedule for:

(1) Achieving full WTP staffing including any transfer of staff originating from the interim design contractor.

(2) Execution of necessary subcontracts including subcontractors of the Tank Farm Contractor for staff employed on the WTP Project (if needed).

(3) Performing due-diligence reviews of existing technical information.

(4) Establishment of project management systems.

(5) Development of an integrated WTP scope, schedule, and cost baseline.

(b) Project Execution Plan: The Contractor shall prepare a Project Execution Plan that describes the approach for managing and controlling the project. The Project Execution Plan, for DOE concurrence (Table C.5-1.1, Deliverable 1.2), shall include two distinct parts, the Project Control System Description and the Project Baseline Description. Requirements for the Project Control System Description and Project Baseline Description are described below.

(c) Project Control System:

(1) Project Control System Definition: The Contractor shall establish, maintain, and use a Project Control System that supports successful execution of the WTP Project during all activities (e.g., transition, design, construction, and commissioning). The System must produce accurate planning, budgeting, reporting, and change control data and meet the requirements of the *RPP Project Management Plan*. The Contractor shall provide all necessary technical information and support related to the WTP Project to enable DOE to proceed with the critical decision process (DOE Order 430.1A, *Life-Cycle Asset Management*) and to enable DOE to meet the data requirements of the integrated planning, accountability, and budgeting system. The Contractor shall also support ORP in developing and maintaining the integrated RPP Baseline.

(2) Project Control System Description: As part of the Project Execution Plan, the Contractor shall provide for DOE concurrence (Table C.5-1.1, Deliverable 1.3) a Project Control System Description. Upon approval by the Contracting Officer, the Contractor shall fully implement the project control system. The Project Control System Description shall describe the management processes and controls utilized to manage and control work and complete Contract requirements. The Project Control System Description shall, at a minimum, include:

(A) The work breakdown structure (WBS) including "dictionary" descriptions of elements of work.

(B) The organizational breakdown structure, including roles and responsibilities of each major organization and identification of key management personnel.

(C) The organizational and management interfaces between the Contractor and ORP, Tank Farm Contractor, and other Hanford Site contractors and the process to manage the interfaces.

(D) The approach the Contractor will use to implement the requirements of the *RPP Project Management Plan* pertaining to project control processes including:

(i) Systems engineering;

(ii) Configuration management;

(iii) Technical and waste treatment process change control;

(iv) Baseline change control;

(v) Contract management;

(vi) Performance measurement;

(vii) Information and reporting;

(viii) Interface management;

(ix) Work authorization;

(x) Work management;

(xi) Risk management;

(xii) Construction project management; and

(xiii) Communications and stakeholder involvement.

(E) The technical, cost, and schedule baseline development process and the hierarchy of documents that will be used to describe and maintain that baseline.

(F) The process the Contractor intends to use to complete design and engineering activities, including standards, design guides, and procedures for document control, configuration control, change control, and quality control.

(G) A brief summary of any supporting procedures and plans that will be used to implement the project including applicable engineering standards, practices, or guides.

(3) Configuration Management: A revised Project Control System Description shall be submitted for DOE concurrence (Table C.5-1.1, Deliverable 1.3) when significant changes are required in management processes (e.g., prior to start of construction or prior to start of commissioning). The Contracting Officer may direct additional compliance reviews to determine whether the Contractor is operating the system efficiently 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.

(4) Interface Management: In concert with DOE (as lead) and the Tank Farm Contractor, the Contractor shall develop and implement an interface management procedure. The procedure shall be submitted for DOE review and concurrence (Table C.5-1.1, Deliverable 1.4). The interface management procedure shall provide the process to:

(A) 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.

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

(C) Define organizational points of contact for participants.

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

(E) Involve appropriate RPP organizations and Hanford contractors in the integration, review and approval of interface requirements and changes (leadership of interface groups should be chaired by DOE or the involved party with the primary responsibility for management of the receipt of material, goods or service, unless otherwise appropriate).

(F) Implement changes to ICDs through the appropriate change control process and, if necessary, contract changes.

(G) Involve individuals with the appropriate level of organizational responsibility and authority to assure the interface is implemented and functioning.

(H) Identify, track, and elevate issues for management review on a regular basis.

(d) Waste Treatment and Immobilization Plant Project Baseline Development:

(1) Baseline Requirements: The Contractor shall develop and maintain an integrated and traceable scope, schedule, and cost baseline for the WTP and delivered to DOE for concurrence (Table C.5-1.1, Deliverable 1.5). The baseline shall include: the WTP project technical requirements; definition of work scope to achieve those requirements; schedule to implement project work scope; cost to implement project work scope on the projected schedule; and assessment of the risks to achieving the baseline. The WTP Project Baseline shall be summarized in the Project Execution Plan and will be supported by additional baseline documentation, as necessary.

(2) Waste Treatment and Immobilization Plant Project Baseline Description: The WTP Project Baseline description shall contain sufficient scope, schedule, and cost information to support development and maintenance of an integrated RPP Baseline and to support the annual budget process. The WTP Project Baseline description shall, at a minimum, contain:

(A) Scope:

(i) WTP functional logic showing the relationships among WTP project activities and other RPP activities. The requirements shall also depict the relationships by facility and interdependencies among the top-level WTP activities.

(ii) Summary of WTP top-level technical requirements with reference to supporting requirements documents and specifications (e.g., Sections C.7, C.8, and C.9; Functional Specification; Basis of Design/Design Criteria Database; and Operations Requirements Document).

(iii) Key Assumptions List that includes assumptions made by the Contractor, especially those that indicate performance or milestones to be accomplished by the DOE or Hanford Site Contractors. The assumptions define the basis for the WTP schedule and cost baseline.

(iv) Key DOE activities and decision points that describe all DOE activities, including critical decisions (DOE Order 430.1A), other decision points, and regulatory actions that must be accomplished for the Contractor's plan to be successful. The activities, decision points, and regulatory actions shall be specifically included in either the top-level or lower-level logics.

(v) Waste treatment and immobilization process description and baseline.

(B) Schedule: The Contractor shall provide schedule information that meets the requirements of the *Project Integration Office Master Schedule Integration Specification,* Revision 0, dated February 15, 2000, (CHG-0000898). Each activity box in the top-level logic shall be further broken down into one or more lower level logics with key milestones and resource profile(s). There shall be a one-to-many relationship between the top-level and the lower-level logics. The schedule updates shall be provided to DOE as an electronic file on CD-ROM. Additionally, the Contractor shall provide DOE monthly schedule updates and shall work with the Tank Farm Contractor and ORP to resolve schedule discrepancies. The schedule shall:

(i) Be logic driven and show the duration of tasks, completion milestones, and critical path;

(ii) Demonstrate the methodology utilized to accomplish the work and meet schedule milestones;

(iii) Contain sufficient levels of detail to promote understanding of the logical sequence of activities and identify all interfaces between performing organizations;

(iv) Be resource loaded with budget cost, labor hours, and quantities, preserved by major groupings, design, and construction progress metrics; and

(v) Be consistent with the information provided in the top-level project logic.

(C) Cost: The WTP Project Baseline description shall include a summary of the project cost baseline, a life-cycle cost estimate, and a monthly spending plan for the current Fiscal Year (FY), next FY (FY +1), and one year out (FY+2). The WTP Project Baseline and supporting documentation package shall be submitted as a written report that contains the following information:

(i) Description of the type and purpose of the estimate being performed including a summary description of facility design, process design, operational concept, and schedule.

(ii) Description of the completeness of the facility and process design.

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

(iv) Description of the WBS and a description of the methodology for its development.

(v) Detailed technical description of the scope to be performed for each of the WBS elements. This shall include, as a minimum, performance specification(s) and the work activities required, but it shall also identify any work specifically excluded, any constraints or special conditions, ground rules, assumptions, and drivers.

(vi) Estimating backup materials, including quantity takeoffs, equipment lists, detailed specifications, plans and drawings, calculations, databases used, historical data, cost estimating relationships, and actual quotes.

(vii) Details of indirect cost including field distributable costs and a description of the work covered by indirect costs and how the indirect costs were estimated and developed. Field distributable costs shall be in enough detail to describe what is included. If, for example, a cost calculation per job hour is used, a complete description of the scope covered by the calculation shall be included.

(viii) Explanation and description of overhead and general and administrative rates, as well as the elements included.

(ix) Description and breakdown of how a standard base rate is burdened to arrive at the estimated hourly rate.

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

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

(xii) Written analysis of how contingency/risk was determined. This includes all pertinent information necessary to understand and perform the calculations. Contingency shall be clearly discernable from all other costs. The probability distribution curve and the cumulative probability distribution curve that reflects the costs used to establish the WTP Target Cost shall be described.

(xiii) Estimate history, if the current estimate is a revision to an earlier estimate and a cross walk between submitted revisions.

(xiv) Basis of escalation, if applicable.

(xv) Sub-tier contractor estimates detailing the same information as required by the Contractor and be traceable to the cost estimate and WBS.

(xvi) Names of the key preparers of the estimate.

(xvii) Information shall be provided at the level for which it was derived.

(D) Contingency Utilization Profile: A cumulative project contingency utilization profile that defines total cumulative contingency utilization against time for the duration of the Contact.

(i) The cumulative project contingency utilization profile establishes projected contingency requirements, allocated to each major project phase (design, construction, acceptance testing, cold commissioning, and hot commissioning) and shall be directly traceable and linked to the schedule baseline and cost baseline. The Contractor may utilize all contingency defined in the cumulative project contingency utilization profile up to the limits established for that point of time on the profile.

(ii) DOE and the Contractor shall review the Contractor's utilization of contingency relative to the cumulative project contingency utilization profile on a quarterly basis. The Contractor shall notify DOE, as soon as practicable but at least 30-days in advance, when contingency utilization is projected to exceed the cumulative project contingency utilization profile at any given period in performance. DOE approval shall be required to utilize contingency in excess of the cumulative project contingency utilization profile.

(3) Waste Treatment and Immobilization Plant Risk Assessment: The WTP risk assessment shall implement the risk management process defined in the Project Execution Plan and provided to DOE for concurrence (Table C.5-1.1, Deliverable 1.6). A quantitative assessment of the WTP risks shall be maintained and support maintenance of the RPP overall risk assessment. The risk assessment shall identify the major risks to achieving the baseline and the Contractor's approach for managing those risks. The Contractor shall include risk management status reports in the monthly status to DOE. The risk assessment shall meet the following requirements:

(A) Project risks shall be identified (Critical Risk List) and analyzed relative to their probabilities and consequences;

(B) Risk management actions (either prevention or mitigation) shall be identified and implemented;

(C) Risk and decision management activities shall be coordinated with DOE (as lead), Tank Farm Contractor, and Hanford Site Contractors. WTP risk analysis information pertaining to "cross-cutting" decisions shall be communicated to DOE, the Tank Farm Contractor, and Hanford Site Contractors, including agreement as to whom should have the risk management lead for each risk;

(D) Performance against risk management actions shall be tracked and reported;

(E) Project contingency fund requirements shall be calculated as a function of identified risks; and

(F) Risk associated with ICDs shall be documented and issue resolution plans prepared.

(4) Maintenance of the Waste Treatment and Immobilization Plant Baseline: The WTP baseline description shall be submitted every April for DOE review and concurrence (Table C.5-1.1, Deliverable 1.5). The WTP baseline description shall contain a summary of all approved changes to the baseline (scope, schedule, and cost). The summary shall include the serial number of each approved change, the WBS numbers affected, a description of the change, and the net cost and schedule impacts of the change. Annual updates, including the project cost and schedule baseline, shall reflect the most current information and logic and include the information at the same or greater level of detail as provided to DOE in the initial baseline and best available information for WTP performance.

(e) Integrated Change Control:

(1) Change Control Process: The Contractor shall implement disciplined change control according to the methods concurred upon in the Project Control System Description (Table C.5-1.1, Deliverable 1.3). Change control and trend monitoring shall be implemented concurrent with DOE concurrence of the WTP Project Baseline (Table C.5-1.1, Deliverable 1.5).

(2) Design Changes: Proposed design changes shall also require a technical analysis using an operations research model and tank utilization model to assess the impact on plant capacity, operability, and throughput. (See Standard 2, *Research, Technology, and Modeling*.)

(3) Baseline Thresholds: As part of the Project Control System Description (Table C.5-1.1, Deliverable 1.3), the Contractor shall propose thresholds to define DOE and Contractor change authority. Thresholds do not apply to proposed changes in Target Cost and Target Schedule (for fee calculations as specified in Section B.(5)(b)), and fees. DOE approval is required for all such changes.

(4) Target Cost, Schedule, and Fee Change: Any changes to target cost, target schedule, or fee shall be executed only by a Contract modification pursuant to the Contract terms and conditions.

(f) Waste Treatment and Immobilization Plant Performance and Reporting System:

(1) Baseline Reporting System: The Contractor shall develop a reporting system that reports project performance on the technical work, schedule, and cost profile defined in the WTP baseline at a level agreed to by DOE. The requirements and procedures for this system shall be defined in the Project Execution Plan.

(2) Monthly Status Reports: The Contractor shall prepare status reports, monthly, and transmit to DOE by the 15th calendar day of the following month for information (Table C.5-1.1, Deliverable 1.7), commencing the first month after Contract award. Status reports shall include narrative and performance curves (earned value based on the schedule) for the cost and job hour status (e.g., planned, actual, and forecast percents complete). The percent variances shall be identified and addressed. Status reports shall include data for the total project cost and performance for the major WBS elements. The status report shall also include a written report and briefing that addresses:

(A) Project manager narrative assessment;

(B) Significant accomplishments and progress towards completion of project goals and objectives;

(C) Construction Inspection and Acceptance status (per Standard 4);

(D) Comparison of the amount of work completed against the project baseline, including an earned value analysis;

(E) Potential problems, impacts, and alternative courses of action, including staffing issues;

(F) Performance, using schedule, earned value, and critical path methods, to identify potential schedule deviations and needed corrective actions before they impact the baseline;

(G) Critical risks, actions planned, and actions taken to address those risks;

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

(I) Ninety day forecast for major activities and milestones;

(J) Report of proposed changes that impact DOE, site interfaces, or major project milestones;

(K) Updated baseline schedule (a statused, resource loaded cost performance measurement schedule) shall be submitted that reflects progress against the baseline. The schedule shall incorporate all approved changes to date. The schedule shall include actual information, including but not limited to, start and finish dates; hours expended; actual costs incurred; units installed; percent complete; and forecast dates;

(L) Critical path analysis to monitor status of key activities;

(M) The performance reporting shall include current period, cumulative and at completion information in terms of budgeted cost of work scheduled, budgeted cost of work performed, actual cost of work performed including a summary of cost trends, and contingency utilization; and

(N) A change control section shall be included that summarizes the scope, technical, cost, and/or schedule impacts resulting from any implemented actions. A section shall be included that discusses any known or pending change control submittals.

(3) Occurrence Reporting: The Contractor shall adhere to DOE Manual 232.1-1A, *Occurrence Reporting and Processing of Operations Information* (or current revision) with Hanford Site specific requirements and methods for notification (Table C.5-1.1, Deliverable 1.8).

(4) Environment, Safety, and Health Reporting: In addition to *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 231.1, *Environment, Safety and Health Reporting*. The process and form of reporting will meet the requirements of this Order and DOE Manual 231.1-1, *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).

(5) Accident Investigation: The Contractor and, as necessary, all subcontractors shall support Type A and Type B accident investigations for accidents that may occur during the Contractors 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.

(6) Quarterly Critical Analysis: Once each quarter, the Contractor shall prepare and submit a comprehensive report that analyzes the overall status of the WTP Project and key metrics (Table C.5-1.1, Deliverable 1.10). The report shall include the following elements pursuant to Section B.7:

(A) Narrative summary of overall project status;

(B) Performance metrics reported quarterly, cumulative, and at completion for budgeted cost of work performed, budget cost of work scheduled, and actual cost of work performed pursuant to the requirements of Section B.7.;

(C) Analysis of schedule trends, project float, and critical path performance;

(D) Analysis of cost trends; and

(E) Analysis of critical manpower skills and other resources.

(F) Analysis of Contractor's use of contingency relative to the cumulative contingency utilization profile.

The Quarterly Critical Analysis will be signed by the Contractor (President, General Manager or Project Manager) to revalidate commitment and accountability for the WTP Project performance.

Standard 2: Research, Technology, and Modeling

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

(a) Research and Technology Testing Program:

(1) Research and Technology Program Plan:

(i) A WTP R&T Program Plan was developed as part of the WTP Conceptual Design and supporting documentation. The R&T Program Plan describes the research and testing work activities that will be conducted to support process and facility design, qualification testing of the waste forms (IHLW and ILAW) and secondary wastes, and provide information to support environmental permitting and establishment of the authorization basis.

(ii) The Contractor shall submit for DOE concurrence, 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 information: purpose and scope of the test, performing organization, and method to test and analyze information used to support the design process, permitting, operations, and/or waste qualification activities.

(iii) The R&T Program Plan will be updated annually or more often if circumstances (new information) require, and shall include testing activities through hot commissioning of the WTP facilities. 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 of the Contractor-approved test plans (Table C.5-1.1, Deliverable 2.2) for all process verification and product qualification testing at least 15 calendar days in advance of conducting the test for information.

(ii) The Contractor shall provide to DOE completed test reports for process verification testing and product qualification within 3 months after testing is complete for review and comment (Table C.5-1.1, Deliverable 2.3). For tests lasting more than 6 months, an interim report shall be provided at 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.

(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 tests unless the scope of the tests are presented to DOE in writing, and DOE agrees to the conduct of the testing.

(iv) The Contractor shall use the process verification test results to verify the associated design calculations and design basis. Specifically, the process verification results and subsequent calculations relating to the design shall be referenced within the appropriate system descriptions and other design control documentation.

(v) 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.

(vi) All IHLW qualification work shall be conducted in accordance with a DOE concurred upon QA Program that complies with the requirements of the QARD, DOE/RW-0333P; and no 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 specifications, test plans, and interim reports to DOE at appropriate intermediate steps, and final reports in accordance with the requirements of Standard 2. 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 Application, 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 shall be characterized on a priority basis 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*, KD 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 characterization scope for R&T Testing shall include characterization of the following feed tanks (unless agreed to otherwise with DOE through optimization of the DQO):

- LAW Feed: AP-101, AZ-101, AZ-102, AN-102, AN-103, AN-104, AN-107, AN-105, AW-101, and AP-104/SY-101;
- HLW Feed: AZ-101, AZ-102, AY-102/C-106, and AY-101/C-104.

(ii) Waste Separations Processing Testing: The Contractor shall continue to test and validate the capability of LAW pretreatment processes for removal of Entrained Solids, ^{137}Cs, ^{99}Tc, ^{90}Sr and TRU elements to meet ILAW product requirements. Activities shall address ability to meet contract requirements, operating requirements, 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.

(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 Sr and TRU removal precipitation reaction mechanism shall be determined.

(iii) Validation of Sludge-Washing Processes: The Contractor shall conduct testing of sludge washing processes using samples provided by DOE to demonstrate the specific procedures for implementing Specification 12, *Number of High-Level Waste Canisters per Batch of Waste Envelope D*. Test size may be adjusted to account for the amount of material provided. Additional leaching steps shall be considered for streams with particularly low waste loading (e.g., oxidative leaching for high chromium feeds).

(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 off-gas compositions for regulatory purposes and effects on the mass material balance due to recycle streams and secondary waste streams.

(C) Confirmation of the acceptability of the selected off-gas equipment.

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

(E) Determination of maximum off-gas flow requirements in an upset condition.

(F) Determination that glasses produced from a continuously fed melter produce glass that 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 Products and Secondary Waste Plan. 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. 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 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 Products and Secondary Waste Plan 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 of Waste Acceptance Systems Requirements Document (WASRD) Requirement 3.2.3.1.1.15.

(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) liquidous temperature; (2) volume fraction of crystals below the liquidous 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*, and 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 Waste Acceptance Product Specification (WAPS), Specification 2.4, *Specification for Canister Length and Diameter*, and 3.11, *Specification for Weight and Overall Dimensions*, as modified by IHLW Specification 1.2.2.1.3. Drop tests shall be conducted to demonstrate compliance with WAPS Specification 3.12, *Drop Test Specification* for IHLW.

(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.

(b) Process and Facility Modeling Requirements:

The Contractor shall develop and use analytical models to support the design of the process and facility system, support pre-operational planning assessments, and provide technical integration with Tank Farm Contractor waste feed staging and product acceptance activities. The Contractor will, 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 based on the WTP for the Pretreatment/HLW Vitrification Plant and LAW Vitrification production facilities to determine that the facility design concept incorporates appropriate design and operational features to meet plant capacity requirements and reduce construction and/or operations costs. The scope of the assessments shall include: sampling and analysis requirements including sample turnaround times; tank capacities and times to conduct individual process steps in unit operations; time for mechanical handling steps; equipment reliability; time estimates for maintenance and repair of facility and process systems; estimated spare equipment inventory; and recommendations to improve reliability and throughput of the production facilities. The Operations Research Model shall also ensure appropriate reliability, availability, maintainability, and inspectibility (RAMI) for the WTP balance of facility. The Operations Research Model results, assumptions, and model input parameters shall be clearly documented and provided to DOE for review and comment (Table C.5-1.1, Deliverable 2.5). The Operations Research Model and outputs shall be updated at least annually, or more often, as necessary, to support design change assessments and reflect the latest design and information from R&T.

(2) Waste Treatment and Immobilization Plant Tank Utilization Assessments: The Contractor shall develop, document, and use G2 Modeling based on the WTP Design. 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 needs. The assessments shall include the baseline plant capacity and the expanded plant capacity. Results shall be provided to DOE for review and comment at least annually (Table C.5-1.1, Deliverable 2.6) or more often, as necessary, to support design change assessments and reflect the latest design and information from R&T.

(3) Material Balance and Process Flowsheet: The Contractor shall use the ASPEN Model to conduct and document process and flowsheet material balance analyses for the treatment of tank waste Envelopes A/D, B/D and C/D. The data sources for the material balances will 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, annual estimates. 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 to 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 licensing 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.

An additional material balance referred to as “instantaneous” or “flowrate” material balance will be established to illustrate the adequacy of equipment capacity decisions for the purpose of estimating the ability to handle process startup, shutdown, and upset flow conditions. DOE and the Contractor shall agree on the assumptions to be used for the instantaneous material balance.

The material balance and process flowsheet shall be updated at least annually, as significant changes occur and provided to DOE for review and comment (Table C.5-1.1, Deliverable 2.7). The material balance shall be maintained consistent with the latest process verification testing, product qualification activities, and feed characterization information, as appropriate. The flowsheet and material balances shall also be updated during cold commissioning, and prior to and following hot commissioning operations.

As part of Deliverable 2.7, an electronic copy of the modeling data for the flowsheet and material balance shall be provided to DOE for review and comment at initial issuance and upon each revision, thereafter.

(4) 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 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 review and comment 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 review and comment.

(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 for DOE review and concurrence (Table C.5-1.1, Deliverable 3.2), a Functional Specification that defines the technical operational requirements of the WTP based on the WTP Conceptual Design and supporting documentation. 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, radiological properties (by ranges, envelopes, tanks, or transfer batches);

(ii) ILAW and IHLW product characteristics such as quantities, mechanical, physical, chemical, 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.

Upon concurrence of the Functional Specification, DOE will control the functional specification and will consider any proposed changes.

(2) Basis of Design/Design Criteria Database: The Contractor shall prepare for DOE review and concurrence (Table C.5-1.1, Deliverable 3.3) and as significant changes occur, a Basis of Design/Design Criteria Database that defines the design requirements and design codes and standards that will serve as the basis for the continued design of the WTP based on the WTP Conceptual Design and supporting documentation. The Basis of Design/Design Criteria Database shall, at a minimum define and describe:

(i) Integration of the requirements from this Contract, environmental permitting requirements, and safety standards accepted by DOE, and operations requirements and documented functional specification requirements;

(ii) Summary of the WTP site characteristics, including climatic, geotechnical, and natural phenomena data;

(iii) Design requirements for the WTP facilities (Balance of Facility, Pretreatment, LAW Vitrification, and HLW Vitrification);

(iv) Product specification;

(v) Facility sub-system design requirements;

(vi) Allowable process and atmospheric temperatures, pressures, flow rates, for normal, upset, and design conditions;

(vii) Applicable codes and standards, regulations and standards, and guidelines correlated to each major structure, system, or component in the WTP; and

(viii) Pertinent design criteria from the ICDs.

(3) Operations Requirements Document: The Contractor shall prepare an operations requirements document for DOE review and concurrence (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 address Operations and Support (O&S) Concepts and 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 (Balance of Facilities, Pretreatment, HLW Vitrification and LAW Vitrification);

(iii) Estimate of operations and maintenance staffing including labor mix, crew size, and operating shift requirements;

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

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

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

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

(viii) General sampling and analyses requirements;

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

(x) Maintenance and spares philosophy and requirements (including items to be present at transition to the future operations contractor);

(xi) Environmental compliance requirements; and

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

Upon concurrence of the Operations Requirement Document, DOE will control the Operations Requirement Document and will consider any proposed changes.

(c) Establish and Maintain Design Documentation: The Contractor is encouraged to use established design practices and shall ensure that design documentation and media comply with best industry practices. DOE shall have access to all Contractor-developed design documents and information, paper and electronic files (Table C.5-1.1, Deliverable 3.5). 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 Balance of Facility, Pretreatment, LAW Immobilization, and HLW Immobilization. Changes to the products shall be documented through engineering change notices. DOE shall be invited to attend configuration control board meetings or other meetings where design products are updated, revised or changed.

(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 sample analysis turnaround times and address reliability, availability, maintainability, and inspectability.

(5) General Arrangement Drawings: General arrangement drawings for the WTP (e.g., Balance of Facility, Pretreatment, LAW Conditioning, 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) Equipment Item List:

(i) All non-U.S. standard (non-off-the-shelf in the U.S.) equipment must be clearly noted on the equipment item list and referenced to the corresponding equipment specification.

(ii) The equipment list must be provided in an electronically sortable format with all records and fields shown.

(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 and Material Balances: 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, and LAW Vitrification and balance of plant facilities. The piping and instrument diagrams shall identify all process and support equipment, preliminary instrument and electrical requirements, and pipe sizes and line numbers. The control system information typically presented on piping and instrument diagrams shall instead be contained on separate instrument and control diagrams.

(11) Instrument and Control Diagrams/Design: The Contractor shall prepare the instrument and control diagrams for the Pretreatment, HLW Vitrification, and LAW Vitrification facilities. These diagrams/design documentation shall include control system specifications, identification of the main control interface, configuration diagrams, and sequence and interlock requirements. The instrument schedules shall be defined in the design documentation. 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, and 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, and LAW Vitrification 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 prepare pipe routing diagrams for the Pretreatment, HLW Vitrification, and LAW Vitrification facilities. Critical systems shall be modeled using three-dimensional analysis to assure that equipment systems are correctly positioned and primary cell penetration requirements are identified.

(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, and balance of plant facilities. The diagrams shall identify the individual systems, all equipment components, and routing within and between 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 Balance of Facility, Pretreatment, HLW Vitrification, and LAW Vitrification 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, and balance of plant 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 review and comment (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.

