SOLICITATION, OFFER AND AWARD

1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700): RATING

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2. CONTRACT NUMBER	3. SOLICITATION NUMBER	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NUMBER
DE-EM0003722	DE-SOL-0005750	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	06/04/2014	15EM0001771

7. ISSUED BY CODE 03001

EMCBC
U.S. Department of Energy
EM Consolidated Business Center
250 E. 5th Street, Suite 500
Cincinnati OH 45202

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

US Department of Energy
Chris Lockhart, Contract Specialist
110 Boggs Lane Suite 450
Springdale, Ohio 45246

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

SOLICITATION

9. Sealed offers in original and 10 copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if hand carried, in the depository located in _____ until 1600 ET (Hour) local time 07/17/2014 (Date)

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
	Christopher A. Lockhart	513	744-0996		christopher.lockhart@emcbc.doe

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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 360 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.

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
Amendment 1	7/07/14	Amendment 3	7/17/14
Amendment 2	7/15/14	Amendment 4	7/28/14

15A. NAME AND ADDRESS OF OFFEROR — CODE 3G6T0 FACILITY 11623

Wastren Advantage, Inc.
1571 Shyville Road
Piketon, Ohio 45661

16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)

Steve Moore
President/CEO

15B. TELEPHONE NUMBER AREA CODE	NUMBER	EXT.	15C. CHECK IF REMITTANCE ADDRESS ☐ IS DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE.	17. SIGNATURE	18. OFFER DATE
740	443-7924			Steve A. Moore	02/19/15

AWARD (To be completed by government)

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION
CLINs 00001 - 00017	$44,562,457.09	01250 2015 34 421301 25422 1110909 0001481

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION: ☐ 10 U.S.C. 2304 (c) ( ) ☐ 41 U.S.C. 253 (c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified): ITEM Section G

24. ADMINISTERED BY (If other than Item 7): US DOE Office of River Protection CODE 00603

25. PAYMENT WILL BE MADE BY: DOE Oak Ridge for ORP CODE 00524

26. NAME OF CONTRACTING OFFICER (Type or print): William B. Hensley

27. UNITED STATES OF AMERICA (Signature of Contracting Officer): William B. Hensley

28. AWARD DATE: 05/28/2015

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

NAME OF OFFEROR OR CONTRACTOR

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Hanford 222-S Laboratory Analysis and Testing Services The purpose of this acquisition is to provide analytical laboratory services at the Department of Energy (DOE) Hanford 222-S Laboratory located in the 200 West Area of the Hanford Site near Richland, Washington. Contractor shall provide all services required to operate, manage and maintain the Hanford 222-S Laboratory.				

PART I – THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES PRICES / COST

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SECTION B - SUPPLIES OR SERVICES PRICES / COST

B.01 TYPE OF CONTRACT – ITEMS BEING ACQUIRED

This is a hybrid contract that includes Fixed-Price with Award Fee, Labor-Hour, and Cost Reimbursement Contract Line Items (CLINS) for the purpose of providing analytical laboratory services at the Department of Energy (DOE) Hanford 222-S Laboratory located in the 200 West Area of the Hanford Site near Richland, Washington. The Contractor shall provide all services required to operate, manage and maintain the Hanford 222-S Laboratory as described in Section C, Description/Specifications/Performance Work Statement (PWS). Specifically, DOE requires a Contractor to provide services that include, but are not limited to: receiving, handling, analyzing, and storing samples; performing special tests; and reporting results. This acquisition supports the Hanford Site tank cleanup program and other site clean-up projects. Samples sent to the 222-S Laboratory typically consist of highly radioactive or hazardous waste materials in gas, liquid, semi-solid or solid matrix form.

B.02 PRICE SCHEDULE

Base Period: Months 1 through 24

CLIN	SCHEDULE OF SUPPLIES/SERVICES	QUANTITY	UNIT OF MEASURE	UNIT PRICE	EXTENDED AMOUNT
00001	Contract Transition – Fixed Price	1	Lump Sum		$__334,187.94__
00002	Routine Analytical Services [1] – Fixed Price	22	Months	$571,083.81	$12,563,843.73_
00003	Award Fee [2]	1	Lump Sum		$__314,096.09_
00004	Surges in Analytical Services [3] – Labor Hour	1	Lump Sum[5]		$__264,726.53_
00005	Pensions and Other Benefit Plans [4] – Cost Reimbursement	1	Lump Sum		$ 3,473,500.00
	Total Price – Base Period				$16,950,354.29__

(a) The Total Available Award Fee for the Base Period is as follows:

PERFORMANCE PERIOD	AVAILABLE AWARD FEE
3 through 12 Months from the end of Contract Transition[2]	Subtotal A: $_142,770.95___

13 through 24 Months from the end of Contract Transition[2]	Subtotal B: $_171,325.14___
Total Available Award Fee CLIN 00003 (Subtotal A and Subtotal B)	**$**_314,096.09___

(b) The Not to Exceed Amount for CLIN 00004 is as follows:

Base Period – Months 3 through 12			
Labor Category	**Estimated Direct Productive Labor Hours (DPLH)**	**Fixed Unit Rate**	**Extended Amount**
Hot Cell Supervisor	100	$___49.11___	$_ 4,910.91__
Project Coordination Supervisor	100	$___59.85___	$_ 5,985.17__
Sr. Project Coordinator	100	$___55.86___	$_ 5,586.16__
Project Coordinator	100	$___55.17___	$_ 5,516.73__
Sr. Chemical Technologist	100	$___73.89___	$__7,388.83__
Chemical Technologist	800	$___70.37___	$_56,293.73__
Sr. Scientist	400	$___56.07___	$_22,428.11__
Scientist	400	$___46.04___	$_18,415.90__
Program Administrator	100	$___45.17____	$__4,516.56__
Subtotal			$131,042.11__
Base Period – Months 13 through 24			
Labor Category	**Estimated DPLH**	**Fixed Unit Rate**	**Extended Amount**
Hot Cell Supervisor	100	$___50.34__	$__5,033.68_
Project Coordination Supervisor	100	$___61.35__	$__6,134.80_
Sr. Project Coordinator	100	$___57.26__	$__5,725.81 _
Project Coordinator	100	$___56.55__	$__5,654.65 _
Sr. Chemical Technologist	100	$___75.00__	$__7,500.02 _
Chemical Technologist	800	$___71.43__	$_57,140.87 _
Sr. Scientist	400	$___57.47__	$_22,988.82 _
Scientist	400	$___47.19__	$_18,876.30_
Program Administrator	100	$___46.29__	$__4,629.47 _
Subtotal			$133,684.42 _
Total Not-to-Exceed Price – CLIN 00004	Insert this Amount in CLIN 00004 above.		$264,726.53_

Option Period 1: Months 25 through 36

CLIN	SCHEDULE OF SUPPLIES/SERVICES	QUANTITY	UNIT OF MEASURE	UNIT PRICE	EXTENDED AMOUNT
00006	Routine Analytical Services [1] – Fixed Price	12	Months	$585,208.65	$ 7,022,503.78
00007	Award Fee [2]	1	Lump Sum		$ 175,562.59
00008	Surges in Analytical Services [3] – Labor Hour	1	Lump Sum[5]		$ 136,380.02
00009	Pensions and Other Benefit Plans [4] – Cost Reimbursement	1	Lump Sum		$ 1,731,500.00
	Total Price – Option Period 1				$9,065,946.39

Option Period 1: Months 25 through 36			
Labor Category	**Estimated DPLH**	**Fixed Unit Rate**	**Extended Amount**
Hot Cell Supervisor	100	$ 51.59	$ 5,159.40
Project Coordination Supervisor	100	$ 62.88	$ 6,288.02
Sr. Project Coordinator	100	$ 58.69	$ 5,868.82
Project Coordinator	100	$ 57.96	$ 5,795.88
Sr. Chemical Technologist	100	$ 76.13	$ 7,612.70
Chemical Technologist	800	$ 72.50	$57,999.38
Sr. Scientist	400	$ 58.91	$23,562.98
Scientist	400	$ 48.37	$19,347.75
Program Administrator	100	$ 47.45	$ 4,745.10
Total Not-to-Exceed Price – CLIN 00008	Insert this Amount for CLIN 00008 above.		$136,380.02

Option Period 2: Months 37 through 48

CLIN	SCHEDULE OF SUPPLIES/SERVICES	QUANTITY	UNIT OF MEASURE	UNIT PRICE	EXTENDED AMOUNT
00010	Routine Analytical Services [1] – Fixed Price	12	Months	$600,790.31	$7,209,483.70
00011	Award Fee [2]	1	Lump Sum		$ 180,237.09
00012	Surges in Analytical Services [3] – Labor Hour	1	Lump Sum[5]		$ 139,815.30

00013	Pensions and Other Benefit Plans [4] – Cost Reimbursement	1	Lump Sum		$1,620,100.00
	Total Price – Option Period 2				$9,149,636.09

Option Period 2: Months 37 through 48			
Labor Category	**Estimated DPLH**	**Fixed Unit Rate**	**Extended Amount**
Hot Cell Supervisor	100	$ 53.14	$ 5,314.18
Project Coordination Supervisor	100	$ 64.77	$ 6,476.66
Sr. Project Coordinator	100	$ 60.45	$ 6,044.88
Project Coordinator	100	$ 59.70	$ 5,969.76
Sr. Chemical Technologist	100	$ 77.65	$ 7,764.96
Chemical Technologist	800	$ 73.95	$59,159.37
Sr. Scientist	400	$ 60.67	$24,269.87
Scientist	400	$ 49.82	$19,928.18
Program Administrator	100	$ 48.87	$ 4,887.45
Total Not-to-Exceed Price – CLIN 00012	Insert this Amount for CLIN 00012 above.		$139,815.30

Option Period 3: Months 49 through 60

CLIN	SCHEDULE OF SUPPLIES/SERVICES	QUANTITY	UNIT OF MEASURE	UNIT PRICE	EXTENDED AMOUNT
00014	Routine Analytical Services [1] – Fixed Price	12	Months	$617,705.68	$7,412,468.10
00015	Award Fee [2]	1	Lump Sum		$ 185,311.70
00016	Surges in Analytical Services [3] – Labor Hour	1	Lump Sum[5]		$ 143,340.51
00017	Pensions and Other Benefit Plans [4] – Cost Reimbursement	1	Lump Sum		$1,655,400.00
	Total Price – Option Period 3				$9,396,520.32

Option Period 3: Months 49 through 60			
Labor Category	**Estimated DPLH**	**Fixed Unit Rate**	**Extended Amount**
Hot Cell Supervisor	100	$ 54.74	$ 5,473.61

Project Coordination Supervisor	100	$ 66.71	$ 6,670.96
Sr. Project Coordinator	100	$ 62.26	$ 6,226.23
Project Coordinator	100	$ 61.49	$ 6,148.85
Sr. Chemical Technologist	100	$ 79.20	$ 7,920.26
Chemical Technologist	800	$ 75.43	$60,342.55
Sr. Scientist	400	$ 62.49	$24,997.96
Scientist	400	$ 51.32	$20,526.03
Program Administrator	100	$ 50.34	$ 5,034.07
Total Not-to-Exceed Price – CLIN 00016	Insert this Amount for CLIN 00016 above.		$143,340.51

Total Contract Price – CLINs 00001 through 00017	$44,562,457.09

Price Schedule Notes:

1. Work under the Contract Transition and Routine Analytical Services CLINs: 00001, 00002, 00006, 00010, 00014 shall be performed on a Fixed Price basis.

2. Available award fee only applies to CLINs 00002, 00006, 00010 and 00014.

3. The estimated cost in CLINs 00004, 00008, 00012, and 00016 is for surges in analytical services that may occur. All work performed under these CLINs shall be on a labor hour basis. This work is not included in the Fixed Price CLINs identified in Note 1 above. All work performed under these CLINs shall be authorized by the Contracting Officer prior to performing the work. The Fixed Unit Rate is a fully burdened labor rate.

4. Work associated with Pensions and Other Benefits Plans CLINs: 00005, 00009, 00013, and 00017 are to be performed on a Cost Reimbursable basis with no Award Fee.

5. The Lump Sum Amount of CLINs 00004, 00008, 00012 and 00016 refers the Not-to-Exceed amounts.

B.03 LIMITATION OF GOVERNMENT'S OBLIGATION

(a) This contract's CLIN 00001, CLIN 00002, CLIN 00006, CLIN 00010, and CLIN 00014 have traditional Federal Acquisition Regulation fixed prices and contract terms and conditions, with the exceptions that: CLIN 00001, CLIN 00002, CLIN 00006, CLIN 00010, and CLIN 00014 or all may be incrementally funded; and if a CLIN is incrementally funded, in the event of termination before it is fully funded the Government's maximum liability for the CLIN will be the lower of the amount of funds allotted to the CLIN or the amount payable to the Contractor per the Termination for Convenience (Fixed-Price) clause of this contract. For each CLIN there is
   1) a fixed price for the action;
   2) a fixed amount of work that corresponds to the fixed price;
   3) a planned funding schedule that corresponds to the fixed price and the fixed amount of work;

4) no Government obligation to the Contractor until the Government allots funds to the contract for the action;
5) if the Government allots funds, a maximum Government obligation, including any termination obligations, to the Contractor equal to the allotted funds; and
6) an obligation that the Government will pay the Contractor for the work the Contractor performs for which funds were allotted based on the price of the work performed, not the costs the Contractor actually incurs.

(b) For each CLIN
1) the Government's maximum obligation, including any termination obligations and obligations under change orders, equitable adjustments, or unilateral or bilateral contract modifications, at any time is always less than or equal to the total amount of funds allotted by the Government to the contract for the CLIN;
2) the Contractor explicitly agrees it reflected (that is, included or could have included an additional amount) in its offered price and in the subsequent negotiated fixed price for each of the fixed-price CLINs included in this contract:
    i. the added complexity, challenges, and risks (including all risks, costs or otherwise, associated with termination as articulated in this clause) to which the Contractor is subject due to the incremental funding arrangement established in this clause; and
    ii. the specific risk that in the event of termination of an incrementally funded CLIN before the CLIN is fully funded, the Contractor could receive less than the Termination for Convenience (Fixed-Price) clause of this contract would allow, that is, because the maximum Government obligation for a fixed-price CLIN is the allotted funds for the CLIN, the Contractor will receive the lower of the allotted funds or what the Termination for Convenience (Fixed-Price) clause of this contract would allow.
3) the Contractor is not authorized to continue work beyond the point at which the total amount payable by the Government, which is the price of the services the allotted funds cover, equals the total amount allotted to the contract for the services;
4) if funds become available and the Government's need continues, the Government will allot funds periodically to the CLIN, the Contractor will provide a fixed amount of work for the funds allotted, and the Government will pay the Contractor based on the price of the fixed amount of work. The Government will not pay the Contractor based on the costs the Contractor incurs in performing the work; and
5) the Contractor agrees to provide the fixed amount of work for the fixed price identified in the contract's Section B, Supplies or services and prices/costs, and in accordance with the delivery schedule identified in the contract's Section F, Deliveries or performance, provided the Government provides the funding per or earlier than the Planned Funding Schedule in paragraph (n) of this clause. At any time, the cumulative amount of funds allotted is the fixed price for the cumulative fixed amount of work identified with the funds.

(c) For each CLIN
1) The fixed price (of both the entire CLIN and of the current cumulative amount of funds allotted to the CLIN at any time during contract performance) is not subject to any adjustment on the basis of the Contractor's cost experience;
2) The contract places the maximum risk and full responsibility on the Contractor for all costs and resulting profit or loss; and
3) If the Government meets the entire Planned Funding Schedule,
    i. the cumulative amount of funds allotted will equal the CLIN's fixed price and
    ii. the Contractor must provide the work the contract requires for the CLIN.

(d) The fixed price for each CLIN is listed in Section B of this contract.
(e) The Planned Funding Schedule for each CLIN is in paragraph (n) of this clause. The sum of the planned funding for each CLIN equals the fixed price of the CLIN.
(f) The Actual Funding Schedule for each CLIN is in paragraph (o) of this clause. It specifies the actual amount of funds allotted and presently available for payment by the Government separately for CLIN 00001, CLIN 00002, CLIN 00006, CLIN 00010, and CLIN 00014 and the work to be performed for the funds allotted.
    1) The Contractor may bill against a CLIN only after the Government has allotted funds to the CLIN and the Contractor has delivered the services and earned amounts payable for the CLIN.
        i. The Contractor may bill only the lower of the two preceding amounts, that is, the lower of allotted funds or amount payable.
(g) If during the course of this contract the Government is allotting funds to a CLIN per or earlier than the Planned Funding Schedule, this contract to that point will be considered a simple fixed-price contract for that CLIN regardless of the rate at which the Contractor is, or is not, earning amounts payable, and
    1) The Government's and the Contractor's obligations under the contract for the CLIN—with the exception that the Government's obligation for the CLIN is limited to the total amount of funds allotted by the Government to the CLIN and similarly the Contractor is not authorized to continue work beyond the point at which the total amount payable by the Government equals the total amount allotted—will be as if the CLIN were both fixed price and fully funded at time of contract execution, that is, the Contractor agrees that: it will perform the work of the contract for that CLIN; and neither the fixed-price for the CLIN nor any other term or condition of the contract will be affected due to the CLIN's being incrementally funded.
        i. The Contractor agrees, for example, if the Government allots funds to a CLIN per or earlier than all of the funding dates in the Planned Funding Schedule for the CLIN, the Government has met all of its obligations just as if the CLIN were fully funded as of the time of contract execution and the Contractor retains all of its obligations as if the CLIN were fully funded as of the time of contract execution, while at the same time the Contractor is not authorized to continue work beyond the point at which the total amount payable by the Government equals the total amount allotted to the contract; consequently, if the Contactor earns amounts payable at any time in performing work for the CLIN that exceed the total amount of funds allotted by the Government to the contract for the CLIN
            A. it (not the Government) will be liable for those excess amounts payable
            B. it will remain liable for its obligations under every term or condition of the contract and
            C. if it fulfills all of its obligations for that CLIN and the Government allots funds to the CLIN equal to the CLIN's fixed price, the Government will pay it the fixed price for the CLIN and no more.
        ii. The Contractor also agrees, for example, if the Government allots funds to a CLIN by the first funding date in the Planned Funding Schedule, the Government has met all of its obligations up to that point in the contract as if the CLIN were fully funded (that is, as if progress payments based on cost had been agreed to and had been made, or milestone payments had been agreed to and been made, or etc.) and the Contractor retains all of its obligations up to that point (such as meeting delivery schedules, maintaining quality, etc.) as if the CLIN were fully funded; consequently, if the Government subsequently terminates the CLIN it

will pay the Contractor the lower of the following two amounts: the amount allotted by the Government to the CLIN; or the amount payable per the Termination for Convenience (Fixed-Price) clause of this contract.