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 and facility general arrangement drawings for all facilities and structures. 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 concurrence (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) Hydraulic gradient diagrams;

(vi) Mechanical flow diagrams;

(vii) Material handling diagrams; and

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

(d) Waste Treatment and Immobilization Plant Optimization Study: The Contractor shall prepare for DOE review and concurrence (Table C.5-1.1, Deliverable 3.8) a proposed set of optimization studies that improve life-cycle performance, cost, and schedule of the WTP, including 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), and affect the Contract requirements. 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 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) Affects 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.

(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 (Table C.5-1.1, Deliverable 3.9). 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. A multi-disciplined design overview shall be scheduled, conducted and documented quarterly (Table C.5-1.1, Deliverable 3.10). The Contractor shall develop a list of systems and items for DOE review and concurrence at least 30 days in advance of the quarterly design overview. In order to improve communications, the Contractor shall provide dedicated office space in the Contractor's design facility for five DOE staff.

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. 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" (Milestone M5).

(a) Construction, Procurement, and Acceptance Testing Plan: The Contractor shall prepare and submit a Construction, Procurement, and Acceptance Testing Plan for DOE concurrence (Table C.5-1.1, Deliverable 4.1) and update the Plan annually 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 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, including: 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 entitled, *Subcontracts* (Table C.5-1.1, Deliverable 4.2).

(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 Contractor shall develop and submit an integrated construction and acceptance testing program to DOE for concurrence (Table C.5-1.1, Deliverable 4.4) that includes the following elements:

(i) Checking and approval of all vendor's 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 and 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 and reports of quantities and values of construction work performed, for payment or other purposes;

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

(x) Providing set(s) of reproducible "as-built" record drawings of the type specified by DOE and set(s) of marked-up specifications, showing construction as actually accomplished.

(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 as part of the monthly Construction Inspection and Acceptance Status Report.

(4) The Contractor shall provide all necessary labor, equipment, materials, test equipment, and other related resources for the acceptance test.

(g) Certification for Start of Construction. The Contractor shall certify to DOE that construction has been initiated. Start of Construction (Milestone M1) is defined as the first pour of structural concrete for one of the three WTP elements, 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 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, functionally tested and the facility design as-built in accordance with the Construction, Procurement, and Acceptance Testing Plan (Table C.5-1.1, Deliverable 4.1, Milestone M3).

Standard 5: Commissioning

The purpose of this Standard is to describe the requirements and deliverables to commission the WTP, including cold commissioning performance testing and radioactive (hot) commissioning performance testing.

(a) The objectives of the Commissioning period for the entire WTP are to demonstrate:

(1) Process and facility performance meets or exceeds Contract requirements.

(2) Adequate and correct procedures, and safety limits exist for operating the process systems and utility systems.

(3) Training and qualification programs for operations and operations support personnel are established, documented, and implemented. (The training and qualification program encompasses the required range of duties and activities.)

(4) WTP safety and environmental compliance documentation is in place and describes the safety and environmental compliance basis of the WTP.

(5) Program(s) are in place to confirm and periodically reconfirm the condition and operability of safety systems, including important to safety process systems and safety related utility systems.

(6) Processes are established to identify, evaluate, and resolve deficiencies and recommendations made by DOE oversight groups, official review teams, and audit organizations.

(7) Management programs are established, sufficient numbers of qualified personnel are provided, and adequate facilities and equipment are available to ensure operational support services (e.g., training, maintenance, waste management, environmental protection, industrial safety and hygiene, radiological protection and health physics, emergency preparedness, fire protection, QA, SAS, criticality safety, and engineering) are adequate for operations.

(8) Functions, assignments, responsibilities, and reporting relationships are clearly defined, understood, and effectively implemented with line management responsibility for control of safety.

(9) WTP systems and procedures, as affected by facility modifications, are consistent with the description of the facility, procedures, and accident analysis included in the authorization basis.

(10) Modifications to the facility have been reviewed for potential impacts on procedures, training, and qualification. Procedures have been revised to reflect these modifications and training has been performed to these revised procedures. The WTP design documentation is complete.

(b) Commissioning Plan: The Contractor shall prepare a detailed Commissioning Plan for DOE review and concurrence (Table C.5-1.1, Deliverable 5.1), a minimum of 24 months prior to the start of commissioning. The Plan shall, at a minimum, define the WTP organization, specific tests, and procedures for commissioning each of the major facilities and supporting facilities. The definition shall demonstrate how each of the WTP facilities will transition to:

(1) Fully operational non-radioactive status, which will demonstrate the design criteria, process, safety, process and product control features, and environmental safety requirements of the Contract; and

(2) A fully operational facility.

The strategy shall identify the system acceptance and operability criteria by which that system will be released to support other systems. The Commissioning Plan shall be updated and provided to DOE for concurrence at least annually, thereafter, and as required.

(c) Training and Qualification of Waste Treatment and Immobilization Plant Operations and Maintenance Staff: The Contractor shall establish an operations and maintenance training organization that will:

(1) Prepare a staffing analysis for the WTP that identifies the types of skills, skill level, and number of personnel needed to operate and maintain the WTP. The analysis shall include operations, maintenance, environmental safety and health, human resources, QA, and facility engineering management and staff. An operations organization shall be established.

(2) Identify training and qualification requirements for the operations and maintenance staff.

(3) Prepare training and certification procedures, tests, and other documentation methods to conduct training.

(4) Prepare operations and maintenance manuals, procedures, and other systems for WTP commissioning (cold and hot), operations, and maintenance activities.

(5) Establish a training and certification organization to assure completion of staff training and certification activities.

(6) Establish a system and procedures to schedule and manage WTP maintenance requirements.

(7) Conduct training and qualify staff responsible for commissioning, operating, and maintaining the WTP.

(d) Commissioning Review Board: The Contractor will chair a Commissioning Review Board with DOE and its designated Contractor participation (Table C.5-1.1, Deliverable 5.2). The Board will review the detailed plans, procedures, barriers and commissioning progress, and results. DOE will identify and control key hold-points throughout the commissioning process starting 12 months prior to commissioning. The Commissioning Review Board shall be conducted monthly and, as necessary, until facility turnover to the future operator. The Contractor shall be responsible for testing and commissioning the equipment and systems, as follows:

(1) Demonstrate the correct functioning of systems important to safety, plant, and equipment;

(2) Demonstrate site emergency procedures;

(3) Test radiation instruments with sealed sources;

(4) Test systems with density changes;

(5) Start-up and recovery from idle condition of the LAW and HLW melter systems;

(6) Sample and analyze systems;

(7) Evaluate shielding;

(8) Validate operations and maintenance instructions;

(9) Validate operations and maintenance procedures;

(10) Train and certify WTP operators and maintenance personnel;

(11) Perform full capacity system environmental performance tests with reagents, acids, and simulants;

(12) Perform WTP integrity and equipment inspections;

(13) Demonstrate construction completeness; and

(14) Demonstrate process and product control features.

(e) Cold Commissioning: During the cold commissioning test period, the Contractor shall conduct all necessary testing operations to verify that the WTP will perform in accordance with design specifications, using DOE approved non-radioactive simulated feeds that demonstrate the ability of the facility to treat a broad range of tank waste. The cold commissioning test periods will also be used to train WTP Contractor staff, and demonstrate that the WTP can safely receive and treat radioactive waste feed (hot commissioning). Prior to cold commissioning, the Contractor shall have in-place all necessary permits, licenses, and demonstrated that all interfaces are ready to support the cold commissioning.

The Contractor shall certify to DOE that Cold Commissioning has commenced. Start of Cold Commissioning (Milestone M2) will occur when the simulated LAW feed has been prepared and pretreated in the Pretreatment facility, and successfully transferred to the LAW Vitrification facility, in accordance with the Commissioning Plan.
The Contractor shall carry out cold commissioning performance tests of the Pretreatment, LAW Vitrification, and HLW Vitrification facilities to meet the following objectives:

- Verify 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 on waste compliance strategies that will be documented in the Products and Secondary Wastes Plan and the IHLW Waste Compliance Plan.

- Demonstrate the WTP design capacity for process systems as defined in Section C.7, *Facility Specification*.

- Determine the operating characteristics of WTP processes under routine and off-standard operating conditions including: demonstration of all remote and hands-on maintenance activities; access to all equipment; ability to install, connect, disconnect, and reconnect all replaceable components; and calibrations of all instruments.

- Verify that the WTP will meet environmental, permitting, and safety requirements.

The tests, combined with other readiness activities, shall be planned and conceived to provide the operational and procedural basis necessary to support the hot operations request.

The Contractor shall provide a strategy to achieve the four cold commissioning performance test objectives in the WTP Commissioning Plan, which may be performed sequentially or in parallel. Resultant products (Deliverable 5.6) shall be transferred to DOE in accordance with the Section C.9, *Interface Control Documents*. During the tests, the Contractor shall provide documentation of the waste form products and secondary wastes for DOE acceptance in accordance with Specification 13, *Waste Product Description and Acceptance*. No credit will be provided for non-conforming product, and if any out of specification product is produced during a test, the test shall be restarted after the condition that created the out of specification product is corrected.

(1) Waste Form Qualification Tests: The Contractor shall complete WTP performance testing using a cold commissioned facility to demonstrate the production of qualified non-radioactive products (ILAW and IHLW) and secondary wastes. All process unit operations, sampling and analysis, and process control systems shall be utilized in these qualification tests. Where needed, and determined beneficial, non-radioactive elements shall be used as a surrogate for radioactive elements. Test results will be evaluated and documented as part of the waste form qualification reports identified in Standard 6, *Product Qualification, Characterization, and Certification* (Table C.5-1.1, Deliverable 5.3).

(2) Design Capacity Performance Tests: During the cold commissioning tests, the following minimum testing shall be conducted to demonstrate the treatment capacity of the WTP. All waste form products and secondary wastes will be produced in accordance with the qualification strategies and requirements identified in the Products and Secondary Wastes Plan and the IHLW Waste Compliance Plan, and meet the relevant specification and interface requirements. The results shall be provided to DOE for review and concurrence. (Table C.5-1.1, Deliverable 5.4).

(i) Pretreatment: The Contractor shall demonstrate all pretreatment unit operations and conduct integrated plant process testing using DOE approved non-radioactive simulants of sufficient volume and representative chemical composition to meet the following test objectives for capacity testing:

The LAW Pretreatment line shall be operated continuously for at least 20 consecutive days using DOE approved LAW feed simulants representing Envelope A, B, and C feeds at an average glass equivalent production rate of 30 MTG/day throughput. As part of the test series, a continuous peak throughput test for 5 consecutive days, at a glass equivalent production rate of 60 MTG/day, shall be conducted with Envelope A feed. The quantity of Envelope A, B, and C feeds to be treated shall at a minimum be sufficient to produce 200, 160 and 360 MT of glass respectively to support vitrification cold commissioning tests. The plant capacity throughput shall be demonstrated using all installed plant, instrumentation, and sampling and analyses systems. All unit operations are to be demonstrated (e.g., LAW feed evaporation, Cs ion-exchange, Tc ion-exchange, Sr/TRU Removal, eluant recycle, radionuclide concentration, etc.).

The HLW Pretreatment line shall be operated continuously for at least 20 consecutive days using a DOE approved HLW feed simulant at an average HLW glass production rate of 1.5 MTG/day. As part of the test a continuous peak throughput test of 6.0 MTG/day shall be completed for a minimum of 5 consecutive days. The quantity of Envelope D feed to be treated shall at a minimum be sufficient to produce 50 MT of IHLW. All unit operations will be demonstrated (e.g., HLW solids separation, HLW solids washing, Cs/Tc/Sr/TRU concentrate incorporation, etc.).

(ii) Low-Activity Waste Vitrification: The Contractor shall demonstrate all LAW Vitrification unit operations and conduct integrated plant process testing using non-radioactive simulants of sufficient volume, and representative composition, to meet the following test objectives for capacity testing (in the sequence of Envelopes B, C, and A). Each ILAW container will be processed through the complete process and equipment system including: level measurement, sampling, inert filling, lid welding, decontamination and placement of the canister in storage and certified to meet Specification 2 requirements.

Envelope B Capacity Test: Test and evaluate the Envelope B feed composition originating from the Pretreatment Plant to examine and verify the operability of the LAW melter system performance while varying the concentration of chemical components (sulfate, phosphate, chloride, etc.) to assess the impacts on melter operation or ILAW product properties. The test shall demonstrate the capability to operate one of the three-melter production lines. At least 200 MTG shall be produced within a 20 consecutive day period.

Envelope C Capacity Test: Test and evaluate the Envelope C feed composition originating from the Pretreatment Plant to examine and verify the operability of the LAW melter system performance while varying the concentration of chemical components from the Envelope C feeds that may have an impact on melter operation of ILAW product properties. The melter glass tank composition turnover from Envelope B to Envelope C waste glass shall be demonstrated and completed prior to the Envelope C capacity test (estimated at ~60 MTG). The test shall demonstrate the capability to operate one of the three-melter production lines; at least 100 MTG shall be produced within a 10 consecutive day period.

Envelope A Capacity Test: Test and evaluate the Envelope A feed composition originating from the Pretreatment Plant to examine and verify the operability of the LAW melter system performance under conditions of a completely functional vitrification plant. The test shall demonstrate the capability to operate all three-melter production lines; at least 600 MTG shall be produced within a period of 20 consecutive day period. As part of the test, an average maximum glass production rate of 40 MTG/day, shall be demonstrated for at least 5 consecutive days. Prior to initiation of the test, the glass tank composition of the melters will be adjusted to represent a qualified Envelope A glass.

(iii) High-Level Waste Vitrification. The Contractor shall demonstrate all HLW Vitrification unit operations and conduct integrated plant process testing using non-radioactive simulants of sufficient volume and composition to meet the following test objectives for capacity testing:

Envelope D Capacity Test: The HLW Vitrification Plant shall be operated for a period of at least 30 consecutive days, and produce 12 containers of IHLW glass in that time. Each container shall be processed through the complete process and equipment system, including level measurement, sampling, lid welding, decontamination, and placement of the canister in storage. The testing shall examine and verify the operability of the HLW melter system performance while varying the concentration of chemical components (iron, aluminum, sulfate, etc.) that may have an impact on melter operation of IHLW product properties.

(3) Off-Standard Operational Testing: The Contractor shall conduct testing of the process and facility system to test and evaluate off-standard operating conditions to determine the capability of the process and facility system for an increased production capacity above the design basis. The results shall be provided to DOE for review and comment (Table C.5-1.1, Deliverable 5.5). The operational tests shall be defined by the Contractor based upon design conservatism and design limitations in specific plant process and equipment systems. Testing may be conducted on individual unit operations or plant systems. As part of the Off-Standard Testing, the melter shall be placed in idle for a period of time to allow for measurement of volatility and off-gas impacts due to the loss of the cold cap. These effects shall also be observed during reformation of the cold cap. A complete assessment of the instrument and control system shall be completed. During the tests, the safety of the facility, operational personnel, the public, or the environment shall not be challenged.

(4) 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 the flowsheet design. 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 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, 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.

(5) Commissioning Results and Documentation: The Contractor shall provide all results from cold commissioning testing to DOE for review and concurrence (Table C.5-1.1, Deliverable 5.8). The information shall be in the form of controlled copies maintained and updated by the Contractor. Information shall include, but not be limited to:

(i) System start-up plans, work packages, and system verification reports;

(ii) Conduct of operations/maintenance plans;

(iii) Operating procedures;

(iv) Test plans and outputs for demonstrating and/or establishing permitting conditions (RCRA, authorization basis, air, performance test plans, etc.), including off normal conditions; and

(v) Test plans and outputs for process verification, 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(e) (Table C.5-1.1, Deliverable 5.9).

(f) Hot Commissioning: During hot commissioning, the Contractor shall conduct all necessary operations to ensure that the facility is ready for hot operations and facility turnover.

(1) Certification of Readiness for Hot Operations: The Contractor shall certify to DOE that the facility is ready to receive waste feed 3 months prior to the requested date for waste transfer (Table C.5-1.1, Deliverable 5.10). At a minimum, the certification shall includes demonstration in that:

(i) The Contractor has all necessary permits, licenses, and other such approvals, and can meet all related compliance conditions;

(ii) The interfaces are ready to support hot operations;

(iii) The facility can meet contractual requirements for all inputs and outputs; and

(iv) The ILAW and IHLW products will meet requirements and that the mass and material balance tracking is sufficient to substantiate for determination of payment for waste treatment services.

(2) For hot commissioning, the Contractor shall provide a written notice to the DOE Contracting Officer, specifying:

(i) The type (LAW or HLW) of feed requested; and

(ii) The date the Contractor requests the start of a transfer of a batch of feed, herein referred to the waste transfer date. The written notice shall be provided to the DOE Contracting Officer at least 2 months prior to the requested waste transfer date.

(3) Certification of Start of Hot Commissioning: The Contractor shall certify to DOE that the facility hot commissioning has started (Table C.5-1.1, Deliverable 5.10, Milestone M4). Start of hot commissioning is defined as having received the first batch of actual tank waste feed and having demonstrated the ability to remove cesium to the required levels to meet design and Contract requirements.

(4) Hot Commissioning Performance Tests: The Contractor shall carry out hot commissioning performance tests as defined below. The results shall be provided to DOE for review and concurrence. (Table C.5-1.1, Deliverable 5.12):

Hot commissioning shall be completed upon the Contractor submitting certification for DOE approval that the WTP has met the production rate requirements described below. In addition, the Contractor will demonstrate successfully treating and immobilizing 300 units of LAW feed (Specification 7), producing fully compliant ILAW (Specification 2), and 60 fully compliant canisters of IHLW (Specification 1) from HLW feed (Specification 8). DOE will accept products produced during hot commissioning in accordance with Specification 13 (Table C.5-1.1, Deliverable 5.13).

(i) Pretreatment: The LAW Pretreatment line shall be operated continuously for 40 days using a LAW feed at an average glass equivalent production rate of 30 MTG/day throughput. As part of the test, a continuous peak throughput test for 5 days at a glass equivalent production rate of at least 60 MTG/day shall be conducted. The plant capacity throughput shall be demonstrated using the installed plant, instrumentation, and sampling and analyses systems.

The HLW Pretreatment line shall be operated continuously for at least 30 days using HLW at an average HLW glass production rate of 1.5 MTG/day. As part of the test, a continuous peak throughput test of 6.0 MTG/day shall be completed for a minimum of 10 consecutive days.

(ii) Low-Activity Waste Vitrification: The LAW Vitrification Facility shall produce at least 150 containers of ILAW in a period of not more than 30 consecutive days. Each container shall be processed through the complete process and equipment system, including level measurement, sampling, inert filling, lid welding, decontamination, and placement of the canister in storage. The facility shall also be operated at its peak design rate and produce 60 containers in a 10 consecutive day period.

(iii) High-Level Waste Vitrification: The HLW Vitrification Facility shall produce at least 12 canisters of IHLW in a period of not more than 30 consecutive days. Each container shall be processed through the complete process and equipment system, including level measurement, sampling, lid welding, decontamination, and placement of the canister in storage. The facility shall also be operated at its peak design rate and produce five canisters in a 10 consecutive day period.

(5) Hot Commissioning Results and Documentation: The Contractor shall provide all Contractor-operated hot commissioning planning information and information resulting from hot commissioning to DOE for review and concurrence (Table C.5-1.1, Deliverable 5.14). The information shall be in the form of controlled copies updated by the Contractor, or electronic access at the Contractor's discretion. Information shall include, but not limited to:

(i) System start-up plans, work packages, and system verification reports:

(A) Conduct of operations plans;

(B) Operating procedures;

(C) Test plans and outputs for demonstrating and/or establishing permitting conditions (RCRA, authorization basis, air, performance test plan, etc.);

(D) Test plans and outputs for process verification and, product qualification, including documentation and certification that the products meet all requirements per Specification 13;

(E) Updated or model assessments based on hot/cold commissioning information;

(F) Updated mass material balances to verify waste treatment services per Standard 6, *Product Qualification, Characterization and Certification*;

(G) Information sufficient to verify quantities subject to waste minimization; and

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

(6) 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).

(g) Post Commissioning Services. Following successful hot commissioning of either LAW Vitrification or HLW Vitrification pursuant to subparagraph (f)(4), but prior to completion of hot commissioning of both facilities, DOE may request the Contractor to provide additional waste treatment from the successfully commissioned facility. In no circumstance will the request for additional production extend beyond the completion of all requirements in subparagraphs (f)(4) and (f)(5). If DOE requests additional waste treatment beyond that required for hot commissioning, such requests will be pursuant to the Section I Clause entitled, *Changes.*

(h) Completion of Contract Workscope Requirements. Following the successful completion of the hot commissioning testing as certified by the Contractor to DOE (Milestone M5), the Contractor shall complete, at a minimum, the following activities to ensure the effective and efficient transition of the WTP facilities to the future operations contractor. The Contract work scope is deemed complete, once these activities have been completed to the satisfaction of DOE, and the future operations contractor has certified acceptable turnover of the facility (Table C.5-1.1, Deliverable 5.16, Milestone M6).

For a period of time of at least 6 months in duration, the Contractor shall maintain the presence of appropriately knowledgeable and trained personnel in the Tri-Cities area to perform the following functions:

(1) Prepare the as-built design of the WTP process and facility.

(2) Complete the closeout of all punch list items that arise from the cold and hot commissioning tests. These items can include equipment and facility modifications and repairs, operations procedure revision, replenishment of spare parts, etc.

(3) Resolve any waste form quality issues for the waste form products and/or secondary waste generated during cold and hot commissioning. This can include

revision to the IHLW Waste Form Compliance Plan, Products and Secondary Wastes Plan, and/or revisions to specific operations procedures and equipment systems.

(4) Provide support for any modifications to the environmental compliance and/or safety authorization basis documentation as a result of the information obtained in the hot commissioning testing.

(5) Assist the future operations contractor in updating operations procedures to reflect lessons learned during commissioning.

(6) Ensure all documents, records, and procedures are complete and accurate and turned over to the future operations contactor.

(7) Respond to technical questions from the future operations contractor.

(8) Provide technical advice on proposed repairs and modifications to the WTP facilities.

(9) Assure the resolution of all equipment warrentee issues.

(10) Provide support to DOE in the conduct of internal and external technical reviews and presentations.

(11) Assure all operations, maintenance, engineering, licensing, and purchasing activities are transitioned to the future operations contractor.

Standard 6: Product Qualification, Characterization, and Certification

The purpose of this Standard is to describe the requirements for documentation that describes the strategies for qualifying the immobilized waste products (IHLW and ILAW) intermediate waste products (entrained solids) 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, intermediate waste product, and secondary waste to be produced or generated by the WTP.

(2) Conduct activities necessary to qualify each immobilized waste product and intermediate waste product 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, intermediate 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 Products and Secondary Wastes Plan describing the plan for qualification, characterization, and certification of each immobilized waste product, intermediate waste product, and secondary waste included under this Contract. The Products and Secondary Wastes Plan shall provide the following information:

(1) Identification, quantification, and description of each immobilized waste product, intermediate waste product, and secondary waste. The description shall include chemical and radiochemical composition, physical properties, and a comparison to Contract requirements.

(2) Planned methods and documentation to qualify each immobilized waste product intermediate waste product and secondary waste.

(3) Planned methods and documentation to characterize and provide a basis for certifying that each immobilized waste product, intermediate waste product, and secondary waste meet 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, or intermediate waste product and secondary waste submitted for transfer that describes the product, documents characterization activities, and 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 in Table S6-1, *Product Qualification, Characterization, and Certification Documentation*:

(1) Annually update and revise Products and Secondary Wastes Plan for DOE concurrence.

(2) Annually update and revise a separate Waste Form Compliance Plan based on the Products and Secondary Wastes Plan that addresses the requirements of the WASRD and WAPS identified in Specification 1, *Immobilized High-Level Waste*, for DOE concurrence. The Contractor shall provide documentation and technical support to DOE during the concurrence process.

(3) Implement the DOE-concurred upon Products and Secondary Wastes Plan and Waste Form Compliance Plan, including all planned qualification, certification, and characterization activities.

(4) Annually, through the construction period, prepare qualification documentation for DOE review and comment related to ILAW, IHLW, and entrained solids. Qualification documentation shall be submitted for DOE concurrence 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.

(5) Annually, through the construction period, prepare a separate Waste Form Qualification Report for DOE review and comment that addresses the requirements of the WASRD and WAPS identified in Specification 1, *Immobilized High-Level Waste*. Waste Form Qualification Report documentation shall be submitted for DOE concurrence during the facility cold and hot commissioning activities. The Contractor shall provide documentation and technical support to DOE during the concurrence process.

(6) 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.

Table S6-1. Product Qualification, Characterization, and Certification Documentation

Item #	Deliverable Description	Reference	Status at Contract Award	Through Construction	Cold Commissioning	Hot Commissioning
6.1	Products and Secondary Wastes Plan	Standard 6	DOE Concurred upon Final	update annually	Final	Update
6.2	Waste Form Compliance Plan	Standard 8 and Specification 1	DOE Concurred upon Final	update annually	Final	Update
6.3	IHLW Qualification Documentation	Standard 8 and Specification 1	Preliminary IHLW Qualification Report	update annually	Final	Final
6.4	Waste Form Qualification Report	Standard 8 and Specification 1	Outline And Preliminary Waste Form Qualification Report	update annually	Final	Final
6.5	IHLW Production Documentation	Standard 6, Specification 1 and ICD14			Product Acceptance	Final for each Canister
6.6	ILAW Qualification Documentation	Standard 6 and Specification 2	Preliminary ILAW Qualification Report	update annually	Final	Final
6.7	ILAW Production Documentation	Standard 6, Specification 2 and ICD 15			Product Acceptance	Final for each Package
6.8	Entrained Solids Qualification Documentation	Standard 6 and Specification 3	Preliminary Entrained Solids Qualification Report	update annually	Final	Final
6.9	Entrained Solids Production Documentation	Standard 6, Specification 3 and ICD 16			Product Acceptance	Final for each transfer
6.10	Secondary Wastes Production Documentation	Standard 6 and ICDs 3, 4, 5, 6, 7, 8, and 22			Product Acceptance	Final
6.11	Quality Assurance Provisions Document	Standard 6	DOE Approved Final Contractor to Update Within 60 Days of Contract Award	update annually	Final	Update

(7) 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.

(8) Prepare production documentation for ILAW and IHLW waste products, entrained solids, and secondary wastes. The production documentation shall verify that the testing, analyses, demonstrations, and inspections 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.

(9) Submit to DOE all required documentation that qualifies, characterizes, quantifies and certifies each immobilized waste product, intermediate waste product, and secondary waste conforms to Contract requirements.

(10) Proposed ILAW glass composition ranges shall be provided to DOE for concurrence no less than 2 years before production of glasses in that range. DOE concurrence (or non) will be provided within 6 months of the proposal. The Contractor shall only produce glasses that have received DOE concurrence.

(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 and 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 and 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 40CFR268, *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 40CFR761; 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 analytes and requirements in the applicable DQO.

(g) The Contractor shall qualify and characterize the immobilized waste products, intermediate 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 Standards.

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 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 Products and Secondary Wastes Plan. 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, intermediate 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, intermediate 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, intermediate 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 an immobilized waste product, intermediate 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, 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 entitled, *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:

(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 regulatory program described in RL/REG-2000-04, *Industrial Hygiene and Safety Regulatory Plan*.

(iii) The documentation of the Contractor's non-radiological worker safety and health program shall be submitted to DOE for review and approval (Table C.5.1-1, Deliverable 7.0), and shall be updated and resubmitted at each authorization action. If a Limited Construction Authorization Request (LCAR) is submitted, the initial non-radiological worker safety and health program shall be submitted with the LCAR. DOE will review the document according to *Industrial Hygiene and Safety Review Guidance for the RPP-WTP Limited Construction and Construction Authorization Requests*, and review updates, as appropriate.

(iv) DOE is responsible for setting and approving non-radiological worker safety and health standards, formal interpretation of standards, conduct of non-radiological worker safety and health inspections, and granting variances.

(v) All submitted regulatory information 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.

(2) Radiological, Nuclear, and Process Safety:

(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 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 Contractor*;

(C) DOE/RL-96-0005, *Concept of the DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor;* and

(D) DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment 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 entitled, *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*.*

(iii) 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*; and accept:

(A) RL/REG-98-05, *Inspection Program Description for the Regulatory Oversight of the RPP-WTP Contractor,* and

(B) RL/REG-98-06, *Corrective Action/Enforcement Action Program Description*.

Changes to the four documents in subparagraph (e)(2)(ii) 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 entitled, *Changes*.

(iv) The Contractor shall prepare and submit to DOE for review and approval, the radiological, nuclear, and process safety deliverables 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.

(v) The Contractor shall submit a revised Standards Approval Package, including all necessary supporting documentation, sufficiently in advance of the submission (at least 14 weeks) of the Construction Authorization Request to support DOE review and approval. The required elements of the Standards Approval Package may be incrementally submitted for review. The scope and content of the submittal shall be in accordance with the requirements for a Construction Authorization Request as stipulated in Section 4.3.2, *Contractor Input*, Items 6) and 8) of DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor.*

(vi) The Contractor shall submit the Construction Authorization Request, with the exception of the Standards Approval Package submitted in paragraph (e)(2)(v) of this *Standard*, 7 months prior to the need for approval of the Authorization to Proceed with construction, for DOE review and approval.

(vii) Reserved.

(viii) DOE and the Contractor shall conduct periodic, approximately monthly, topical meetings. The subject and time of the meetings should be held to an agreed prearranged schedule. These meetings will be conducted in accordance with a pre-arranged protocol. DOE will establish the minimum content of the meetings. To the extent practicable, the outcome of a meeting should result in the regulatory closure of the topic. Closure will result from approval of submitted written correspondence.

These meetings will be held in accordance with DOE RL/REG-97-04, *Policy for Openness and Openness Plan for the Office of Safety Regulation of the RPP-WTP Contractor*. Following approval of the Construction Authorization Request, DOE and the Contractor shall conduct periodic, approximately quarterly, topical meetings. The subject and time of the meetings should be set to a mutually agreed, prearranged schedule. These meetings shall not exceed twelve in number and will be conducted in accordance with a pre-arranged protocol. Schedule, content, and issue closure criteria shall be established for at least four meetings in advance. DOE will establish the minimum content of the meetings. To the extent practicable, the outcome of a meeting should result in the regulatory closure of the topical issue. Closure will result from approval of submitted written correspondence.

These meetings will be held in accordance with DOE RL-REG-97-04, *Policy for Openness and Openness Plan for the Office of Safety Regulation of the RPP-WTP Contractor.*

(ix) 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.

(x) 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 Construction Authorization Request, complete with scope and content of the proposed request, not less than 4 months prior to its submission. 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 12 months prior to its submission.

The Contractor may provide the following limited authorization requests:

(A) Limited Construction Authorization for site preparation and excavation; and

(B) Others, 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.

(xi) DOE developed and provided review guidance for the Construction Authorization Request (RL/REG-99-05) identified in Table S7-1 and for the LCAR (RL/REG-99-17) identified in (2)(x) of this Standard.

(xii) 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 9 months prior to the scheduled submission of the authorization request. Guidance for Deactivation Safety Assessment shall be provided prior to cold commissioning.

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Table S7-1. Radiological, Nuclear, and Process Safety Deliverables

Regulatory Action	Deliverable	References	Deliverables included in Conceptual Design and Supporting Documentation	Start of Construction	Start of Commissioning
Standards Approval	Safety Requirements Document	DOE/RL-96-0003	Final	Revision	Revision
	Integrated Safety Management Plan	DOE/RL-96-003, 10CFR830, 29CFR1910	Final	Revision	Revision
	Hazards Analysis Report	DOE-STD-3009-94, 29CFR1910.119	Final	Revision	Revision
	Employee Concerns Management System	DOE Order 5480.29	Final		
	Radiation Exposure Standard for Workers Under Accident Conditions	DOE/RL-96-0006	Final		
	Quality Assurance Program	10CFR830.120	Final	Revision	Revision
Initial Safety Evaluation	Initial Safety Assessment	DOE/RL-96-0003	Final		
Authorization for Construction and Cold Commissioning	Construction Authorization Request	DOE/RL-96-0003	Outline	Final	N/A
	Construction Occurrence Reporting Plan	DOE/RL-96-0003	Outline	Final	N/A
	Deactivation Plan	DOE/RL-96-0003	Outline	Revision	Revision
Authorization for Hot Commissioning	Operating Authorization Request	DOE/RL-96-0003		Outline	Final
	Safety Analysis Report	DOE/RL-96-0003, 29CFR1910.119	Initial	Preliminary	Final
	Emergency Response Plan	See Note 2	Outline	Draft	Final
	Unreviewed Safety Question Plan	DOE/RL-96-0003	Outline	Draft	Final
	Conduct of Operations Plan	DOE/RL-96-0006, 29CFR1910	Outline	Draft	Final
	Technical Safety Requirements	DOE/RL-96-0006	Outline	Draft	Final
	Training and Qualification Plan	29CFR1910, 40CFR68	Outline	Draft	Final
	Maintenance Implementation Plan	DOE/RL-96-0006, WAC246-247	Outline	Draft	Final
	Occurrence Reporting Plan	DOE/RL-96-0006, WAC246-247	Outline	Draft	Final
	Environmental Radiological Protection Program	DOE/RL-96-0006, 29CFR1910, 40CFR68	Outline	Draft	Final
	Radiation Protection Program	DOE/RL-96-0006	Outline	Revision	Final
Oversight Process Determination	Plan for Operational Assessment Reports	DOE/RL-96-0003	Outline	Draft	Final
Deactivation Safety Assessment	Deactivation Safety Assessment	DOE/RL-96-0003		Outline	Draft

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 40CFR68, 40CFR355, DOE/RL-94-02, and 29CFR1910.38, and WAC 246-247 (Plan must comply with DOE/RL-94-02, but exposure standards are contained in SRD Vol. II, Section 2.1)

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 entitled, *Changes*.

(xiii) 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.

(3) Quality Assurance:

The Contractor shall develop a QA Program, supported by documentation that describes overall implementation of QA requirements. Documentation shall identify the procedures, instructions, and manuals used to implement the Contractor's QA program within the Contractor's scope of work. Specific requirements for process development, waste form qualification and testing are described in Standards 2 and 6. The Contractor's documentation 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:

(i) QA for radiological, nuclear, and process safety shall be conducted in accordance with 10 CFR 830.120.

(ii) QA for process development, waste form qualification and testing shall be conducted as described in Standards 2 and 6. This portion of the QA program shall be described in a QA Provisions document and be provided to DOE for concurrence within 2 months of Contract award. The quality assurance program description shall address the following requirements:

(A) The Contractor shall implement the Office of Civilian Radioactive Waste Management's, *Quality Assurance Requirements and Description Document* (QARD), DOE/RW-0333P, Revision 10, 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.

(B) The Contractor shall implement the *National Consensus Standard* AMSE/NQA-1, 1989, Revision (NQA-1) for elements of the Contractor's scope that may affect product quality of the Immobilized Low-Activity Waste (ILAW), entrained solids, and sludge washing, including, but not limited to, waste form development, qualification, characterization, production process control, certification of ILAW, entrained solids, and sludge washing. Furthermore, all research and technology activities (other than IHLW – see (A)), shall be conducted in accordance with NQA-1.

(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 414.1A.

(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 (1989 Revision) as the primary QA reference document and the Contractor shall utilize this Standard to help achieve the quality objectives of this Contract, as necessary.

(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:

(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 and 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 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: 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 concurrence, and include identification of where and when DOE or other site contractor action is anticipated or required. The Plan shall be submitted within 3 months after contract award. The Plan shall be updated at least annually or as significant changes to the permitting schedules warrant.

(B) Dangerous Waste Permit Application: Prepared as a chapter to the Dangerous Waste Portion of the RCRA Permit for the Treatment, Storage, and Disposal of Dangerous Waste, Permit Number 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 concurrence (Table C.5-1.1, Deliverable 7.4) 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: 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: 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 concurrence 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: 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 concurrence 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: 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 concurrence.

(G) Petition for a New Treatment Standard for Hanford Tank Waste: 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 concurrence.

Standard 8: Safeguards and Security

The purpose of this Standard is to describe the 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 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 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) Information and personnel security 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 *Safeguards and Security Program Plan*, Revision 0, PL-W375-MG00004. 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.

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 DOE/RL-96-0002	Not Required[1]	NA	NA	NA
Security Plan	Standard 8 and DOE/RL-96-0002	Existing DOE approved preliminary draft	Draft	Final	Annual Revision
Classified Attachment	Standard 8 and DOE/RL-96-0002	Existing DOE approved preliminary draft	Draft	Final	Annual Revision
Internal Assessment Reports	Standard 8 and DOE/RL-96-0002	NA	NA	Final	Annual
External Assessment Reports	Standard 8 and DOE/RL-96-0002	Submission within 45 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.

C.7 FACILITY SPECIFICATION

The Facility Specification provides minimum requirements for process and facility design 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. Changes shall be proposed in accordance with requirements of Standard 1.

(a) Functional Design Requirements**:** The WTP shall include three major processing elements: (1) Pretreatment; (2) LAW Vitrification; and (3) HLW Vitrification and a number of supporting balance of plant facilities (including an analytic laboratory). The WTP shall be designed to:

(1) Have a 40 year operating life.

(2) Receive LAW feed (defined in Specification 7, *Low-Activity Waste Envelopes Definition*) and HLW feed (defined in Specification 8, *High-Level Wastes Envelope Definition*) through DOE provided transfer lines at an interface point described in ICDs 19 and 20 respectively.

(3) Treat and immobilize the low-activity fraction and any LAW Entrained Solids not returned to DOE, and provide the final waste products described in Specification 2, *Immobilized Low-Activity Waste*, for return to DOE.

(4) Manage entrained solids separated from LAW (Envelopes A, B, and C), as either returned intermediate waste product (Specification 3, *Entrained Solids*) or immobilize the solids as HLW (Specification 1, *Immobilized High-Level Waste*) or LAW (Specification 2, *Immobilized Low-Activity Waste*).

(5) Treat in accordance with Specification 12, *Number of High-Level Waste Canisters per Batch of Waste Envelope D*; immobilize the HLW feed and radionuclides separated from LAW feed and any HLW Entrained Solids not returned to DOE, and provide the final waste products described in Specification 1, *Immobilized High-Level Waste*, for return to DOE.

(6) Disposition all secondary wastes in accordance with ICD requirements; secondary wastes are identified in Section C.9, *Interface Control Documents*.

(7) Be safely and efficiently deactivated, decommissioned, and closed at the completion of the WTP mission.

(8) Protect materials from diversion, and the facilities and materials from sabotage or other acts that can result in wide-spread exposure of workers and the public.

(9) Include a Radiochemical Analytical Laboratory to support the operations of the facilities, including: receipt and analysis of Hanford tank core samples, 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 increased operational capacity of the facilities (as described in paragraph (c), without being a hold up to waste treatment capacity).

(10) Have the ability to receive NaOH slightly contaminated with ^{24}Na for use as a process chemical.

(11) Capability to obtain samples of ILAW and IHLW glass and provide to DOE for independent analysis of the ILAW and IHLW.

(12) Include process and facility designs features to safely and efficiently facilitate deactivation, decontamination, decommissioning, and RCRA closure the facilities.

(13) 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 offsite individual (nonacute exposure) is As Low As Reasonably Achievable (ALARA) but not more than 1.5 mrem per year and organic emissions, are ALARA but not more than 0.375 tons per year.

(14) Include office space sufficient for the exclusive use of eight full time DOE personnel and temporary space for ten transient DOE personnel.

(15) Minimize:

(i) Use of services and utilities including: ICD 1, *Raw Water*; ICD 2, *Potable Water*; ICD 11, *Electricity*;

(ii) Generation of secondary wastes, including: ICD 3, *Radioactive Solid Wastes*; ICD 4, *Dangerous Wastes*; ICD 5, *Non-Radioactive, Non-Dangerous Liquid Effluents*; ICD 6, *Radioactive, Dangerous Liquid Effluents*; and

(iii) Primary product volumes through improved waste loading greater than the Contract minimums: Specification 1, *Immobilized High-Level Waste*, and Specification 2, *Immobilized Low-Activity Waste*.

(b) Initial Treatment Capacity Requirements: The initial WTP design treatment capacity:

(1) Pretreatment shall be sized to meet the waste treatment capacity requirements of the initial Waste Treatment Capacity, and the Expanded Treatment Capacity as defined in paragraph (c) below (60 MTG/day ILAW and 6 MTG/day IHLW).

(2) LAW Vitrification shall be designed to process waste Envelopes A, B, and C feed in accordance with Specification 2.2.2.2, *Waste Loading*, and produce glass at a design rate of greater than 30 MTG/day. The average LAW Facility availability shall be such that the facility can average 1100 units of waste throughput a year, in accordance with Specification 7.2.3.

(3) HLW Vitrification shall be designed to process waste Envelope D feed in accordance with Specification 1.2.2.1.6, *Product Loading*, and produce glass at a design rate of at least 1.5 MTG/day. The HLW Facility availability shall produce an average of 120 canisters per year.

(4) Capability to receive and store 1.5 Mgal (5680 m^3) of LAW feed. The design shall include the capability to receive without interruption 1.0 Mgal (3780 m^3) of LAW feed while processing from the remaining capacity of 0.5 Mgal (1900 m^3) of LAW feed. The tanks shall be connected to allow blending if necessary.

(5) Sufficient feed forward capability for 60 days of HLW operations, while capable of receiving without interruption no less than 600 m^3 of HLW feed per batch. HLW feed batch receipt facilities shall be designed to allow receipt without interruption to waste feed processing.

(6) Capability to store 600 m^3 of entrained solids (defined in Specification 3, *Entrained Solids)*.

(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 operational capacities, as follows:

(1) LAW Vitrification capacity can be increased from 30 MTG/day to 60 MTG/day by the addition of a parallel separate LAW Vitrification Facility.

(2) HLW Vitrification treatment capacity can be expanded from 1.5 MTG/day to a minimum of 3.0 MTG/day and with the possibility of further expansion through performance enhancements to 6.0 MTG/day. The expansion shall be accommodated in the design by the requirement that the Contractor including an additional HLW Vitrification cell in the original plant. The expansion cell shall be fitted and equipped by the Contractor with all equipment that would be difficult to emplace once hot commissioning commences. Both cells shall be designed to incorporate potential Vitrification system performance enhancements.

(3) Pretreatment, balance of plant facilities, and analytic capabilities, can support both the LAW and HLW Vitrification at the increased capacities required by the expansion case in paragraphs (c)(1) and (c)(2) above, and have radionuclide removal capability consistent with the scope defined in this Standard.

(4) Pretreatment can connect to a potential new facility designed to receive and treat the Hanford Cs and Sr capsules prior to incorporation into the HLW feed for immobilization in the HLW Vitrification Facility.

(5) 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.

(6) A routing pit, prior to the pretreatment building, shall be included in the tank waste transfer line to allow for potential new facilities.

(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) Low-Activity Waste Supernatant Ultra-Filtration: This operation separates HLW solids from the HLW supernatant to provide partial decontamination of the supernatant solutions and remove solids that could plug down stream ion-exchange columns.

(ii) Sr/TRU Removal: This operation removes ^{90}Sr and TRU elements in a single process step from the filtered supernatant to allow for production of an ILAW waste form that meets the Specification 2.2.2.8, *Radionuclide Concentration Limitations*. In the treatment of the Envelope C wastes, the Sr/TRU removal and ultra-filtration steps will be combined. The technology for the removal of Sr is an isotopic dilution process that uses non-radioactive Sr as the reagent. The removal of TRU is accomplished using potassium permanganate for de-complexation and adsorption of the TRU elements.

(iii) Cs Ion Exchange: This operation removes ^{137}Cs from the filtered supernatant to allow for production of an ILAW waste form that meets the Specification 2.2.2.8, *Radionuclide Concentration Limitations*. In addition, ^{137}Cs will be further removed, by a factor of at least 10, to facilitate the maintenance concept established for the ILAW melter system. The Cs ion-exchange process uses the elutable Superlig ® SL-644 resin (registered trademark of IBC Advanced Technologies, Inc.).

(iv) Tc Ion Exchange: This operation removes ^{99}Tc from the filtered supernatant to allow for production of an ILAW waste form that meets the Specification 2.2.2.8, *Radionuclide Concentration Limitations*. The Tc ion-exchange process uses the elutable Superlig ® SL-639 resin (registered trademark of IBC Advanced Technologies, Inc.).

(v) Radionuclide Concentration: This operation concentrates and recycles process streams that contain the recovered radionuclides and entrained solids recovered form the Envelope A, B, and C supernatants.

(vi) Liquid Effluent Treatment: This operation concentrates and recycles waste processing streams resulting from the treatment of HLW and LAW Vitrification system off-gas condensates. Treated condensates will be transferred to the Effluent Treatment Facility on the Hanford Site.

(vii) High-Level Waste Sludge Ultra-Filtration and Washing/Leaching: This operation separates HLW solids from the HLW slurries to concentrate the HLW sludge. In addition, the HLW sludge will be washed with water, and potentially, leached with caustic solutions in accordance with Specification 12, *Number of High-Level Waste Canisters per Batch of Waste Envelope D*, to prepare the sludge for HLW Vitrification.

(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 HLW solids, concentrates from radionuclide recovery processes and glass forming chemicals. The HLW feeds will be prepared, sampled, and qualified prior to the Vitrification operation. The specific procedures for the qualification strategy are to be developed and documented in the IHLW Waste Compliance Plan.

(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*.

(iii) High-Level Waste Melter Off-gas Treatment: Off-gas treatment system shall be designed to meet all environmental permitting requirements. The primary melter off-gas system consists of a Submerged Bed Scrubber (SBS), Wet Electrostatic Precipitator (WESP), High Efficiency Mist Eliminator (HEME), and High Efficiency Particle Absorber (HEPA) filter. The primary off-gas system cools the off-gas and removes aerosols generated by the melter. An air film cooler reduces the off-gas temperature before entering the SBS. In the SBS, gas bubbles are drawn through a submerged packed bed. There, steam is condensed, the gas is further cooled, and larger particles, aerosols, and soluble constituents are removed. Off-gas from the HLW vessel vent system enters the HLW off-gas treatment system between the WESP and the HEME. The HEME further removes aerosols from the melter off-gas stream and the vessel vent off-gas. Condensate from the SBS and HEME, and wash water from the WESP tubing are collected in vessels and transferred to the HLW pretreatment feed receipt vessels. The HEPA filters further remove entrained particulate by forcing the off-gas through two sets of filters. Before exiting the facility, the off-gas passes through an off-gas caustic scrubber followed by a thermal catalytic oxidizer for volatile organic compound control.

(iv) High-Level Waste Canister Closure, Decontamination, and Inspection: Shall be conducted in accordance with Specification 1, *Immobilized High-Level Waste*. The HLW canister is sealed via welding. The canister is decontaminated using a chemical etching process that uses Ce (IV) as the chemical reagent. Following decontamination, the canister is weighed and checked for straightness and ovality. Temperature and gamma dose rate measurements will be taken on selected canisters.

(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 decontaminated supernatant and glass forming chemicals. The LAW feeds will be prepared, sampled, and qualified prior to the Vitrification operation. The specific procedures for the qualification strategy shall be developed and documented in the Products and Secondary Wastes Plan.

(ii) Low-Activity Waste Vitrification: LAW feed shall be converted to a glass that meets Specification 2, *Immobilized Low-Activity Waste*, in ceramic lined, joule heated ceramic melter similar in design to the melter used at the West Valley Demonstration Project. However, the melter itself will be much larger than the HLW melter because of the increased melter surface area needed to achieve the required melting rate.

(iii) Low-Activity Waste Melter Off-gas Treatment: The off-gas treatment system shall be designed to meet all environmental permitting requirements. The primary melter off-gas system consists of a SBS, WESP, HEPA filter, Selective Catalytic Reduction Units, and caustic scrubber. The primary off-gas system cools the off-gas and removes aerosols generated by the melter. An air film cooler reduces the temperature of the off-gas before entering the SBS. In the SBS, gas bubbles are drawn through a submerged packed bed. There, steam is condensed, the gas is further cooled, and larger particles, aerosols, and soluble constituents are removed. Off-gas from the LAW vessel vent system enters the LAW off-gas treatment system between the WESP and the HEPA filters. The HEPA filters further remove aerosols from the melter off-gas stream and the vessel vent off-gas. The Selective Catalytic Reduction Units use a selective catalyst to remove volatile organic compounds followed by another catalyst and ammonia to reduce the NO_X generated from the Vitrification of the LAW feeds. Condensate from the SBS are collected in vessels and transferred to the HLW pretreatment feed receipt vessels.

(iv) Low-Activity Waste Canister Closure, Decontamination, and Inspection: Shall be conducted in accordance with Specification 2. The LAW canister is sealed with a Gas Tungsten Arc welding process. The canister is decontaminated using a solid carbon dioxide abrasion process. Following decontamination, the canister is weighed and checked for dimensionality. Temperature and gamma dose rate measurements will be taken on selected canisters.

(e) Application on National Design Codes and Standards: The Contractor shall design and construct the WTP in accordance with the following national codes and standards, as applicable and consistent with the Safety Requirements Document (SRD). The Contractor shall identify and document the specific publication, year, and paragraph of the applicable code or standard as it applies to each feature of the design or construction of the WTP in the appropriate design and safety basis documents.

UBC	Building Code
NFPA	Fire Protection
NEC	Electrical Code
IEEE	Code for Nuclear Electrical and Instrumentation Systems
ASME B&PV	Code for Pressure Vessels and Nuclear Piping Systems
ASME AG-1	Air Cleaning System Components
ANS	Single Failure Criteria for Nuclear Piping and Vessels
ANSI B31.3	Piping Code for Chemical Plants
ANSI N690	Design, Fabrication, and Erection of Nuclear Steel Structures
AISC	Design, Fabrication, and Erection of Steel Structures
ASCE	Seismic Analysis and Design Loadings for Nuclear Structural Concrete
ACI	Nuclear and Non-Nuclear Structural Concrete
ISA	Nuclear Instrumentation
TEMA	Heat Exchangers
(ARI) AMCA	Fans and Blowers
OSHA	Industrial Safety and Health in Construction and 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
Specification 2:	Immobilized Low-Activity Waste
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:	Number of High-Level Waste Canisters per Batch of Waste Envelope D
Specification 13:	Waste Product Inspection and Acceptance

Specification 1: Immobilized High-Level Waste

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 DOE. May 1998. *Civilian Radioactive Waste Management Systems Requirements Document*, Rev. 4. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Washington, D.C.

1.2.1.2 DOE Manual 435.1-1. July 9, 1999. *Radioactive Waste Management Manual.* U.S. Department of Energy, Washington, D.C.

1.2.1.3 WASRD. DOE/RW-0351P. Rev. 3. DCN 02. April 1999. *Waste Acceptance System Requirements Document (WASRD*). U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Washington, D.C.

1.2.1.4 WAPS. DOE/EM-0093. Rev. 2. December 1996. *Waste Acceptance Product Specifications for Vitrified High Level Waste Forms* (*WAPS*). U.S. Department of Energy, Office of Environmental Management, Washington, D.C.

1.2.1.5 QARD. DOE/RW-0333P. Rev. 10. April 28, 2000. *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.

1.2.1.6 40CFR268. *Land Disposal Restrictions*. Code of Federal Regulations. U.S. Environmental Protection Agency, Washington, D.C.

1.2.1.7 WAC 173-303. *Dangerous Waste Regulations*. Washington Administrative Code, as amended.

1.2.1.8 HWMA. *Hazardous Waste Management Act.*

1.2.1.9 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 in the WASRD, WAPS, and QARD. The WASRD is the senior requirements document and defines the minimum set of requirements and associated limits for acceptance of the IHLW product in the proposed geologic repository. The WAPS establishes the minimum set of product requirements for the IHLW product. The QARD establishes the minimum QA requirements for the IHLW product.

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.

1.2.2.1.3 Exception to WASRD: The WASRD Specification 4.2.3.1, *Specific Acceptance Criteria for High-Level Waste*, shall form a 4.5-meter long canister system and shall be modified as follows:

1. Fill height shall be equivalent to at least 87% of the volume of the empty canister. The average fill height over all the canisters shall be at least 95% of the volume of the empty canister.

2. Total heat generation rate for any single canister shall not exceed 1500 watts per canister at the year of delivery to DOE. The average heat generation rate for all canisters shall not exceed 300 watts per canister at the year of delivery to DOE.

1.2.2.1.4 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).

1.2.2.1.5 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 40CFR268, *Land Disposal Restrictions*.

1.2.2.1.6 Product Loading: Loading of non-volatile components in Envelope D, and, if directed by DOE, entrained solids after washing in accordance with Specification 12, *Number of High-Level Waste Canisters per Batch of Waste 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 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 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 Products and Secondary Wastes Plan, 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. In addition to Specification 13 requirements for IHLW, the Contractor shall conform to the Contractor Certification Program as described in DOE Manual 435.1-1, Chapter IV, Section J.(1).

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
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

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 10CFR61. *Licensing Requirements for Land Disposal of Radioactive Waste*, Code of Federal Regulations. U.S. Nuclear Regulatory Commission, Washington, D.C.

2.2.1.2 40CFR268. *Land Disposal Restrictions*. Code of Federal Regulations. U.S. Environmental Protection Agency, Washington, D.C.

2.2.1.3 49CFR172.101. *Table 2 - Radionuclides*. Code of Federal Regulations. U.S. Department of Transportation, Washington, D.C.

2.2.1.4 49CFR173. *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-99. July 10, 1999. *Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens*. American Society for Testing and Materials, Easton, Maryland.

2.2.1.10 ASTM C1285-94. October 15, 1994. *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*, Rev. 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. Rev. 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. WAC 173-303. May 2000. *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 concurrence 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 5.0 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 based on Na_2O.

2.2.2.3 Size and Configuration: The package shall be a 304 stainless-steel right circular cylinder. The as fabricated package dimensions shall be constant and have a dimensional tolerance of +/- 0.01m. The height of the package shall be 2.3 m, and the diameter shall be 1.22 m. At the time of acceptance, the ILAW package shall stand without support on a flat, horizontal surface and shall fit completely and without forcing when lowered vertically into a right circular cylindrical cavity having internal dimensions of 1.27 m diameter by 2.4 m high.