(h) The Contractor shall notify the Contracting Officer in writing whenever it has reason to believe that the amount payable it expects to earn for the CLIN in the next 60 days, when added to all amounts payable previously earned, will exceed 75 percent of the total amount allotted to the CLIN by the Government.
   1) The notification is for planning purposes only and does not change any obligation of either the Government or the Contractor.
   2) The Contractor is not authorized to continue work beyond the point at which the total amount payable by the Government equals the total amount allotted to the CLIN.
   3) The Government may require the Contractor to continue performance of that CLIN for as long as the Government allots funds for that CLIN sufficient to cover the amount payable for that CLIN.

(i) If the Government does not allot funds to a CLIN per or earlier than its Planned Funding Schedule, the Contractor will be entitled to an equitable adjustment and
   1) the Government's maximum obligation, including any termination obligation, to reimburse the Contractor remains limited to the total amount of funds allotted by the Government to the contract for that CLIN;
   2) the Contractor is not authorized to continue work beyond the point at which the total amount payable by the Government, equals the total amount allotted to the contract;
   3) if the Government subsequently terminates the CLIN, it will pay the Contractor the lower of the following two amounts: the total amount of funds allotted by the Government to the contract for the CLIN; or the amount payable per the Termination for Convenience (Fixed-Price) clause of this contract.

(j) Except as required by either other provisions of this contract specifically citing and stated to be an exception to this clause, or by, among other things, terminations, change orders, equitable adjustments, or unilateral or bilateral contract modifications specifically citing and stated to be an exception to this clause, for either CLIN—
   1) The Government is not obligated to reimburse the Contractor in excess of the total amount allotted by the Government to this contract for the CLIN; and
   2) The Contractor is not obligated to continue performance under this contract related to the CLIN or earn amounts payable in excess of the amount allotted to the contract by the Government until the Contracting Officer notifies the Contractor in writing that the amount allotted by the Government has been increased and specifies an increased amount, which shall then constitute the total amount allotted by the Government to the CLIN.

(k) No notice, communication, or representation in any form, including, among other things, change orders, equitable adjustments, or unilateral or bilateral contract modifications, other than that specified in this clause, or from any person other than the Contracting Officer, shall affect the amount allotted by the Government to this contract for a CLIN, which will remain at all times the Government's maximum liability for a CLIN. In the absence of the specified notice, the Government is not obligated to reimburse the Contractor for any amounts payable earned for a CLIN in excess of the total amount allotted by the Government to this contract for a CLIN, whether earned during the course of the contract or as a result of termination.

(l) Change orders, equitable adjustments, unilateral or bilateral contract modifications, or similar actions shall not be considered increases in the Government's maximum liability or authorizations to the Contractor to exceed the amount allotted by the Government for a CLIN unless they contain a statement increasing the amount allotted.

(m) Nothing in this clause shall affect the right of the Government to terminate this contract for convenience or default.

(n) Planned Funding Schedule

CLIN 00001

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
05/28/15	$334,188.00	Transition	$334,188.00	Transition

CLIN 00002

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00006

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00010

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical		Routine Analytical

		Services		Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00014

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

(o) Actual Funding Schedule

CLIN 00001

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
05/28/15		Transition		Transition

CLIN 00002

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00006

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be

				Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00010

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

CLIN 00014

Date	Funds To Be Allotted	Work To Be Accomplished	Cumulative Funds To Be Allotted	Cumulative Work To Be Accomplished
		Routine Analytical Services		Routine Analytical Services
		Routine Analytical Services		Routine Analytical Services

PART I – THE SCHEDULE

SECTION C – DESCRIPTIONS/SPECIFICATIONS/ WORK STATEMENT

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SECTION C - PERFORMANCE WORK STATEMENT

C.1 OVERVIEW OF 222-S LABORATORY SERVICES

C.1.1 BACKGROUND

C.1.1.1 The Hanford Site

The 586 square-mile Hanford Site, located in southeast Washington State, was established in the 1940s as a plutonium production complex for the Manhattan Project. Throughout Hanford's 50 years of operation, byproducts of plutonium production have accumulated to become this country's largest environmental cleanup project. In 1989, the Department of Energy (DOE), the U. S. Environmental Protection Agency, and the Washington State Department of Ecology signed the Hanford Federal Facility Agreement and Consent Order, commonly known as the Tri-Party Agreement (TPA), which codifies the DOE's commitment to clean up the Hanford Site. The TPA outlines legally enforceable project milestones for Hanford cleanup over the next several decades.

C.1.1.2 Site Management

The Hanford Site is managed by two DOE field offices, the Richland Operations Office (RL) and the Office of River Protection (ORP). ORP manages 177 underground tanks of liquid and solid radioactive chemical waste, and is responsible for construction of the Waste Treatment and Immobilization Plant (WTP). RL has responsibility for the remainder of the Hanford Site, which includes: cleanup of the river corridor, cleanup and ongoing waste management operations in the central plateau, and providing a variety of crosscutting site services (e.g., utilities, security, information technology (IT), fire department, emergency management, and occupational medical services).

C.1.1.3 222-S Laboratory

The Contractor shall provide all services required to operate, manage and maintain the Hanford 222-S Laboratory. The scope of this contract is to perform the Analytical Services production functions of receiving, handling, analyzing, storing samples, and reporting the results of analyses to the contractors of Department of Energy Offices at the Hanford Nuclear Site near Richland, Washington. These functions will be performed through a contract with the DOE Office of River Protection at the 222-S Laboratory complex, a Hazard Category 3 Nuclear Facility, located in the 200 West Area of Hanford. These services support cleanup and closure of the Hanford site and are a critical activity in achieving closure goals of all Hanford projects. As directed by the Contracting Officer, the Contractor shall perform work supporting scientific research and other DOE sites.

The 222-S Laboratory building complex is owned by DOE and managed by the Tank Operations Contractor (TOC). The TOC is also the major customer for analytical services at the 222-S Laboratory; some other site contractors are minor customers. The Contractor’s work will be performed under DOE-

approved programs managed by other Hanford site contractors. The Contractor shall interface with the TOC, other customers, and site-wide program managers in a manner so as to maintain consistency of business and site practices among Hanford prime contractors. This requires close coordination with other contractors on the site that provide infrastructure, programs, and samples to be analyzed.

The Contractor shall not use offsite laboratory facilities or services to analyze Hanford samples.

C.1.1.4 Sources of Samples to be Analyzed

The samples analyzed at 222-S come from sampling activities at Tank Farms and across the Hanford site. Such activities include, but are not limited to:

- Tank waste sampling events. These samples may be liquid, solid (sludge), salt cake, or a mixture. Samples are drawn for a variety of purposes, such as corrosion monitoring, chemistry control, and caustic addition; physical, chemical and radiological characterization; waste compatibility assessments; tank closure; and hard heel (gibbsite and boehmite) dissolution studies.
- Vadose zone sampling. Samples consist of a soil matrix potentially contaminated with tank waste or separations process waste.
- Evaporator campaigns to reduce the volume of tank waste. Samples are composed of evaporator feed (tank supernate) or evaporator boildown.
- Emergent work in a variety of matrices. For example soil, building materials, air and aqueous or organic liquids. Samples may be contaminated with tank waste, separations process waste or other hazardous chemical and/or radiological materials.
- Beryllium testing. Samples are primarily 100 cm2 swipes but may be other matrices, such as soil or building materials, contaminated with beryllium. Some beryllium samples may be radiologically contaminated.
- Support for demolition of Hanford's Plutonium Finishing Plant. Samples may contain high alpha contamination.
- Industrial hygiene monitoring. Samples typically consist of vapor tubes which are tested for ammonia and mercury but may include air grab samples.
- Support for groundwater monitoring. Samples may contain water soluble radionuclide species, such as cesium or pertechnetate.

C.1.2 LABORATORY OPERATIONS OVERVIEW

C.1.2.1 Analytical Operations

The Contractor shall provide analytical chemistry support for all restoration, tank waste processing and closure operations on the Hanford site. An estimated range of 15,000 to 25,000 analyses will be performed annually on individual samples, field blanks and calibration standards. The tank operations contractor (TOC) is the 222-S laboratory's primary customer, with a comparatively small amount of work required by other site contractors, DOE sites or DOE research facilities. Responsibilities will include but will not be limited to sample receipt at the 222-S facility, sample handling and preparation, customer consultation,

sample analysis, data management, issue of data reports, and site standards laboratory services. Work shall be performed in compliance with DOE directives, quality assurance requirements, safety requirements, and federal and state of Washington regulations applicable to a DOE hazard category 3 nuclear facility.

Samples received at the 222-S laboratory may be highly radioactive, potentially exceeding 300 rad/hour (3 Gy/hour) with a significant portion gamma. The Contractor sample custodian shall work closely with the facility special nuclear materials inventory steward to manage inventory levels and maintain compliance with the Technical Safety Requirements shown in Attachment J.6. The 222-S analytical services Contractor shall be responsible for hot cell operations necessary for sample receipt, preparation and distribution. The Contractor shall also receive samples not requiring hot cell work which they shall analyze or distribute to TOC personnel within the 222-S facility, or package for shipment to other facilities as required by the TOC.

The Contractor shall interface with customers to plan and schedule analytical services and tailor sample analysis methods and reporting formats to customer requirements. Planning and scheduling shall consider the cyclical nature of the laboratory workload as well as customer priorities. The Contractor shall assist with analysis method selection and develop new methods to meet evolving customer needs. The Contractor shall provide analytical support for unplanned and emergent work. Components of report formats may include raw data, data summary reports, method detection limits with qualifiers, QA data and associated QA qualifiers, and data upload into the Laboratory Information Management System (LIMS) with defined electronic deliverables. Note that OmniLIMS™ is the product used at 222-S Laboratory.

Analytical procedures developed for use in the 222-S laboratory are primarily EPA SW-846 methods with customer approved modifications for laboratory worker safety. Industrial hygiene procedures are based upon NIOSH methods. Radiochemistry protocols are generally based upon commercially available technologies or have been developed by the 222-S Laboratory specifically for use in the facility.. Samples will be in a variety of different liquid, solid and gas matrices. Work will include organic chemistry, inorganic chemistry, radiochemistry and physical characterization of sample material. Attachment C.1 of this section lists required analytical chemistry capabilities. The Contractor shall strictly adhere to sample holding time requirements defined by the customer according to expected sample properties and constituents to be analyzed. Analyses shall be performed by qualified Contractor personnel utilizing appropriate provided instrumentation. The Contractor shall perform required instrument calibration checks and routine housekeeping. Section C.2.1.10.2 lists the types of instrumentation provided.

Data generated by analyses shall be reviewed, entered into the OmniLIMS™, QA reviewed by a process chemist, and written into a narrative for issuance in a final report. The Contractor shall utilize the 222-S OmniLIMS™ to track samples and manage data.

The Contractor shall adhere to the 222-S facility manager's sample waste disposal procedures. Alternatively customers may request archiving of samples or have excess samples returned to them. Archival approval is obtained from the TOC. Sample archiving is described in Section C.1.2.4.

The Contractor shall perform the following chemical management functions at the 222-S Laboratory: chemical procurement needs to the (TOC and Contractor's needs) TOC; quality assurance; receiving, unpacking, inspection, storage, and tracking; chemical custodianship; and compiling data to meet reporting requirements. The Contractor shall also perform chemical management functions for chemical storage areas shared with the TOC within the 222-S Laboratory. The Contractor shall maintain compliance with 222-S Laboratory safety and chemical hygiene requirements.

The Contractor shall participate in the Operating Experience (OpEx) lessons learned program.

The Contractor shall support TOC's planning for the development of 222-S laboratory annual and multi-year tank waste treatment baselines. Support will include providing information on laboratory work activities, inspecting and documenting the condition of the facility and equipment, assessing necessary laboratory upgrades and renovations, and estimating the materials and developing the assumptions required for providing continued analytical services at the 222-S laboratory. The contractor shall provide the foregoing information formally or informally, as necessary after the completion of the transition period, for the TOC to maintain awareness, develop their project baselines, and produce 222-S Laboratory/Performance Status Reports (Deliverable C-03).

The Contractor shall meet all holding time deadlines. Holding times are the length of time from sample collection allotted to the Contractor to perform sample analysis and are not negotiable. Holding times are established by regulatory organizations to prevent sample degradation and are dependent upon the analyte and testing methodology.

C.1.2.2 Development of Laboratory Standards and Reagents

The Contractor shall produce analytical reagents and standards for use in the 222-S facility and serve as standards custodian.

The Contractor shall perform routine standards inventory maintenance, chemical stabilization and document traceability to National Institute of Standards and Technology (NIST) standards, if available. When recognized standards material is not available, or its purchase is impractical, the Contractor should attempt to purchase standards material from a reliable source. The Contractor shall have procedures in place to determine the acceptability of such materials. In addition, the standards laboratory may be asked to clean and chemically inactivate sample collection equipment.

C.1.2.3 Development of New Analytical Methods

The Contractor shall work with the TOC to determine needs for new and replacement instruments, and shall be responsible for developing methods and procedures for new equipment and instruments delivered to the Laboratory for which the Contractor is the primary user.

In addition, the Contractor shall develop new analytical methods each fiscal year to meet customer requirements.

C.1.2.4 Sample archiving

Customers may request to have samples which are analyzed at the 222-S laboratory archived by the lab. The Contractor shall be responsible for sample archiving, sample reconstitution, documentation and tracking of archive samples and annual archive maintenance. The Contractor shall notify customers annually of their archive inventory and make requests to dispose of samples that are no longer needed.

C.1.2.5 Workload and Customer Interface Management

The Contractor shall work with its customers to develop Service Level Agreements (SLAs) for each fiscal year or more often if mutually agreeable. Prior to implementation the SLAs (Deliverable C-13) shall be submitted to DOE for review and approval. DOE will review and approve the deliverable within thirty (30) days of receipt. The SLAs shall describe the task requirements including reporting format and shall contain a level of detail sufficient for DOE to determine weather the task is consistent with customer baselines and represents a reasonable use of resources. DOE will review customer projections to determine whether they are realistic given expected site conditions and work with the Contractor to develop a strategy for managing the expected work.

The Contractor shall deliver final sample analysis reports (deliverables) to the customer on or before the date agreed upon with the customer at sample receipt. The time allotted for generation and transmittal to the customer of a final deliverable is generally dependent upon sample characteristics, analyses requested and report format requirements.

C.2 SCOPE ALLOCATION

C.2.1 ROUTINE ANALYTICAL SERVICES (FIXED PRICE SCOPE WITH AWARD FEE)

The Contractor shall perform laboratory operations, maintain a “Readiness to serve capability”, and providing analytical services to site customers as negotiated through Service Level Agreements. “Readiness to serve” means ability to perform the analytical work described in all approved LA&TS contractor procedures with required safety and quality. The Contractor may not turn down work for which it has applicable procedures and functioning equipment and appropriately trained and qualified staff unless specifically approved by DOE. If the Contractor wishes to cancel an existing procedure without issuing a replacement procedure that provides equivalent capability, the Contractor must first receive approval from the CO

The Contractor shall furnish all things necessary for, or incident to, the performance of work described above and in this section of the contract, excluding that which is specifically identified as Labor-Hour in Section C.2.2 and excluding that which is furnished directly by the Government or through other site contractors as identified in Section C.2.1.10.

C.2.1.1 Management and Administration

(a) The Contractor shall submit a Monthly Performance Report (Deliverable C-03) representing the prior month's activities and transmit it to the Contracting Officer by the 15th of the month. The Monthly Performance Report shall be a Microsoft PowerPoint presentation that includes, at a minimum, the following:

- Manager or Chief Financial Manager narrative assessment.
- Significant accomplishments, special activities, and process improvements.
- Summary of the results of any self-assessments performed.
- Number of samples expected vs. received from customers for the month and the fiscal year-to-date.
- Summary of SLA status/updates and 30-day forecast for sample receipt.
- List of reports issued to customers.
- 30-day forecast for major activities and 60-day forecast for the projected volume of analytical work, planned surveillances and assessments, new laboratory methods to be developed, planned instrument purchases and retirements, staff training and qualification, and any planned initiatives related to health, safety, quality, and environmental stewardship.
- Summary of report reissues and feedback received from customers.
- Evaluation of performance metrics for the month and the fiscal year-to-date.
- Status of new method development activities.
- Summary of any unplanned events and occurrences and actions taken to address them.
- Issues affecting Laboratory productivity.
- Evaluation of safety performance (including ISMS metrics, radiological safety performance, and all recordable injuries, lost-time injuries, and near-misses).
- Status of the condition of infrastructure and utilities, including facilities, equipment, and systems, as needed to understand productivity and performance.

The Contractor shall participate in a monthly review with the Contracting Officer and be prepared to address any of the information in the monthly report.

(b) DOE may at any time conduct surveillances, assessments, or audits on any aspect of Contractor activities.

(c) The Contractor shall be responsible for buying any office supplies, office computers, office furniture and other office equipment it needs beyond those provided as described in C.2.1.10.

C.2.1.2 Environmental Compliance and Waste Management

(a) Environmental Compliance

The contractor shall develop and implement an environmental management program to identify, manage, and implement measures that maintain compliance with regulatory requirements. These include, but are not limited to:

- Permitting,
- Environmental reporting,
- Agreements negotiated by DOE with state and local authorities,
- Federal initiatives for pollution prevention, waste minimization, and sustainability (see Section J, List of Applicable DOE Orders, for implementing Orders and Directives), and
- Development of an Environmental Management System (EMS) conforming to ISO 14001.

A list of Applications, Permits, and Notices of Construction applicable to the 222-S Laboratory complex is provided in Attachment J.4. The Contractor's environmental management program shall establish environmental performance objectives, measures, and commitments (POMCs) integrated into the EMS and ISMS. POMCs shall be submitted to DOE as part of the ISMS submittal. The POMCs shall be developed in consultation with the TOC and shall be consistent with the TOC's program. The Contractor's environmental management program shall ensure Contractor activities are integrated within the Hanford site environmental compliance framework. The Contractor shall submit to DOE a description of the EMS and how conformity to ISO14001 will be demonstrated within sixty (60) days of the Notice to Proceed. The Contractor's EMS shall be fully implemented within twelve (12) months of the Notice to Proceed.

The Contractor shall compile the environmental data necessary to comply with the reporting requirements of applicable environmental laws, regulations, DOE and executive orders, and operating permits, and shall provide that data upon request to MSC, TOC, and DOE.

The Contractor shall cooperate with the TOC and MSC to report, track, and address environmental compliance issues affecting 222-S Laboratory facilities. The contractor shall be responsible for resolving issues it causes.

The Contractor is not responsible for establishing and updating facility operating permits; however, the Contractor is responsible for ensuring its activities are compliant with facility operating permits and for providing information and support to the TOC for any modifications the Contractor requires.

(b) Waste Management

Waste management activities at the 222-S Laboratory are the responsibility of the TOC; however, they require close cooperation between the Contractor (as generator) and the TOC (as disposer) and are governed by procedures maintained by both contractors under frequent consultation with each other. Dangerous Resource Conservation and Recovery Act (RCRA) wastes are disposed in one of two ways. Approved liquid wastes are discharged through designated drains into the 219-S tank system and later transferred to the Hanford Tank Farms for long-term storage. Solid wastes and liquid wastes not approved for discharge into 219-S are accumulated in Satellite Accumulation Areas (SAAs) and 90-day Accumulation Areas (90DAAs) in accordance with state and local codes; most of these wastes are sent to an on-site treatment, storage, and disposal facility, and a small amount is packaged and shipped offsite for treatment. The Contractor is required to comply with all policies and procedures applicable to its activities.

The Contractor is responsible for maintaining SAAs and 90DAAs located in its work areas in a safe and compliant manner. The Contractor shall, when required, place its waste in a bag or lab pack and move it to designated areas within the 222-S Laboratory complex for collection as per TOC procedures. The Contractor shall support the TOC in inspection of SAAs and 90DAAs. The Contractor shall obtain advance TOC approval for each waste stream it generates, and it shall cooperate with the TOC to plan waste disposition. The Contractor shall document the contents of self-generated waste streams and assign waste codes prior to transfer to others.

The Contractor shall cooperate with the TOC in management of non-routine wastes and spills. The Contractor is responsible for cleaning up its own spills.

The Contractor is not responsible for the following work activities: management of the 219-S tank system; designation of the laboratory wastes; determining whether specific waste streams may be brought into or generated within the Lab; discharge of specific waste streams into the 219-S tank system; packaging, collection and disposal of wastes; and janitorial services for offices within the 222-S Laboratory. The Contractor is not responsible for the costs of managing and disposing of waste after it has been collected from 90DAAs, discharged into the 219-S tank system or otherwise removed from the 222-S Laboratory complex.

C.2.1.3 Safety and Health

(a) The Contractor shall at all times assign the highest priority to worker safety and health, and shall never allow either financial or schedule considerations to compromise its commitment to the same. Laboratory work shall be performed by qualified staff in a safe manner using approved procedures and test plans. The Laboratory shall be kept in a clean and well-organized condition to promote a safe environment for workers, prevent leaks and spills, minimize fire risk, and maintain access to emergency equipment.

(b) The Contractor shall establish an Integrated Safety Management System (ISMS), in compliance with the Section I clause, DEAR 970.5223-1 Integration of Environment, Safety and Health into Work Planning and Execution. Within 15 days of notice to proceed, the Contractor will be provided guidance on the preparation, review, and approval of the Contractor's ISMS. No later than 90 days after notice to proceed, the Contractor shall submit to the Contracting Officer for approval the Integrated Safety Management System Description (Deliverable C-07). Until DOE approves this system, the Contractor shall use the existing ISMS descriptions.

(c) The Contractor shall comply with site-wide safety standards and procedures applicable to its work scope at the 222-S Laboratory. The Contractor shall also comply with DOE-approved worker safety and health programs that are established by the TOC for use at the 222-S Laboratory. Records pertaining to industrial hygiene at the 222-S Laboratory are maintained by the TOC.

(d) The Contractor shall prepare a Worker Safety and Health Plan (Deliverable C-08) for DOE approval as described in the clause in Section H entitled, "Worker Safety and Health Program" within 60 days of the notice to proceed. The Contractor shall designate a single point of contact among its staff who shall liaise with external entities on industrial safety and hygiene and radiological protection.

(e) The TOC is responsible for providing and funding radiological instruments and radiological technicians. Some radiological records are kept by the TOC, MSC, and/or the testing vendor(s); however the Contractor bears the ultimate responsibility for accumulating a complete set of records and making appropriate safety decisions for its employees.

(f) The Contractor shall actively promote a healthy safety culture among management and staff, fostering open communication, a questioning attitude, and trust. It shall provide a means for employees to anonymously raise issues affecting health and safety, and it shall participate in site-wide safety culture assessments and activities. Additional guidance may be found in DOE G 450.4-1C ISMS Guide, Attachment 10, "Safety Culture Focus Areas and Associated Attributes."

C.2.1.4 Quality Assurance

The Contractor shall submit to DOE for approval within 90 days of the notice to proceed a Quality Assurance Program (QAP) Plan (Deliverable C-12) in accordance with EM-QA-001 Revision 1, DOE O 414.1D for nuclear facilities and 10 CFR 830 Subpart A, and in compliance with the site-wide Hanford Analytical Services Quality Assurance Requirements Document (HASQARD). The Contractor shall accept and implement the existing QAP until the Contractor's QAP is approved and implemented. The Contractor's QAP shall implement Parts I and II of the standard American Society of Mechanical Engineers (ASME) NQA-1-2008 with the NQA-1a-2009 addenda, Quality

Assurance Requirements for Nuclear Facility Applications and indicate within the QAP those portions of Parts III and IV that are to be applied to the Contractor's work scope. ASME NQA-1-2008 with the NQA-1a-2009 addenda is the national consensus standard for implementing QA Criteria of 10 CFR 830 Subpart A and DOE O 414.1D. If additional standards are required to address unique/specific work activities, the standards shall be identified within the Contractor's QAP.

The Contractor shall establish and maintain American Industrial Hygiene Association (AIHA) accreditation commensurate with a limited scope of IH analytes and the Washington Department of Ecology accreditation. The Contractor shall participate in applicable performance evaluation (PE) testing programs. PEs are analytical testing programs of samples provided by accredited third party testing laboratories to evaluate the Contractor's analytical capability. The contractor will be required to participate in PE testing programs from several evaluation laboratories.

C.2.1.5 Safeguards, Security, and Emergency Services

The MSC is responsible for the management and execution of Hanford's site-wide Safeguards and Security (SAS) and Emergency Services programs. The Contractor's role is to maintain compliance with site security and emergency services requirements and to participate in the site-wide SAS and Emergency Services programs. Of particular importance is the Contractor's role in safeguarding Category IV accountable nuclear material kept at the 222-S Laboratory. Because the Contractor performs its work using facilities and infrastructures maintained by the TOC, coordination is required with the TOC to meet SAS and Emergency Services requirements. To facilitate the support provided by the MSC and TOC, the Contractor will interface with them in the following areas:

C.2.1.5.1 Safeguards and Security

The Contractor will not process or store classified information. The Contractor may use MSC and TOC safeguards and security procedures, or it may develop its own procedures that comply with site wide programs.

(a) Safeguards and Security Program Management.

The Contractor shall coordinate and interface with the MSC and its subcontractors who provide safeguards and security (SAS) services (e.g., Hanford Site access control, security police officers, vulnerability analysis).

The Contractor shall perform the following SAS program management functions:

- SAS Program Planning, Oversight, and Administration. The Contractor shall identify and coordinate their SAS operational planning activities with MSC operational planning activities on a Hanford Site-wide basis.
- Security Conditions (SECON)

  - The Contractor shall conform to and comply with the DOE Security Conditions (SECON) system.
  - The Contractor shall comply with any protective measure requirements that may be implemented in the event of a crisis or emergency, and/or in response to a malevolent or terrorist threat to any or all DOE facilities, assets, and personnel.
- Site Safeguards and Security Plan and Other SAS Plans. The Contractor shall provide information to the MSC in support of maintaining the Hanford Site Safeguards and Security Plan and other SAS plans.
- Vulnerability Assessments. The Contractor shall provide the necessary operational and technical expertise in support of the preparation of vulnerability assessments, security analyses, and special SAS studies and evaluations as identified by the MSC for the Hanford Site.
- Graded Security Protection (GSP). The Contractor shall implement SAS actions, procedures, and/or processes as assigned by DOE that are necessary to comply with DOE GSP requirements. Overall GSP implementation actions and/or plans shall be consolidated and prepared by the MSC and approved by the DOE.
- Performance Assurance. The Contractor shall provide information on a yearly basis to the MSC to support preparation of the Hanford Site-wide Performance Assurance Program Plan as part of the Site Safeguards and Security Plan.
- Surveys, Reviews and Assessments
  - The Contractor shall provide operational and technical expertise, when requested, to support SAS surveys, reviews, assessments and/or SAS performance tests (e.g., force-on-force exercises) that are conducted by the MSC and/or DOE for SAS program elements.
  - The Contractor shall identify, implement, and close corrective actions for deficiencies in accordance with the SAS corrective action management programs.
- Facility Clearance and Registration. In the event that possession of accountable nuclear material is subcontracted to another entity, the Contractor shall submit all required information to the MSC for facility clearance and registration actions.
- SAS Training. The Contractor shall identify SAS training needs for staff and shall arrange, fund, and schedule training in accordance with applicable requirements.
- SAS Awareness
  - The Contractor shall comply with the requirements of the Hanford Security Awareness Program.
  - The Contractor shall maintain awareness of Hanford Site wide security issues/topics and incorporate them into the Contractor's internal practices and procedures, as appropriate.

    - The Contractor shall implement supplementary SAS awareness activities and/or briefings (e.g., at staff and safety meetings) in coordination with Site-wide policies.
- Deviations
    - The Contractor shall identify, evaluate, and submit deviations to SAS requirements to DOE.
    - The Contractor shall coordinate with the MSC prior to submitting deviations to DOE. Deviation requests shall be applicable and unique to the project/program scopes of work, and submitted only when other means to meet requirements would not meet DOE's SAS program objectives.
- Incidents of Security Concern
    - The Contractor shall develop and implement procedures and processes consistent with DOE requirements for addressing incidents of security concern. The Contractor shall provide information and facility access to the MSC for investigation of security incidents. The Contractor shall develop and implement corrective actions to address investigation findings.
    - The Contractor shall provide information to MSC to support the administration of the Hanford Site Security Infraction Program.

(b) Physical Security

- The Contractor shall comply with the MSC security plans and DOE security plans/requirements.
- The Contractor shall support the MSC in the development or updating of facility asset protection agreements for facilities and shall conduct operations consistent with the agreements.
- The Contractor shall be responsible for any physical security requirements/upgrades and associated costs to Contractor owned facilities.
- The Contractor is not responsible for physical security requirements/upgrades for Government furnished facilities.
- The Contractor shall submit, through MSC for DOE review and approval, any SAS arrangements or changes prior to operations commencing, or changing operations, or configurations that might alter the performance of existing SAS systems (e.g., limited/protected area boundaries, physical security configurations and associated hardware [sensors/cameras], patrol coverage and responses, safeguards methods or boundaries, entry/access control systems/procedures).

(c) Protective Forces

The protective forces function is comprised of select security elements (armed personnel, specialized equipment, tactical procedures, etc.)

associated with physically protecting people and property on the Hanford Site. The MSC is responsible for all protective forces activities; however, there are many areas of facility operations management that interweave with the 222-S Laboratory. The MSC Protective Forces function serves DOE, all Hanford Site contractors, and in particular facilities possessing critical safeguards and security interests, e.g., special nuclear material (SNM).

- The Contractor shall work with MSC Protective Forces to protect SNM, industrial assets, and mitigate and deter radiological and toxicological sabotage events at the 222-S Laboratory.
- The Contractor shall manage their activities consistent with DOE-RL and DOE-ORP approved risk and vulnerability assessments, the Site Safeguards and Security Plan, and other security plans and facility asset protection requirements coordinated by the MSC that involve the use of Protective Forces.

(d) Information Security

The Information Security program encompasses the identification and protection of sensitive and classified information and matter. The Information Security scope shall include, but is not limited to: Sensitive Information Management (e.g., OUO), and Operations Security (OPSEC).

The Contractor shall perform the following information security functions:

- Operations Security
    - The Contractor shall participate in and support Hanford Site-wide OPSEC Working and Awareness groups and perform the necessary management and support functions required for an effective OPSEC program.
    - The Contractor shall provide support to the MSC OPSEC assessments of all Hanford Site facilities that have the potential to process or store classified or sensitive information.
    - The Contractor shall support the annual Site OPSEC threat assessment and preparation of the annual OPSEC plan.
- Official Use Only (OUO). The Contractor shall manage and implement an OUO information program consistent with the common Hanford Site-wide OUO information program policies including the following:
    - Provide OUO education and awareness for all staff; and
    - Review documents released to the public or assigned a formal document number for OUO content.

(e) Personnel Security-Badging

The MSC manages and conducts a centralized Personnel Security-Badging program for the Hanford Site on behalf of DOE.

- The Contractor shall obtain badging services from MSC
- The Contractor shall support MSC's processes for obtaining security badges, keys, proximity cards, etc., from terminating employees and support the MSC in removing such individuals from automated access control systems.

(f) Workplace Substance Abuse Programs

The Contractor shall comply with requirements outlined in 10 CFR 707, Workplace Substance Abuse Programs (WSAP) at DOE Sites.

(g) Services shown as "Direct-Funded" will be paid for directly by DOE.

(h) Unclassified Foreign National Visits and Assignment (FNVA)

- The Contractor shall notify the MSC of potential foreign visitors or employees, prepare and submit security plans to the MSC for foreign national visitors to the Hanford Site before approval of the visit/assignment.
- The Contractor shall require FNVA training for Contractor personnel who host FNVAs.
- The Contractor shall conduct FNVA in compliance with approved security plans.

(i) Foreign Travel

The Contractor shall administer Official Foreign Travel in accordance with applicable DOE Orders, submitting all official foreign travel requests packages to DOE-ORP for review and subsequent submittal to DOE-HQ for approval in accordance with established timeframes prior to any official foreign travel. Notification to CO and approval by CO before being submitted to HQ is required for any foreign travel.

(j) Nuclear Material Control and Accountability (MC&A)

The MSC manages and conducts a centralized MC&A program for the Hanford Site on behalf of DOE. The Contractor shall perform the following MC&A Functions:

- Assign an individual that will serve as the Contractor's MC&A single point-of-contact, independent of line operations, with the responsibility and authority to affect implementation of MC&A requirements. This individual shall work with the Hanford Site MC&A management official within the MSC to provide

oversight of accountable nuclear material in possession of the Contractor.

- Support the MSC in preparation and maintenance of a Hanford Site-wide MC&A plan, administration of treaty related activities (e.g., IAEA), performing safeguards occurrence investigation and reporting, scheduling of periodic inventories consistent with the Contractor's project work schedules.
- Identify personnel requiring MC&A training provided by the MSC and coordinate training schedules with the MSC.
- Conduct on-the-job MC&A training specific to 222-S Laboratory facilities and systems.
- Request from the MSC:
    - Final authorization to move, ship, process, or store nuclear materials, including approval of shipper/receiver plans;
    - Final approval of Material Balance Area (MBA) Custodians; and
    - Final determination of MBA categorizations; and
    - Final approval of MC&A-related implementing procedures.

- Respond to MSC or DOE calls related to the MC&A program.

The Contractor shall coordinate and integrate all aspects of its MC&A activities with the MSC. The Contractor shall utilize the MSC for:

- MC&A requirement interpretation with overall responsibility for the MC&A program;
- Training and qualification of all personnel performing MC&A functions (with the exception of specific facility/system on-the-job MC&A training);
- Nuclear materials accounting and reporting requirements for all nuclear materials both active and inactive (e.g., "V-RIS") and be responsible for the official nuclear material inventory, including discrepancy reconciliation;
- Statistical Services needed for managing nuclear material;
- Purchasing, regulating, and managing MC&A-controlled forms and tamper indicating devices; and
- Nuclear materials measurement system approvals and measurement system control requirements for all MC&A nuclear materials measurement activities (e.g., monitoring measurement control information; collecting and analyzing measurement control information; calculating control limits and monitoring equipment performance against those limits, etc.).

The Contractor shall integrate MC&A requirements with other plans, projects/programs, and activities at all life-cycle stages and inform the MSC of such. The Contractor shall proactively take into account MC&A requirements, systems, and technologies in the planning, design,

construction, and operation of new or renovated DOE facilities and activities.

C.2.1.5.2 Emergency Services

The TOC maintains the Emergency Management Program at the 222-S Laboratory, interfacing with and training Contractor support staff at the laboratory. The Contractor shall proactively support the TOC Emergency Preparedness Coordinator in development, implementation, assessment, and testing of the Emergency Management Program, including participation in the annual Emergency Preparedness assessment. The Contractor shall designate an individual on its staff to serve as point of contact for emergency preparedness, shall provide a representative at the DOE Emergency Operations Center during emergencies affecting the 222-S Laboratory, and shall designate three or more individuals qualified as members of the Facility Emergency Response Organization. The Contractor shall provide staff to serve as observers, controllers, and /or evaluators during emergency preparedness drills. The Contractor shall provide qualified Building Emergency Directors and/or other trained emergency preparedness response staff on an as-needed basis to support day shift emergency management needs.

The MSC manages and conducts the Fire Services for the Hanford Site. This includes wild land fire, structural fire, and ambulance emergency response. Also included, are activities, such as, hazardous material and chemical/biological/ radiological emergency response, pre-fire planning, site-wide respiratory protection services, and the testing and maintenance of life safety fire protection systems in designated facilities. The Contractor shall support facility access to the MSC fire services personnel, and notify the Fire Department of work activities, events, and incidents that may require Fire Services involvement and/or response (e.g emergency medical assistance, hazardous or radiological emergency help, etc.).

C.2.1.6 Interface Management

Numerous interfaces exist between the Hanford Laboratory Services Contractor, MSC, PRC, TOC, other Hanford Site contractors, and the DOE Offices. Because the Contractor shares facilities with the TOC and the bulk of analyses are performed for the TOC, the interface between the Contractor and the TOC is of particular importance. The following paragraphs describe general features and requirements for Contractor interface management:

(a) A site-wide plan (MSC-IMP-00001 Hanford Site Interface Management Plan) signed by the PRC, MSC, and TOC Contractors provide a framework for inter-contractor relations and establishes interface-related processes. The Contractor may, at its option, participate in the various boards, teams, and committees established by the Hanford Site Interface Management Plan subject to the rules established by those groups.

(b) The Contractor, in the course of fulfilling its obligations under this Contract, will provide services to, or receive services from, other Hanford Site U.S. Department of Energy (DOE) prime contractors. Section J, Attachment J.3 entitled, Hanford Site Services and Interface Requirements Matrix (Matrix) identifies the service provider and the associated general interface obligations. The Matrix is not an all-inclusive listing of services that may be required or provided; however; all services provided to another contractor shall fall within the scope of the provider's contract.

Individual interfaces are established and managed through various controlling agreements such as Interface Control Documents (ICDs), Memoranda of Agreement/Understanding (MOA/MOU), Administrative Interface Agreements, and Service Level Agreements. At a minimum, controlling agreements shall define:

- The interface and/or the services work request elements, and service levels (quantity and delivery rates);
- If applicable, the method and timing for charging costs associated with the service and the payment methods; and target performance measures for meeting required service levels;
- Decision process and a robust dispute resolution process; and
- Clear delineation of roles, responsibilities, accountabilities, and authorities.

(c) Services are identified in the Matrix as either "Mandatory," or "Optional."