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, the container shall be filled with suitable inert dry filler such that the void space shall not exceed five percent.

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 Chemical Composition Qualification: The ILAW qualification documentation shall identify the expected chemical composition of the 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.

2.2.2.6.2 Chemical Composition During Production: The production documentation 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 Crystalline Phase Identification: The ILAW qualification documentation shall provide the crystalline and non-crystalline phases expected to be present and the estimated amount of each phase for the waste form and filler material. The Contractor shall provide a time-temperature-transformation diagram that identifies the duration of exposure at any temperature that causes significant changes in either the phase structure or the phase compositions.

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 49CFR172.101 (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 qualification documentation shall identify the estimated radionuclide concentration in the waste form.

2.2.2.7.2 Radionuclide Composition During Production: The ILAW production documentation 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 be less than Class C limits as defined in 10CFR61.55 and as described in NRC's *Branch Technical Position on Concentration Averaging and Encapsulation*. In addition, the average glass concentrations of ^{137}Cesium (^{137}Cs), ^{90}Strontium (^{90}Sr), and ^{99}Tc shall be limited as follows: ^{137}Cs < 3 Ci/m^3, ^{90}Sr < 20 Ci/m^3 and ^{99}Tc < 0.1 Ci/m^3. The average concentrations shall be calculated by summing the actual inventories of each of the above radionuclides in the packages that have been presented to date for acceptance and dividing by the total volume of waste in these packages. On average, a minimum of 80 percent of the ^{99}Tc present in the feed shall be removed.

2.2.2.9 Surface Dose Rate Limitations: The dose rate at any point on the external surface of the package shall not exceed 1,000 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 49CFR173.443(a).

2.2.2.11 Labeling: Each package shall have a welded bead identification number on the shoulder and side of the package. 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. The label must be readable remotely by an electronic scanner.

2.2.2.12 Closure and Sealing: The fully loaded package shall be closed and sealed by welding. The closure system shall be leak tight as defined by ANSI Standard N14.5. 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 50°C 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 Leachability Index: The waste form shall have a sodium leachability index greater than 6.0 when tested for 90 days in deionized water using the ANSI/ANS-16.1 procedure.

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 a seven day vapor hydration test run at 200°C as defined in the DOE concurred upon Product and Secondary Waste 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 statistically representative of the production glass.

2.2.2.18 Compressive Strength: The mean compressive strength of the waste form (and any optional filler material) 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 C391C39M-99 or an equivalent testing method.

2.2.2.19 Thermal, Radiation, Biodegradation and Immersion Stability: The ILAW product shall be resistant to thermal, radiation, biodegradation, and immersion degradation, as described in NRC *Technical Position on Waste Form*. Resistance to each of these types of degradation shall be established by showing that the mean compressive strength of representative non-radioactive samples shall be equal to or greater than 3.45E06 Pa and not less than 75 percent of the initial compressive strength after subjecting the samples to the following:

2.2.2.19.1 Thermal Degradation: Thirty thermal cycles between a high of 60°C and a low of -40°C in accordance with the ASTM B553-79 or an equivalent testing method.

2.2.2.19.2 Radiation Degradation: Exposure to a minimum radiation dose of 1.0E08 rad or to a dose equivalent to the maximum level of exposure expected from self-irradiation during storage, transportation and disposal if this is greater than 1.0E08 rad.

2.2.2.19.3 Biodegradation: No evidence of culture growth when representative samples are tested in accordance with ASTM G21-96 and ASTM G22-76 (R1996), or equivalent methods.

2.2.2.19.4 Immersion degradation: Immersion for 90 days under the ANSI/ANS-16.1 testing conditions.

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 40CFR268.

2.2.2.21 Compression Testing: Each fully loaded package shall be able to withstand a compression load of 100,000 kg. Compliance with this specification shall be established by using the compression test described in 49CFR173.465(d). The integrity of the package shall be demonstrated by showing that the dimensions of the tested packages are within the tolerance range and 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 shall be resistant to degradation by microbial action, moisture, radiation effects, or chemical reactions with the container contents under the expected storage conditions that may reasonably occur during storage (in an ambient-temperature, ventilated enclosure) and handling and disposal operations. 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 50 years. The integrity of the container shall not be jeopardized by wind, blowing sand, precipitation, sunlight, or extreme temperatures (60°C, -40°C).

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 N, 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, movement, and stacking of the packages when fully loaded. The package shall maintain its integrity during handling, transportation, and stacking. The package design shall allow for vertical stacking to a total height of 10 meters.

2.3 Quality Assurance: A QA Program for the ILAW form development, qualification, characterization, and certification is required and shall be based upon NQA-1, 1989 Revision. The QA Plan shall address the QA/quality control requirements addressed in SW-846 and WAC 173-303-806.

2.4 Inspection and Acceptance: The DOE-approved Products and Secondary Wastes Plan, 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: Entrained Solids

3.1 Scope: This Specification defines the requirements for the entrained solids product, an intermediate waste product that may be produced to comply with the requirements of Specification 2, *Immobilized Low-Activity Waste*.

3.2 Requirements:

3.2.1 References:

3.2.1.1 DOE Manual 435.1-1. July 9, 1999. *Radioactive Waste Management Manual.* U.S. Department of Energy, Washington, D.C.

3.2.1.2 WAC 173-303. *Dangerous Waste Regulations*, Washington Administrative Code, as amended.

3.2.2 Product Requirements:

3.2.2.1 Limitation on ^{137}Cs Content: The total quantity of soluble ^{137}Cs returned to DOE in the entrained solids product shall be less than five percent of the total ^{137}Cs provided by DOE in the LAW feed.

3.2.2.2 Limitation on ^{99}Tc Content: The total quantity of soluble ^{99}Tc returned to DOE in the entrained solids product shall be less than five percent of the total ^{99}Tc provided by DOE in the LAW feed.

3.2.2.3 Volume Limitation: The entrained solids must meet one of the following criteria:

- Greater than 20 volume percent solids;
- Greater than 50 percent of the solids content at which the slurry viscosity is 30 cP; or
- Greater than 50 percent of the solids content at which the slurry specific gravity is 1.5.

The preceding criteria represent minimum constraints. Maximum constraints are defined in Specification 9, *Liquids or Slurries Transferred to DOE Tanks by Pipeline*.

3.2.2.4 Material Additions: The following materials shall not be added to the entrained solids intermediate waste product without advance approval by DOE: sulfur; phosphorous; fluorine; chlorine; chromium; radionuclides; organics; noble metals; iodine; materials that are designated in WAC 173-303 as dangerous waste; and materials excluded by regulatory requirements and permits at the Hanford Site. No more than 1 gram of material per kilogram of insoluble solids, measured on a dry basis to the entrained solids product may be added to the entrained solids product. Trace components may be present in chemical reagents used by the Contractor.

3.2.2.5 Sodium Return in Intermediate Waste Products: For the entrained solids intermediate waste product, the Contractor shall return less than 60 grams of sodium (excluding the sodium contained in the insoluble Entrained Solids) per kilogram of insoluble solids, measured on a dry solids basis.

3.2.3 Handling Requirements: Entrained solids separated from the low-activity fraction, if returned to DOE, shall meet the requirements of Specification 9, *Liquids or Slurries Transferred to DOE Tanks by Pipeline.*

3.3 Quality Assurance: A QA Program for the entrained solids development, qualification, characterization, and certification is required and shall be based upon NQA-1, 1989 Revision.

3.4 Inspection and Acceptance: The DOE-approved Products and Secondary Wastes Plan, 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 entrained solids QA Program. In addition to Specification 13 requirements for entrained solids, the Contractor shall conform to the Contractor Certification Program as described in DOE Manual 435.1-1, Chapter IV, Section J.(c).

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; and defines how a unit of LAW is determined for each LAW envelope. 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.

7.2 Requirements:

7.2.1 References:

7.2.1.1 HNF-SD-WM-SAR-067, Rev. 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, Rev. 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, Rev. 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, Rev. 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 and AZ-102 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 two weight percent 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 Tank AZ-101 and AZ-102 feeds shall not exceed 3.0 Ci/l.

7.2.3 Units of Low-Activity Waste: Units of LAW shall be defined as follows:

(a) Envelope A: The quantity of Waste Envelope A containing one metric ton of waste sodium shall equal one unit.

(b) Envelope B: The quantity of Waste Envelope B containing one metric ton of waste sodium shall be the lesser of the following number of units:

(1) 2.6 units;or

(2) $\frac{X}{Y}$ units

where X is equal to 18-weight percent sodium oxide loading in the ILAW glass and Y is equal to the achievable waste sodium oxide loading, for the particular waste feed. The waste loading limitations shall be based solely upon effects of chlorine, chromium, phosphate, and sulfate.

(c) Envelope C: The quantity of Waste Envelope C containing one metric ton of waste sodium shall be the lesser of the following number of units:

(1) 1.15 units; or

(2) $\frac{X}{Y}$ units

where X and Y are defined above. The waste loading limitations shall be based solely upon sodium additions required for cesium, technetium, strontium and TRU removal from Envelope C for the particular waste feed.

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
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
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

Table TS-7.2 Low-Activity Waste Radionuclide Content, Soluble Fraction Only

Radionuclide	Maximum Ratio, radionuclide (Bq) to sodium (mole)		
	Envelope A	Envelope B	Envelope C
TRU[2]	4.8E+05	4.8E+05	3.0E+06
^{137}Cs	4.3E+09	2.0E+10	4.3E+09
^{90}Sr	4.4E+07	4.4E+07	8.0E+08
^{99}Tc	7.1E+06	7.1E+06	7.1E+06
^{60}Co	6.1E+04	6.1E+04	3.7E+05
^{154}Eu	1.2E+06	1.2E+06	4.3E+06

Notes:
[1] The activity limit shall apply to the feed certification date.
[2] TRU is defined as: Alpha-emitting radioncludes with an atomic number greater than 92 with half-life greater than 10 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.

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.

8.2 Requirements:

8.2.1 References:

8.2.1.1 HNF-SD-WM-SAR-067, Rev. 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, Rev. 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, Rev. 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, Rev. 10. December 21, 1999. *Double Shell Tank Unit Permits Application*. U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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, 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, 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, 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	^{155}Eu	2.9E-02	^{241}Am	9.0E-02
^{125}Sb	3.2E-02	^{233}U	9.0E-07	$^{243+244}Cm$	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 entrained solids 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 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 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 Products and Secondary Wastes Plan.

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 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 DOE-approved Products and Secondary Wastes 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: Number of High-Level Waste Canisters Per Batch of Waste Envelope D

12.1 Scope: This Specification defines the procedure for determining the number of HLW canisters that will be accepted for each batch of HLW feed delivered per Specification 8, *High-Level Waste Envelope Definition*, analysis and reporting requirements for the separated HLW supernatant and, the separated entrained solids contained within the LAW feed delivered. This procedure shall be implemented by the Contractor once per HLW feed source tank.

12.2 Requirements:

12.2.1 References: None.

12.2.2 Determination of Aqueous Insoluble Fraction: For a HLW feed batch, the mass, and composition of aqueous insoluble solids present shall be determined.

12.2.2.1 Representative Sample: A representative sample of the HLW feed slurry containing at least 100 grams of solids shall be obtained. Interstitial liquids shall be displaced through a series of three washes using 0.01 M NaOH at a temperature of 25°C to 30°C followed by filtration or centrifugation. Each wash shall use a wash volume at least three times the slurry volume.

12.2.2.2 Mass and Composition of Aqueous Insoluble Solids: The mass and composition of aqueous insoluble solids present in the representative sample shall be determined in the following sequence:

(a) The solids shall be separated from the HLW feed slurry by centrifugation at ambient temperature.

(b) The solids shall be contacted with 0.01M NaOH solution for a minimum of eight hours at 80°C to 90°C and ambient pressure. The volume of 0.01M NaOH solution shall be at least four times the volume of the centrifuged filtered solids. The solids and water shall be gently stirred to promote dissolution of soluble components.

(c) The solids shall be separated from the contact solution by centrifugation at a temperature of 80-90°C.

(d) Steps (b) and (c) shall be repeated two more times for a total of three contacts.

(e) The solids remaining after the three batch contacts with 0.01M NaOH solution shall be analyzed to determine the mass of aqueous insoluble solids and the concentration of elements and radionuclides identified in Specification 8, *High-Level Waste Envelope Definition*.

(f) The above tests shall not be conducted under saturated conditions for sodium, phosphate, and sulfate.

(g) For aqueous washing, not more than four grams of sodium per kilogram of insoluble solids received in the HLW slurry shall be added without approval from DOE.

(h) Prior to the use of alternate methods or reagents, the Contractor shall obtain DOE concurrence.

12.2.3 Determination of Caustic Insoluble Fraction: The mass and composition of caustic insoluble solids present shall be determined for each HLW feed batch.

12.2.3.1 Representative Sample: A representative sample of the HLW feed slurry containing at least 100 grams of solids shall be obtained. Interstitial liquids shall be displaced through a series of three washes using 0.01 M NaOH at a temperature of 25°C to 30°C followed by filtration or centrifugation. Each wash shall use a wash volume at least three times the slurry volume.

12.2.3.2 Mass and Composition of Caustic Insoluble Solids: The mass and composition of caustic insoluble solids present in the representative sample shall be determined in the following sequence:

(a) The solids shall be separated from the HLW feed slurry by centrifugation at ambient temperature.

(b) The solids shall be contacted with 3M NaOH solution for a minimum of eight hours at 80°C to 90°C and ambient pressure. The volume of caustic solution shall be at least three times the volume of the centrifuged solids. The solids and caustic solution shall be gently stirred to promote dissolution of caustic soluble components.

(c) The solids shall be separated from the contact solution by centrifugation at 80°C to 90°C temperature.

(d) The caustic-contacted solids shall be contacted with 0.01M NaOH solution for a minimum of eight hours at 80°C to 90°C and ambient pressure. The volume of 0.01M NaOH solution shall be at least four times the volume of the centrifuged solids. The solids and water shall be gently stirred to promote dissolution of soluble components.

(e) The solids shall be separated from the contact solution by centrifugation at a temperature of 80°C to 90°C.

(f) The solids shall be contacted a second time with 0.01M NaOH solution for a minimum of eight hours at 80°C to 90°C and ambient pressure. The volume of 0.01M NaOH solution shall be at least four times the volume of the centrifuged solids. The solids and water shall be gently stirred to promote dissolution of soluble components.

(g) The solids shall be separated from the contact solution by centrifugation at a temperature of 80°C to 90°C.

(h) The solids remaining after the single batch contact with caustic solution and two batch contacts with 0.01M NaOH solution shall be analyzed to determine the mass of caustic insoluble solids and the concentration of elements and radionuclides identified in Specification 8, *High-Level Waste Envelope Definition*.

(i) The above tests shall not be conducted under saturated conditions for sodium, phosphate, and sulfate.

(j) For caustic washing, not more than 360 grams of sodium per kilogram of insoluble solids received in the HLW slurry shall be added without approval from DOE.

(k) Prior to the use of alternate methods or reagents, the Contractor shall obtain DOE concurrence.

12.2.4 Estimated Number of High-Level Waste Canisters from Aqueous Insoluble Solids: The expected number of HLW canisters from aqueous-washed solids shall be determined using: (1) IHLW glass component limits provided in Specification 1, *Immobilized High-Level Waste*, Table TS-1.1; (2) 95 percent canister fill height in accordance with Specification 1.2.2.1.3; and (3) mass and composition of the aqueous insoluble solids determined in Specification 12.2.2. These estimates shall also include the volume of ILAW to be produced in accordance with Specification 2, *Immobilized Low-Activity Waste*, from the immobilization of the solutions resulting from the sludge treatment process.

12.2.5 Estimated Number of High-Level Waste Canisters from Caustic Insoluble Solids: The expected number of HLW canisters from caustic-washed solids shall be determined using: (1) IHLW glass component limits provided in Specification 1, *Immobilized High-Level Waste*, Table TS-1.1; (2) 95 percent canister fill height in accordance with Specification 1.2.2.1.3; and (3) mass and composition of the caustic insoluble solids determined in Specification 12.2.3. These estimates shall also include the volume of ILAW to be produced in accordance with Specification 2, *Immobilized Low-Activity Waste*, from the immobilization of the solutions resulting from the sludge treatment process.

12.2.6 Specification of Number of High-Level Waste Canisters per Batch of High-Level Waste: Estimates shall be provided with experimental and calculational data to determine the expected number of HLW canisters (and volume of ILAW) resulting from aqueous washing of the sludge as determined by the requirements of Specification 12.2.4, and caustic washing as determined by the requirements of Specification 12.2.5. DOE will determine the sludge treatment method (aqueous-washing or caustic-washing).

12.2.7 Adjustment to Sodium Content of Low-Activity Fraction: The quantity of LAW feed treated will be adjusted to account for the liquid fraction of the HLW feed per Specification 8, *High Level Waste Envelope Definition*, sodium removed during HLW pretreatment and the sodium hydroxide solution used to treat the HLW feed.

12.2.8 Determination of High-Level Waste Supernatant Mass and Composition: The mass and composition of the HLW supernatant generated from HLW pretreatment shall be determined as follows:

12.2.8.1 Mass and Composition of High-Level Waste Supernatant: The mass and composition shall be determined by analysis of the HLW Supernatant generated in Pretreatment Plant Operations, which includes the original filtered HLW supernatant and water or caustic leach solutions generated from HLW pretreatment. The chemical and radiochemical composition shall be reported in accordance with the analytes identified in Table TS-7.1 and Table TS-7.2 of Specification 7, *Low-Activity Waste Envelopes Definition*. DOE will determine the LAW Envelope Designation based upon this analysis.

12.2.8.2 Sodium Added to High-Level Waste Supernatant: No more than 70 grams of sodium per kilogram shall be added of soluble sodium received in the HLW Feed Envelope. This does not include sodium added for HLW pretreatment described in 12.2.2 or 12.2.3, or sodium leached from the HLW solids.

12.3 Quality Assurance: A QA Program for the work to be performed to determine the number of HLW canisters per batch of waste Envelope D is required. The QA Program shall be based upon NQA-1, 1989 Revision.

12.4 Inspection and Acceptance: The DOE concurred upon Products and Secondary Wastes Plan, described in Standard 6, *Product Qualification, Characterization, and Certification*, defines the content and delivery of documentation required to demonstrate compliance with this specification. Product inspection and acceptance shall be performed in accordance with Specification 13, *Waste Product Inspection and Acceptance* and an appropriate QA program. The Contractor shall describe in the Products and Secondary Wastes Plan the procedure for implementing this specification. At a minimum, the procedure shall address the method(s) for obtaining representative samples, determining the HLW solids volume and composition, volume and composition of the HLW supernatant and verification that the conditions in this specification are achieved.

Specification 13: Waste Product Inspection and Acceptance

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Waste product will be accepted as follows:

13.1 Interim Acceptance: Product will be accepted on an interim basis when the following required documentation has been submitted: (1) objective evidence for the results of analysis, testing, inspection, and demonstration defined in Standard 6, *Product Qualification, Characterization, and Certification* and required by the Products and Secondary Wastes Plan, and (2) certification that the product complies with Contract requirements.

The Contracting Officer will determine interim acceptance within 15 working days of receipt of all required documentation described above.

13.2 Final Acceptance: Final acceptance of product will be made on a lot basis. The lot size shall be defined subject to the following limitations: (1) for ILAW, the lot size shall not exceed the amount of product that is produced in 15 days; and (2) for IHLW, the lot size shall be a canister-by-canister basis.

Final acceptance will be determined by the Contracting Officer within 90 working days after all required documentation has been submitted as described under Interim Acceptance for all product in the lot.

DOE reserves the right at any time to: (1) verify submitted documentation, and (2) verify product compliance with Contract requirements. Verification methods used by DOE include, but are not limited to, independent inspection, review of operating records, or independent sampling and analysis of product. Upon request by DOE, representative product samples shall be provided.

In the event the product is identified as non-conforming, the product shall be segregated and a corrective action plan shall be prepared for DOE approval for the non-conforming product along with a plan to correct and prevent recurrence of the non-conforming condition. The Contracting Officer shall be notified within 24-hours after the Contractor has determined that a non-conforming product has been produced.

If DOE agrees that the non-conforming condition cannot be reasonably corrected based upon the analysis of the non-conforming product presented in the corrective action plan, DOE will agree to take possession of the non-conforming product only if the product conforms to the specification requirements or the alternate requirements in Table 13.1 and 13.2.

In the event that the Contractor produces non-conforming waste during the commissioning activity, an additional lot size of waste shall be processed to demonstrate ability of the facility to produce conforming waste product. Final acceptance of Contractor waste shall not be given until the Contractor has demonstrated production, on a lot basis, of waste product meeting specification requirements.

Table 13.1 Alternate Non-Conforming Product Requirements for Immobilized High-Level Waste

Additional Contract Specific Requirements (Specification 1)
1.2.2.1.3 Fill height shall be at least 87%
1.2.2.1.3 Heat generation rate shall not exceed 2200 watts at time of delivery to DOE
1.2.2.1.3 Canister weight shall not exceed 4200 kgs

Table 13.2 Alternate Non-Conforming Product Requirements for Immobilized Low-Activity Waste

Specification 2 Requirements
2.2.2.3 Size and Configuration - A non-conforming product shall be no more than 10 cm larger in each dimension than the standard package size
2.2.2.4 Mass – A non-conforming product shall have a mass that does not exceed 12,000 kgs
2.2.2.8 Radionuclide Concentration Limitations - A non-conforming product shall be less than Class C as defined in 10CFR61.55 and shall have less than 15 Ci/m^3 of ^{137}Cs, 60 Ci/m^3 of ^{90}Sr, and 0.3Ci/m^3 of ^{99}Tc

C.9 INTERFACE CONTROL DOCUMENTS

This Section provides the requirements for ICDs that describe the physical and administrative interfaces between DOE, ORP, 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 a physical 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) 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: Dangerous Wastes
ICD 5: Non-Radioactive, Non-Dangerous Liquid Effluents
ICD 6: Radioactive, Dangerous Liquid Effluents
ICD 7: Reserved
ICD 8: Liquid Sanitary Wastes
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: Entrained Solids
ICD 17: Reserved
ICD 18: Reserved
ICD 19: Low-Activity Waste Feed
ICD 20: High-Level Waste Feed
ICD 21: Reserved
ICD 22: Reserved
ICD 23: Waste Treatability Samples
ICD 24: Reserved
ICD 25: Emergency Response
ICD 26: Reserved
ICD 27: Telecommunications

(b) The Contractor shall update the ICDs every 6 months 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 an element of the design basis.

(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.

SECTION D

PACKAGING AND MARKING

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PACKAGING AND MARKING

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SECTION D

PACKAGING AND MARKING

D.1 PACKAGING

Preservation, packaging, and packing for shipment or mailing of all work delivered hereunder shall be in accordance with good commercial practice and adequate to ensure acceptance by common carrier and safe transportation at the most economical rate(s).

D.2 MARKING

Each package, report or other deliverable shall be accompanied by a letter or other document which:

(a) Identifies the Contract by number under which the item is being delivered.

(b) Identifies the deliverable Item Number or Report Requirement that requires the delivered item(s).

SECTION E

INSPECTION AND ACCEPTANCE

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INSPECTION AND ACCEPTANCE

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SECTION E

INSPECTION AND ACCEPTANCE

E.1 DEAR 952.236-71 INSPECTION (APR 1994)

The Government, through any authorized representatives, has the right at all reasonable times, to inspect, or otherwise evaluate the work performed or being performed hereunder and the premises in which it is being performed. If any inspection or evaluation is made by the Government on the premises of the Contractor or a subcontractor, the Contractor shall provide and shall require his subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the Government representatives in the performance of their duties. All inspections and evaluations shall be performed in such a manner as will not unduly delay the work.

E.2 INSPECTION AND ACCEPTANCE

(a) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the Contract conforms to Contract requirements. The Contractor shall maintain complete inspection records and make them available to DOE. All work is subject to DOE inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract.

(b) DOE inspections and tests are for the sole benefit of the Government, and do not:

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of DOE after acceptance of the completed work.

(c) The presence or absence of a DOE inspector does not relieve the Contractor from any Contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(d) DOE will verify the Contractor's performance of inspection and acceptance.

E.3 PRODUCT ACCEPTANCE DURING COMMISSIONING

See Section C, Specification 13, *Waste Product Inspection and Acceptance.*

E.4 FINAL ACCEPTANCE

The Contracting Officer will determine final acceptance within 60 days after the Contractor has met the milestone "Completion of Contract Requirements," unless the Contracting Officer determines that there is a non-conformance with Contract requirements.

In the event that the Contracting Officer determines a non-conformance with Contract requirements, the Contracting Officer may require the Contractor to prepare a Corrective Action

Plan. The Corrective Action Plan shall describe the non-conforming condition and the specific actions the Contractor will take to correct the non-conforming condition.

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

(a) The period of performance for this Contract shall extend from the date of Contract award in SF-33, *Solicitation, Offer, and Award* until July 31, 2011.

(b) Milestone due dates for specific activities are as follows:

Milestone No.	Activity	Date
M1	Start of Construction	TBD
M2	Start of Cold Commissioning	TBD
M3	Completion of Acceptance Testing	November 30, 2007
M4	Start of Hot Commissioning	December 31, 2007
M5	Completion of Hot Commissioning	January 31, 2011
M6	Completion of Contract Requirements	July 31, 2011

TBD = To Be Determined

(c) Milestones shown as "TBD" will be established in the WTP Project Baseline required by Section C, Standard 1, *Management Products and Controls*, and concurred on by the U.S. Department of Energy (DOE).

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 G

CONTRACT ADMINISTRATION DATA

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CONTRACT ADMINISTRATION DATA

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SECTION G

CONTRACT ADMINISTRATION DATA

G.1 CORRESPONDENCE PROCEDURES

To promote timely and effective administration, correspondence submitted under this Contract shall include the Contract number and be subject to the following procedures:

(a) Technical Correspondence. Technical correspondence (as used herein, excludes technical correspondence where patent or technical data issues are involved and correspondence which proposes or otherwise involves waivers, deviations, or modifications to the requirements, terms, or conditions of this Contract) shall be addressed to the U.S. Department of Energy (DOE) Office of River Protection (ORP) Contracting Officer's Representative (COR), with an information copy addressed to the DOE-ORP Contracting Officer and DOE-ORP Correspondence Control.

(b) Other Correspondence. All other correspondence shall be addressed to the ORP Contracting Officer (CO) with information copies of the correspondence to the COR, DOE-ORP Correspondence Control, and the U.S. Department of Energy, Richland Operations Office (RL) Patent Counsel (when patent or technical data issues are involved).

G.2 CONTRACT ADMINISTRATION

The ORP Contracting Officer (CO) is:

U. S. Department of Energy
Office of River Protection, MS H6-60
Michael K. Barrett
Contracting Officer
Office of Business Management and Administration
P.O. Box 450
Richland, WA 99352

Tele: (509) 373-4143
Fax: (509) 373-9140
E-mail: Michael_K_Barrett@rl.gov

G.3 CONTRACTING OFFICER REPRESENTATIVE (COR)

The COR will be designated by separate letter and will represent the CO in the technical phases of the work. The COR is not authorized to change any of the terms and conditions of this Contract. The CO, through properly written modification(s) to the Contract, is the only person authorized to make changes to the work scope.