- "Mandatory" services, if needed by the Contractor, shall be obtained by the indicated provider. If, for any reason, a provider of a mandatory service cannot provide the required service to meet the requesting contractor's needs, the requesting contractor must obtain Contracting Officer approval prior to obtaining the services from any other source.
- "Optional" services are non-compulsory.
- If the Contractor believes it is in DOE's interest to change a "Mandatory" service to "Optional" so that it may be self-performed or procured from a different source, the Contractor shall propose this change to the DOE Contracting Officer, providing a written justification showing the benefits of the change and the describing impacts to all parties to the interface. If, at the unilateral discretion of the Contracting Officer, the decision is made to implement the proposed change, the change will not take effect until the Contractor receives Contracting Officer direction to implement the change. Contracting Officer rejection or delay of a proposed change shall not be the basis for a Request for Equitable Adjustment (REA) or subject to the Section I Clause entitled, FAR 52.233-1, Disputes – ALT I (DEC 1991).

(d) The Contractor shall resolve interface-related issues as agreed within individual service delivery agreements or using the process described in the Hanford Site Interface Management Plan. If these are unsuccessful, the Contractor may elevate the issue to the Contracting Officer. The Contractor shall, with coordination and adequate preparation, allow service-providing contractors access to its work areas to perform agreed-upon services. The Contractor shall coordinate with the TOC to ensure that any work performed within the 222-S Laboratory by other contractors is within the facility Technical Safety Requirements and operating permits..

(e) In cooperation with the TOC, the Contractor shall respond to annual requests for input to the Infrastructure and Services Alignment Plan (ISAP) and the Annual Forecast of Services and Infrastructure.

(f) Fee-for-Service providers shall provide to DOE and make available to users an adequate basis for liquidation of the charge for usage-based, "Mandatory" services. Service rates will be developed by the providers based upon customer-projected usage and may be subsequently adjusted to account for unplanned changes in demand.

(g) Contractors retain the responsibility to reach agreement on interfaces and for the appropriate delivery of services. The Government makes no guarantees or warranties regarding the delivery of services, and services between contractors shall not constitute government-furnished services or government-furnished information. The Government shall not be held responsible for the delivery or non-delivery of services between Hanford Site contractors. Contractors shall resolve any disputes regarding service interfaces and the provision of services among themselves. If contractors are unable to achieve a timely resolution of issues between themselves regarding interfaces or the appropriate delivery of services, contractors may seek direction from the Contracting Officer. DOE shall be the exclusive authority for resolving disputes associated with any interface issues that cannot be resolved between parties in a timely manner. Any litigation undertaken by the Contractor to resolve disputes over services is at the Contractor's own risk.

C.2.1.7 Records Management

The Contractor shall establish, within 60 days of the notice to proceed, a Records Management Plan (Deliverable C-11) in accordance with applicable laws and DOE Orders. All records (see 44 USC 3301 for statutory definition of a record) acquired or generated by the Contractor in performance of this contract, except for those defined as contractor-owned (see Section I, DEAR 970.5204-3, Access to and Ownership of Records), including records from the predecessor contractor and records described by the contract as being maintained in Privacy Act systems of records, shall be the property of the Government.

C.2.1.8 Training

The Contractor is responsible for establishing, implementing and maintaining a training program to ensure that all employees are qualified to perform their assigned duties. The training program shall be in accordance with DOE Orders for nuclear facility operations. The Contractor shall maintain records documenting the qualification and certification of its personnel.

The TOC provides required facility specific-training at no charge. Attachment J-3 identifies other training that the Contractor is required to purchase from the MSC and provide to affected employees.

C.2.1.9 Contract Transition

(a) Upon Contracting Officer (CO) issuance of the Notice to Proceed, the Contractor shall begin transition from the incumbent provider of laboratory services for a period of two (2) months. During the transition period, the incumbent contractor will be responsible for delivery of laboratory services. The Contractor shall assume full responsibility for delivery of laboratory services as approved by the CO at the end of the transition period.

(b) During the transition period as specified in the clause in Section F entitled "Period of Performance," the Contractor shall perform those activities that are necessary to transition work from the incumbent contractor in a manner that:

- Assures that all work for which the Contractor is responsible under the contract is continued without disruption;
- Provides for an orderly transfer of resources, responsibilities, and accountability from the incumbent contractor; and
- Assures that when the transition period is complete the Contractor is ready to perform the work in an effective, compliant, and safe manner.

(c) The Contractor is responsible for securing its own personnel and logistical support (office space, computers, telephone, etc.) during the transition period unless specifically directed otherwise by the Contracting Officer.

(d) The Contractor shall submit a Transition Plan (Deliverable C-01) to the Contracting Officer for approval within seven days after notice to proceed. The plan shall include a schedule of major activities, and at a minimum will address:

- Communication process among DOE, the incumbent Contractor, assigned subcontractors, incumbent employees, other Hanford Site contractors, and site tenants;
- Identification of key transition issues and milestones;

- Identification of a transition team (inclusive of consultants and teaming members, if any);
- Integration of work packages (direct and indirect) and Service Level Agreements from the incumbent contractor;
- Approach to minimizing impacts on continuity of operations;
- Assumption of laboratory operations;
- Human resource management;
- Implementation plan for the management systems (procedures, plans, guides, instructions, operator aids, and other controlled documents) required to accomplish the scope of Sections C.2.1 and C.2.2.
- Development of all interface control documents identified in Section C.2.1.6;
- Preparation of the Quality Assurance Program Plan (Deliverable C-12) and submission for DOE approval;
- Establishment of an invoicing system that is acceptable to the CO;
- Assumption of existing procedures; and
- Assumption of permits, applications, licenses, and other regulatory documents.

(e) The Contractor shall provide a Communications Plan (Deliverable C-10) to the Contracting Officer within seven days of receiving Notice to Proceed and update it on an as-requested basis. The Communications Plan shall address the following:

- Internal and external communications during contract award and transition
- Internal Communications (establishing a point of contact and a protocol for receiving and forwarding site wide information to employees)
- External Communications (establishing a point of contact and a protocol for receiving inquiries and doing external outreach)

(f) Within seven days of notice to proceed, the Contracting Officer will provide to the Contractor a list of all incumbent personnel.

(g) The Contractor shall provide in-process verification of Contract transition through weekly written Transition Status Reports (Deliverable C-02).

(h) The Contractor and the incumbent contractor shall jointly reconcile the government property inventory and provide a written reconciliation of to the Contracting Officer (Deliverable C-06, Physical Inventory Report) within 60 days of the notice to proceed. This information shall be used to provide a baseline for this contract and for closeout of the predecessor contract.

(i) The Contractor shall develop the inter-contractor ordering and financial agreements as defined by the Section J, Attachment J.3

entitled, Hanford Site Services and Interface Requirements Matrix and Service Level Agreements defined by Section C.1.2.5 that are necessary to support Transition and Contract performance.

(j) The Contractor shall prepare a Property Management Plan (Deliverable C-04) within 60 days of the notice to proceed, to be updated as needed.

(k) The Contractor shall prepare an Assurance System Description (Deliverable C-15) within 60 days of the notice to proceed, to be updated as needed.

(l) After completion of the transition activities contained in the approved transition plan and such other transition activities as may be authorized or directed by the Contracting Officer, the Contractor shall notify the Contracting Officer in writing that it is ready to assume full responsibility for the work (Deliverable C-14). Upon written approval from the Contracting Officer, the Contractor shall assume full responsibility for the work the day after the end of the transition period specified in Section F.03, Period of Performance.

C.2.1.10 Government Furnished Facilities, Property, and Services

The Contractor will be provided with facilities, programs, and services to accomplish its mission. A detailed listing of services and information is given in Section J, Attachment J.3 entitled, Hanford Site Services and Interface Requirements Matrix (Matrix). The Contractor shall integrate these services with the analytical services scope.

The Contractor is encouraged to review the Facilities, Equipment and Services during the contract period and make recommendations for improvements or changes that will effect cost savings to the government and/or benefit DOE's cleanup mission at the Hanford site. Facilities and analytical equipment will be available and maintained as described below.

C. 2.1.10.1 Facilities

The 222-S complex consists of the 222-S Building, a 70,000 square foot laboratory facility, which includes 11 hot cells for handling and analyzing highly radioactive samples, and the auxiliary buildings that support the analytical chemistry mission. The analytical services will be primarily performed at the 222-S Building with nearby office spaces available for use by laboratory personnel.

C.2.1.10.2 Instrumentation

The types of laboratory equipment available to the Contractor are listed below.

Sample Preparation Equipment:

- Liquid/liquid extractors

- Acid digestion apparatus
- Water digestion apparatus
- Microdistillation apparatus

Inorganic Instrumentation:

- Inductively Coupled Plasma/Mass Spectrometer systems (ICP/MS)
- ICP/AES (Atomic Emission Spectrometer systems)
- Differential Scanning Calorimeters (DSC)
- Ion Chromatographs (IC)
- Thermal Gravimetric Analyzers (TGA)
- pH on Specific Electrodes
- Titration Equipment

Organic Instrumentation:

- Total Organic Carbon analyzers
- Gas Chromatographs
- Gas Chromatograph/Mass Spectrometers (GC/MS)
- Spectrophotometer

Radiochemistry Instrumentation:

- Liquid Scintillation Counters
- Alpha/Beta Proportional Counters, and
- Gamma (GEA) and Alpha Energy Analyzers (AEA)

There are 11 hotcells and 33 remote manipulators available within the 222-S Laboratory. Of these, 3 hotcells in the 11A facility and their manipulators are available for use by the Contractor.

Any needed maintenance and repair of instruments and equipment that falls outside the scope of the procedures used for routine calibration, cleaning of equipment, and sample analysis will be provided at no charge to the Contractor.

C. 2.1.10.3 Information and Telecommunications Technology, Software, and Support

Electronic databases used for administration of the laboratory operations work scope will be turned over to the Contractor at transition. The Contract shall be provided with access to the software programs listed in Attachment J.13.

Computer work stations including basic software (Windows operating system, Microsoft Office, anti-virus protection, and Hanford site applications required for lab operation), networking with the Hanford Large Area Network (HLAN), file storage areas, and associated support will be provided at no charge to the Contractor. The Contractor is responsible for any workstations added above the existing configuration, for peripheral equipment such as printers and scanners installed in individual offices, for its own business administrative software

systems (compliant with Hanford Site requirements), and the cost of any additional software

The Contractor will be provided with a telephone network and associated desktop units. The Contractor is responsible for telephone usage charges and for costs associated with any changes to the telecommunications configuration.

Any Non-Government furnished items brought into the Government-owned or leased facilities are at the Contractor's own risk.

C. 2.1.10.4 Supplies and Equipment

Laboratory equipment, chemicals, and supplies are provided by the TOC at no charge to the Contractor. Purchases are made through DOE-approved vendors. The TOC maintains the Approved Chemical Suppliers List.

Thermoluminescent dosimeters and associated record-keeping, and bioassay services and records, are provided for a fee as described in Attachment J-3, Interface No. 32. Area monitoring, clothing and dosimetry for short-term (daily) use, and personnel contamination monitoring are direct-funded by DOE and provided by the TOC and MSC. Personal protective equipment that is not customized to the user, for example clothing, is provided at no charge. Respiratory protection equipment, including fitted masks, is also provided at no charge, (although mask fitting is not a government furnished service; see Section J, Attachment, entitled, Hanford Site Services and Interface Requirements Matrix (Matrix)). The Contractor is responsible for purchasing any other custom or specially-fitted clothing and equipment required by its employees, including prescription safety glasses, boots/shoes, and ergonomic office equipment.

C. 2.1.10.5 Government Furnished and Other Available Services

The Contractor shall coordinate with service providers (other site contractors) using processes established by those providers to request needed services.

TOC provides radiological control and industrial hygiene technicians who support maintenance and operations at the 222-S Laboratory. The radiological control and industrial hygiene technicians' priorities are established monthly, weekly, and daily by TOC based on agreed upon maintenance and operational activities.

The TOC and other Hanford site contractors provide and maintain software specific to the 222-S Laboratory or used by all Hanford site contractors. The software provided and maintained includes laboratory instrument controller software, Hanford site access training records, Industrial Hygiene (IH) monitoring records, medical records of services performed by the Hanford medical provider, and employee dosimeter and dose records. The contractor is responsible for any additional databases and software programs they deem necessary to manage staff training requirements for laboratory equipment and analysis, compliance with environmental regulations, and protection of the safety and health of its employees.

TOC maintains the nuclear safety basis for the 222-S Laboratory including the Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR) which are provided in Section J, Attachment J.6. TOC performs facility maintenance and provides those utilities as are normally required for operation of an analytical laboratory.

DOE will directly pay the fee for the Contractor's required medical support for Hanford badged employees assigned to this contract. Medical support services are provided by the site Occupational Medical Services Provider and include walk-in medical consultation and first aid, occupation-related medical monitoring examinations, ergonomic assessment, services associated with the beryllium medical program, influenza vaccinations, behavioral health services, health education, and case management. The Contractor is responsible for any costs associated with missed appointments (No Shows).

DOE will directly fund services as indicated in Attachment J.3. The DOE Employee Concerns Program (ECP) is available to Contractor staff without charge to the Contractor although the Contractor is still required to maintain its own ECP in accordance with H.20 entitled, "Employee Concern Program." (Deliverable C-09).

The MSC provides fee-based services as described in Section C.2.1.6 and Section J, Attachment J.3.

C.2.1.10.6 Hanford Site Data Systems

The Contractor shall be provided access to, and where applicable shall use the software systems listed in Attachment J.13 and other software systems as may be necessary to coordinate information exchange with customers and interface partners. The Contractor is not responsible for maintenance and updates of listed software except where noted. The Contractor is responsible for maintaining and updating any software it implements in the 222-S Laboratory.

C.2.2 SURGE ANALYTICAL SERVICES (LABOR HOUR SCOPE)

This section is to be used when a "surge" occurs which requires increased labor hours and/or the addition of more staff. Such work is identified as Labor-Hour scope and may be triggered by the following:

- Negotiation of one or more Service Level Agreements with customers that exceed the capacity of Lab staff described in Attachment J-12, when need-by dates do not allow for any reasonable resource-leveling strategy.
- An emergent event requiring analytical support in excess of expected levels.

Even when the workload does not exceed the capacity of Lab staff in Attachment J-12, the CO may nevertheless authorize use of this section under special circumstances.

Each request for authorization under this section shall be approved by the Contracting Officer prior to the work being performed. Work surge will not be authorized if the Contractor staff assigned to Section C.2.1 work scope is not in accordance with the Contractor's Staffing Plan in Section J, Attachment J.12.

C.2.3 PENSIONS AND OTHER BENEFIT PLANS (COST REIMBURSEMENT SCOPE)

The Contractor shall manage pensions and other employee benefit plans in accordance with the Section H clauses entitled "Pension and Benefit Plans" and "Post-Contract Responsibilities for Pension and Other Benefit Plans".

ATTACHMENT C.1 REQUIRED LABORATORY PROCESSES AND ANALYSES

Processes

- Sample Breakdown
- Homogenize Sample
- Centrifuge Sample
- Composite Sample
- Bulk Density
- Volume of % Centrifuged Solids
- Liquid Weight
- Solid Weight
- Volume of Solid
- Acid Digest for ICP/AA/Radiochemistry
- Water Digest for ICP/AA/Radiochemistry
- Fusion with KOH
- Solvent Extractions
- Water Digest (no acid)
- Quality Control Standards, Blanks and Calibration Samples
- SVOA sample preparation
- Core sample extrusion

Analyses

Inorganic, Physical Analyses, Total Organic Carbon

- Ammonium by Ion Chromatography (IC)/Cations by IC
- Endotherm and Exotherm Analysis by TGA DSC
- Iso Uranium by ICP/Mass Spectrometry(MS)
- Density
- % Water by Thermo Gravimetric Measurement
- Anions by IC
- ICP Acid Digest/Routine Analysis
- Total Organic Carbon by Persulfate/Coulometry
- Hg and NH3 Vapor Tube Analysis
- Actinides and IH metals by ICP
- CN and Cr(VI) by Spectrophotometry
- pH, OH and S by ISE

Organic Analyses

- PCB Sample Preparation
- PCB Analyses (SW846 8082)
- Volatile Analyses (SW846 8260)
- Semivolatile Analyses (SW846 8270)
- Total Carbon/Total Organic Carbon by Combustion Furnace

Radionuclide Analyses

- Alpha in liquid sample

- Am-241, Cm-243 by TRU-SPEC Resin
- Pu-238, 239 by TRU-SPEC Resin
- GEA, AEA
- Alpha/Beta and Liquid Scintillation Counters
- Sr-89,90 High Level
- I-129, N-63, H-3, Se-79 and Tc-99

Data Reporting

- Full Data Package
- Summary Data Package
- Summary Data Package with Quality Assurance and TCD Upload
- HEIS and ABCASH uploads

PART I – THE SCHEDULE

SECTION D - PACKAGING AND MARKING

D.01 PACKAGING D-2
D.02 MARKING D-2

SECTION D - PACKAGING AND MARKING

D.01 PACKAGING

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

D.02 MARKING

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

1. Identifies the Contract by number under which the item is being delivered.
2. Identifies the deliverable Item Number or Report Requirement which requires the delivered item(s).
3. Indicates whether the Contractor considers the delivered item to be a partial or full satisfaction of the requirement.

(b) For any package, report, or other deliverable being delivered to a party other than the Contracting Officer (CO), a copy of the document required in (a) above shall be simultaneously provided to the CO administering the contract, as identified in Section G of the contract.

PART I – THE SCHEDULE

SECTION E - INSPECTION AND ACCEPTANCE

E.01 FAR 52.246-4 INSPECTION OF SERVICES – FIXED PRICE (AUG 1996)..... E-2
E.02 FAR 52.246-5 INSPECTION OF SERVICES – COST REIMBURSEMENT (APR 1984) E-2
E.03 FAR 52.246-6 INSPECTION OF SERVICES – TIME-AND-MATERIALS AND LABOR – HOUR (MAY 2001)..... E-2
E.04 INSPECTION AND ACCEPTACE..... E-2

E.01 FAR 52.246-4 INSPECTION OF SERVICES – FIXED PRICE (AUG 1996)

E.02 FAR 52.246-5 INSPECTION OF SERVICES – COST REIMBURSEMENT (APR 1984)

E.03 FAR 52.246-6 INSPECTION OF SERVICES – TIME-AND-MATERIALS AND LABOR – HOUR (MAY 2001)

E.04 INSPECTION AND ACCEPTACE

Inspection of all items under this contract shall be accomplished by the CO, the Contracting Officer's Representative (COR), or any other duly authorized Government representative identified by the CO responsible for contract. The contractor will be notified in writing or by a copy of the delegation of authority if a representative other than the CO or the COR identified in Section G of the contract is designated.

Acceptance of all work and effort under this contract shall be accomplished in writing by the Contracting Officer or by his/her duly authorized representative.

Final inspection and acceptance of the work under this contract shall be accomplished by the Contracting Officer upon completion of all contract requirements.