G.4 BILLING INSTRUCTIONS

(a) Invoices: Invoices shall be submitted in triplicate (original and two copies), in accordance with the following:

(1) Original and copies of invoices shall be submitted simultaneously. Invoices not simultaneously received by all addressees may be rejected or have payment delayed.

(2) In addition to the information required by the Section I Clause entitled, *Prompt Payment* (FAR 52.232-25), the following information must be included on each invoice:

Budget and Reporting (B&R) Breakout (if required).

(3) Original invoice shall be submitted to the paying office at either the postal address or express courier address, as follows:

PAYING OFFICE - POSTAL ADDRESS:

U.S. Department of Energy
Oak Ridge Financial Service Center
P.O. Box 4307
Oak Ridge, TN 37831

PAYING OFFICE - EXPRESS COURIER ADDRESS:

U.S. Department of Energy
Oak Ridge Financial Service Center
200 Administration Road
Oak Ridge, TN 37830
(Phone No. 423-241-5073)

(4) One copy of each invoice submitted to the COR and CO at the following addresses, as appropriate:

CO POSTAL ADDRESS:
U.S. Department of Energy
Office of River Protection
Michael K. Barrett
Contracting Officer
Office of Business Management and Administration
P.O. Box 450 (MS H6-60)
Richland, WA 99352

CO EXPRESS COURIER ADDRESS:
U.S. Department of Energy
Office of River Protection
Michael K. Barrett
Contracting Officer
Office of Business Management and Administration
2440 Stevens Drive (MS H6-60)
Richland, WA 99352
(Phone No. 509-373-4143)

COR POSTAL ADDRESS:
U.S. Department of Energy
Office of River Protection
Neil R. Brown, COR
Project Requirements Division
P.O. Box 450 (MS H6-60)
Richland, WA 99352

COR EXPRESS COURIER ADDRESS:
U.S. Department of Energy
Office of River Protection
Neil R. Brown, COR
Project Requirements Division
2440 Stevens Drive (MS H6-60)
Richland, WA 99352
(Phone No. 509-372-2323)

NOTE: Changes in COR or COR address will be transmitted by letter

(b) Invoices for payment shall be submitted the first Federal business day on or after the 1st and 15th of each month. All invoices shall be supported by a billing schedule summarized by funding source/project breakdown summary (PBS) group. Under Section I Clause entitled, *Prompt Payment* (FAR 52.232-25, paragraph (b)), the inserted text shall be "seventh".

(c) Payment of submitted invoices shall be made electronically and in accordance with the *Prompt Payment Act*. Specific payment instructions shall be included in the invoice.

G.5 DOE-ORP PROPERTY ADMINISTRATION

For purposes of administering DOE-ORP property, the point of contact is:

U. S. Department of Energy
Richland Operations Office
Organizational Property Management Officer
Site Infrastructure Division, MS G3-18
P.O. Box 550
Richland, WA 99352

G.6 RESERVED

G.7 REPRESENTATIONS AND CERTIFICATIONS

The Representations, Certifications, and Other Statements of Offerors, submitted with the Contractor's latest offer, are hereby incorporated into this Contract by reference.

G.8 DELIVERY DESTINATION FOR CORRESPONDENCE AND CONTRACT DELIVERABLES

(a) The following delivery points apply to technical correspondence and deliverables described in Section C, *Statement of Work*:

(1) Contracting Officer (CO)

U. S. Department of Energy
Office of River Protection
Business Management and Administration
MS H6-60
Attn: Michael K. Barrett
P.O. Box 450 (for U.S. Mail delivery) or 2440 Stevens Drive (for hand delivery)
Richland, WA 99352

(2) DOE-ORP Correspondence Control

U. S. Department of Energy
Office of River Protection
DOE-ORP Correspondence Control
MS H6-60
P.O. Box 450 (for U.S. Mail delivery) or 2440 Stevens Drive (for hand delivery)
Richland, WA 99352

(3) Contracting Officer Representative (COR)

U. S. Department of Energy
Office of River Protection
Project Requirements Division
MS H6-60
Attn: Neil R. Brown, COR
P.O. Box 450 (for U.S. Mail delivery) or 2440 Stevens Drive (for hand delivery)
Richland, WA 99352

(b) For other correspondence, the delivery points are those specified in Clause G.8(a). The following delivery point also applies when patent or technical data issues are involved.

RL Patent Counsel

U. S. Department of Energy
Richland Operations Office
Office of Chief Counsel
MS A4-52
P.O. Box 550
Richland, WA 99352

(c) The following delivery point applies to deliverables required under DOE Order 241.1, *Scientific and Technical Information Management*.

Office of Scientific and Technical Information (OSTI)
U.S. Department of Energy
P.O. Box 62
Oak Ridge, TN 37831

G.9 REPORTS AND DRAWINGS

The following requirements apply to submission of all data deliverables.

(a) The Contractor shall ensure that all data deliverables are as follows:

(1) Legible, sequentially numbered, and securely bound; and

(2) Clear, concise English using precise technical writing.

(b) The Contractor shall prepare and submit reports as follows:

(1) Title page or cover sheet that identifies author, deliverable(s), and date;

(2) Text on standard 8 ½" x 11" letter size paper (one-way foldouts or larger sizes may be included with report text); and

(3) Other requirements identified in Section C, Standard 1, *Management Products and Controls*.

(c) The Contractor shall prepare and submit drawings in accordance with American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME) Standard Y-14 series, Drafting Standards and shall be assigned a unique number by the Contractor.

(d) The Contractor shall submit deliverables, as follows:

(1) One reproducible hard copy with attachments and enclosures to the CO.

(2) Three reproducible hard copies with attachments and enclosures and one electronic copy of all to the COR.

(3) One reproducible hard copy with attachments and enclosures to the DOE-ORP Correspondence Control.

(4) All electronic files shall be editable and have all functions normally available in the software for which the data was originally generated. Electronic files will be complete and consist of all data used or developed by the Contractor to generate the submission. The Contractor shall also provide a list of the electronic files included in the submission, documenting the specific deliverable for which the electronic files pertain, and the software and version used. In the event that the Contractor uses an internal proprietary software package, a copy shall be provided to DOE-ORP.

(e) The Contractor shall maintain configuration control over changes to information provided to the Contractor by DOE-ORP or Government contractors, including and not limited to drawings, specifications, electronic files, letter reports, calculations, analysis reports, etc., as appropriate, using Contractor's established policies and procedures. The Contractor shall assign their own identifying number to information that they either create or change.

SECTION H

SPECIAL CONTRACT REQUIREMENTS

SECTION H

SPECIAL CONTRACT REQUIREMENTS

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SECTION H

SPECIAL CONTRACT REQUIREMENTS

H.1 TECHNICAL DIRECTION

(a) Performance of the work under this contract shall be subject to the technical direction of U.S. Department of Energy (DOE) Contracting Officer's Representative (COR). The term "technical direction" is defined to include, without limitation:

(1) Provision of written information to the Contractor, which assists in the interpretation of drawings, specifications or technical portions of the work description.

(2) Review and, where required by the contract, approval of technical reports, drawings, specifications and technical information to be delivered by the Contractor to the Government under the contract.

(b) Technical direction must be within the scope of work stated in the contract. The COR does not have the authority to, and may not, issue any technical direction which:

(1) Constitutes an assignment of additional work outside the *Statement of Work*;

(2) Constitutes a change as defined in the Contract Section I Clause entitled, *Changes*;

(3) Changes any of the express terms, conditions or specifications of the contract; or

(4) Interferes with the Contractor's right to perform the terms and conditions of the contract.

(c) All technical direction shall be issued in writing by the COR.

(d) The Contractor shall proceed promptly with the performance of technical direction duly issued by the COR in the manner prescribed by this clause and within its authority under the provisions of this clause. If, in the opinion of the Contractor, any instruction or direction by the COR falls within one of the categories defined in (b)(1) through (b)(4) above, the Contractor shall not proceed but shall notify the Contracting Officer in writing within five (5) working days after receipt of any such instruction or direction and shall request the Contracting Officer to modify the contract accordingly. Upon receiving the notification from the Contractor, the Contracting Officer shall:

(1) Advise the Contractor in writing within thirty (30) days after receipt of the Contractor's letter that the technical direction is within the scope of the contract effort and does not constitute a change under the Contract Section I Clause entitled, *Changes*.

(2) Advise the Contractor in writing within a reasonable time that the Government will issue a written change order.

(e) A failure of the Contractor and Contracting Officer to agree that the technical direction is within the scope of the contract, or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the Section H Clause entitled, *Alternative Dispute Resolution.*

H.2 MODIFICATION AUTHORITY

Notwithstanding any of the other clauses of this Contract, the Contracting Officer shall be the only individual authorized to:

(a) Accept nonconforming work,

(b) Waive any requirement of this contract, or

(c) Modify any term or condition of this contract.

H.3 KEY PERSONNEL

A listing of Key Personnel on this Contract is provided as Section J, Attachment F, *Key Personnel*. These Key Personnel are considered to be essential to the work being performed on this Contract. Prior to diverting to other positions or substituting any of the specified Key Personnel, or proposing them as a Key person under another contract, the Contractor shall notify the Contracting Officer in writing at least thirty (30) days in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the work being performed under this Contract. No diversion or substitution shall be made by the Contractor without the written consent of the Contracting Officer, provided that the Contracting Officer may ratify in writing such diversion or substitution and such ratification shall constitute the consent of the Contracting Officer required by this Clause. Unless approved in writing by the Contracting Officer, no Key Personnel position will remain unfilled by a permanent replacement for more than 60 days. The Key Personnel list shall be amended during the course of the Contract to add or delete Key Personnel as appropriate and as approved by the Contracting Officer.

Anytime the Project Manager is replaced or removed for any reason under the Contractor's control within two (2) years of contract award, fee earned will be reduced by the amount of $1,000,000. In addition, each time any other Key Personnel for the functions of Environment, Safety, Quality, and Health (ESQ&H); Procurement/Contracting; Technology Management; Engineering; Construction Management; and Design Management for Systems, Facilities, and/or Engineering Disciplines are replaced or removed for any reason under the Contractor's control within two (2) years of Contract award, fee earned shall be reduced by the amount of $500,000 for each removed or replaced individual. DOE will effectuate the appropriate reduction in fee by reducing the next provisional payment due to the Contractor for invoiced fee by the appropriate dollar amount as set forth in this Clause. If no or insufficient provisional fee is due the Contractor within 30 days, the Contractor shall refund to DOE the amount of the reduction due under this Clause. The Contractor may request, in writing, that the Contracting Officer waive all part or part of these reductions in fee, if special circumstances exist. The Contracting Officer shall have unilateral discretion to waive or not to waive all or part of a reduction.

H.4 SMALL BUSINESS SUBCONTRACTING PLAN

The Small Business Subcontracting Plan submitted by the Contractor and approved by the Contracting Officer (via contract award) is incorporated into this Contract as Section J, Attachment D, *Small Business Subcontracting Plan*. Any revisions thereto shall be approved by the Contracting Officer and incorporated into the contract by a separate contract modification. Plans shall provide strong consideration for local and Washington and Oregon State businesses.

H.5 REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF THE OFFEROR

The Representations, Certifications, and Other Statements of the Offeror submitted with the offer for this Contract are, by reference, hereby incorporated in and made a part of this Contract.

H.6 DISPLACED EMPLOYEE HIRING PREFERENCE

(a) Definition. Eligible employee means a former or current employee of a Contractor or subcontractor (1) who has been employed at a U.S. Department of Energy (DOE) Defense Nuclear Facility as defined in Section 3163 of the *National Defense Authorization Act for FY 1993* (Public Law 102-484) and the Interim Planning Guidance for Contractor Work Force Restructuring (DEC 1998) or other applicable DOE guidance for Contractor work force restructuring, as may be amended or supplemented from time to time (hereinafter "Guidance"), (2) whose employment at such a Defense Nuclear Facility has been involuntarily terminated (other than for cause) or who has been notified that they are facing termination, (3) who has also met the job attachment test as set forth in applicable DOE Guidance, and (4) who is qualified for a particular position with the Contractor or, with retraining, can become qualified within the time and cost limits set forth in the DOE Guidance.

(b) The Contractor will assess the skills needed for the work to be performed under this Contract and will provide to DOE Job Opportunity Bulletin Board System (JOBBS) all information relevant to the qualifications for all of the positions for which the Contractor has vacancies.

(c) Consistent with the DOE Guidance as supplemented by the appropriate site work force restructuring plan, the Contractor agrees that it will provide to the extent practicable a preference in hiring to an eligible employee as defined other than for managerial positions (define as those above the first level of supervision) for work to be performed under this Contract.

(d) The Contractor will develop training programs designed to improve the qualifications of employees to fill vacancies with the Contractor and will take such training into account in assessing the qualifications of eligible employees.

(e) The requirements of this Clause shall be included in subcontracts at any tier (except subcontracts for commercial items pursuant to 41 United States Code 403) expected to exceed $500,000.

H.7 IMPLEMENTATION OF SECTION 3161 POLICY ON WORK FORCE RESTRUCTURING AND PREFERENCE IN HIRING

(a) The Contractor will give preference, where practicable and consistent with the Contractor's judgment of business needs, for filling job vacancies for work under this Contract to eligible workers who meet the position qualification requirements, and are employed on the WTP Project.

(b) After implementation of subpart (a), pursuant to the requirements of Section 3161 of the *National Defense Authorization Act for Fiscal Year 1993* (Public Law 102-484), and consistent with Clause H.6, preference is to be provided to displaced employees whose eligibility is defined in the U.S. Department of Energy (DOE) guidelines on work force restructuring and the *Hanford Site Work Force Restructuring Plan*, including lower-tier subcontractor employees, for work at the Hanford Site in accordance with the following, unless modified by Section 3161 guidance issued by DOE.

(c) The Contractor and any lower-tier subcontractor subject to this Clause shall negotiate with affected unions to implement the hiring preference, including if necessary, special agreements for allocation of work or arrangements for exceptions to internal union rules that might otherwise be obstacles to implementation of the hiring preference, consistent with *Planning Guidance for Contractor Work Force Restructuring* (December 1998).

(d) Where these requirements conflict with any existing contract or collective bargaining agreement, the Contractor may be relieved of the obligation to meet these requirements if it specifically identifies the conflict in its proposal and the reasons the conflict cannot be reasonably resolved by other means.

(e) Nothing in this Clause shall be construed to excuse the Contractor or any subcontractor from compliance with the requirements of any applicable law.

H.8 LABOR RELATIONS

(a) The Contractor, and its major subcontractors, will respect the rights of employees, (1) to organize, form, join, or assist labor organizations; bargain collectively through representatives of the employees own choosing; and engage in other protected concerted activities for the purpose of collective bargaining, or (2) to refrain from such activities.

(b) To the extent required by law, the Contractor and its major subcontractors shall give notice to any lawfully designated representative of its employees for purposes of collective bargaining and, upon proper request, bargain to good faith impasses or agreement, or otherwise satisfy applicable bargaining obligations.

(c) The Contractor shall promptly advise the Contracting Officer of, and provide all appropriate documentation regarding, any labor relations developments at the prime or subcontract level that involve or appear likely to involve:

(1) Possible strike situations affecting the facility;

(2) Referral to the Energy Labor-Management Relations Panel;

(3) The National Labor Relations Board at any level;

(4) Recourse to procedures under the *Labor-Management Act of 1947*, as amended, or any other Federal or state labor law; and

(5) Any grievance that may reasonably be assumed to be arbitrated under a Collective Bargaining Agreement.

(d) Cost of wages and fringe benefits, to employees represented by collective bargaining units, not in excess of those in appropriate collective bargaining agreements including the Hanford Site Stabilization Agreement, shall be allowable. The costs associated with grievance processing and settlements, arbitration, and arbitration awards shall be allowable in accordance with the provisions of the Contract Section I Clause entitled, *Insurance – Litigation and Claims*.

H.9 IMPLEMENTATION OF THE HANFORD SITE STABILIZATION AGREEMENT

(a) The Hanford Site Stabilization Agreement for all construction work for the U.S. (DOE) at the Hanford Site, which is referenced in this Section, consists of a Basic Agreement dated September 10, 1984, plus appendices thereto, signed by J.A. Jones Construction Services Company and Morrison-Knudsen Company, Inc., the Building and Construction Trades Department, AFL-CIO, and its affiliated International Unions, and the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America.

(b) In accordance with the Hanford Site Stabilization Transition Agreement, dated December 18, 1986, and effective 12:01 a.m., March 1, 1987, the ICF Kaiser Hanford Company (ICF-KH) is recognized as successor in interest to those rights, duties, and obligations previously held by J.A. Jones Construction Services Company under the terms of the Hanford Site Stabilization Agreement.

(c) This Section applies to employees performing work, under contracts (or subcontracts thereunder) administered by the DOE, which are subject to the *Davis-Bacon Act*, in the classifications set forth in the Hanford Site Stabilization Agreement for work performed at the Hanford Site.

(d) Contractors and subcontractors at all tiers who are parties to an agreement(s) for construction work with a local union having jurisdiction over DOE construction work performed at the Hanford Site, or who are parties to a national labor agreement for such construction work, shall become signatory to the Hanford Site Stabilization Agreement and shall abide by all of its articles, including all current appendices thereto. Subcontractors at all tiers who have subcontracts with a signatory contractor or subcontractor shall become signatory to the Hanford Site Stabilization Agreement and shall abide by all of its articles, including all current appendices thereto.

Contractors and subcontractors at all tiers who are not signatory to the Hanford Site Stabilization Agreement and who are not required under this Section to become signatory to it, shall pay not less and no more than the wages, fringe benefits, and other employee compensation set forth in Appendix A thereto and shall adhere, except as otherwise directed by the Contracting Officer, to the following Articles of the Hanford Site Stabilization Agreement:

(1) Article VII, Employment, Section 2 only

(2) Article XII, Non-Signatory Contractor Requirements

(3) Article XIII, Hours of Work, Shifts, and Overtime

(4) Article XIV, Holidays

(5) Article XV, Wage Scales and Fringe Benefits, Sections 1 and 2 only

(6) Article XVII, Payment of Wages - Checking In & Out, Section 3 only

(7) Article XX, General Working Conditions

(8) Article XXI, Safety and Health

(e) The obligation of the Contractor and its subcontractors to pay fringe benefits shall be discharged by making payments required by this Contract in accordance with the Articles of the amendments to the *Davis-Bacon Act* contained in the Act of July 2, 1964 (Public Law 88-349-78, Statutes 238-239), and the U.S. Department of Labor regulations in implementation thereof (29 Code of Federal Regulations (CFR) Parts 1, 3, 5).

(f) DOE may from time to time provide notice to the Contractor of any changes in wages, fringe benefits, and the parties may modify other employee compensation as the Hanford Site Stabilization Agreement, including all current appendices thereto from time to time. The Contractor shall not be entitled to any change in the minimum, target, or maximum fees due to any such change in wages or fringe benefits under the Hanford Site Stabilization Agreement during the term of the Contract.

(g) The requirements of this Section are in addition to, and shall not relieve the Contractor of any obligation imposed by other sections or subsections of the Contract.

(h) The Contractor agrees to maintain its bid or proposal records showing rates and amounts used for computing wages and other compensation, and its payroll and personnel records during the course of work, and to preserve such records for a period of three years thereafter, for all employees performing such work. Such records will contain the name and address of each such employee, the employee's correct classification, rate of pay, daily and weekly number of hours worked, and dates and hours of the day within which work was performed, deductions made, and amounts for wages and other compensation covered in this Section. The Contractor agrees to make these records available for inspection by the Contracting Officer and will permit him/her to interview employees during working hours on the job.

(i) The Contractor agrees to insert the clauses of this Section in all subcontracts for the performance of work subject to the *Davis-Bacon Act* administered by DOE at the Hanford Site.

H.10 DETERMINATION OF APPROPRIATE LABOR STANDARDS

The U.S. Department of Energy (DOE) shall determine the appropriate labor standards in accordance with the *Davis-Bacon Act*, which shall apply to work performed under this Contract. Where requested by DOE, the Contractor shall provide whatever information is relevant to labor standards determinations, in the form and timeframe required by DOE, as may be necessary for DOE to make such labor standards determinations. The Contractor will then be responsible for ensuring that the appropriate labor standards provisions are included in subcontracts.

H.11 AGE DISCRIMINATION IN EMPLOYMENT

The Contractor shall not discriminate against any employee, applicant for employment, or former employee on the basis of age. The Contractor shall comply with the *Age Discrimination in Employment Act*, with any state or local legislation regarding discrimination based on age, and with all applicable regulations thereunder.

H.12 OPERATIONS AND ENGINEERING CONTRACT MULTIPLE EMPLOYER PENSION PLAN

(a) The Contractor will use its best efforts to become a sponsoring employer and to ensure participation by its teaming partners, if any, in the existing Hanford Operations and Engineering Pension Plan, a multiple employer pension plan (hereinafter MEPP). The MEPP will cover only those individuals who were employed by the Tank Farm Contractor on the Waste Treatment and Immobilization Plant (WTP) at the time of Contract award and who are existing participants in the plan as of the date of their initial employment on the WTP Project by the Contractor (or its teaming partner(s), if any). Individuals covered by the Hanford Site Stabilization Agreement are not eligible to participate in the MEPP. Employees will earn credit for their service with the Contractor (and any teaming partner) only for services performed by them under this Contract.

(b) At the request of the U.S. Department of Energy (DOE), the Contractor will provide DOE with such documents, information, and representations as DOE deems necessary to insure that the Contractor's participation (or that of any teaming partners) in the MEPP has not and will not adversely affect the MEPP's exempt status under the Internal Revenue Code and/or the Employee Retirement Income Security Act (ERISA). The MEPP documents and subsequent amendments are subject to the DOE approval.

H.13 SELF-PERFORMED WORK

Unless otherwise approved by the Contracting Officer, the percentage of work which may be self-performed by the Contractor (including any teaming partner(s) and any parent, wholly-owned subsidiary or affiliated organizations), shall be limited to not more than 40% of the sum of Target Cost plus Target Fee. Unless otherwise approved by the Contracting Officer, the remainder of the work shall be performed through competitive procurements with an emphasis on fixed price subcontracts.

H.14 PAYMENT BONDS AND PERFORMANCE BONDS

The Contractor will not be required to furnish payment bonds and performance bonds. However, all fixed price subcontractors will be required to submit the necessary payment bonds and performance bonds as required by the *Miller Act*. Specific requirements and penal amounts can be found in Federal Acquisition Regulation (FAR) 28.102.

H.15 GUARANTEE OF PERFORMANCE

The Contractor or the Contractor's parent organization(s) has (have) provided a Performance Guarantee Agreement in a manner and form acceptable to the Contracting Officer assuring the performance, duties, and responsibilities of the Contractor, including repayment of unearned provisional fee, will be satisfactorily fulfilled. The Performance Guarantee Agreement dated December 11, 2000, is incorporated herein by reference and made part of this Contract.

H.16 DOE ACCESS TO CONTRACTOR MANAGEMENT AND CONTRACT DOCUMENTATION

(a) In order to facilitate interactions with the U.S. Department of Energy (DOE), support safe and efficient performance of the Contract and effective contract administration, the Contractor shall locate Contractor offices on the Hanford Site or in the Tri-Cities, Washington area for, at a minimum, senior level management responsible for the following major project management functions: Project Management; Environment, Safety, Quality and Health (ESQ&H); Project Cost and Schedule Control; Procurement/Contracting; Environmental Compliance; Technology Management; Labor Relations; Human Resources; Engineering; Construction Management; and Design Management for Systems, Facilities, and/or Engineering Disciplines.

(b) Although not all work is required to be performed in the Tri-Cities area, the Contractor shall use judgment in relocation of project staff to the Tri-Cities to facilitate the objectives of cost efficiency, project integration and meeting DOE's needs for frequent and informative interactions.

(c) The design process must have the capability for efficient electronic integration. Video teleconferencing shall also be used to facilitate communications with satellite work locations where critical work is to be performed.

(d) All major design reviews shall be held in the Tri-Cities Area unless otherwise approved by the Contracting Officer.

H.17 WASTE TREATMENT AND IMMOBILIZATION PLANT CONCEPTUAL DESIGN AND SUPPORTING INFORMATION

The Waste Treatment and Immobilization Plant (WTP) Conceptual Design and supporting information are provided 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 is responsible for designing, constructing, and commissioning the WTP in a manner that meets all Contract specifications and requirements, and results in an operating facility that meets or exceeds all functional and performance specifications and requirements. The U.S. Department of Energy (DOE) makes no warranties as to the accuracy, reliability, completeness or usefulness of the WTP Conceptual Design materials. The Contractor shall have no recourse against DOE, or the individuals, or contractors who prepared such information for DOE, for impacts resulting from the Contractor's use or reliance upon WTP Conceptual Design or supporting information. The Contractor shall perform such reviews and evaluations, as it deems necessary for the Contractor to satisfy itself as to the accuracy, reliability, usefulness and completeness of any WTP Conceptual Design or supporting information, which it may utilize in performing the Contract. Any reference to the contractor(s) who prepared the WTP Conceptual Design and supporting information shall not be carried forward by the Contractor in any work products, permits, presentations or deliverables produced under this Contract except where necessary to comply with applicable laws or comply with proprietary data requirements. A listing of the WTP Conceptual design and supporting information is provided in Section J, Attachment K, *Listing of WTP Conceptual Design and Supporting Information.*

H.18 RESPONSIBLE CORPORATE OFFICIAL

The Contractor shall guarantee performance as evidenced by the *Guarantee of Performance Agreement* (Clause H.15). If a separate business entity is established for this Contract, the Contractor's parent company shall guarantee performance as evidenced by the *Guarantee of Performance Agreement* (Clause H.15). If the Contractor is a joint venture or other similar entity where more than one company is involved, the parent companies shall assume joint and several liability for the performance of the Contractor. In the event any of the signatories to the Guarantee of Performance enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish written notification of the bankruptcy to the Contracting Officer. Notwithstanding the provisions of this Clause, the Government may contact, as necessary, the single responsible corporate official identified below, who is at a level above the Project Manager for the Contractor and who is accountable for the performance of the Contractor, regarding Contractor performance issues. Should the responsible corporate official change during the period of the Contract, the Contractor shall promptly notify the Contracting Officer in writing of the change in the individual to Contract.

Name:	Thomas F. Hash
Position:	President
Company/Organization:	Bechtel National Inc.
Address:	45 Fremont Street, San Francisco, CA 94105
Phone:	(415) 768-1740
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H.19 ASSIGNMENT OF SUBCONTRACTS

The Government reserves the right to direct the Contractor to assign to the Government or another Contractor any subcontract awarded under this contract.

H.20 OTHER GOVERNMENT CONTRACTORS

The Government may undertake or award other contracts for additional work or services. The Contractor agrees to fully cooperate with such other Contractors and Government employees and carefully fit its own work to such other work as may be directed by the Contracting Officer. The Contractor shall not commit or permit any act, which will interfere with the performance of work by any other Contractor or by Government employees. If the U.S. Department of Energy (DOE) determines that the Contractor's activities may interfere with another DOE Contractor, the Contracting Officer shall so notify the Contractor and the Contractor shall comply with any instructions the Contracting Officer may provide.

H.21 ASSIGNMENT

Neither this Contract nor any interest therein nor claim thereunder shall be assigned or transferred by the Contractor except as expressly authorized in writing by the Contracting Officer.

H.22 SUBCONTRACTOR ENVIRONMENT, SAFETY, QUALITY, AND HEALTH REQUIREMENTS

The U.S. Department of Energy (DOE) and the Contractor are committed to zero accidents on the WTP. To that end, unless expressly approved by the Contracting Officer, the Contractor is required to subcontract only with subcontractors that have an acceptable Environmental, Safety, Quality, and Health (ESQ&H) program and that satisfy the following minimum requirements:

(a) An ESQ&H program that is compliant with applicable local, State, Federal and DOE regulatory requirements;

(b) Employees are properly trained and equipped to perform their assigned work. The subcontractor has established an orientation program for new hires, which includes ESQ&H;

(c) Policies and procedures are in place to eliminate accidents, injuries/illnesses, and damage to property and equipment;

(d) ESQ&H records are adequately and properly maintained;

(e) Accidents/incidents are investigated promptly and required reports are generated. If the investigation discovers inadequacies in either the work process or the policies and procedures, the appropriate processes are put in place to avert the accident/incident in the future and personnel are provided proper training;

(f) Hazards are identified and appropriate measures are taken to ensure that personnel and equipment are adequately protected as a result of identified hazards;

(g) Employees have the right to report unsafe conditions and to interrupt or stop work without fear of reprisal;

(h) The frequency of ESQ&H meetings with employees to discuss the work to be performed and the hazards associated with the work is based on the scope of work and commensurate with the work hazards;

(i) ESQ&H inspections/audits are conducted to evaluate effectiveness of the program;

(j) The subcontractor has an average Experience Modification Rate (EMR), Occupational Safety and Health Administration (OSHA) Recordable, and Lost Workday case rate(s) of (1.0, 3.2, and 0.64), respectively, or less, for the previous three (3) years and shows an improving trend in safety performance; however, for construction subcontractors the values shall be less than 1.0, 3.2, and 3.0.

(k) The subcontractor has an established written Hazard Communication Program and a system within the program to maintain Material Safety Data Sheets (MSDS);

(l) The subcontractor has had no significant willful citations from OSHA or other regulatory organizations during the previous three (3) years;

(m) The subcontractor has received no citations, other than those determined to be minor violations, or fines for Price-Anderson Amendments Act (PAAA) non-compliances during the previous three (3) years; and

(n) The subcontractor has received no fines for Nuclear Regulatory Commission non-compliances during the previous three (3) years.

The Contractor shall flow down all applicable ESQ&H program criteria to the lowest tier subcontractor performing construction, equipment fabrication or commissioning.

H.23 TRI-PARTY AGREEMENT

The U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency Region 10 (EPA), and the Washington State Department of Ecology (Ecology) have entered into the *Hanford Federal Facility Agreement and Consent Order*; referred to as the Tri-Party Agreement (TPA) to ensure compliance with the *Resource Conservation and Recovery Act* (RCRA) and the *Comprehensive Environmental Response, Compensation, and Liability Act*, as amended (CERCLA). The TPA sets forth certain requirements and milestones for cleanup activities at the Hanford Site. The Contractor agrees to plan and perform the work under this Contract in accordance with DOE direction concerning implementation of the TPA and achievement of current and future milestones in the TPA.

H.24 EMERGENCY CLAUSE

(a) The Manager, Office of River Protection (ORP), or designee shall have sole discretion to determine when an emergency situation exists as a result of facility operations within the physical boundaries defined by this Contract affecting personnel, public health, safety, the environment, or security. The Manager, Richland Operations Office (RL), or designee has the discretion to determine when an emergency condition exists elsewhere on the Hanford Site that may affect ORP employees. In the event that either the ORP or RL Manager or designee, determines that an emergency exists, the Manager, Office of River Protection, or designee will have the authority to direct any and all activities of the Contractor and subcontractors necessary to resolve the emergency situation. The Manager, Office of River Protection, or designee may direct the activities of the Contractor and subcontractors throughout the duration of the emergency.

(b) The Contractor shall include this clause in all subcontracts at any tier for work performed at the Hanford Site.

H.25 SHUTDOWN AUTHORIZATION

(a) In the event of a specific imminent environmental, health, or safety hazard, identified by facility line management, U.S. Department of Energy (DOE) Facility Representatives, operators, or facility health and safety personnel overviewing facility operations, the individual or group identifying the specific imminent hazard situation shall immediately take actions to eliminate or mitigate the hazard. This shall be accomplished by directing the operator/implementer of the activity or process causing the imminent hazard to shutdown the activity or the facility or by initiating emergency response actions or other actions to protect the health and safety of the workers and the public and to protect DOE facilities and the environment.

(b) The Contractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage or other action ordered in accordance with this Clause.

H.26 ENVIRONMENTAL PERMITS

The Contractor is required to comply with all environmental laws, regulations, and procedures applicable to the work being performed under this Contract. This includes, but is not limited to, compliance with applicable Federal, State, and local laws and regulations, interagency agreements such as the Hanford Federal Facility Agreement and Consent Order, consent orders, consent decrees, and settlement agreements between DOE and Federal and State regulatory agencies.

(a) Environmental Permits: The Contractor shall accept as co-operator assignment or transfer of permits currently held by the U.S. Department of Energy (DOE) and its existing contractor for the Waste Treatment and Immobilization Plant (WTP). The Contractor is responsible to DOE for operation of the treatment, storage, and/or disposal unit known as the WTP in compliance with the laws, regulations, etc., as stated in the paragraph above and in accordance with the terms of the environmental permits.

(b) Contractor and DOE as Joint Permittees: Where appropriate, required by law, or required by applicable regulatory agencies, DOE shall sign permits as owner or co-operator with the Contractor as the operator or co-operator. DOE will co-sign Hazardous Waste and State Dangerous Waste Permit Applications as owner/co-operator where required by applicable law. In this scenario, the Contractor must coordinate its actions with DOE. The Contractor shall accept assignment as co-operator of the State Dangerous Waste Permit Application, which has been submitted to the Washington State Department of Ecology for the WTP. DOE is responsible for timely notification to the Contractor of any issues or changes in the regulatory environment that impact or may impact Contractor implementation of any permit requirement. The Contractor is responsible for timely notification to DOE of any issues or changes in the regulatory environment that impact or may impact Contractor implementation of any permit requirement.

(c) Multiple Contractors as Permittees: Where appropriate, in situations where multiple Contractors are operators or co-operators of operations requiring environmental permits, DOE shall sign such permits as owner or co-operator and affected contractors shall sign as operators or co-operators. In this scenario, the Contractor must coordinate as appropriate with DOE and other contractors affected by the permit.

(d) Permit Applications: The Contractor shall provide to DOE for review and comment in draft form any permit applications and other regulatory materials and permits necessary to be submitted to regulatory agencies for the purposes of obtaining a permit for construction or operation of the WTP. In the event the permit application is required to be co-signed, submitted by DOE, or is related to a permit in which DOE is a permittee, the Contractor shall provide the application for review and comment. Whenever reasonably possible, all such materials shall be provided to DOE initially not later than 150-days prior to the date they are to be submitted to the regulatory agency. The Contractor shall normally provide final regulatory documents to DOE at least 30-days prior to the date of submittal to the regulatory agencies for DOE's final review and signature or concurrence that shall be performed by DOE in a prompt manner. Special circumstances may require permits to be submitted in a shorter time frame. The Contractor may submit for DOE's consideration, requests for alternate review, comment, or signature schedules for environmental permit applications or other regulatory materials covered by this Clause. Any such requests shall be submitted 180-days prior to the date the materials are to be submitted to the regulatory agencies. Any such schedule revision shall be effective only upon approval from the Contracting Officer.

In case of permit applications that are co-signed by DOE with the Contractor, DOE may sign the application through either the Manager of the Richland Operations Office or the Manager of the Office of River Protection, or the Manager's authorized designees, as determined by DOE in its sole discretion.

(e) Financial Responsibility: DOE agrees that if bonds, insurance, or administrative fees are required as a condition for permits obtained by the Contractor under this Contract, such costs shall be allowable. In the event such costs are determined by DOE to be excessive or unreasonable, DOE shall provide the regulatory agency with an acceptable form of financial responsibility. Under no circumstances shall the Contractor or its parent be required to provide any corporate resources or corporate guarantees to satisfy such regulatory requirements.

(f) Copies of Technical Information: The Contractor shall provide DOE with copies of environmental permits, authorizations, and regulatory approvals issued to the Contractor by regulatory agencies. DOE shall provide the Contractor access to copies of environmental permits, authorizations, and approvals issued by the regulatory agencies to DOE that the Contractor may need to comply with applicable law.

The Contractor and DOE shall provide to the each other, copies of documentation, such as letters, reports, or other such materials transmitted either to or from regulatory agencies relating to the contract work.

The Contractor and DOE shall maintain all necessary technical information required to support applications for revision of DOE or other Hanford Site contractor environmental permits when such applications or revisions are related to the Contractor's operations.

(g) Certifications: The Contractor shall provide a written certification statement attesting that information DOE is requested to sign was prepared in accordance with applicable requirements. The Contractor shall include the following certification statement in the submittal of such materials to DOE:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

The certification statement shall be signed by the individual who is authorized, in writing, by the Contractor to sign such certification statements submitted to Federal or State regulatory agencies under the applicable regulatory program.

(h) Negotiations: DOE may elect to be in charge of, and direct, all negotiations with regulatory agencies regarding permits, fines, penalties, and any other proposed notice, notice, administrative order, and similar type of notice. As directed or required by DOE, the Contractor shall participate in negotiations with regulatory agencies; however, the Contractor shall not make any commitments or offers to regulators purporting to bind or binding the Government in any form or fashion, including monetary obligations, without receiving written authorization or concurrence from the Contracting Officer or his/her authorized representative prior to making such offers/commitments. Failure to obtain such advance written approval may result in otherwise allowable costs being declared unallowable and/or the Contractor being liable for any excess costs to the Government associated with or resulting from such offers/commitments. In the event DOE elects to allow the Contractor to conduct such negotiations without direct DOE participation, the Contractor shall keep DOE fully advised as to the progress of such negotiations.

(i) Permit Transfer Upon Contract Termination or Expiration: In the event of expiration or termination of this Contract, DOE may require the Contractor on an allowable cost basis to take all necessary steps to transfer to DOE some or all environmental permits held by the Contractor. DOE will assume responsibility for such permits, with the approval of the regulating agency, and the Contractor shall be relieved of all liability and responsibility to the extent that such liability and responsibility results from the acts or omissions of a successor contractor, DOE, or their agents, representatives, or assigns. The Contractor shall remain liable for all unresolved costs, claims, demands, fines, and penalties, including reasonable legal costs arising prior to the date such permits are transferred to another party in accordance with other provisions of the Contract. The Contractor shall not be liable for any such claims occurring after formal transfer of this contract unless said claims result from Contractor's action or inaction.

H.27 CONTRACTOR ACCEPTANCE OF NOTICES OF VIOLATION OR ALLEGED VIOLATIONS, FINES, AND PENALTIES

(a) The Contractor shall accept, in its own name, service of notices of violation or alleged violations (NOVs/NOAVs) issued by Federal or State regulators to the Contractor resulting from the Contractor's performance of work under this Contract, without regard to liability. The allowability of the costs associated with fines and penalties shall be subject to the other provisions of this Contract.

(b) The Contractor shall notify the U.S. Department of Energy (DOE) promptly when it receives service from the regulators of NOVs/NOAVs and fines and penalties.

H.28 ALLOCATION OF RESPONSIBILITIES FOR CONTRACTOR ENVIRONMENTAL COMPLIANCE ACTIVITIES

(a) This Clause allocates the responsibilities of the U.S. Department of Energy (DOE) and the Contractor, referred to collectively as the "parties" for implementing the environmental requirements at facilities within the scope of the Contract. In this Clause, the term "environmental requirements" means requirements imposed by applicable Federal, State and local environmental laws and regulations, including, without limitation, statutes, ordinances, regulations, court orders, consent decrees, administrative orders or compliance agreements including the *Hanford Federal Facility Agreement and Consent Order*, consent orders, permits and licenses.

(b) Liability and responsibility for civil fines or penalties arising from or related to violations of environmental requirements shall be borne by the party that caused the violation irrespective of the fact that the cognizant regulatory authority may assess any such fine or penalty upon either party or both parties without regard to the allocation of responsibility or liability under this Contract. This contractual allocation of liability for any such fine or penalty is effective regardless of which party signs permit applications, manifests, reports or other required documents, is a permittee, or is the named subject of an enforcement action or assessment of a fine or penalty.

(c) Regardless of which party to this contract is named subject of an enforcement action for noncompliance with environmental requirements by the cognizant regulatory authority, provisions of this contract related to allowable costs will govern liability for payment of any fine or penalty. If the named subject of an enforcement action or assessment of a fine or penalty is DOE and the fine or penalty would not otherwise be reimbursable under the allowable cost provisions of this contract if the Contractor was the named subject of the enforcement action, the Contractor will either pay the fine or penalty or reimburse the DOE (if DOE pays the fine or penalty).

H.29 HAZARDOUS MATERIALS

In implementation of the Section I Clause entitled, *Hazardous Material Identification and Material Safety Data*, the Contractor shall obtain, review and maintain a Material Safety Data Sheet (MSDS) in a readily accessible manner for each hazardous material (or mixture containing a hazardous material) ordered, delivered, stored, or used; and maintain an accurate inventory and history of use of hazardous materials at each use and storage location. After Contract award the Offeror shall submit the information required by paragraph (b) of the Section I Clause referenced above. The MSDS shall conform to the requirements of 29 CFR 1910.1200 (g). MSDS shall be readily accessible during each work shift to employees when they are in their work areas.

H.30 PRESERVATION OF ANTIQUITIES AND LAND AREAS

Federal law provides for the protection of antiquities located on land owned or controlled by the U.S. Department of Energy (DOE). Antiquities include Indian graves or campsites, relics, and artifacts. The Contractor shall control the movements of its personnel and its subcontractors' personnel at the job site and provide appropriate training to ensure that any existing antiquities discovered thereon will not be disturbed or destroyed by such personnel. It shall be the duty of the Contractor to report to the Contracting Officer the existence of any antiquities so discovered. The Contractor shall also preserve all vegetation except where such vegetation must be removed for survey or construction purposes. Any removal of vegetation shall be in accordance with the terms of applicable habitat mitigation plans and permits.

H.31 INFORMATION

(a) Release of Information

(1) The Contractor shall be responsible for developing, planning, and coordinating timely dissemination of information regarding performance of work under the Contract.

(2) The Contractor shall be responsible for following the U.S. Department of Energy (DOE) guidelines and/or procedures for all oral, written and audio/visual information material prepared for public use, including technical information.

(b) Unclassified Controlled Nuclear Information (UCNI): Documents originated by the Contractor or furnished by the Government to the Contractor, in connection with this contract, may contain unclassified controlled nuclear information as determined pursuant to Section 148 of the *Atomic Energy Act of 1954*, as amended. The Contractor shall be responsible for protecting such information from unauthorized dissemination in accordance with applicable DOE regulations, directives and orders.

(c) Confidentiality of Information: To the extent that the work under this contract requires that the Contractor be given access to confidential or proprietary business, technical, or financial information belonging to the Government or other companies, the Contractor shall, after receipt thereof, treat such information as confidential and agrees not to appropriate such information to its own use or to disclose such information to third parties unless specifically authorized by the Contracting Officer in writing. The foregoing obligations, however, shall not apply to:

(1) Information, which, at the time of receipt by the Contractor, is in the public domain.

(2) Information that is published after receipt thereof by the Contractor or otherwise becomes part of the public domain through no fault of the Contractor.

(3) Information that the Contractor can demonstrate was in its possession at the time of receipt thereof and was not acquired directly or indirectly from the Government or other companies.

(4) Information that the Contractor can demonstrate was received by it from a third party that did not require the Contractor to hold it in confidence.

The Contractor shall obtain the written agreement, in a form satisfactory to the Contracting Officer, of each employee permitted access to such information, whereby the employee agrees that he will not discuss, divulge or disclose any such information or data to any person or entity except those persons within the Contractor's organization directly concerned with the performance of the contract.

The Contractor agrees, if requested by the Government, to sign an agreement identical, in all material respects, to the provisions of this subparagraph (c), with each company supplying information to the Contractor under this contract, and to supply a copy of such agreement to the Contracting Officer. From time to time upon request of the Contracting Officer, the Contractor shall supply the Government with reports itemizing information received as confidential or proprietary and setting forth the company or companies from which the Contractor received such information.

The Contractor agrees that upon request by DOE, it will execute a DOE-approved agreement with any party whose facilities or proprietary data it is given access to or is furnished, restricting use and disclosure of the data or the information obtained from the facilities. Upon request by DOE, Contractor personnel shall also sign such an agreement.

(d) The Government reserves the right to require the Contractor to include this clause or a modified version of this clause in any subcontract as directed in writing by the Contracting Officer.

H.32 COSTS ASSOCIATED WITH WHISTLEBLOWER ACTIONS

(a) Definitions.

Covered contractors and subcontractors for the purposes of this Section means those contractors and subcontractors with contracts for an excess of $500,000.

Employee whistleblower action encompasses any action filed by an employee in Federal and State court for redress of a retaliatory act by a contractor and any administrative procedure brought by an employee under 29 Code of Federal Regulations (CFR) Part 24, 48 CFR subpart 3.9, 10 CFR Part 708 or 42 United States Code (U.S.C.) 7239.

Retaliatory acts means discharge, demotion, reduction in pay, coercion, restraint, threat, intimidation, or other similar negative action taken against an employee by a contractor as a result of an employee's activity protected as a whistleblower activity by a Federal or State statute or regulation.

Settlement and award costs means defense costs and costs arising from judicial orders, negotiated agreements, arbitration, or an order from a Federal agency or board and includes compensatory damages, underpayment for work performed, and reimbursement for a complainant employee's legal counsel.

(b) For costs associated with employee whistleblower actions where a retaliatory act is alleged against a covered contractor or subcontractor, the Contracting Officer:

(1) May authorize reimbursement of costs on a provisional basis, in appropriate cases;

(2) Must consult with the DOE Office of General Counsel whistleblower cost point of contact before making a final allowability determination; and

(3) Must determine allowability of defense, settlement, and award costs on a case-by-case basis after considering the terms of the contract, relevant cost regulations, and the relevant facts and circumstances, including Federal law and policy prohibiting reprisal against whistleblowers, available at the conclusion of the employee whistleblower action.

(c) Covered contractors and subcontractors must segregate legal costs including costs of in-house counsel, incurred in the defense of an employee whistleblower action so that the costs are separately identifiable.

(d) If a Contracting Officer provisionally disallows costs associated with an employee whistleblower action for a covered contractor or subcontractor, funds advanced by the U.S. Department of Energy (DOE) may not be used to finance costs connected with the defense, settlement and award of an employee whistleblower action.

(e) Contractor defense, settlement and award costs incurred in connection with the defense of suits brought by employees under Section 2 of the *Major Fraud Act of 1988* are excluded from coverage of this Section.

H.33 LITIGATION MANAGEMENT PLAN

The Contractor shall prepare a Litigation Management Plan that shall be submitted to the Contracting Officer for approval within ninety (90) days following Contract award. The purpose of the Plan will be to control the cost of litigation and implement the DOE policy favoring the use of Alternative Dispute Resolution (ADR) techniques where appropriate and beneficial to the Government. The *Litigation Management Plan* should, at a minimum, follow the procedures and cost guidelines in the policy statement published in the Federal Register on April 3, 1996, (61 FR 147.63). The Plan should also cover legal costs not connected with litigation. The Plan will be revised from time to time to conform to litigation management and ADR policies established by DOE.

H.34 ALTERNATIVE DISPUTE RESOLUTION

The U.S. Department of Energy (DOE) and the Contractor both recognize that methods for fair and efficient dispute resolution are essential to the successful and timely achievement of critical milestones and completion of all Contract requirements. To facilitate the prevention and early resolution of disputes, the parties agree to the following alternative dispute resolution (ADR) provisions:

(a) Dispute Avoidance

(1) DOE and the Contractor agree to participate in a partnering workshop to be conducted by an experienced professional jointly agreed upon by the parties, within 60 days after Contract award.

(2) The parties agree to jointly select a “standing neutral” within 30 days of completion of the partnering workshop. The “standing neutral” will be available to help resolve disputes, as they arise. This can be an individual, a board comprised of three independent experts, or a company with specific expertise in the Contract area. If a “standing neutral” cannot be agreed upon, the DOE Office of Dispute Resolution will make a selection. The specific ADR processes and procedures, as well as the process for selecting the “standing neutral” will be determined at the partnering workshop.

(b) Early Resolution of Disputes

(1) DOE and the Contractor shall use their best efforts to informally resolve any dispute, claim, question, or disagreement by consulting and negotiating with each other in good faith, recognizing their mutual interests, and attempting to reach a just and equitable solution satisfactory to both parties. If an agreement cannot be reached through informal negotiations after 30 days, then such agreement shall be referred to the “standing neutral,” pursuant to the procedures jointly developed in the partnering workshop.

(2) The “standing neutral” will not render a decision, but will assist the parties in reaching a mutually satisfactory agreement. In the event the parties are unable after 30 days to reach such an agreement either party may request, and the neutral will render a non-binding advisory opinion. Such opinion shall not be admissible in evidence in any subsequent proceeding. All costs incurred by the Contractor in connection with this mediation procedure, shall if reasonable, be an allowable cost under this Contract.

(c) Formal Complaint

If the dispute is not resolved through the "standing neutral" process, no later than 30 days after the completion of said process either party may proceed under the Section I Clause, *Disputes*.

H.35 LOBBYING RESTRICTION (ENERGY AND WATER DEVELOPMENT APPROPRIATION ACT, 2000)

The Contractor agrees that none of the funds obligated on this award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 United States Code (U.S.C.) 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

H.36 COOPERATION DURING TRANSITION TO OPERATIONS

The Contractor shall cooperate with U.S. Department of Energy (DOE) and other contractor(s) as the Contracting Officer directs in planning for and carrying out the transition from the Waste Treatment and Immobilization Plant (WTP) to a future operations contractor. The Contractor shall take all necessary steps to effectuate a smooth transition of responsibility for operation of the WTP to such entity(s) and to transfer to such entity all permits, WTP operating documentation, other technical data, and government furnished property and equipment in the possession of the Contractor in accordance with direction of the Contracting Officer. The Contractor shall prepare, as directed by the Contracting Officer, a plan for smooth transition of property, documentation, and WTP personnel necessary for operation of the WTP to such contractor as the Contracting Officer directs. The transition will occur upon completion of commissioning activities as approved by the Contracting Officer.

H.37 ADVANCE UNDERSTANDING ON COSTS

The U.S. Department of Energy (DOE) and the Contractor will, within 60 days after Contract award, reach advance understandings regarding certain costs under this Contract. Such advance understandings enable both DOE and the Contractor to determine the allocability, allowability, and reasonableness of such costs prior to their incurrence, thereby avoiding subsequent disallowances and disputes, and facilitating prudent expenditure of public funds. It is expected that costs covered by such advance understandings will include employee travel and relocation, corporate home office, employee compensation and benefits, and facilities capital costs of money. Generally, DOE expects the incurrence of costs to be consistent with the Contractor's corporate-wide policies consistently and uniformly applied throughout its domestic operations subject to the specific limitations, conditions, and exclusions of subpart 31.2 of FAR as supplemented by Department of Energy Acquisition Regulation (DEAR) 931.2, and such understanding shall be consistent with DOE Order 350.1, *Contractor Human Resource Management*. Such policies will be summarized and submitted to DOE for approval. Advance understandings will be appended to the Contract in Section J, Attachment J, *Advance Understanding on Costs*.

H.38 ADDITIONAL RIGHTS IN INVENTIONS AND TECHNICAL DATA

In addition to rights specified elsewhere, the Contractor agrees that it will, upon request by the Government, grant to the Government an irrevocable, non-exclusive, paid-up license in and to any inventions or discoveries regardless of when conceived or actually reduced to practice or acquired by the Contractor, and any other intellectual property, which are owned or controlled by the Contractor, at any time through completion of this Contract. This right of the Government shall apply to inventions, discoveries, and intellectual property that are incorporated or embodied in the construction or design of the Waste Treatment and Immobilization Plant (WTP) or which are utilized in the operation of the WTP or which cover articles, materials, or products manufactured at the WTP. The acceptance or exercise by the Government of the aforesaid rights and license shall not prevent the Government at any time from contesting the enforceability, validity, or scope of, or title to, and rights or patents or other intellectual property herein licensed.

The Contractor shall take all necessary steps to assign permits, authorizations, leases, and any licenses in any third party intellectual property for design, construction, operation, and closure of the WTP to U.S. Department of Energy (DOE) or such other third party as DOE may designate.

H.39 PATENT INDEMNITY - SUBCONTRACTS

Except as otherwise authorized by the Contracting Officer, the Contractor must obtain indemnification of the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a secrecy order by the Government) from the Contractor's subcontractors for any contract work subcontract in accordance with Federal Acquisition Regulation (FAR) 52.227-3.

H.40 GOVERNMENT-FURNISHED PROPERTY AND GOVERNMENT-FURNISHED EQUIPMENT

A list of government-furnished property and government-furnished-equipment is provided in Section J, Attachment C, *Government-Furnished Property and Government-Furnished Equipment*.

H.41 THIRD PARTIES

Nothing contained in this Contract or its amendments shall be construed to grant, vest, or create any rights in any person not a party to this Contract. This provision is not intended to limit or impair the rights, which any person may have under applicable Federal Statutes.