PART I – THE SCHEDULE

SECTION F - DELIVERIES OR PERFORMANCE

F.01 FAR 52.242-15 STOP WORK ORDER (AUG 1989) F-2
F.02 FAR 52.242-17 GOVERNMENT DELAY OF WORK (APR 1984) F-2
F.03 PERIOD OF PERFORMANCE F-2
F.04 PLACE OF PERFORMANCE F-2
F.05 STOP-WORK AND SHUTDOWN AUTHORIZATION F-2

SECTION F - DELIVERIES OR PERFORMANCE

F.01 FAR 52.242-15 STOP WORK ORDER (AUG 1989)

F.02 FAR 52.242-17 GOVERNMENT DELAY OF WORK (APR 1984)

F.03 PERIOD OF PERFORMANCE

The base period of performance for this contract is twenty-four (24) months from written Notice to Proceed. The base period of performance includes a two (2) month contract transition period and twenty-two (22) months of Laboratory Operations. The contract includes three (3) one-year option periods that may be exercised unilaterally in accordance with FAR 52.217-9, "Option to Extend the Term of the Contract."

F.04 PLACE OF PERFORMANCE

The place of performance of this contract shall be the Hanford Site, near Richland, Washington.

F.05 STOP-WORK AND SHUTDOWN AUTHORIZATION

(a) Definitions:

Imminent Danger: Any condition or practice such that a hazard exists that could reasonably be expected to cause death, serious physical harm, or other serious hazard to employees, unless immediate actions are taken to mitigate the effects of the hazard and/or remove employees from the hazard.

Adversely Affects Safe Operation of Facility or Serious Facility Damage: A condition, situation, or activity that if not terminated or mitigated could reasonably be expected to result in: nuclear criticality; facility fire/explosion; major facility or equipment damage or loss; or, a facility evacuation response.

Stop Work Criteria:

1. Conditions exist that pose an imminent danger to the health and safety of workers or the public; or

2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, the facility; or

3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

(b) DOE Stop Work Order.

In accordance with Section I, *Contract Clause*, I.115, DEAR 970.5223-1 *Integration of Environment, Safety, and Health into Work Planning and Execution*, the DOE Contracting Officer has the ability to issue a DOE Stop Work Order stopping work in whole or in part if:

1. the contractor fails to provide resolution of any noncompliance with applicable ES&H and Safety Management System requirements or,

2. at any time the contractor's acts or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public.

In addition, a DOE Stop Work Order can be initiated if the Stop Work Criteria as defined in Section F.05 (a) are met dependent on the severity and extent of the condition.

(c) DOE Stop Work Action.

DOE personnel provide safety oversight of contractor operations and have the authority to initiate a DOE Stop Work Action if the Stop Work Criteria as defined in Section F.05 (a) are met. DOE personnel have the authority to shut down an entire facility, activity, or job. Following a DOE Stop Work Action the contractor shall:

1. immediately stop the identified activity or activities (up to and including entire plant shutdown);

2. place the area, activity, facility, etc. into a safe condition;

3. determine actions necessary to address the unsafe condition;

4. provide proposed corrective actions to the DOE initiator of the DOE Stop Work Action;

5. prior to restarting work, inform the DOE initiator that the corrective actions allowing for restart have been completed;

6. restart work only after the unsafe condition is mitigated and the DOE has given verbal direction to allow restart; and

7. if requested, provide DOE a Corrective Action Plan (Deliverable F-01) subsequent to the resumption of work in accordance with contractual requirements.

(d) Contractor Stop Work Action.

1. The contractor shall establish a stop work process/procedure that:

   a. Meets the requirement of 10 CFR 851.20, *Management responsibilities and worker rights and responsibilities.*

   b. At a minimum, uses the Stop Work Criteria defined in Section F.05 (a) for when a Contractor Stop Work Action is required; and

   c. Meets the tenets of the "Stop Work Policy."

2. Upon initiating a Contractor Stop Work Action the contractor shall:

a. Immediately stop the identified activity or activities (up to and including entire plant shutdown);

b. Place the area, activity, facility, etc. into a safe condition;

c. Notify the DOE Facility Representative if the Contractor's Stop Work Action meets the Stop Work Criteria defined in Section F.05 (a), or notification of facility management is required for the issue;

d. Determine actions necessary to address the unsafe condition; and

e. Restart work only after the unsafe condition is mitigated.

(e) Stop Work Policy.

The following represent the site's Stop Work Policy:

Stop Work Responsibility: Every Hanford site employee, regardless of employer, has the responsibility and authority to stop work IMMEDIATELY, without fear of reprisal, when the employee is convinced:

1. Conditions exist that pose a danger to the health and safety of workers or the public;

2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, a facility; or

3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

Reporting Unsafe Conditions: Employees are expected to report any activity or condition which he/she believes is unsafe. Notification should be made to the affected worker(s) and then to the supervisor or designee at the location where the activity or condition exists. Following notification, resolution of the issue resides with the responsible supervisor.

Right to a Safe Workplace: Any employee who reasonably believes that an activity or condition is unsafe is expected to stop or refuse work without fear of reprisal by management or coworkers and is entitled to have the safety concern addressed prior to participating in the work.

Stop Work Resolution: If you have a "stop work" issue that has not been resolved through established channels, immediately contact your employer’s Safety Representative or your Union Safety Representative. Alternatively, you may contact the employer’s Employee Concerns Program or the DOE Employee Concerns

PART I – THE SCHEDULE

SECTION G - CONTRACT ADMINISTRATION DATA

G.01 CORRESPONDENCE PROCEDURES G-2
G.02 BILLING INSTRUCTIONS G-3
G.03 DEFECTIVE OR IMPROPER INVOICES G-5
G.04 CONTRACTOR'S POINT OF CONTACT G-5

SECTION G - CONTRACT ADMINISTRATION DATA

G.01 CORRESPONDENCE PROCEDURES

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

(a) Technical Correspondence. Technical correspondence (as used herein, this term 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 DOE Contracting Officer with an information copy of the correspondence to the DOE Contracting Officer's Representative (COR).

(b) Patents Correspondence. The Chicago Operations Office, acting through the Intellectual Property Law Division of the Office of Chief Counsel, DOE, 9800 South Cass Avenue, Argonne, Illinois, 60439, is hereby designated to represent the CO in administering the Patent Clauses in this contract. Correspondence concerning patent and technical data issues shall be addressed to the Chicago Operations Office in care of Gary Drew, Assistant Chief Counsel for Intellectual Property, One Cyclotron Road MS90-1023, Berkeley, CA, 94720, with copies to the:

Michael D. O'hagen
Assistant Chief Counsel for the Office of River Protection
2440 Stevens Center
Richland, WA, 99354

David Garcia
Contracting Officer
2440 Stevens Center
Richland, WA, 99354

Dawn MacDonald
Contracting Officer's Representative
2440 Stevens Center
Richland, WA, 99354

(c) Subject Line(s). All correspondence shall contain a subject line commencing with the contract number as illustrated below:

"SUBJECT: CONTRACT NO. DE-EM0003722"

(Insert subject topic after contract number, e.g., "Request for Subcontract Consent").

(d) Electronic Media for Reports/Plans/Documents. All required reports, plans, and other documents shall be submitted to DOE electronically, and upon request by the DOE CO or the DOE COR, in hard copy form. The Contractor will prepare the requested reports and documents via site standard software and provide a copy on diskette or Compact Disk (CD-R, CD-RW) as required by the size of the document. The data shall be in a format that will allow conversion to Portable Document Format (PDF) or Hyper Text Markup Language (HTML) for potential posting on the Internet, Intranet, or in an electronic library. If other software is used, the documents shall be scanned and then provided on diskette or Compact Disk. Electronic data shall be available within five days of the DOE request.

(e) Other Correspondence.

All correspondence, other than technical correspondence, shall be addressed to the DOE CO, with information copies of the correspondence to the DOE COR. The Contractor shall use the COR as the point of contact on technical matters, subject to the restrictions of the clause in Section I entitled "DEAR 952.242-70 Technical Direction (DEC 2000)."

(f) DOE Contracting Officer Address.
United States Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, WA 99352
Attention: David Garcia
Email at: david.garcia@orp.doe.gov

(g) DOE Contracting Officer's Representative Address.
United States Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, WA 99352
Attention: Dawn MacDonald
Email at: dawn.macdonald@rl.doe.gov

G.02 BILLING INSTRUCTIONS

(a) Contractors shall submit invoices using the Standard Form 1034 (Public voucher for Purchases and Services Other Than Personal) electronically through the Oak Ridge Financial Service Center's (ORFSC) Vendor Inquiry Payment Electronic Reporting System (VIPERS). The VIPERS system allows vendors to submit invoices, attach supporting documentation and check the payment status of any voucher submitted to the DOE. Submitting electronically provides benefits to vendors by:

- Reducing the cost of paper and postage
- Allowing supporting documentation to be attached and routed with the voucher to program and approving officials

- Immediately interfacing invoices to DOE's accounting system saving several days of mail and manual processing time

- Decreasing potential errors caused by manual input

- Facilitating the prompt payment of invoices

(b) To obtain access to and to use VIPERS, please visit the web page at https://vipers.oro.doe.gov. Detailed instructions on how to enroll and use the system are provided on the web page. Please do not send a paper copy of a voucher that has been submitted electronically. The invoice must include a statement of cost and supporting documentation for services rendered. This statement should include, as a minimum, a breakout by cost or price element and program value level of all services actually provided by the Contractor, both for the current billing period and cumulatively for the entire contract.

(c) For Fixed Price CLINs 00001, 00002, 00006, 00010, and 00014, the Contractor shall submit invoices (Standard Form 1034) in accordance with FAR 52.232-1 "Payments" (APR 1984).

(d) For Labor-Hour CLINs 00004, 00008, 00012, and 00016, the Contractor shall submit invoices (Standard Form 1034) that include:

i. A breakout by functional area of the PWS for all services actually provided by the Contractor and authorized for payment under the payment provisions of the contract for the current billing period. The Direct Productive Labor Hour (DPLHs) incurred during the current billing period shall be broken down into hours worked, names of employees who incurred the cost, and specific tasks associated with the billing. A cumulative summary for DPLHs expended and the associated billing amounts charged shall also be provided.

ii. The invoice must include a certification statement signed by a responsible official of the Contractor.

(e) For Cost Reimbursable CLINS: 00005, 00009, 00013, and 00017, the Contractor shall submit invoices (Standard Form 1034) for the actual amount paid for the pension and benefit employer costs. No Award Fee will be paid for these CLINs.

(f) In accordance with FAR 52.232-25, Prompt Payment, The Government will make payments to the Contractor by electronic funds transfer not later than thirty (30) calendar days after receipt of an acceptable invoice from the Contractor.

(g) For Award Fee CLINs 00003, 00007, 00011, and 00015, the amount of annual award fee earned by the Contractor, if any, shall be unilaterally determined by the Fee Determining Official (FDO) in accordance with the Performance Evaluation & Measurement Plan (PEMP). Upon the FDO's determination, the

CO shall notify the Contractor in writing regarding the amount of award fee earned, if any, and the Contractor shall submit an invoice to the Government for this amount.

(h) Any basis for invoice withholding, adjustment or reduction which is discovered after payment will be corrected on subsequent invoices. If the Government discovers such defects, the CO will notify the Contractor in writing. The CO's written notification will explain the nature of the basis for withholding, adjustment, or reduction, and will specify the dollar amount of the withholding, adjustment or reduction.

G.03 DEFECTIVE OR IMPROPER INVOICES

Name, title, phone number, office name, and complete mailing address of the official(s) of the business concern who are to be notified when DOE receives a defective or improper invoice.

Keith Tucker
Vice President, Business Development
740-443-7924
Wastren Advantage, Inc.
1571 Shyville Road
Piketon, OH 45661

G.04 CONTRACTOR'S POINT OF CONTACT

The Contractor shall identify to the Contracting Officer the official who has the authority to sign this Contract and who is also responsible for managing, administering, negotiating, and executing changes or modifications to the terms and conditions of this Contract.

Keith Tucker
Vice President, Business Development
740-443-7924
Wastren Advantage, Inc.
1571 Shyville Road
Piketon, OH 45661

PART I – THE SCHEDULE

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SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.01 CONSECUTIVE NUMBERING

Due to automated procedures employed in formulating this document, clauses and provisions contained within may not always be consecutively numbered.

H.02 PENSION AND BENEFIT PLANS

(a) Background on Benefit Plans

(1) The Hanford Site Pension Plan (HSPP) is a multi-employer pension plan which includes three (3) separate benefit structures: two (2) for bargaining unit employees and one (1) for non-bargaining unit employees (exempt and nonexempt). The HSPP covers eligible employees of certain U.S. Department of Energy (DOE) Hanford prime contractors and subcontractors. The HSPP is managed and administered by committees composed of representatives from each of the sponsoring employers.

(2) The Hanford Site Savings Plans (HSSPs) cover eligible employees of certain DOE Hanford prime contractors and subcontractors. The HSSPs includes three (3) separate plans: two (2) plans for bargaining unit employees and one (1) plan for non-bargaining unit employees (exempt and nonexempt). The HSSPs are managed and administered by committees composed of representatives from each of the sponsoring employers.

(3) The Hanford Employee Welfare Trust (HEWT) is a multiple employer welfare arrangement (MEWA). Health and welfare benefits are administered under the HEWT which contains provisions for a wide range of medical and insurance benefits for eligible Hanford workers of certain DOE Hanford prime contractors and subcontractors and their beneficiaries. The HEWT is managed and administered by the HEWT Committee, which is composed of representatives from each sponsoring employer.

(4) The Contractor is required in paragraph (h) to offer a market-based package of retirement and medical benefits to Non-Incumbent Employees (as defined in paragraph (c)). These benefit plans are referred to herein as "Market-Based Plans." Benefit costs associated with Market-Based Plans are not reimbursable under this contract, costs are to be included in the firm fixed price portion of the contract.

(5) The HSPP, HSSP and HEWT are collectively referred to herein as the "Plans" for purposes of the Section H Clauses entitled, Pension and Benefit Plans, Post-Contract Responsibilities for Pension and Other Benefit Plans, and Incumbent Employees Benefit Plans.

(b) Incumbent Employees for the purposes of this Contract

Based on prior employment and the terms of the HSPP, Incumbent Employees are those employees eligible under the terms of the HSPP to participate, or to return to and participate, in the HSPP and accrue Benefit Service as defined in the HSPP.

(c) Non-Incumbent Employees

If an employee does not meet the definition of an Incumbent Employee with respect to the HSPP as described in paragraph (b), the employee will be considered a Non-Incumbent Employee for the purposes of this Contract.

(d) Pension and Other Benefit Programs

(1) The Contractor shall become a sponsor of the pension and other benefit plans identified in paragraph (a)(5), when it hires Incumbent Employees unless the Contractor demonstrates to the satisfaction of the Contracting Officer that there are no practicable means of doing so that would maintain its segment of the HSPP in a tax-qualified basis, and shall be responsible for the management and administration of the Market-Based Plans identified in paragraphs (a)(4).

(2) Unless otherwise required by applicable law or approved by the Contracting Officer, no implementation of a benefit program and no amendment to any of the plans identified in paragraph (a)(5) or underlying trust documents thereto shall result in allowable costs (FAR Part 31) under this Contract.

(3) No presumption of allowability will exist when the Contractor implements a new benefit plan or makes changes to existing benefit plans identified in paragraph (a)(5) until the Contracting Officer makes a determination of cost allowability for reimbursement for new or changed benefit plans.

(4) Cost reimbursement for pension and other benefit plans identified in paragraph (a)(5) sponsored by the Contractor will be based on the Contracting Officer's approval of Contractor actions pursuant to an approved Ben-Val and an Employee Benefits Cost Study as described below.

(5) The Contractor shall submit the studies required in (i) and (ii) below. The studies shall be used by the Contractor in calculating the cost of benefits under existing benefit plans. An Employee Benefits Value (Ben-Val) Study Method using no less than 15 comparator organizations and an Employee Benefits Cost Survey comparison Method shall be used in this evaluation to establish an appropriate comparison method. In addition, the Contractor shall submit updated studies to the Contracting Officer for approval prior to the adoption of any change to a pension or other benefit plan identified in paragraph (a)(5).

(i) Separate Ben-Val studies are required every two years for all

plans identified in paragraph (a)(5). A Ben-Val is an actuarial study of the relative value (RV) of the benefits programs offered by the Contractor measured against the RV of benefit programs offered by comparator companies approved by the Contracting Officer. To the extent that the value studies do not address post retirement benefits other than pensions, the Contractor shall provide a separate cost and plan design data comparison for the post-retirement benefits other than pensions using external benchmarks derived from nationally recognized and Contracting Officer approved survey sources; and,

(ii) Separate Employee Benefits Cost Study comparisons are annually required for all plans identified in paragraph (a)(5). An Employee Benefits Cost Study is a study which analyzes the Contractor's employee benefits cost on a per capita per full time equivalent employee basis and as a percent of payroll and compares them with the costs reported by the U.S. Department of Labor's Bureau of Labor Statistics or other Contracting Officer approved, broad based, national survey.

(6) When net benefit value exceeds the comparator group by more than five (5) percent (%), the Contractor shall submit a corrective action plan to the Contracting Officer for approval, unless waived by the Contracting Officer.

(7) When the average total benefit per capita cost or total benefit cost as a percent of payroll exceeds the comparator group by more than 5 %, and if required by the Contracting Officer, the Contractor shall submit an analysis of the specific plan costs that are above the per capita cost range or total benefit cost as a percent of payroll and a corrective action plan to achieve conformance with a Contracting Officer directed per capita cost range or total benefit cost as a percent of payroll.

(8) Within two (2) years of approval of the Contractor's corrective action plan by the Contracting Officer, the Contractor shall implement corrective action plans to align employee benefit programs with the benefit value and per capita cost range or percent of payroll as approved by the Contracting Officer.

(9) The Contractor may not terminate any plans identified in paragraph (a)(5), during the term of the Contract without prior approval of the Contracting Officer in writing.

(10) Cost reimbursement for Post-Retirement Benefits (PRBs) is contingent on the specific terms of the plans identified in paragraph (a)(5), as amended. Unless required by Federal or State law, advance funding of PRBs is not allowable.

(11) All costs of administration shall be costs of each plan individually and allocated to participating plan sponsors. Costs of administration shall be directly billed to the plans and not charged by indirect allocation.

(12) The Contractor shall maintain a sufficient number of trained and qualified personnel to perform all of the functions of the plans.

(13) The Contractor shall render all ordinary and normal administrative services and functions which may be reasonably required for those plans identified in paragraph (a)(5). The Contractor shall annually provide an itemization of costs incurred for plan administration for each plan to the Contracting Officer within 60 days of the end of each plan year.

(14) The Contractor shall manage Plan assets in a prudent manner. The Contractor shall develop and submit to the Contracting Officer an Investment Policy Statement for each plan that clearly defines investment return objectives and risk tolerances, and shall perform annual pension plan Investment Performance Self-Assessments. The Contractor performance self-assessments shall address investment objectives, development of the plans to achieve investment objectives, execution of the plans, performance monitoring, and appropriate corrective action planning and execution. The Contractor shall provide the Contracting Officer with a copy of each plan's Investment Performance Self-Assessment.

(15) The Contractor shall comply with the Investment Policy Statements developed for the plans identified in paragraph (a)(5). Should the Contractor incur higher costs because the Contractor fails to comply with all or part of the established Investment Policy Statements provided to DOE, the additional costs incurred are unallowable.

(16) Each contractor sponsoring a pension and/or postretirement benefit plan shall participate in the annual plan management process which includes written responses to a questionnaire regarding plan management, providing forecasted estimates of future reimbursements in connection with the plan and participating in a conference call to discuss the contractor submission (see (e)(8) below for Pension Management Plan requirements).

(17) Each contractor shall respond to quarterly data calls issued through iBenefits, or its successor system for plans identified in paragraph (a)(5).

(18) Contractors shall submit new benefit plans and changes to plan design or funding methodology for plans identified in paragraph (a)(5) with justification to the Contracting Officer for approval. The justification must:

(i) demonstrate the effect of the plan changes on the contract net benefit value or per capita benefit costs,

(ii) provide the dollar estimate of savings or costs, and

(iii) provide the basis of determining the estimated savings or cost.

(e) Establishment and Maintenance of Pension Plans for which DOE Reimburses Costs

(1) The Contractor shall comply with the requirements of Employee Retirement Income Security Act (ERISA) if applicable to the pension plan and any other applicable laws.

(2) Employees working for the Contractor shall only accrue credit for service under this Contract after the date of Contract award.

(3) Any pension plan maintained by the Contractor, for which DOE reimburses costs, shall be maintained as a separate pension plan distinct from any other pension plan which provides credit for current service not previously paid through a DOE cost reimbursement contract.

(4) The following reports shall be submitted to DOE as soon as possible after the last day of the plan year by the contractor responsible for each designated pension plan funded by DOE but no later than the dates specified below:

(i) Actuarial Valuation Reports. The annual actuarial valuation report for each DOE-reimbursed pension plan and when a pension plan is commingled, the contractor shall submit separate reports for DOE's portion and the plan total by the due date for filing IRS Form 5500.

(ii) Forms 5500. Copies of IRS Forms 5500 with Schedules for each DOE-funded pension plan, no later than that submitted to the IRS.

(iii) Forms 5300. Copies of all forms in the 5300 series submitted to the IRS that document the establishment, amendment, termination, spin-off, or merger of a plan submitted to the IRS.

(5) At least sixty (60) days prior to the adoption of any changes to a pension plan, the Contractor shall submit the information required below, as applicable, to the Contracting Officer for approval or disapproval and a determination as to whether the costs are deemed allowable pursuant to FAR 31.205-6, as supplemented by DEAR 970.3102-05-6.

(1) For proposed changes to pension plans and pension plan funding, the Contractor shall provide the following to the Contracting Officer:

(A) a copy of the current plan document (as conformed to show all prior plan amendments), with the proposed new amendment indicated in redline/strikeout;
(B) an analysis of the impact of any proposed changes on actuarial accrued liabilities and costs;
(C) except in circumstances where the Contracting Officer indicates that it is unnecessary, a legal explanation of the proposed changes from the counsel used by the plan

for purposes of compliance with all legal requirements applicable to private sector defined benefit pension plans;

(D) the Summary Plan Description; and,

(E) any such additional information as requested by the Contracting Officer.

(6) The Contractor shall not terminate any pension plan without at least 60 days notice to and the approval of the Contracting Officer prior to the scheduled date of plan termination.

(7) Each contractor pension plan shall be subjected to a limited-scope audit annually that satisfies the requirements of ERISA section 103, except that every third year the contractor must conduct a full-scope audit satisfying ERISA section 103. Alternatively, the contractor may conduct a full-scope audit satisfying ERISA section 103 annually. In all cases, the Contractor must submit the audit results to the contracting officer. In years in which a limited scope audit is conducted, the contractor must provide the contracting officer with a copy of the qualified trustee or custodian's certification regarding the investment information that provides the basis for the plan sponsor to satisfy reporting requirements under ERISA section 104.

(8) The Pension Management Plan shall include the following:

(A) A Pension Management Plan (PMP) discussing the Contractor's plans for management and administration of all pension plans consistent with the terms of this contract. The PMP shall be updated and submitted to the Contracting Officer in draft annually no later than 45 days after the last day of the Plan year along with its draft actuarial valuation.

(B) Within thirty (30) days after the date of the submission, appropriate Contractor representatives shall meet with the Contracting Officer to discuss the Contractor's proposed draft annual update of the PMP to specifically discuss any anticipated changes in the projected pension contributions from the prior year's contributions and any discrepancies between the actual contributions made for the most recent year preceding that meeting and the projected contributions for that year which the Contractor had submitted to the Contracting Officer the prior year. The annual revision of the PMP shall include:

(i) The Contractor's best projection of the contributions which it will be legally obligated to make to the pension plan(s), beginning with the required contributions for the coming fiscal year, based on the latest actuarial valuation, and continuing for the following four years. This estimate will be based upon compliance with all applicable legal requirements relating to the determination of contributions and upon the assumptions set out in the plan document(s).

(ii) If the actuarial valuation submitted pursuant to the annual PMP update indicates that the sponsor of the pension plan must impose pension plan benefit restrictions, the Contractor shall provide the following information:

(aa) The type of benefit restriction that will take place,
(bb) The number of Contractor employees that potentially could be impacted and the nature of the restriction (e.g., financial impact) by imposition of the required benefit restriction, and
(cc) The amount of money that would need to be contributed to the pension plan to avoid legally required benefit restrictions.

(iii) A detailed discussion of how the Contractor intends to manage the pension plan(s) to maximize the contribution predictability (i.e. forecasting accuracy) and contain current and future costs, to include rationale for selection of all plan assumptions that determine the required contributions and which impact the level and predictability of required contributions. The Contractor is required to annually establish a long term (e.g. five year) plan that outlines the projected retirement plan costs, and any planned action steps to be taken to better manage predictability. The contractor must also share the following information with the Department during the meeting:

(aa) Strategy for achieving and maintaining fully-funded status of the plan(s)
(bb) Investment policy statement for the plan, with any recent updates
(cc) Results of recent asset liability studies (required to be performed every 3 years or after a significant event) including rational for maintaining current asset allocation strategy
(dd) Comparison of budget projections submitted to the Department to actual contributions
(ee) Any recent reports, findings, or recommendations provided by plan's investment consultant.
(ff) Actuarial experience studies to set the plan's actuarial assumptions (required to be performed every 3-5 years)

(iv) An assessment to evaluate the effectiveness of the Contractor's pension plan(s) investment management/results. The assessment shall include at a minimum: a review and analysis of pension plan investment objectives; the strategies employed to achieve those objectives; the methods used to

monitor execution of those strategies and the achievement of the investment objectives; and a comparative analysis of the objectives and performance of other comparable pension plans. The Contractor shall also identify its plans, if any, for revising any aspect of its pension plan management based on the results of the review.

(9) Reimbursement of Contractors for Contributions to Defined Benefit Pension Plans

Contractors that sponsor plans identified in paragraph (a)(5) will be reimbursed for pension contributions in the amounts necessary to ensure that the plans are funded to meet the annual minimum requirement under ERISA, as amended by the Pension Protection Act (PPA). However, reimbursement for pension contributions above the annual minimum contribution required under ERISA, as amended by the PPA, will require prior approval of the Contracting Officer and will be considered on a case by case basis. Reimbursement amounts will take into consideration all pre-funding balances and funding standard carryover balances.

(10) Terminating Operations

When operations at a designated DOE facility are terminated and no further work is to occur under the prime contract, the following apply:

(1) No further benefits for service shall accrue.

(2) The Contractor shall provide a determination statement in its settlement proposal, defining and identifying all liabilities and assets attributable to the DOE contract.

(3) The Contractor shall base its pension liabilities attributable to DOE contract work on the market value of annuities or lump sum payments or dispose of such liabilities through a competitive purchase of annuities or lump sum payouts.

(4) Assets shall be determined using the “accrual-basis market value” on the date of termination of operations.

(5) DOE and the Contractor(s) shall establish an effective date for spinoff or plan termination. On the same day as the contractor notifies the IRS of the spinoff or plan termination, all plan assets assigned to a spun-off or terminating plan shall be placed in a low-risk liability matching portfolio until the successor trustee, or an insurance company, is able to assume stewardship of those assets.

(11) Terminating Plans

(1) DOE contractors shall not terminate any pension plan (Commingled or site specific) without requesting Departmental approval at least 60 days prior to the scheduled date of plan termination.

(2) To the extent possible, the contractor shall satisfy plan liabilities to plan participants by the purchase of annuities through competitive bidding on the open annuity market or lump sum payouts. The contractor shall apply the assumptions and procedures of the Pension Benefit Guaranty Corporation.

(3) Funds to be paid or transferred to any party as a result of settlements relating to pension plan termination or reassignment shall accrue interest from the effective date of termination or reassignment until the date of payment or transfer.

(4) If ERISA or IRC rules prevent a full transfer of excess DOE reimbursed assets from the terminated plan, the contractor shall pay any deficiency directly to DOE according to a schedule of payments to be negotiated by the parties.

(5) On or before the same day as the contractor notifies the IRS of the spinoff or plan termination, all plan assets assigned to a spun-off or terminating plan shall be placed in a low-risk liability matching portfolio until the successor trustee, or an insurance company, is able to assume stewardship of those assets.

(6) DOE liability to a Commingled pension plan shall not exceed that portion which corresponds to DOE contract service. The DOE shall have no other liability to the plan, to the plan sponsor, or to the plan participants.

(7) After all liabilities of the plan are satisfied, the contractor shall return to DOE an amount equaling the asset reversion from the plan termination and any earnings which accrue on that amount because of a delay in the payment to DOE. Such amount and such earnings shall be subject to DOE audit. To effect the purposes of this paragraph, DOE and the contractor may stipulate to a schedule of payments.

(f) Benefits for Incumbent Employees under the HSPP and HSSP

(1) HSPP

(i) The Contractor shall allow individuals who are Incumbent Employees to accrue credit under the HSPP for service under this Contract. The Contractor shall timely supply the Plan Administrator(s) with the information required by the Administrator(s) necessary to effectively administer the Plan(s). Contributions to the HSPP as determined by the Plan Administrator shall be allowable costs under this Contract, subject to compliance with other provisions of this Contract and terms of the Plans, as amended. At Contract completion, the Contractor shall fully fund its withdrawal liability under the HSPP;

provided, however, that when or if this Contract expires or terminates, the Contractor shall continue as a plan sponsor of the HSPP pursuant to the Section H Clause entitled, *Post-Contract Responsibilities for Pension and Other Benefit Plans*.

(ii) The Contractor shall coordinate with the HSPP Administrator to ensure DOE receives an annual reporting and accounting of the Contractor's pension obligations, pursuant to Financial Accounting Standard (FAS) 87, for those employees participating in the HSPP and supply the Administrator with all the information necessary to maintain the Federal tax qualifications of all Contractor and Hanford Site pension plans.

(2) HSSP

(i) Contributions to the HSSP shall be allowable costs under this Contract, subject to compliance with other provisions of this Contract and terms of the Plans, as amended.

(g) Benefits for Incumbent Employees under the HEWT

(1) The Contractor shall be a sponsor of the HEWT. Individuals who are Incumbent Employees for purposes of the HEWT shall be eligible to participate in the HEWT and receive medical and other benefits under the HEWT consistent with the terms of that HEWT, as amended. As a sponsor to the HEWT, the Contractor shall recognize service credited under the HEWT toward the service period required to receive severance.

(2) The Contractor shall in a timely manner supply the HEWT Administrator with the information required by the Administrator necessary to effectively administer the HEWT. The Contractor shall coordinate with the HEWT Administrator to ensure that DOE receives copies of all annual reports, actuarial reports, and submissions of FAS 106 data, and other reports as required by the Contracting Officer, of the Contractor's benefit obligations for those employees participating in the HEWT under this Contract. Contributions to the HEWT as determined by the HEWT Administrator shall be allowable costs under this Contract, subject to compliance with other provisions of this Contract.

(h) Pension and Other Benefits for Non-Incumbent Employees

(1) The Contractor shall offer a market-based package of retirement and medical benefits competitive for the industry to individuals who are not Incumbent Employees. If the Contractor meets all applicable legal and tax requirements, the Contractor may establish a separate line of business pursuant to Internal Revenue Code (IRC) 410 and 414 for the purpose of maintaining the Federal tax qualification of pension covering the Contractor's employees.

(2) All cost for market-based retirement, and medical benefits are borne by the Contractor as part of the firm fixed price bid. This includes Contractor costs for establishment, maintenance, and administration of market-based plans.

H.03 POST-CONTRACT RESPONSIBILITIES FOR PENSION AND OTHER BENEFIT PLANS

(a) If this Contract expires or terminates and the U.S. Department of Energy (DOE) has awarded a contract under which the new contractor becomes a sponsor of the Hanford Site Pension Plan (HSPP), Hanford Site Savings Plan (HSSP), Hanford Employee Welfare Trust (HEWT), as defined in paragraph (a) of the Section H Clause entitled, *Pension and Benefit Plans*, of this contract, the Contractor shall cooperate and transfer to the new contractor its responsibility for sponsorship, management and administration of the plans as appropriate and consistent with direction from the Contracting Officer.

(b) If this Contract expires or terminates without a contract with a new contractor under which the new contractor becomes a sponsor of the HSPP, HSSP, HEWT, as defined in paragraph (a) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract, or if the Contracting Officer determines that the scope of work under the Contract has been completed (any one such event may be deemed by the Contracting Officer to be "Contract Completion" for purposes of this clause), whichever is earlier, and notwithstanding any other obligations and requirements concerning expiration or termination under any other clause of this Contract, the following actions shall occur regarding the Contractor's obligations regarding all of the plans as defined in paragraph (a) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract at the time of Contract Completion:

(1) Subject to subparagraph (2) below, and notwithstanding any legal obligations independent of the Contract the Contractor may have regarding responsibilities for sponsorship, management, and administration of the plans as defined in paragraph (a)(5) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract, the Contractor shall remain the sponsor of the plans as defined in paragraph (a) of the Section H Clause entitled, *Employee Compensation: Pay and Benefits*, of this Contract, in accordance with applicable legal requirements.

(2) The parties shall exercise their best efforts to reach agreement on the Contractor's responsibilities for sponsorship, management and administration of the plans as defined in paragraph (a)(5) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract prior to or at the time of Contract Completion. However, if the parties have not reached agreement on the Contractor's responsibilities for sponsorship, management and administration of the plans as defined in paragraph (a) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract prior to or at the time of Contract Completion, unless and until such agreement is reached, the Contractor shall comply with written direction from the Contracting Officer regarding the Contractor's responsibilities for continued provision of pension and other benefits under the plans as defined in paragraph (a)(5) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract, including but not limited to continued sponsorship of the plans as defined in paragraph (a)(5) of the Section H Clause entitled, *Pension and Benefit Plans*, of this Contract, in accordance with applicable legal requirements. To the extent that the Contractor incurs costs in implementing direction from the Contracting Officer, the Contractor's costs will be reimbursed pursuant to applicable Contract provisions.

H.04 INCUMBENT EMPLOYEES BENEFIT PLANS, AND APPROVAL FOR SUBCONTRACTORS TO PARTICIPATE IN THE PLANS

(a) DOE and the Contractor shall agree to those subcontractors that will be subject to the requirements to provide pension and other benefits for Incumbent Employees as defined in paragraph (b) of the Section H Clause entitled, *Pension and Benefit Plans*. The Contractor shall submit its proposed agreement to DOE no later than thirty days prior to the close of the Transition Period, as defined in the Section F Clause entitled, *Period of Performance*. After the parties have reached agreement, as set forth above, upon those subcontractors subject to paragraph (a) of the Section H Clause entitled *Pension and Benefit Plans*, the Contractor may propose changes to the agreement. Prior to initiating any subcontracting action (e.g., issuing a solicitation) that may require a subcontractor to offer benefits to Incumbent Employees, the Contractor shall provide the Contracting Officer with rationale to support the benefits of its proposed change. Proposed changes shall not be effective or implemented without prior written approval by the Contracting Officer. Approval of the proposed change is at the unilateral discretion of the Contracting Officer.

(b) The Contractor shall flow down to all subcontractors that are subject to the agreement in paragraph (a) of this Clause the requirements of paragraphs (e), (f), (g), and (h) of the Section H Clause entitled, *Pension and Benefit Plans*, and paragraphs (a) and (b) of the Section H clause entitled, *Post-Contract Responsibilities for Pension and Other Benefit Plans*.

(c) For the purpose of determining allowability of costs, the Contractor shall not take any action that would result in the change of status of an Incumbent Employee with respect to Plans identified in paragraphs (a)(5) of the Section H Clause entitled, *Pension and Benefit Plans*, without the prior written approval of the Contracting Officer.

(d) Subject to other subcontract review and approval requirements in this Contract, this Clause does not limit the Contractor's ability to utilize subcontractors as necessary to perform Contract requirements.

H.05 NO THIRD PARTY BENEFICIARIES

This Contract is for the exclusive benefit and convenience of the parties hereto. Nothing contained herein shall be construed as granting, vesting, creating or conferring any right of action or any other right or benefit upon past, present or future employees of the Contractor, or upon any other third party. This provision is not intended to limit or impair the rights which any person may have under applicable Federal statutes.

H.06 LABOR RELATIONS

(a) The Contractor shall respect the right of employees to organize and to form, join, or assist labor organizations, to bargain collectively through their chosen labor representatives, to engage in other concerted activities for the purpose of collective bargaining or other mutual aid or protection, and to refrain from any or all of these activities.

(b) The Contractor shall meet with the Contracting Officer or designee(s) for the purpose of reviewing the Contractor’s bargaining objectives in the areas of wages, pension, and medical benefits prior to negotiations of any collective bargaining agreement or revision there to and shall consult with and obtain the approval of the Contracting Officer regarding appropriate economic bargaining parameters in the above listed areas prior to the Contractor entering into the collective bargaining process. During the collective bargaining process, the Contractor shall notify the Contracting Officer before submitting or agreeing to any collective bargaining proposal which can be calculated to affect allowable costs under this Contract.

(c) The Contractor shall seek to maintain harmonious bargaining relationships that reflect a judicious expenditure of public funds, equitable resolution of disputes and effective and efficient bargaining relationships consistent with the requirements of FAR Subpart 22.1 and DEAR Subpart 970.2201 and all applicable Federal and state labor relations laws.

(d) The Contractor shall notify the Contracting Officer or designee in a timely fashion of all labor relations issues and matters of local interest including organizing initiatives, unfair labor practice, work stoppages, picketing, labor arbitrations, and settlement agreements and will furnish such additional information as may be required by the Contracting Officer.

(e) Provide the contracting officer with a “Report of Settlement” after ratification of a collective bargaining agreement by accessing the Labor Relations Module in iBenefits, a DOE reporting system, during the next open quarter. Data will include information only for negotiated wages, pension, and medical costs.