SECTION I

CONTRACT CLAUSES

SECTION I

CONTRACT CLAUSES

Clause No.	FAR/DEAR Reference	Title	Fill-In Information (See FAR 52.104(d))
I.1	FAR 52.202-1	Definitions (OCT 1995)	None
I.2	FAR 52.203-3	Gratuities (APR 1984)	None
I.3	FAR 52.203-5	Covenant Against Contingent Fees (APR 1984)	None
I.4	FAR 52.203-6	Restrictions on Subcontractor Sales to the Government (JUL 1995)	None
I.5	FAR 52.203-7	Anti-Kickback Procedures (JUL 1995)	None
I.6	FAR 52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity (JAN 1997)	None
I.7	FAR 52.203-10	Price or Fee Adjustment for Illegal or Improper Activity (JAN 1997)	None
I.8	FAR 52.203-12	Limitations on Payments to Influence Certain Federal Transactions (JUN 1997)	None
I.9	FAR 52.204-4	Printing/Copying Double-Sided on Recycled Paper (JUN 1996)	None
I.10	FAR 52.209-6	Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended or Proposed for Debarment (JUL 1995)	None
I.11	FAR 52.215-2	Audit and Records – Negotiation (JUN 1999)	None
I.12	FAR 52.215-8	Order of Precedence – Uniform Contract Format (OCT 1997)	None
I.13	FAR 52.215-11	Price Reduction for Defective Cost or Pricing Data–Modifications (OCT 1997)	None
I.14	FAR 52.215-13	Subcontractor Cost or Pricing Data–Modifications (OCT 1997)	None
I.15	FAR 52.215-15	Pension Adjustments and Asset Reversions (DEC 1998)	None
I.16	FAR 52.215-17	Waiver of Facilities Capital Cost of Money (OCT 1997)	None
I.17	FAR 52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other Than Pensions (OCT 1997)	None
I.18	FAR 52.215-19	Notification of Ownership Changes (OCT 1997)	None
I.19	FAR 52.216-7	Allowable Cost and Payment (MAR 2000)	None
	FAR 52.215-20	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data (OCT 1997)	None
I.20	FAR 52.216-10	Incentive Fee (MAR 1997)	(e) See Section B
I.21	FAR 52-219-4	Notice of Price Evaluation Preference for HUBZone Small Business Concerns (JAN 1999)	None
I.22	FAR 52.219-8	Utilization of Small Business Concerns (OCT 1999)	None
I.23	FAR 52.219-9	Small Business Subcontracting Plan (OCT 1999) – Alternate II (JAN 1999)	None
I.24	FAR 52.219-10	Incentive Subcontracting Program (FEB 2000)	(b) To Be Negotiated After Contract Award
I.25	FAR 52.219-16	Liquidated Damages – Subcontracting Plan (JAN 1999)	None
I.26	FAR 52.219-23	Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (OCT 1999)	(b) 0
I.27	FAR 52.219-25	Small Disadvantaged Business Participation Program – Disadvantaged Status and Reporting (OCT 1999)	None
I.28	FAR 52.219-26	Small Disadvantaged Business Participation Program – Incentive Subcontracting (FEB 2000)	(b) To Be Negotiated After Contract Award
I.29	FAR 52.222-1	Notice to the Government of Labor Disputes (FEB 1997)	None
I.30	FAR 52.222-3	Convict Labor (AUG 1996)	None
I.31	FAR 52.222-4	Contract Work Hours and Safety Standards Act – Overtime Compensation (JUL 1995)	None
I.32	FAR 52.222-6	Davis-Bacon Act (FEB 1988)	None
I.33	FAR 52.222-7	Withholding of Funds (FEB 1988)	None
I.34	FAR 52.222-8	Payrolls and Basic Records (FEB 1988)	None
I.35	FAR 52.222-9	Apprentices and Trainees (FEB 1988)	None
I.36	FAR 52.222-10	Compliance with Copeland Act Requirements (FEB 1988)	None
I.37	FAR 52.222-11	Subcontracts (Labor Standards) (FEB 1988)	None
I.38	FAR 52.222-12	Contract Termination – Debarment (FEB 1988)	None
I.39	FAR 52.222-13	Compliance with Davis-Bacon and Related Act Regulations (FEB 1988)	None
I.40	FAR 52.222-14	Disputes Concerning Labor Standards (FEB 1988)	None
I.41	FAR 52.222-15	Certification of Eligibility (FEB 1988)	None

Clause No.	FAR/DEAR Reference	Title	Fill-In Information (See FAR 52.104(d))
I.42	FAR 52.222-21	Prohibition of Segregated Facilities (FEB 1999)	None
I.43	FAR 52.222-26	Equal Opportunity (FEB 1999)	None
I.44	FAR 52.222-27	Affirmative Action Compliance Requirements for Construction (FEB 1999)	None
I.45	FAR 52.222-35	Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (APR 1998)	None
I.46	FAR 52.222-36	Affirmative Action for Workers with Disabilities (JUN 1998)	None
I.47	FAR 52.222-37	Employment Reports on Disabled Veterans and Veterans of the Vietnam Era (JAN 1995)	None
I.48	FAR 52.223-3	Hazardous Material Identification and Material Safety Data (JAN 1997) – Alternate I (JUL 1995)	(b) TBD
I.49	FAR 52.223-5	Pollution Prevention and Right-to-Know Information (APR 1998)	None
I.50	FAR 52.223-6	Drug-Free Workplace (JAN 1997)	None
I.51	FAR 52.223-14	Toxic Chemical Release Reporting (OCT 1996)	None
I.52	FAR 52.224-1	Privacy Act Notification (APR 1984)	None
I.53	FAR 52.224-2	Privacy Act (APR 1984)	None
I.54	FAR 52.225-5	Trade Agreements (APR 2000)	None
I.55	FAR 52.225-11	Buy American Act – Balance of Payments Program-Construction Materials under Trade Agreements (FEB 2000)	(b)(3) None
I.56	FAR 52.225-13	Restrictions on Certain Foreign Purchase (JUL 2000)	None
I.57	FAR 52.226-1	Utilization of Indian Organizations and Indian-Owned Economic Enterprises (FEB 2000)	None
I.58	FAR 52.227-1	Authorization and Consent (JUL 1995)	None
I.59	FAR 52.227-2	Notice and Assistance Concerning Patent and Copyright Infringement (AUG 1996)	None
I.60	FAR 52.227-3	Patent Indemnity (APR 1984)	None
I.61	FAR 52.227-6	Royalty Information (APR 1984)	None
I.62	FAR 52.227-23	Rights to Proposal Data (Technical) (JUN 1987)	TBD/TBD
I.63	FAR 52.230-2	Cost Accounting Standards (APR 1998)	None
I.64	FAR 52.230-6	Administration of Cost Accounting Standards (NOV 1999)	None
I.65	FAR 52.232-17	Interest (JUN 1996)	None
I.66	FAR 52.232-22	Limitation of Funds (APR 1984)	None
I.67	FAR 52.232-23	Assignment of Claims (JAN 1986)	None
I.68	FAR 52.232-25	Prompt Payment (JUN 1997)	(b) seventh
I.69	FAR 52.232-34	Payment of Electronic Funds Transfer – Other than Central Contractor Registration (MAY 1999)	None
I.70	FAR 52.233-1	Disputes (DEC 1998) Alternate I (DEC 1991)	None
I.71	FAR 52.233-3	Protest After Award (AUG 1996) – Alternate I (JUN 1985)	None
I.72	FAR 52.236-5	Material and Workmanship (APR 1984)	None
I.73	FAR 52.236-7	Permits and Responsibilities (NOV 1991)	None
I.74	FAR 52.236-8	Other Contracts (APR 1984)	None
I.75	FAR 52.236-18	Work Oversight in Cost-Reimbursement Construction Contracts (APR 1984)	None
I.76	FAR 52.236-19	Organization and Direction of the Work (APR 1984)	None
I.77	FAR 52.236-25	Requirements for Registration of Designers (APR 1984)	None
I.78	FAR 52.242-1	Notice of Intent to Disallow Costs (APR 1984)	None
I.79	FAR 52.242-3	Penalties for Unallowable Costs (OCT 1995)	None
I.80	FAR 52.242-4	Certification of Final Indirect Costs (JAN 1997)	None
I.81	FAR 52-242-13	Bankruptcy (JUL 1995)	None
I.82	FAR 52.243-2	Changes – Cost Reimbursement (AUG 1987) – Alternate III (APR 1984)	None
I.83	FAR 52.243-6	Change Order Accounting (APR 1984)	None
I.84	FAR 52.243-7	Notification of Changes (APR 1984)	(b) 10 days. (d) 30 days.
I.85	FAR 52.244-2	Subcontracts (AUG 1998)	(e) Operability and Commissioning Subcontract. (k) None.
I.86	FAR 52-244-5	Competition in Subcontracting (DEC 1996)	None
I.87	FAR 52-244-6	Subcontracts for Commercial Items and Commercial Components (OCT 1998)	None
I.88	FAR 52-245-5	Government Property (Cost Reimbursement, Time-and-Material, or Labor-Hour Contracts) (JAN 1986)	None

Clause No.	FAR/DEAR Reference	Title	Fill-In Information (See FAR 52.104(d))
I.89	FAR 52.247-1	Commercial Bill of Lading Notations (APR 1984)	(a) U.S. Department of Energy…(b) U.S. Department of Energy…Contract No. DE-AC27-01RV14136 ... U.S. Department of Energy, Office of River Protection, Office of Business Management and Administration, H6-60, P.O. Box 450, Richland, WA 99352
I.90	FAR 52.247-63	Preference for U.S.-Flag Air Carriers (JUN 1997)	None
I.91	FAR 52.247-64	Preference for Privately Owned U.S.-Flag Commercial Vessel (JUN 1997)	None
I.92	FAR 52.249-6	Termination (Cost Reimbursement) Alternate I (SEP 1996)	None
I.93	FAR 52.249-14	Excusable Delays (APR 1984)	None
I.94	FAR 52.251-1	Government Supply Sources (APR 1984)	None
I.95	FAR 52.251-2	Interagency Fleet Management System Vehicles and Related Services (JAN 1991)	None
I.96	FAR 52.252-2	Clauses Incorporated by Reference (FEB 1998)	http://www.arnet.gov/far; http://www.pr.doe.gov/dear.html
I.97	FAR 52.252-6	Authorized Deviations in Clauses (APR 1984)	(b) The use in this solicitation or contract of any Department of Energy Acquisition Regulation (48 CFR Part 9) Clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation
I.98	FAR 52.253-1	Computer Generated Forms (JAN 1991)	None
I.99	DEAR 952.202-1	Definitions (JAN 1997)	None
I.100	DEAR 952.208-7	Tagging of Leased Vehicles (APR 1984)	None
I.101	DEAR 952.208-70	Printing (APR 1984)	None
I.102	DEAR 952-216-7	Allowable Cost and Payment (JAN 1997)	None
I.103	DEAR 952.217-70	Acquisition of Real Property (APR 1984)	None
I.104	DEAR 952.222-70	Whistleblower Protection for Contractor Employees (APR 1999)	None
I.105	DEAR 952.223-71	Integration of Environment, Safety, and Health into Work Planning and Execution (JUN 1997)	None
I.106	DEAR 952.223-75	Preservation of Individual Occupational Radiation Exposure Records (APR 1984)	None
I.107	DEAR 952.224-70	Paperwork Reduction Act (APR 1994)	None
I.108	DEAR 952.245-5	Government Property (Cost Reimbursement, Time-and-Material, or Labor-Hour Contracts	None
I.109	DEAR 952.247-70	Foreign Travel (MAR 2000)	None
I.110	DEAR 952.250-70	Nuclear Hazards Indemnity Agreement (JUN 1996)	None
I.111	DEAR 952.251-70	Contractor Employee Travel Discounts (JUN 1995)	None
I.112	DEAR 970.5204-9	Accounts, Records, and Inspection (MAY 2000)	None
I.113	DEAR 970.5204-31	Insurance -- Litigation and Claims (JUN 1997)	The reference in paragraph e(2) to 48 CFR 970.5204-15 is changed to 48 CFR 52.232-22
I.114	DEAR 970.5204-58	Workplace Substance Abuse Programs at DOE Sites (AUG 1992)	None
I.115	DEAR 970.5204-72	Patent Rights Acquisition by the Government (SEP 1997)	None
I.116	DEAR 970.5204-77	Workforce Restructuring Under Section 3161 of the National Defense Authorization Act for Fiscal Year 1993 (JUN 1997)	None
I.117	DEAR 970.5204-78	Laws, Regulations, and DOE Directives (JUN 1997)	None
I.118	DEAR 970.5204-79	Access to and Ownership of Records (JUN 1997)	(b)(1) through (b)(5) are Contractor-owned records

I.119 DEAR 970.5204-82 RIGHTS IN DATA—FACILITIES (FEB 1998)

(a) Definitions.

(1) Computer data bases, as used in this Clause, means a collection of data in a form capable of, and for the purpose of, being stored in, processed, and operated on by a computer. The term does not include computer software.

(2) Computer software, as used in this Clause, means (i) computer programs which are data comprising a series of instructions, rules, routines, or statements, regardless of the media in which recorded, that allow or cause a computer to perform a specific operation or series of operations and (ii) data comprising source code listings, design details, algorithms, processes, flow charts, formulae, and related material that would enable the computer program to be produced, created, or compiled. The term does not include computer data bases.

(3) Data, as used in this Clause, means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data and computer software. The term "data" does not include data incidental to the administration of this contract, such as financial, administrative, cost and pricing, or management information.

(4) Limited rights data, as used in this Clause, means data, other than computer software, developed at private expense that embody trade secrets or are commercial or financial and confidential or privileged. The Government's rights to use, duplicate, or disclose limited rights data are as set forth in the Limited Rights Notice of subparagraph (e) of this Clause.

(5) Restricted computer software, as used in this Clause, means computer software developed at private expense and that is a trade secret; is commercial or financial and is confidential or privileged; or is published copyrighted computer software, including minor modifications of any such computer software. The Government's rights to use, duplicate, or disclose restricted computer software are as set forth in the *Restricted Rights Notice* of paragraph (f) of this Clause.

(6) Technical data, as used in this Clause, means recorded data, regardless of form or characteristic, that are of a scientific or technical nature. Technical data does not include computer software, but does include manuals and instructional materials and technical data formatted as a computer data base.

(7) Unlimited rights, as used in this Clause, means the rights of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, including by electronic means, and perform publicly and display publicly, in any manner, including by electronic means, and for any purpose whatsoever, and to have or permit others to do so.

(b) Allocation of Rights.

(1) The Government shall have:

(i) Ownership of all technical data and computer software first produced in the performance of this Contract;

(ii) Unlimited rights in technical data and computer software specifically used in the performance of this Contract, except as provided herein regarding copyright, limited rights data, or restricted computer software, or except for other data specifically protected by statute for a period of time or, where, approved by DOE, appropriate instances of the DOE Work for Others Program;

(iii) The right to inspect technical data and computer software first produced or specifically used in the performance of this Contract at all reasonable times. The Contractor shall make available all necessary facilities to allow DOE personnel to perform such inspection;

(iv) The right to have all technical data and computer software first produced or specifically used in the performance of this Contract delivered to the Government or otherwise disposed of by the Contractor, either as the Contracting Officer may from time to time direct during the progress of the work or in any event as the Contracting Officer shall direct upon completion or termination of this Contract. The Contractor agrees to leave a copy of such data at the facility or plant to which such data relate, and to make available for access or to deliver to the Government such data upon request by the Contracting Officer. If such data are limited rights data or restricted computer software, the rights of the Government in such data shall be governed solely by the provisions of paragraph (e) of this Clause (*Rights in Limited Rights Data*) or paragraph (f) of this Clause (*Rights in Restricted Computer Software*); and

(v) The right to remove, cancel, correct, or ignore any markings not authorized by the terms of this Contract on any data furnished hereunder if, in response to a written inquiry by DOE concerning the propriety of the markings, the Contractor fails to respond thereto within 60 days or fails to substantiate the propriety of the markings. In either case DOE will notify the Contractor of the action taken.

(2) The Contractor shall have:

(i) The right to withhold limited rights data and restricted computer software unless otherwise provided in accordance with the provisions of this Clause; and

(ii) The right to use for its private purposes, subject to patent, security or other provisions of this Contract, data it first produces in the performance of this Contract, except for data in DOE's Uranium Enrichment Technology, including diffusion, centrifuge, and atomic vapor laser isotope separation, provided the data requirements of this Contract have been met as of the date of the private use of such data.

(3) The Contractor agrees that for limited rights data or restricted computer software or other technical, business or financial data in the form of recorded information which it receives from, or is given access to, by DOE or a third party, including a DOE contractor or subcontractor, and for technical data or computer software it first produces under this Contract which is authorized to be marked by DOE, the Contractor shall treat such data in accordance with any restrictive legend contained thereon.

(c) Copyrighted Material.

(1) The Contractor shall not, without prior written authorization of the Patent Counsel, assert copyright in any technical data or computer software first produced in the performance of this contract. To the extent such authorization is granted, the Government reserves for itself and others acting on its behalf, a nonexclusive, paid-up, irrevocable, world-wide license for Governmental purposes to publish, distribute, translate, duplicate, exhibit, and perform any such data copyrighted by the Contractor.

(2) The Contractor agrees not to include in the technical data or computer software delivered under the contract any material copyrighted by the Contractor and not to knowingly include any material copyrighted by others without first granting or obtaining at no cost a license therein for the benefit of the Government of the same scope as set forth in paragraph (c)(1) of this Clause. If the Contractor believes that such copyrighted material for which the license cannot be obtained must be included in the technical data or computer software to be delivered, rather than merely incorporated therein by reference, the Contractor shall obtain the written authorization of the Contracting Officer to include such material in the technical data or computer software prior to its delivery.

(d) Subcontracting.

(1) Unless otherwise directed by the Contracting Officer, the Contractor agrees to use in subcontracts in which technical data or computer software is expected to be produced or in subcontracts for supplies that contain a requirement for production or delivery of data in accordance with the policy and procedures of 48 CFR (FAR) Subpart 27.4 as supplemented by 48 CFR (DEAR) 927.401 through 927.409, the Clause entitled, *Rights in Data-General* at 48 CFR 52.227-14 modified in accordance with 927.409(a) and including Alternate V. Alternates II through IV of that Clause may be included as appropriate with the prior approval of DOE Patent Counsel, and the Contractor shall not acquire rights in a subcontractor's limited rights data or restricted computer software, except through the use of Alternates II or III, respectively, without the prior approval of DOE Patent Counsel. The Clause at FAR 52.227-16, *Additional Data Requirements*, shall be included in subcontracts in accordance with DEAR 927.409(h). The Contractor shall use instead the *Rights in Data-Facilities* Clause at DEAR 970.5204-82 in subcontracts, including subcontracts for related support services, involving the design or operation of any plants or facilities or specially designed equipment for such plants or facilities that are managed or operated under its contract with DOE.

(2) It is the responsibility of the Contractor to obtain from its subcontractors technical data and computer software and rights therein, on behalf of the Government, necessary to fulfill the Contractor's obligations to the Government with respect to such data. In the event of refusal by a subcontractor to accept a Clause affording the Government such rights, the Contractor shall:

(i) Promptly submit written notice to the Contracting Officer setting forth reasons or the subcontractor's refusal and other pertinent information which may expedite disposition of the matter, and

(ii) Not proceed with the subcontract without the written authorization of the Contracting Officer.

(3) Neither the Contractor nor higher-tier subcontractors shall use their power to award subcontracts as economic leverage to acquire rights in a subcontractor's limited rights data or restricted computer software for their private use.

(e) Rights in Limited Rights Data.

Except as may be otherwise specified in this Contract as data which are not subject to this paragraph, the Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, paid-up license by or for the Government, in any limited rights data of the Contractor and shall obtain an equivalent license in any limited rights data of its subcontractors specifically used in the performance of this Contract, provided, however, that to the extent that any limited rights data when furnished or delivered is specifically identified by the Contractor at the time of initial delivery to the Government or a representative of the Government, such data shall not be used within or outside the Government except as provided in the *Limited Rights Notice* set forth. All such limited rights data shall be marked with the following:

Limited Rights Notice

These data contain "limited rights data," furnished under Contract No. DE-AC27-01RV14136 with the United States Department of Energy which may be duplicated and used by the Government with the express limitations that the ”limited rights data" may not be disclosed outside the Government or be used for purposes of manufacture without prior permission of the Contractor, except that further disclosure or use may be made solely for the following purposes:

(a) Use (except for manufacture) by support services contractors within the scope of their contracts;

(b) This "limited rights data" may be disclosed for evaluation purposes under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;

(c) This "limited rights data" may be disclosed to other contractors participating in the Government's program of which this Contract is a part for information or use in connection with the work performed under their contracts and to prospective bidders on any contracts for this program, and under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;

(d) This "limited rights data" may be used by the Government or others on its behalf for emergency repair or overhaul work under the restriction that the "limited rights data" be retained in confidence and not be further disclosed; and

(e) Release to a foreign government, or instrumentality thereof, as the interests of the United States Government may require, for information or evaluation, or for emergency repair or overhaul work by such government. This Notice shall be marked on any reproduction of this data in whole or in part.

(End of Notice)

(f) Rights in Restricted Computer Software.

(1) Except as may be otherwise specified in this Contract as data which are not subject to this paragraph, the Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, paid-up, license by or for the Government, in any restricted computer software of the Contractor specifically used in the performance of this Contract, provided, however, that to the extent that any restricted computer software when furnished or delivered is specifically identified by the Contractor at the time of initial delivery to the Government or a representative of the Government, such data shall not be used within or outside the Government except as provided in the *Restricted Rights Notice* set forth below. All such restricted computer software shall be marked with the following "Restricted Rights Notice":

Restricted Rights Notice-Long Form

(a) This computer software is submitted with restricted rights under U.S. Department of Energy Contract No. DE-AC27-01RV14136. It may not be used, reproduced, or disclosed by the Government except as provided in paragraph (b) of this notice.

(b) This computer software may be:

(1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;

(2) Used, copied for use, in a backup or replacement computer if any computer for which it was acquired is inoperative or is replaced.

(3) Reproduced for safekeeping (archives) or backup purposes;

(4) Modified, adapted, or combined with other computer software, provided that only the portions of the derivative software consisting of the restricted computer software are to be made subject to the same restricted rights; and

(5) Disclosed to and reproduced for use by contractors under a service contract (of the type defined in FAR 37.101) in accordance with subparagraphs (b)(1) through (4) of this Notice, provided the Government makes such disclosure or reproduction subject to these restricted rights.

(6) Disclosed to other contractors participating in the Government's program of which this Contract is a part for information or use in connection with the work performed under their contracts and to prospective bidders on any contracts for this program, and under the restriction that the "restricted computer software" be retained in confidence and not further disclosed.

(c) Notwithstanding the foregoing, if this computer software has been published under copyright, it is licensed to the Government, without disclosure prohibitions, with the rights set forth in the restricted rights notice above.

(d) This Notice shall be marked on any reproduction of this computer software, in whole or in part.

(End of Notice)

(2) Where it is impractical to include the *Restricted Rights Notice* on restricted computer software, the following short-form Notice may be used in lieu thereof:

Restricted Rights Notice--Short Form

Use, reproduction, or disclosure is subject to restrictions set forth in the Long Form Notice of DOE Contract No. DE-AC27-01RV14136 with (name of Contractor).

(End of Notice)

(3) If the software is embedded, or if it is commercially impractical to mark it with human readable text, then the symbol R and the Clause date (mo/yr), in brackets or a box, a [R-mo/yr], may be used. This will be read to mean restricted computer software, subject to the rights of the Government as described in the Long Form Notice, in effect as of the date indicated next to the symbol. The symbol shall not be used to mark human readable material. In the event this Contract contains any variation to the rights in the Long Form Notice, then the contract number must also be cited.

(4) If restricted computer software is delivered with the copyright notice of 17 U.S.C. 401, the software will be presumed to be published copyrighted computer software licensed to the Government without disclosure prohibitions and with unlimited rights, unless the Contractor includes the following statement with such copyright notice "Unpublished-rights reserved under the Copyright Laws of the United States."

(g) Relationship to patents. Nothing contained in this Clause creates or is intended to imply a license to the Government in any patent or is intended to be construed as affecting the scope of any licenses or other rights otherwise granted to the Government under any patent.

SECTION J

LIST OF ATTACHMENTS

SECTION J

LIST OF ATTACHMENTS

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SECTION J – LIST OF ATTACHMENTS
ATTACHMENT A – LIST OF ACRONYMS

The following list of acronyms may be used in this contract.

ACWP	Actual Cost of Work Performed
ADR	Alternative Dispute Resolution
AFL-CIO	American Federation of Labor-Congress of Industrial Organizations
ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
ANSI	American National Standards Institute
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
B&R	Budgeting and Reporting
CD-ROM	Compact Disc-Read Only Memory
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	Code of Federal Regulations
CO	Contracting Officer
COR	Contracting Officer Representative
CPI	Cost Performance Index
CPIF	Cost Plus Incentive Fee
CSPI	Cost and Schedule Performance Index
DEAR	Department of Energy Acquisition Regulation
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
ECOLOGY	Washington State Department of Ecology
EMR	Experience Modification Rate
EPA	U.S. Environmental Protection Agency
EPCRA	*Emergency Planning and Community Right-To-Know Act of 1986*
ERISA	*Employee Retirement Income Security Act of 1974*
ES&H	Environment(al), Safety and Health
ESQ&H	Environment(al), Safety, Quality and Health
FAR	Federal Acquisition Regulation
FOCI	Foreign Ownership, Control or Influence
FY	Fiscal Year
HLW	High-Level Waste
HUBZone	Historically Underutilized Business Zone
HWMA	*Hazardous Waste Management Act*
ICD	Interface Control Document
ISMS	Integrated Safety Management System
JOBBS	Job Opportunities Bulletin Board System
LAW	Low Activity Waste
LDR	Land Disposal Restrictions
MEPP	Multiple Employer Pension Plan
MS	Mail Stop
MSDS	Material Safety Data Sheet
MTG	Metric Tons of Glass
NEPA	*National Environmental Policy Act of 1969*
NQA	Nuclear Quality Assurance
NOC	Notice of Construction
NOV	Notice of Violation
NOAV	Notice of Alleged Violation
NRC	Nuclear Regulatory Commission
NTE	Not to Exceed
OCI	Organizational Conflict of Interest

ORP	U.S. Department of Energy, Office of River Protection
OSHA	Occupational, Safety and Health Administration
PBS	Project Breakdown Structure
PSD	Prevention of Significant Deterioration
PAAA	*Price Anderson Amendments Act of 1988*
PL	Public Law
PCB	Polychlorinated biphenyls
PPA	*Pollution Prevention Act of 1990*
ppm	Parts Per Million
QARD	Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program
RCRA	*Resource Conservation and Recovery Act of 1976*
RFP	Request for Proposal
RL	U.S. Department of Energy, Richland Operations Office
ROD	Record of Decision
RPP	River Protection Project
SAS	Safeguards and Security
SEB	Source Evaluation Board
SF	Standard Form
SIC	Standard Industrial Classification
SPI	Schedule Performance Index
SRD	Safety Requirements Document
TBD	To Be Determined
TIN	Taxpayer Identification Number
TPA	*Hanford Federal Facility Agreement and Consent Order* (also known as Tri-Party Agreement)
TRU	Transuranic (waste)
TSCA	*Toxic Substances Control Act of 1976*
TSR	Technical Safety Requirements
UCNI	Unclassified Controlled Nuclear Information
USC	United States Code
WAC	Washington Administrative Code
WBS	Work Breakdown Structure
WDOH	Washington State Department of Health
WTP	Hanford Tank Waste Treatment and Immobilization Plant

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT B

Reserved

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT C
GOVERNMENT-FURNISHED PROPERTY AND GOVERNMENT-FURNISHED EQUIPMENT

Government-Furnished Property and Government-Furnished Equipment as referenced in Section C.9, *Interface Control Documents*.

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT D – SMALL BUSINESS SUBCONTRACTING PLAN

Hanford Waste Treatment and Immobilization Plant
Small Business Subcontracting Plan

Name of Contractor: Bechtel National, Inc.

Address: 45 Fremont Street
San Francisco, CA 94105

Solicitation Number: DE-RP27-00RV14136

This subcontracting plan describes our approach to involving HUBZone small business, small business, small disadvantaged business, and women-owned small business concerns to the maximum extent practicable in the design, construction, and commissioning of Hanford's Waste Treatment and Immobilization Plant (WTP) for DOE.