H.07 COLLECTIVE BARGAINING AGREEMENT(S)

The Contractor shall use its best efforts to ensure that collective bargaining agreements negotiated under this Contract contain provisions designed to assure continuity of services. All such agreements entered into during the Contract period of performance should provide that grievances and disputes involving the interpretation or application of the agreement will be settled without resorting to strike, lockout, or other interruption of normal operations. For this purpose, each collective bargaining agreement should provide an effective grievance procedure with arbitration as its final step, unless the parties mutually agree upon some other method of assuring continuity of operations. The Contractor shall include the substance of this Clause in any subcontracts performed on the U.S. Department of Energy (DOE)-owned site which will affect the continuity of operation of the facility.

H.08 WORKFORCE RESTRUCTURING

Notwithstanding any other provision in this Contract, when the Contractor determines that a reduction of force is necessary, the contractor shall notify the Contracting Officer in writing at least 30 days in advance of employees being laid off. Information to be provided will include the number of impacted employees along with a list of impacted job classifications.

H.09 WORKERS' COMPENSATION

The Hanford Workers' Compensation Program is an administrative function that provides for the support of the Hanford Site Workers' Compensation Program under U.S. Department of Energy (DOE) State of Washington Self-Insurance. Pursuant to State of Washington Revised Code (RCW) Title 51, DOE is a group self-insurer for purposes of workers' compensation coverage. Notwithstanding any other provision in this Contract, the coverage afforded by the workers' compensation statutes shall, for performance of work under this Contract at the Hanford Site, be subject to the following:

(a) Under the terms of a Memorandum of Understanding with the Washington State Department of Labor and Industries (L&I), DOE has agreed to perform all functions required by self-insurers in the State of Washington.

(b) The Contractor shall take such action, and only such action, as DOE requests in connection with workers' compensation claims. Those actions will be limited to providing those documents that are customary and usual in the workers' compensation claims processing.

(c) Under RCW Title 51.32.073, DOE is the self-insurer and is responsible for making quarterly payments to the L&I. In support of this arrangement, the Contractor shall be responsible for withholding appropriate employee contributions and forwarding these contributions on a timely basis, plus the employer-matching amount to DOE.

(d) The workers' compensation program shall operate in partnership with Contractor employee benefits, risk management, and environmental, safety, and health management programs. The Contractor shall cooperate with DOE for the management and administration of the DOE-RL self-insurance program.

(e) The Contractor shall be responsible for predecessor Contractor claims that fall under DOE's self-insurance. The Contractor shall;

1. Verifying the requestor's employment record to ensure the individual was covered by the DOE Self-Insurance for workers compensation.

2. Provide an L&I Self-Insurer Accident Report (SIF-2) form, and prescription card information (provided by DOE Third Party Administrator (TPA)).

3. When the SIF-2 is returned to the Contractor, provide a copy to DOE TPA along with those documents that are customary and usual in the workers' compensation claims processing, such as the Employee Job Task Analysis (EJTA), timecard or payroll information, if available.

(f) The Contractor shall certify as to the accuracy of the payroll record used by DOE in establishing the self-insurance claims reserves and cooperate with any state audit.

(g) The Contractor shall provide statutory workers' compensation coverage for staff members performing work under this Contract outside of the State of Washington and not otherwise covered by the State of Washington workers' compensation laws.

(h) Time-loss compensation shall be paid by DOE-RL's self-insurance program to injured workers in accordance with the RCW § 51.08.178 and other applicable requirements.

(i) Workers compensation loss income benefit payments, when supplemented by other programs (such as salary continuation, short-term disability) are to be administered so that total benefit payments from all sources shall not exceed 100 percent of the employee's net pay.

(j) Upon request, the Contractor shall submit to DOE, or other party as designated by DOE, payroll records as required by Washington State Workers' Compensation laws.

(k) Upon request, the Contractor shall submit to DOE, or other party as designated by DOE, the accident reports required by RCW Title 51, Section 51.28.010, or any other documentation requested by DOE pursuant to the Washington State Workers' Compensation laws.

(l) Upon request, the Contractor shall submit to the Contracting Officer an evaluation and analysis of workers' compensation cost as a percent of payroll compared with the percentage of payroll cost reported by a nationally recognized Cost of Risk Survey that has been pre-approved by DOE.

(m) The Contractor shall ensure all employees receive training and have a clear understanding of the workers' compensation process.

(n) The Contractor shall develop and maintain a web site with Workers Compensation information and ensure that the web site is made available to employees within 45 days of the close of Transition.

(o) The Contractor shall provide additional training to claimants on the workers' compensation process when a claim is filed. This training shall include but is not limited to information regarding company contacts, approvals needed for appointments, time off, documentation requirements, etc.

(p) The Contractor shall provide briefings to DOE as requested.

(q) For purposes of workers' compensation, all entities included in the Contractor team arrangement, as defined below, shall be covered by DOE's self-insurance certification under Washington State Department of Labor and Industries for workers' compensation:

(1) Contractor team arrangement means an arrangement in which –

(i) Two or more companies form a partnership or joint venture to act as a potential prime Contractor; or

(ii) A potential prime Contractor agrees with one or more other companies to have them act as its sub-contractors under a specified Government contract or acquisition program.

(2) Any changes to the Contractor team arrangement for purposes of workers' compensation coverage shall be subject to the prior approval of the Contracting Officer.

(r) Sub-contractors not meeting the Contractor teaming arrangement definition performing work under this Contract on behalf of the Contractor are not covered by the provision of the Memorandum of Understanding referenced above.

(s) The Contractor shall flow-down to its subcontractors the requirements to provide statutory workers compensation coverage for the subcontractors' employees. The Contractor shall have no responsibility for subcontractor workers' compensation when it includes this requirement in the sub-contract(s).

H.10 ACCESS TO DOE-OWNED OR LEASED FACILITIES

(a) The performance of this contract requires that employees of the Contractor have physical access to DOE-owned or leased facilities; however, this clause does not control requirements for an employee's obtaining a security clearance. The Contractor understands and agrees that DOE has a prescribed process with which the Contractor and its employees must comply in order to receive security badges that allow such physical access. The Contractor further understands that it must propose employees whose backgrounds offer the best prospect of obtaining approval for access, considering the following potentially disqualifying criteria, which are not all inclusive and may vary depending on access requirements:

1. Is or is suspected of being, a terrorist;
2. Is the subject of an outstanding warrant;
3. Has deliberately omitted, concealed, or falsified relevant and material facts from any Questionnaire for National Security Positions (SF-86), Questionnaire for Non-Sensitive Positions (SF-85), or similar form;
4. Has presented false or forged identity source documents;
5. Has been barred from Federal employment;
6. Is currently awaiting a hearing or trial or has been convicted of a crime punishable by imprisonment of six (6) months or longer; or
7. Is awaiting or serving a form of pre-prosecution probation, suspended or deferred sentencing, probation or parole in conjunction with an arrest or criminal charges against the individual for a crime that is punishable by imprisonment of six (6) months or longer.

(b) The Contractor shall assure:

1. In initiating the process for gaining physical access, (i) compliance with procedures established by DOE, including use of any forms directed by DOE; (ii) that employees properly complete said forms; and (iii) that the employees submit the forms to the person designated by the Contracting Officer.
2. In completing the process for gaining physical access, that its employees (i) cooperate with DOE officials responsible for granting access to DOE–owned or leased facilities; and (ii) provide any additional information as DOE may request.

(c) The Contractor understands and agrees that DOE may unilaterally deny a security badge to an employee and that the denial remains effective until such time as DOE determines that access may be granted. Upon notice from DOE that an employee's application for a security badge is or will be denied, the Contractor shall promptly identify a substitute employee and initiate the process for gaining access for the substitute. DOE's denial of a security badge to individual employees shall not be cause for extension of the period of performance of this Contract or any contractor claim against DOE.

(d) The Contractor shall return to the Contracting Officer or designee the badge(s) or other credential(s) provided by DOE pursuant to this clause, granting physical access to DOE-owned or leased facilities by the Contractor's employee(s), upon (1) the termination of this Contract; (2) the expiration of this Contract; (3) the

termination of employment on this Contract by an individual employee; or (4) demand by DOE for return of the badge.

(e) The Contractor shall include this clause, including this paragraph (e), in any subcontract, awarded in the performance of this Contract, in which one or more subcontractor employees will require physical access to DOE–owned or leased facilities.

H.11 CONFIDENTIALITY OF INFORMATION

(a) 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 agree 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 which is published after receipt thereof by the Contractor or otherwise becomes part of the public domain through no fault of the Contractor;
3. Information which the Contractor can demonstrate was in his possession at the time of receipt thereof and was not acquired directly or indirectly from the Government or other companies;
4. Information which the Contractor can demonstrate was received by it from a third party who did not require the Contractor to hold it in confidence.

(b) The Contractor shall obtain the written agreement, in a form satisfactory to the Contracting Officer, of each employee permitted access, 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.

(c) The Contractor agrees, if requested by the Government, to sign an agreement identical, in all material respects, to the provisions of this clause, with each company supplying information to the Contractor under this Contract, and to supply a copy of such agreement to the Contracting Officer.

(d) 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, such an agreement shall also be signed by Contractor personnel.

(e) This clause shall flow down to all subcontracts.

H.12 CONSERVATION OF UTILITIES

The Contractor shall instruct Contractor employees in utilities conservation practices. The Contractor shall operate under conditions that preclude the waste of utilities. The Contractor shall use lights only in areas where and at the time when work is actually being performed except in those areas where lighting is essential for purpose of safety and security.

H.13 CONTRACT PARTICIPATION BY FOREIGN NATIONALS

(a) The Contractor shall notify the Contracting Officer, in writing, prior to the employment of or participation by any foreign national in the performance of work under the Contract.

(b) The Contractor shall notify the Contracting Officer, in writing, prior to any visit to sites covered by this Contract by any foreign national in connection with the work being performed under this Contract. This notification shall be made at least 75 days prior to the planned visit.

H.14 DEPARTMENT OF LABOR WAGE DETERMINATIONS

In the performance of this Contract, the Contractor shall comply with the requirements of the U.S. Department of Labor Wage Determination(s), located in Section J of this solicitation, designated for Richland, Washington and the surrounding area.

H.15 LOBBYING RESTRICTIONS (ENERGY AND WATER DEVELOPMENT AND RELATED AGENCIES APPROPRIATIONS ACT, 2013)

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 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statue and regulations.

H.16 MODIFICATION AUTHORITY

Notwithstanding any of the other clauses of this Contract, the CO 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.17 INCORPORATION OF REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFEROR

The representations, certifications, and other statements of Offeror, completed by the Contractor, Dated February 10, 2015, are hereby incorporated by reference and made a part of this contract.

H.18 NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS

It is the Sense of the Congress that, to the greatest extent practicable, all equipment and material purchased with funds made available under this award should be American-made.

H.19 WORKER SAFETY AND HEALTH PROGRAM

(a) 10 CFR 851 sets forth the worker health and safety requirements for the conduct of contractor activities at DOE sites. A "DOE site" means a DOE-owned or –leased area or location or other area or location controlled by DOE where activities and operations are performed at one or more facilities or places by a contractor in furtherance of a DOE mission. A "Covered workplace" means a place at a DOE site where a contractor is responsible for performing work in furtherance of a DOE mission.

(b) The Contractor shall comply with all applicable safety and health requirements set forth in 10 CFR 851, Worker Safety and Health Program. The Contractor shall develop, implement, and maintain a written Worker Safety and Health Plan (WSHP) which shall describe the Contractor's method for complying with and implementing the applicable requirements of 10 CFR 851. The WSHP shall be submitted to and approved by DOE within 60 days of the notice to proceed. The approved WSHP must be implemented prior to the start of work. In performance of the work, the Contractor shall provide a safe and healthful workplace, and must comply with its approved WSHP and all applicable Federal and state environmental, health, and safety regulations. The Contractor shall take all reasonable precautions to protect the environment, health, and safety of its employees, DOE personnel, and members of the public. The Contractor shall take all necessary and reasonable steps to minimize the impact of its work on DOE functions and employees. When more than one contractor works in a shared workplace, the Contractor shall coordinate with the other contractors to ensure roles, responsibilities, and worker safety and health provisions are clearly delineated. The Contractor shall participate in all emergency response drills and exercises.

(c) The Contractor shall immediately report all job-related injuries and/or illnesses which occur in any DOE facility to the Contracting Officer's Representative. Upon request, the Contractor shall provide a copy of occupational safety and health self-assessments and/or inspections of work sites for job hazards for its DOE facilities to the Contracting Officer's Representative.

(d) The Contracting Officer will notify the Contractor, in writing, of any noncompliance with the terms of this clause, plus the corrective action to be taken. After receipt of such notice, the Contractor shall immediately take corrective action.

(e) In the event that the Contractor fails to comply with the terms and conditions of this clause, the Contracting Officer may, without prejudice to any other legal or contractual rights, issue a stop work order halting all or any part of the work. Thereafter, a start order for resumption of the work may be issued at the discretion of the Contracting Officer. The Contractor shall not be entitled to an equitable

adjustment of the Contract amount or extension of the performance schedule on any stop work order issued under this special Contract requirement.

H.20 EMPLOYEE CONCERNS PROGRAM

The Contractor shall submit an implementation plan to the Contracting Officer for approval within 90 days of issuance of the Notice to Proceed that describes an Employee Concerns Program (ECP) that implements all programmatic requirements in DOE Order 442.1A Employee Concerns Program, and all superseding versions.

H.21 ALTERNATIVE DISPUTE RESOLUTION (ADR)

(a) The DOE and the Contractor both recognize that methods for fair and efficient resolution of significant disputes are essential to the successful and timely achievement of critical milestones and completion of all Contract requirements. Accordingly, the parties agree that in the event of a dispute to jointly select a 'standing neutral.' The standing neutral will be available to help resolve disputes as they arise. Such standing neutral 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. Specific joint ADR processes shall be developed.

(b) The parties agree the following provision may be invoked for significant disputes upon mutual agreement of the DOE and the Contractor:

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 any agreement cannot be reached through informal negotiations within 30 days after the start of negotiations, then such disagreement shall be referred to the standing neutral, pursuant to the jointly-developed ADR procedures.

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 standing neutral will render, a non-binding advisory opinion. Such opinion shall not be admissible in evidence in any subsequent proceedings.

(c) If one party to this Contract requests the use of the process set forth in Paragraphs b(1) and b(2) of this clause and the other party disagrees, the party disagreeing must express its position in writing to the other party. On any such occasion, if the party requesting the above process wishes to file a claim they may proceed in accordance with Section I, FAR 52.233-1 Disputes Alternate I.

(d) All of the above must be in writing.

H.22 ASSIGNMENT AND ADMINISTRATION OF SUBCONTRACTS

(a) Assignment of DOE Prime Contracts. During the period of performance of this Contract, it may become necessary for the U.S. Department of Energy (DOE) to transfer and assign existing or future DOE prime contracts supporting site work to this contract. The Contractor shall accept the transfers and assignments of contracts. Any recommendations and/or suggestions regarding individual transfers directed by DOE shall be submitted in writing to the Contracting Officer prior to the transfer or assignment.

(b) Administration of Subcontracts. The administration of all subcontracts entered into and/or managed by the Contractor, including responsibility for payment hereunder, shall remain with the Contractor. The Government reserves the right at any time to require that the Contractor submit any or all other contractual arrangements, including but not limited to purchase orders or classes of purchase orders, for approval, and provide information concerning methods, practices, and procedures used or proposed to be used in subcontracting and purchasing. Subcontracts and purchase orders shall be made in the name of the Contractor, shall not bind nor purport to bind the Government, shall not relieve the Contractor of any obligation under this contract (including, among other things, the obligation to properly supervise and coordinate the work of subcontractors), and shall be in such form and contain such provisions as are required by this contract or as the Contracting Officer may prescribe. Any consent by the Contracting Officer to the placement of subcontracts shall not be construed to create subcontractor privity of contract with the Government.

(c) Transfer of Subcontracts. As the successor contractor, the Contractor agrees to accept the transfer of existing subcontracts as determined necessary by DOE for continuity of operations. The Contractor shall attempt to negotiate changes to the assigned subcontracts incorporating mandatory flow-down provisions at no cost. If the subcontractor refuses to accept the changes or requests price adjustments, the Contractor will notify the Contracting Officer in writing. DOE reserves the right to direct the Contractor to transfer to DOE or another Contractor any subcontract awarded under this contract.

H.23 SUBCONTRACTS

(a) Prior to the placement of subcontracts and in accordance with the clause entitled FAR 52.244-6, "Subcontracts for Commercial Items (DEC 2010) ," the Contractor shall ensure that:

1. They contain all of the clauses of this contract (altered when necessary for proper identification of the contracting parties) which contain a requirement for such inclusion in applicable subcontracts. Particular attention should be directed to the potential flow-down applicability of the clauses entitled "Utilization of Small Business Concerns and Small Disadvantaged Business Concerns" contained in Part II, Section I of the contract;

2. Any applicable subcontractor Certificate of Current Cost or Pricing Data (see FAR 15.404-3b) and subcontractor Representations and Certifications (see Part IV, Section K and the document referenced in the Representations, Certifications and Other Statements of the Bidder clause are received); and

3. Any required prior notice and description of the subcontract is given to the Contracting Officer and any required consent is received. Except as may be expressly set forth therein, any consent by the Contracting Officer to the placement of subcontracts shall not be construed to constitute approval of the subcontractor or any subcontract terms or conditions, determination of the allowability of any cost revision of this contract or any of the respective obligations of the parties there under, or creation of any subcontractor privity of contract with the Government.

(b) Prior to the award of any subcontracts for advisory and assistance services, the Contractor shall obtain from the proposed subcontractor or consultant the disclosure required by, and shall determine in writing whether the interests disclosed present an actual or significant potential for an organizational conflict of interest, in accordance with the contained in Section I of this contract. The subcontractor shall perform no work until the Contractor has cleared the subcontractor for Organizational Conflicts of Interest (OCI).

H.24 KEY PERSONNEL

(a) Introduction.

Key Personnel are considered essential to the success of all work being performed under this Contract. This Clause provides specific requirements for the Key Personnel Team, requirements for changes to Key Personnel, contract commitment, and identification of all Key Personnel for this Contract.

(b) Key Personnel Team Requirements.

All Key Persons under this Contract are collectively referred to as the Key Personnel Team. The Contracting Officer and designated Contracting Officer's Representative(s) shall have direct access to the Key Personnel.

(c) Definitions

(1) For the purposes of this Clause, *Changes to Key Personnel* is defined as: (i) any change to the position assignment of a current Key Person under the Contract, except for a person who acts for short periods of time, in the place of a Key Person during his or her absence, the total time of which shall not exceed 30 working days during any given year; (ii) utilizing the services of a new substitute Key Person for assignment to the Contract; or (iii) assigning a current Key Person for work outside the Contract.