We support DOE's strong, long-term commitment to diversity. We believe that diversity is much more than affirmative action in the workplace. For us, it is an operating principle of management that plays a key role in our success. Our belief in diversity—transformed into action—provides us with a competitive advantage over other organizations, both in the workplace and in the business community. Diversity in subcontracting provides vital links to the local community, increases our flexibility in meeting project goals, strengthens the local economy, creates new opportunities, is cost effective, and represents best business practices.

We have a long-established record of involving small business concerns in meaningful roles in government and commercial contracting. By building on our experience and by setting challenging and aggressive goals, we have made small business participation and development an integral aspect of our approach to project execution. We will follow this approach for the WTP project.

In executing the WTP project, we will comply with FAR 52.219-8 and 52.219-9, prime contract requirements, and current DOE policies and practices. Our policy is to aggressively encourage participation of small business concerns to the maximum extent practicable consistent with efficient performance of WTP scope of work. All procurements are reviewed to identify opportunities for including small business suppliers and contractors, developing good working relationships with them, and encouraging them to offer their products and services to the WTP project.

Total estimated dollars available for subcontracting: $2,379,000,000

Category	Percentage of Total Estimated Subcontracting Effort	Dollar Amount
Total planned and available for subcontracting to SB concerns	46	$1,094,340,000
Total planned and available for subcontracting to HUBZone SB concerns (included in SB concern numbers)	1.5	35,685,000
Total planned and available for subcontracting to SDB concerns (included in SB concern numbers)	12	285,480,000
Total planned and available for subcontracting to 8(a)-certified SB concerns (included in SB concern numbers)	3	71,370,000
Total planned and available for subcontracting to WOSB concerns (included in SB and partially in SDB concern numbers)	5	118,950,000
Total planned and available subcontracting to NAB concerns (included in SB concern numbers)	1	23,790,000
Total dollars to Washington/Oregon-based business concerns (includes large and small business)	25	594,750,000
Total number of actions to Washington/Oregon-based business concerns (includes large and small business)	75	N/A

1. and 2. Goals (Percentages and Dollar Value)

Figure d.1-1 shows our small business, HUBZone business, small disadvantaged business, women-owned small business, and Native American business goals expressed in percentages of total planned subcontracting dollars as well as estimated dollars .

3. Potential Subcontracting Opportunities for Small Business

Figure d.1-2 lists the principal categories of subcontracting opportunities that will be made available for small business concerns. The categories shown are for general work groupings only. As additional opportunities are identified, the list will be expanded and goal percentages revised accordingly. Opportunities that are directed, or for which there is only a single supplier, are not considered available and are therefore not included in these goals.

4. Method Used to Develop Subcontracting Goals

To establish our subcontracting goals and commitments, we gathered available WTP information, forecast probable acquisition needs, and analyzed project estimates. We also used our collective DOE experience to determine potential requirements and contingencies. Our subcontracting goals are both realistic and attainable.

5. Methods Used to Identify Potential Sources for Solicitation

We continually identify and review potential sources of supplies and services, including, but not limited to, the following:

- Online access to U.S. Small Business Administration PRONET
- Our proprietary Supplier Information System, which includes past performance data
- National Minority Purchasing Council Vendor Information Services
- Historical reports and data showing products and services obtained from small business concerns by other associate contractors
- Various directories and source lists such as the:
  - Minority Supplier Development Council
  - Local U.S. Small Business Administration listings
  - National Association of Minority Contractors
  - MBISYS (National Minority Supplier

Subcontracting Opportunities	HUBZone	SB	SDB	WOSB
Computer equipment	■	■	■	■
Office furniture		■	■	■
Office supplies		■		■
Communication equipment		■	■	
Electrical and electronic supplies		■	■	■
Fuel and petroleum products		■		
Lab equipment and supplies		■	■	■
Small tools		■	■	
Construction equipment		■	■	
Building materials		■	■	
Site preparation		■	■	
Temporary construction	■	■	■	
Structural steel construction	■	■		
Batch plant construction		■		
Yard piping		■	■	
Nondestructive examination		■		
Civil testing		■		
Surveying services		■	■	
Security services		■		
Insulation		■		
Cooling towers D/B		■		
Building siding		■		
Roofing		■		
HVAC		■	■	
Administration building D/B		■		
Finish grading		■	■	
Fire protection		■		
Facilities maintenance and repair	■	■	■	
Road maintenance and repair		■	■	
Maintenance services (janitorial/equipment)		■	■	■
Technical and personal services		■		■
Computer service/maintenance		■	■	■
Administrative services (printing/copying/advertising)		■		■

SBP Matrix

Figure d.1-2. Principal Categories of Subcontracting Opportunities.

Development Council database)

- Dun & Bradstreet Procurement Planning Directory for Small Business Products and Services
- National Minority Business Directory, "Try Us!"
- Minority Business Development Agency– Department of Commerce
- "Funded Organizations," published by U.S. Minority Business Development Agency
- "National Directory of Minority-Owned Business Information System," published by Business Research Services, Inc.
- "Minority and Women-Owned Business Information System," published by Source Publications, Inc.
- "Minority-Owned High Technology Business Directory," published by Business Research Services, Inc.

- Bechtel-sponsored small business fairs and forums designed to attract additional small business sources

6. Indirect Costs

Indirect costs are not included in the goals under this plan.

7. Administrator of Subcontracting Plan

Mr. Tom Doolittle, Procurement Manager, is designated to administer this Subcontracting Plan. He will manage the following activities and ensure they are performed efficiently and effectively:

- Maintain source lists of potential small business subcontractors.
- When the number of prospective sources is not adequate, seek out other small businesses through the use of mass media tools such as Internet bulletin boards.
- Mentor existing small businesses currently under subcontract, enhancing their ability to provide timely, cost-effective, and quality services.
- Advise and train project management personnel on the purposes of this plan and foster support.
- Keep records measuring performance against the goals established here.
- Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and SF 295, Summary Subcontract Report, in accordance with the prime contract and instructions provided by the DOE Contracting Officer.
- Verify that subcontracts contain the flowdown clauses pertaining to small business concerns when required and maintain the policies and procedures required by the prime contract.
- Maintain good working relationships with Small Business Administration representatives to obtain assistance and coordination in finding capable small businesses.
- Maintain a close working relationship with DOE to ensure that our project objectives and activities are consistent with DOE programs.
- Require lower-tier subcontractors to submit subcontracting plans and monitor for compliance with those plans.
- Make monthly reports to our President and General Manager concerning progress toward achievement of goals under this program.

8. Implementation

The following additional functions will be performed to effectively implement this plan.

- Package solicitations (including time for preparation, scope of work, quantities, specifications, and delivery schedules) to facilitate participation by small businesses in subcontracting opportunities and solicitation, offer, and proposal activities.
- Establish and maintain contacts with small business trade associations and business development organizations.
- Conduct internal workshops, seminars, and training programs to ensure that internal customers and buyers are acquainted with our policies and prime contract requirements, and to ensure that, externally, small businesses are familiar with requirements for doing business on the WTP project.
- Maintain an effective outreach program by sponsoring and attending regional procurement conferences, trade fairs, and other functions, to locate additional qualified sources.
- Implement an ongoing "inreach" program that gives small businesses access and exposure to key project planners and managers.
- Develop a comprehensive small business source list (which includes past performance) that is easily accessible and useful to buyers.
- Preselect and qualify small business

concerns to perform specific scopes of work.

- Structure the program to help develop the capabilities and quality of services provided by small business suppliers and subcontractors currently performing work on the WTP project.

9. Subcontract Terms and Conditions

We incorporate the flowdown clause requirements of FAR 52.219-9 as applicable into subcontracts that offer further subcontracting opportunities. This requires all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1 million for construction of any public facility) to adopt a similar plan. Our Procurement Manager will be responsible for implementing and monitoring this aspect of the Subcontracting Plan.

10. Reports, Studies, and Surveys

We will (i) cooperate in any studies or surveys as may be required; (ii) submit periodic reports to allow the government to determine the extent of our compliance with this Subcontracting Plan; (iii) submit SF 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with the instructions on the forms as provided in agency regulations; and (iv) ensure that our subcontractors agree to submit SF 294 and SF 295.

11. Records

The types of records that will be maintained to demonstrate the procedures adopted to ensure compliance with the requirements and goals of the Subcontracting Plan include:

(i) source lists (e.g., PRONET), guides, and other data that identify small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns;

(ii) organizations contacted in an attempt to locate sources that are small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns;

(iii) records on each subcontract solicitation resulting in an award of more than $100,000 indicating:
- whether small business concerns were solicited and, if not, why not;
- whether HUBZone small business concerns were solicited and, if not, why not;
- whether small disadvantaged business concerns were solicited and, if not, why not;
- whether women-owned small business concerns were solicited and, if not, why not; and
- if applicable, the reason award was not made to a small business concern;

(iv) records of any outreach efforts to contact
- trade associations,
- business development organizations,
- conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources;

(v) records of internal guidance and encouragement provided to buyers through
- workshops, seminars, training, etc., and
- monitoring of performance to evaluate compliance with program requirements; and

(vi) on a contract-by-contract basis, records to support award data submitted by the offeror to the government, including the name, address, and business size of each subcontractor.

SUBMITTED BY: 

Signature: _____

Typed Name: Ron Naventi

Title: Senior Vice President, Bechtel National, Inc.

Date: 10/18/2000

PLAN ACCEPTED BY:

Signature: _____

Typed Name: Michael K. Barrett

Title: Contracting Officer

Date: December 11, 2000

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT E – LIST OF APPLICABLE DIRECTIVES (LIST B-DEAR 970.5204.78)

(a) Environmental, safety and health (ES&H) requirements appropriate for work conducted under this Contract that have been determined by a DOE approved process to evaluate the work and the associated hazards and identify an appropriately tailored set of standards, practices and controls:

DOCUMENT NUMBER	DATE	TITLE
BNFL-5193-SRD-01, Rev 2	12/02/98	Tank Waste Remediation System Privatization Project-Safety Requirements Document
DOE/RL-96-0003	07/98	DOE Regulatory Process for Radiological, Nuclear and Process Safety Regulation of the RPP Waste Treatment Plant Contractor
DOE/RL-96-0004	07/98	Process for Establishing a Set of Radiological, Nuclear and Process Safety Standards and Requirements for the RPP Waste Treatment Plant Contractor
DOE/RL-96-0005	07/98	Concept of the DOE Regulatory Process for Radiological, Nuclear and Process Safety Regulation of the RPP Waste Treatment Plant Contractor
DOE/RL-96-0006	07/98	Top-Level Radiological, Nuclear and Process Safety Standards and Principles for the RPP Waste Treatment Plant Contractor
RL/REG-97-13	07/17/00	Regulatory Unit Position on Contractor-Initiated Changes to the Authorization Basis
RL/REG-98-05	07/01/99	Inspection Program Description for the Regulatory Oversight for the RPP-WTP Contractor
RL/REG-98-06	06/30/99	Corrective Action/Enforcement Action Program Description
RL/RE-98-14	06/29/98	Regulatory Unit Position on New Safety Information and Back-fits
RL/REG-2000-04	06/30/00	Industrial Hygiene and Safety Regulatory Plan

(b) Additional Directives applicable to this Contract. The directive(s) or applicable section(s) of the directive(s) are applied as specified in other Sections of this Contract.

DOCUMENT NUMBER	DATE	TITLE
DOE M 140.1-1A	01/26/99	Interface with Defense Nuclear Facilities Safety Board
DOE M 231.1-1	01/28/00	Environment, Safety and Health Reporting Manual
DOE M 232.1-1A	07/21/97	Occurrence Reporting and Processing of Operations Information
DOE M 435.1-1	07/09/99	Radioactive Waste Management Manual
DOE 0 231.1	11/07/96	Environment, Safety and Health Reporting
DOE 0 241.1	08/17/98	Scientific and Technical Information Management
DOE 0 350.1	05/08/98	Contractor Human Resource Management Program
DOE 0 414.1A	09/29/99	Quality Assurance
DOE 0 430.1A	10/14/98	Life-Cycle Asset Management
DOE 0 5480.29	01/15/93	Employee Concerns Management System
DOE/EM-0093	12/96	Waste Acceptance Product Specifications for Vitrified High Level Waste Forms (WAPS)
DOE/ORP-2000-06	09/27/00	River Protection Project, Project Management Plan
DOE/RL-88-21	10/01/96 12/21/99	Double-Shell Tank Unit Permit Application
DOE/RL-94-02	04/95	Hanford Emergency Response Plan
DOE/RL-96-0002	02/96	Top-Level Safeguards and Security Requirements for TWRS Privatization

DOCUMENT NUMBER	DATE	TITLE
DOE/RW-0333P	04/28/00	Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program (QARD)
DOE/RW-0351P	04/99	Waste Acceptance System Requirements Document (WASRD)
PL-W375-MG00004	02/22/00	Safeguards and Security Program

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT F – KEY PERSONNEL

Name	Position
Ronald F. Naventi	Project Manager
Edward T. Molnar	Deputy Project Manager
James Q. Hicks	Area Project Manager, Balance of Facilities
Phillip W. Schuetz	Area Project Manager, High-Level Waste
Robert E. Lawrence	Area Project Manager, Low-Activity Waste
Richard M. Keenan	Area Project Manager, Pretreatment
Fred Beranek	ES&H
George T. Shell	Quality Assurance
William G. Poulson	Operations Manager
Todd Wright	Research and Technology
Kenneth J. Rueter	Process Technology
Neil Brosee	Commissioning
Fred B. Marsh	Engineering Manager
William T. Clements	Construction Manager
John R. (Jack) Monrean	Labor Relations
William L. Wagner	Business/Project Controls Manager
Thomas C. Doolittle	Procurement
Timothy C. Green	Human Resources

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT G – PERFORMANCE GUARANTEE AGREEMENT

For value received, and in consideration of: and in order to induce the United States (the Government) to enter into Contract DE-AC27-01RV14136 for the design, construct, and commission of the Waste Treatment and Immobilization Plant (WTP) to treat and immobilize Hanford tank waste (Contract dated, December 11, 2000), by and between the Government and Bechtel National, Inc. (Contractor), the undersigned, Bechtel National, Inc.(Guarantor), a corporation incorporated in the State of Nevada with its principle place of business at 45 Fremont Street, San Francisco, CA 94105, hereby unconditionally guarantees to the Government (a) the full and prompt payment and performance of all obligations, accrued and executory, which Contractor presently or hereafter may have to the Government under the Contract, and (b) the full and prompt payment and performance by Contractor of all obligations and liabilities of Contractor to the Government, fixed or contingent, due or to become due, direct or indirect, now existing or hereafter and howsoever arising or incurred under the Contract, and Guarantor further agrees to indemnify the Government against any losses the Government may sustain and expenses it may incur as a result of the enforcement or attempted enforcement by the Government of any of its rights and remedies under the Contract, in the event of a default by Contractor hereunder, and/or as a result of the enforcement or attempted enforcement by the Government of any of its rights against Guarantor hereunder.

Guarantor has read and consents to the signing of the Contract. Guarantor further agrees that Contractor shall have the full right, without any notice to or consent from Guarantor, to make any and all modifications or amendments to the Contract without affecting, impairing, or discharging, in a whole or in part, the liability of Guarantor hereunder.

Guarantor hereby expressly waives all defenses which might constitute a legal or equitable discharge of a surety or guarantor, and agrees that this Performance Guarantee Agreement shall be valid and unconditionally binding upon Guarantor regardless of (i) the reorganization, merger, or consolidation of Contractor into or with another entity, corporate or otherwise, or the liquidation or dissolution of Contractor, or the sale or other disposition of all or substantially all of the capital stock, business or assets of Contractor to any other person or party, or (ii) the institution of any bankruptcy, reorganization, insolvency, debt agreement, or receivership proceedings by or against Contractor, or adjudication of Contractor as a bankrupt, or (iii) the assertion by the Government against the Contractor of any of the Governments rights and remedies provided for under the Contract, including any modifications or amendments thereto, or under any other document(s) or instrument(s) executed by Contractor, or existing in the Government's favor in law, equity, or bankruptcy.

Guarantor further agrees that its liability under this Performance Guarantee Agreement shall be continuing, absolute, primary, and direct, and that the Government shall not be required to pursue any right or remedy it may have against Contractor or other Guarantors under the Contract, or any modifications or amendments thereto, or any other document(s) or instrument(s) executed by Contractor, or otherwise. Guarantor affirms that the Government shall not be required to first commence any action or obtain any judgment against Contractor before enforcing this Performance Guarantee Agreement against Guarantor, and that Guarantor will, upon demand, pay the Government any amount, the payment of which is guaranteed hereunder and the payment of which by Contractor is in default under the Contractor or under any other document(s) or instrument(s) executed by Contractor as aforesaid, and that Guarantor will, upon demand, perform all other obligations of Contractor, the performance of which by Contractor is guaranteed hereunder.

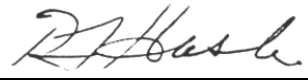
Guarantor agrees to assure that it shall cause this Performance Guarantee Agreement to be unconditionally binding upon any successor(s) to its interests regardless of (i) the reorganization, merger, or consolidation of Guarantor into or with another entity, corporate or otherwise, or the liquidation or dissolution of Guarantor, or the sale or other disposition of all or substantially all of the capital stock, business, or assets of Guarantor to any other person or party, or (ii) the institution of any bankruptcy, reorganization, insolvency, debt agreement, or receivership proceedings by or against Guarantor, or adjudication of Guarantor as a bankrupt.

Guarantor further warrants and represents to the Government that the execution and delivery of this Performance Guarantee Agreement is not in contravention of Guarantor's Articles of Organization, Charter, bylaws, and applicable law; that the execution and delivery of this Performance Guarantee Agreement, and the performance thereof, has been duly authorized by the Guarantor's Board of Directors, Trustees, or any other management board which is required to participate in such decisions; and that the execution, delivery, and performance of this Performance Guarantee Agreement will not result in a breach of, or constitute a default under, any loan agreement, indenture, or contract to which Guarantor is a party or by or under which it is bound.

No express or implied provision, warranty, representation or term of this Performance Guarantee Agreement is intended, or is to be construed, to confer upon any third person(s) any rights or remedies whatsoever, except as expressly provided in this Performance Guarantee Agreement.

In witness thereof, Guarantor has caused this Performance Guarantee Agreement to be executed by its duly authorized officer, and its corporate seal to be affixed hereto on.

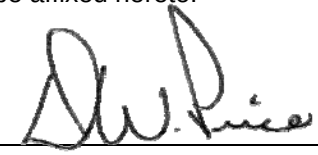
BECHTEL NATIONAL, INC.



T. F. Hash, President

GUARANTEE AGREEMENT ON
BEHALF OF GUARANTOR

I, D.W. Price, certify that I am the Assistant Secretary of the corporation named as Guarantor herein; that T.F. Hash who signed this certificate on behalf of the Guarantor, was then President of said corporation; that said certificate was duly signed for and in behalf of said corporation, and is within the scope of its corporate powers; that I have caused the corporate seal to be affixed hereto.



D. W. Price, Assistant Secretary

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT H
TANK FARM CONTRACTOR STAFF AND SUBCONTRACTORS EMPLOYED ON THE WTP PROJECT

Staffing

The Tank Farm Contractor hired a total of 183 staff from BNFL Inc. and Bechtel National Inc. that were previously supporting the Waste Treatment and Immobilization Plant (WTP) activities; approximately 138 are currently identified as available for transition to the WTP Contractor. Discipline and experience are as follows:

INTERIM DESIGN CONTRACTOR EMPLOYEES EXPERIENCE
SUMMARY AS OF 8/30/00

DISCIPLINE	SENIOR LEVEL	JUNIOR LEVEL (1-5 Years)	YEARS EXPERIENCE	AVERAGE YEARS EXPERIENCE
Engineers:				
Managers	2	0	18-30	18
Process Engineers	9	2	1-33	16
Civil/Structural	7	1	1-35	23
Mechanical	17	5	1-33	18
HVAC	21	0	7-35	25
Elect, I&C	18	0	9-39	24
Architectural	2	1	1-21	13
Construction Engineering	1	0	9	9
Quality Assurance	2	0	25-30	28
Layout/Design	2	0	18-35	27
Subtotal	81	9		
Designers:				
Civil/Structural	3	1	4-36	21
Mechanical	19	2	3-34	21
HVAC	5	0	7-20	16
Piping	5	0	10-25	22
Elect, I&C	2	0	14-35	23
Layout	9	2	2-15	7
Subtotal	43	5		
Total	124	14		
Total Interim Design	**138**			

Subcontracts

The Tank Farm Contractor placed subcontracts with 27 firms; providing about 260 total staff supporting the design, science and technology, and ongoing operations roles. Most of the staff augmentation contracts will be available for transition to the WTP Contractor. Summary of contracts, scope, and numbers of staff identified includes:

Subcontractor	Current Scope	Number of Staff
Associated Western Universities	Summer Interns	5
EnergX	Staff Augmentation	2
ESG (ESG Technical Services)	Staff Augmentation	3
Enabling Technology	Staff Augmentation	1
Fircroft	Staff Augmentation	51
Global Environmental	Staff Augmentation	1
GTS-Duratek	Staff Augmentation	19
Individual Consultants (7 each) Doug Campbell Gary Dukelow Mike Fox Bruce Hensley William Roe Gene Schroeder John Deichman	Staff Augmentation	7
Kelly Temporary Services	Staff Augmentation	31
LATA (Los Alamos Technical Associates)	Staff Augmentation	8
Manpower	Staff Augmentation	3
MCE (Mid-Columbia Engineering)	Staff Augmentation	7
MH Chew	Staff Augmentation	2
Noramtec	Staff Augmentation	30
Onsite Engineering	Staff Augmentation	15
Project Time & Cost	Staff Augmentation	3
SAIC (Science Applications International Corp.)	Staff Augmentation-safety, permitting, and design	44
Scientech	Staff Augmentation	2
SCM	Staff Augmentation	8
TRI (Technical Resources International)	Staff Augmentation	13
Vista Engineering	Staff Augmentation	5

Science and Technology Support

The Tank Farm Contractor will have established work orders with Savannah River Technology Center (SRTC), GTS-Duratek (including the Vitreous State Laboratory (VSL) at Catholic University), Pacific Northwest National Laboratory, and IBC, Inc. for significant Science and Technology (S&T) support to the WTP Project in the following areas:

S&T Provider	Scope
SRTC	Chemical and radiochemical separations, waste form qualification
PNNL	Chemical and radiochemical separations, waste form qualification
GTS-D	Pilot melter testing, melter testing, and glass development
IBC, Inc.	Ion exchange media development and testing

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT I – FUNDING PROFILE

Fiscal Year (FY)	Budget Authority ($1M)
2001	$ 370
2002	$ 690
2003	$ 690
2004	Funding requirements for FY 2004 and beyond will be determined based on the Waste Treatment and Immobilization Plant (WTP) Project Baseline, and cannot exceed $690M in any FY.
2005	
2006	
2007	
2008	
2009	

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT J
ADVANCE UNDERSTANDING ON COSTS

This Attachment will be prepared subsequent to Contract award pursuant to Clause H.37, *Advance Understanding of Costs*.

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT K
LISTING OF WTP CONCEPTUAL DESIGN AND SUPPORTING INFORMATION

The following information associated with the Waste Treatment and Immobilization Plant (WTP) Conceptual Design and Supporting Information is provided at http://www.hanford.gov/orp/procure/solicitations/index.html.

The information includes:

(a) Process and Facility Design Documentation and Analyses

Facility Mass and Energy Balances
Process Description
Process and Facility Drawings
Systems Descriptions
Facility Descriptions
Facility Capability Studies
Facility Expansion Capability Study
Interface Control Documents

(b) Construction Planning

Engineering Execution Plan
Construction Strategy
Construction Mobilization Plan
Facility Acceptance Strategy

(c) Technology Planning and Testing Information

Technology Development Plan
Tank Waste Sample Analyses
Technology Test Reports

(d) Waste Form Qualification Strategies

Products and Secondary Wastes Plan
IHLW Waste Compliance Plan

(e) Environmental Permitting Documentation

Dangerous Waste Permit Application
Environmental Plan
Risk Assessment Work Plan
Approach for Immobilized High Level Waste (HLW) Delisting
Approach for Immobilized Low Activity Waste (LAW) Land Disposal Restrictions (LDR) Compliance
Environmental Report Revision

(f) Integrated Safety Management Program, Hazards and Safety Analysis Information

Documentation prepared for, and correspondence between the DE-AC06-96RL13308 Contractor Organization and the U.S. Department of Energy (DOE) Regulatory Unit can be found at http://www.hanford.gov/osr/osr.asp.

(g) Cost and Schedule Documentation

Integrated Master Plan
Government Fair Cost Estimate

(h) Quality Assurance

Quality Assurance Program Description

SECTION J – LIST OF ATTACHMENTS
ATTACHMENT L
SMALL DISADVANTAGED BUSINESS PARTICIPATION PROGRAM TARGETS

A — Bechtel Washington

SIC Code	Description of SIC Major Group	SDB Dollars	Percentage**
N/A			

B — Subcontractors

SIC Code	Description of SIC Major Group	SDB Dollars	Percentage**
23	Apparel and other finished products made from fabrics	$26,880	.0007
25	Furniture and fixtures	248,700	.0063
28	Chemicals and allied products	1,747,750	.0441
34	Fabricated metal products	9,564,827	.2412
36	Electronic and other electrical equipment and components, except computers	15,730,940	.3967
38	Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks	720,120	.0182
48	Communications	711,489	.0179
50	Wholesale trade, durable goods	3,340,970	.0843
51	Wholesale trade, nondurable goods	2,403,444	.0606
52	Building materials, hardware, garden supply, and mobile home dealers	491,220	.0124
73	Business services	125,468	.0032
87	Engineering, accounting, research, management, and related services	16,046,472	.4047
89	Miscellaneous services	512,040	.0129
	Subtotal ***	$51,670,320	1.3032

C — Total (A + B)

SIC Code	Description of SIC Major Group	SDB Dollars	Percentage**
23	Apparel and other finished products made from fabrics	$26,880	.0007
25	Furniture and fixtures	248,700	.0063
28	Chemicals and allied products	1,747,750	.0441
34	Fabricated metal products	9,564,827	.2412
36	Electronic and other electrical equipment and components, except computers	15,730,940	.3967
38	Measuring, analyzing, and controlling instruments; photographic, medical, and optical goods; watches and clocks	720,120	.0182

48	Communications	711,489	.0179
50	Wholesale trade, durable goods	3,340,970	.0843
51	Wholesale trade, nondurable goods	2,403,444	.0606
52	Building materials, hardware, garden supply, and mobile home dealers	491,220	.0124
73	Business services	125,468	.0032
87	Engineering, accounting, research, management, and related services	16,046,472	.4047
89	Miscellaneous services	512,040	.0129
	Subtotal ***	$51,670,320	1.3032

Total Estimated Contract Value = $3,965,000,000 143

* SDB participation from industries eligible for the 10% Price Evaluation Adjustment
** All percentages shown as a percent of the estimated total Target Cost
*** Total SDB target cost