(2) For the purposes of this Clause, *Beyond the Contractor's Control* is defined as an event for which the Contractor lacked legal authority or ability to prevent *Changes to Key Personnel*.

(d) Requirements for Changes to Key Personnel

(1) The Contractor shall notify the Contracting Officer and request approval in writing at least 60 days in advance of any changes to Key Personnel.|

(2) The Contractor shall not make a change in Key Personnel without prior written approval of the Contracting Officer.

(3) No Key Person position shall remain vacant for a period more than 30 days following Contracting Officer approval of a change in Key Personnel.

(4) Approval of changes to Key Personnel is at the unilateral discretion of the Contracting Officer.

(e) Unless approved in advance, in writing, by the CO. Key Personnel shall not be removed, replaced or diverted by the Contractor for reasons under the Contractor's control within one (1) year of performance from the date of assuming full responsibility for the PWS; or for a replacement Key Personnel within one year of being placed in the position,

(f) The list of personnel may, with the consent of the contracting parties, be amended from time to time during the course of the contract to add or delete personnel.

Key Personnel	
Name	**Position**
Kristine Kuhl-Klinger	Laboratory/Project Manager
Terence Romanko	Analytical Services Manager
Anthony Scott	Operations Manager
Matthew Miller	Environmental, Safety, Health, and Security Manager

H.25 GREEN PURCHASING UNDER DOE SERVICE CONTRACTS

Pursuant to Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, the Department of Energy is committed to managing its facilities in a manner that will promote the natural environment and protect the health and well-being of its Federal employees and contractor service providers. In the performance of work under this contract, the Contractor shall exert its best efforts to provide its services in a manner that will promote the natural environment and protect the health and well-being of Federal employees, contract service providers and visitors using the facility. Green purchasing or environmentally preferable contracting includes the initiatives described below:

- Alternative Fuels and Vehicles are described at http://afdc.energy.gov/afdc/
- Biobased Products are described at http://www.biopreferred.gov/
- Energy efficient products are described at http://;energystar.gov/products for Energy Star products and at http://www.eere.energy.gov/femp/procurement for FEMP designated products

- Environmentally Preferable Computers are described at http://www.epeat.net
- Non-Ozone Depleting Products are described at http://www.epa.gov/Ozone/snap.index.html
- Recycled Products are described at http://epa.gov/cpg
- Water efficient products are described at http://epa.gov/watersense/

To the extent that the services provided by the Contractor require the provision of any of the above types of products, the environmentally preferable type of product is to be furnished unless that type of product is not available competitively within a reasonable time, at a reasonable price, is not life cycle cost efficient in the case of energy consuming products, or does not meet reasonable performance standards. The clauses at FAR 52.223-2, Affirmative Procurement of Biobased products under Service and Construction Contracts, 52.223-15, Energy Efficiency in Energy Consuming Products, and 52.223-17, Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts, in Section I require the use of products that have biobased content, are energy efficient, or have recycled content.

H.26 DOE CONTRACT ADMINISTRATION AND OVERSIGHT

The Hanford 222-S Laboratory Contract at the Hanford site presents significant work scope, and makes it imperative that DOE has a focused approach for providing oversight of Contractor work. DOE oversight activities will focus primarily on ensuring safe operation and management of the 222-S Laboratory contract at Hanford. The DOE oversight will be conducted in a tailored and proactive manner with minimal interference with contract performance. The Contractor shall respond to DOE oversight and to concerns, findings, and observations as identified by the CO or COR during the conduct of these oversight activities. The areas of oversight are:

(a) Management Oversight: This includes field inspection and the monthly assessments of contract status, which will be used to determine and validate contract performance.

(b) Contract Management Oversight: Administration and monitoring of the prime contract will be in accordance with the contract terms and conditions which include, but are not limited to, the oversight required under FAR Subchapter G – Contract Management (FAR Parts 42-51) and its supplements, as applicable.

(c) Other Oversight: The COR, Facility Representatives and/or Subject Matter Experts will conduct regular oversight and assessments. The purpose of these contacts will be to assess performance. In addition to this regular involvement, the Contractor shall support:

(1) Management Walkthroughs conducted in areas or locations where work is ongoing;

(2) Periodic Walkthroughs by DOE-HQ personnel or regulators; and

(3) Employee concerns elevated to DOE for evaluation.

H.27 PRIVACY ACT SYSTEMS OF RECORD

(a) The Contractor shall design, develop, or adopt the following systems of records on individuals to accomplish an agency function pursuant to the Section I Clause entitled, *FAR 52.224-2, Privacy Act*.

Title

Personnel Records of Former Contractor Employees
Emergency Locator Records
Payroll & Locator Records
Report of Compensation
Payroll & Pay-Related Data for Employees of Terminated Contractors
General Training Records
Personnel Medical Records
Personnel Radiation Exposure Records
Contractor Employees Insurance Claims
Personnel Security File
Security Investigations
Employee and Visitor Access Control Records
Access Authorization for ADP Equipment
General Correspondence Files

(b) The above list shall be revised by mutual agreement between the Contractor and the Contracting Officer as necessary to keep it current. A formal modification to the Contract is not required to incorporate these revisions; but the revisions become effective upon mutual agreement of the parties. The mutually agreed upon revisions shall have the same effect as if actually listed above for the purpose of satisfying the listing requirement contained in paragraph (a)(1) of the Section I Clause entitled, *FAR 52.224-2, Privacy Act*. The revisions will be formally incorporated per the next annual Contract update modification, unless added sooner by the Contracting Officer.

H.28 TRANSITION TO FOLLOW-ON CONTRACT

The Contractor recognizes that the work and services covered by this contract are vital to the DOE mission and must be maintained without interruption, both at the commencement and the expiration of this contract. It is therefore understood and further agreed in recognition of the above:

(a) At the expiration of the contract term or any earlier termination thereof, the Contractor shall cooperate with a successor contractor by allowing its employees to interview for possible employment. For those employees who accept employment with the successor contractor, such employees shall be released in coordinated manner to the successor contractor. The Contractor shall cooperate with the successor contractor with regard to the termination or transfer arrangements for such employees to assure maximum protection of employee service credits and fringe benefits.

(b) At contract expiration or termination, the Contractor shall cooperate with a successor contractor to jointly prepare a mutual detailed plan for the phase-out and phase-in of

operations. This plan shall specify a training and orientation program to cover each phase of the scope of work covered by the contract. A proposed date by which the Contractor will assume responsibility from the outgoing contractor for such work shall be established. The outgoing contractor will maintain full responsibility for such work until assumption thereof by the Contractor. Execution of the proposed plan or any part thereof shall be accomplished in accordance with the Contracting Officer's direction and approval.

H.29 EXTERNAL AFFAIRS

External Affairs includes information and involvement programs to reach diverse external parties interested in Hanford (e.g. Tribal Nations, stakeholders, news media, elected officials and their staffs, local community officials and the public) with the status, challenges and objectives of the cleanup work. For all external constituencies, the Contractor shall anticipate specific areas of concern, interest, or controversy, and employ appropriate communication strategies that inform and involve.

DOE retains the primary role in directing the timing, substance and form of public information and must approve all products and outreach.

For activities within the Contract scope, the Contractor shall:

(a) Provide information and/or resources as requested in support of DOE-ORP media interactions.

(b) As requested, work with DOE-ORP to inform and involve the Tribal Nations as part of cleanup decision making processes, in accordance with the DOE American Indian and Alaska Native Tribal Government Policy and implementation guidance. Support and coordinate with DOE-ORP on the ongoing technical staff interactions to ensure that affected Tribes can be involved early and often in proposed plans and activities.

(c) As requested, inform and involve the public, citizen advisory boards, and other interested parties in proposed plans and activities. Provide resources for required public comment and outreach processes related to upcoming decision making (e.g., NEPA and CERCLA).

(d) As necessary, participate in tour planning and preparation, and make facilities and personnel available as requested by DOE. Visits to the project sites shall be part of ongoing communication and outreach activities.

(e) Provide MSC with current information related to the Contract scope to maintain the external Hanford website.

(f) Participate in meetings and briefings to update interested external parties on Contract activities when requested by DOE.

(g) Provide ongoing support to DOE in the preparation of communication materials, such as presentations, fact sheets, specialized graphics and charts, large posters, and up-to-date photography.

H.30 RADIOLOGICAL SITE SERVICES AND RECORDS, AND OCCUPATIONAL MEDICINE SERVICES AND RECORDS

(a) The Contractor shall obtain Radiological Site Services (RSS) and occupational medicine services for all Contractor and subcontractor employees performing hazardous work that may expose workers to chemical, physical (including radiological), biological, and/or similar hazards. The Contractor shall identify required RSS and occupational medicine services as required by Section C. 2.1.10.5 Other Government Furnished Services.

(b) RSS are obtained as specified in Contract Section J, Attachment J.3 entitled, *Hanford Site Services and Interface Requirements Matrix*. RSS includes external dosimetry, internal dosimetry services, radiological instrumentation program, and radiological records services. The Section I Clauses entitled, DEAR 952.223-75, *Preservation of Individual Occupational Radiation Exposure Records* and *DEAR 970.5204-3, Access to and Ownership of Records* are implemented as follows with respect to radiological records: All radiological exposure records generated during the performance of Hanford-related activities will be maintained by the designated provider of this service listed in Section J, Attachment J.3 entitled, *Hanford Site Services and Interface Requirements Matrix* and are the property of the U.S. Department of Energy (DOE).

(c) Occupational medicine services are provided under this Contract by the Hanford Site occupational medicine services contractor as specified in Contract Section J, Attachment J.3 entitled, *Hanford Site Services and Interface Requirements Matrix*. The Section I Clause entitled, *DEAR 970.5204-3, Access to and Ownership of Records* is implemented as follows with respect to occupational medicine records: All occupational medicine records generated during the performance of Hanford-related activities will be maintained by the Hanford Site occupational medicine services provider and are the property of DOE.

H.31 DISPOSITION OF INTELLECTUAL PROPERTY – FAILURE TO COMPLETE CONTRACT PERFORMANCE

The following provisions shall apply in the event the Contractor does not complete contract performance for any reason:

(a) The Government may take possession of and use all the technical data, including limited rights data, restricted computer software, and data and software obtained from subcontractors, licensors, and licensees, necessary to complete the work in conformance with this contract, including the right to use the data in any Government solicitations for the completion of the work contemplated under this contract. Technical data includes, but is not limited to, specifications, designs, drawings, operational manuals, flowcharts, software, databases and any other information necessary for the completion of the work under this contract. The Contractor shall ensure that its subcontractors and licensors make similar rights available to the Government and its contractors.

(b) The Contractor agrees to and does hereby 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 by the Contractor, and any other

intellectual property, including technical data, which are owned or controlled by the Contractor, at any time through completion of this Contract and which are incorporated or embodied in the construction of the facilities or which are utilized in the operation or remediation of the facilities or which cover articles, materials or products manufactured at a facility: (1) to practice or to have practiced by or for the Government at the facility; and (2) to transfer such license with the transfer of that facility. 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, any rights or patents or other intellectual property herein licensed.

(c) In addition, the Contractor will take all necessary steps to assign permits, authorizations, leases, and licenses in any third party intellectual property to the Government, or such other third party as the Government may designate, that are necessary for the completion of the work contemplated under this Contract.

H.32 PRICE-ANDERSON AMENDMENTS ACT NON-COMPLIANCE

The Contractor shall establish an internal Price-Anderson Amendments Act (PAAA) noncompliance identification, tracking, and corrective action system and shall provide access to and fully support DOE reviews of the system. The Contractor shall also implement a Price- Anderson Amendments Act reporting process which meets applicable DOE standards. The Contractor shall be accountable for ensuring that subcontractors adhere to these requirements.

H.33 CONTRACTOR ACCEPTANCE OF NOTICES OF VIOLATION OR ALLEGED VIOLATIONS, FINES, AND PENALTIES

(a) The Contractor shall accept, in its own name, notices of violation(s) 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 other provisions of this contract.

(b) After providing DOE advance written notice, the Contractor shall conduct negotiations with regulators regarding NOVs/NOAVs and fine and penalties. However, the Contractor shall not make any commitments or offers to regulators that would bind the Government, including monetary obligations, without first obtaining written approval from the CO. Failure to obtain 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.

(c) The Contractor shall notify DOE promptly when it receives service from the regulators of NOVs/NOAVs and fines and penalties.

H.34 ALLOCATION OF RESPONSIBILITY AND LIABILITY FOR CONTRACTOR AND U.S. DEPARTMENT OF ENERGY (DOE) ENVIRONMENTAL COMPLIANCE ACTIVITIES

(a) In this Clause:

(1) "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; and

(2) "Party" means either the Contractor or DOE.

(b) Responsibility and liability for fines or penalties arising from or related to violations of environmental requirements shall be borne by the party causing the violation regardless of which party:

(1) The cognizant regulatory authority fines or penalizes;

(2) Signs permit applications (including situations where DOE signs defective or non-conforming permit applications or other environmental submittals prepared by or under the direction of the Contractor), manifests, reports, or other required documents;

(3) Is a permittee; or

(4) Is the named subject of an enforcement action or assessment of a fine or penalty.

(c) Consequently, if the Contractor causes a violation:

(1) All fines and penalties arising from or related to violations of environmental requirements are to be paid by Contractor. If DOE pays a fine or penalty for a violation that the Contractor caused, the amount of the fine or penalty shall be due from the Contractor, and DOE may immediately offset that amount against payments to which the Contractor is otherwise entitled to or any other funds otherwise owed by the Government to the Contractor; and

(2) Costs of challenging or defending actions brought against the Contractor for violations of environmental requirements are to be borne by the Contractor.

H.35 ENVIRONMENTAL RESPONSIBILITY

(a) General. 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 Decree* [also known as the Tri-Party Agreement (TPA)], consent orders, consent decrees, and settlement agreements between the U. S. Department of Energy (DOE) and Federal and state regulatory agencies. For the purposes of this Contract, the TPA constitutes a requirement pursuant to which the Contractor agrees to plan and perform the Contract work.

(b) Environmental Permits. This Clause addresses three permit scenarios, where the Contractor is the sole permittee; where the Contractor and DOE are joint permittees; and where multiple Contractors are permittees.

H.36 EMERGENCY CLAUSE

(a) The U.S. Department of Energy (DOE) Richland Operations Office (DOE-RL) Manager and/or the DOE Office of River Protection (DOE-ORP) Manager or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site. In the event that either the DOE-RL or DOE-ORP Manager or designee determines such an emergency exists, the applicable DOE Manager or designee will have the authority to direct any and all activities of the Contractor and subcontractors necessary to resolve the emergency situation. The applicable DOE Manager or designee may direct the activities of the Contractor and subcontractors throughout the duration of the emergency.

(b) During declared security events, DOE-RL may assume direct command and control of the Hanford Patrol. The Chief of the Hanford Patrol shall report directly to the DOE-RL Director of Security and Emergency Services (SES) once DOE-RL has assumed command.

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

H.37 PROTECTION OF PERSONALLY IDENTIFIABLE INFORMATION (PII)

(a) Definitions.

(1) Personally Identifiable Information: Any information about an individual maintained by DOE or its contractors, (e.g. medical, education, financial, criminal or other employment history and information, etc.), which can be used to distinguish or trace an individual's identity, (e.g. name, social security numbers, date and place of birth, mother's maiden name, biometric records, etc.), and any other personal information which is linked or linkable to an individual.

(2) PII Incident: Any suspected or confirmed cyber security or physical security incident involving PII.

(b) Requirements.

(1) All suspected or confirmed cyber security and physical security incidents involving PII are to be reported to the DOE Cyber Incident Advisory Capability (CIAC) within 45 minutes of discovering the incident. Reports to the CIAC may be sent via email to ciac@ciac.org, by phone to (925) 422-8193, or by fax to (925) 423-8002. The CIAC website is www.ciac.org.

(2) In addition to notification to CIAC, all suspected or confirmed cyber security and physical security incidents involving PII shall be reported telephonically within 45 minutes of discovering the incident to: (i) the EM-3 Chief Operating Officer; and (ii) the ORP Manager, ORP Deputy Manager, or ORP Duty Officer.

(3) While the initial notification may be telephonic, the Contractor must follow-up writing signed by a senior Contractor official. Notices must at a minimum contain factual information describing both the circumstances surrounding the loss and the information that was compromised. All notifications shall include the name and telephone number of a contact person.

(4) Appropriate steps shall be taken to minimize identity theft risks to the affected individuals.

(5) The Contractor shall notify all employees and others affected by the PII loss unless after consultation with law enforcement officials, the Assistant Secretary for Environmental Management determines that notification will significantly compromise the investigation.

H.38 COMPLIANCE WITH FIPS PUB 201-2

This contract involves the acquisition of hardware, software, or services related to physical access to Federal premises or electronic authentication or access control to a Federal agency's computer systems and electronic infrastructure. Any such hardware, software, or services delivered under this contract shall comply with FIPS Pub 201-2, and FIPS Pub 201-2 shall take precedence over any conflicting performance requirement of this contract. Should the contractor find that the Performance Work Statement or specifications of this contract do not conform to FIPS Pub 201-2, it shall notify the Contracting Officer of such nonconformance and shall act in accordance with instructions of the Contracting Officer.

H.39 HANFORD SITE RECREATION POLICY

The Contractor shall comply with the Hanford Site Recreation Policy. The Contractor shall flow-down applicable requirements of this Clause to any subcontractors.

H.40 PAPERLESS DIRECTIVE PROCESSING SYSTEM

(a) The Contractor, in addition to complying with applicable laws, rules, and other regulations, shall comply with those DOE orders and other directives applicable to Contractors, with the applicable departmental policies, plans, programs, and management directives, and with all changes to assigned work as agreed to by the

Contractor and the Contracting Officer (CO) or designee.

(b) DOE has developed an operating and administrative requirements "List of Applicable DOE Directives," attached to the contract as Section J, Attachment J.1. The Contractor shall comply with the directives identified in such list. The Contractor shall make no claim, including a claim for equitable adjustment under the Changes clauses of this contract, for additional costs, fee or extension of time of performance relating to compliance with the directives in such list.

(c) The List of Applicable DOE Directives to the contract will be revised and issued, by the DOE CO, as a contract modification, as necessary. The CO may direct the Contractor to comply with additional DOE directives and local directives and revisions thereto, as follows:

Pursuant to any Environment, Safety, and Health provisions of this contract, and in accordance with the Changes clause of this contract with respect to changes in directives involving safety, environment, health, and quality.

(d) At least once a month, the Contractor will extract directives from the DOE Paperless Directive System utilizing the Internet as notification of their availability by DOE electronic prompting. Copies of DOE directives may be obtained without charge from the CO or by citing the number of this contract in a written request sent to the following address:

U.S. DOE
Distribution Section
1000 Independence Ave S.W.
Washington, DC 20585
James V. Forrestal Building

(e) The CO and his/her representative(s) expressly authorized in writing to do so are the only Government officials authorized to provide explanations as to the applicability of directives. The CO is the only Government Official authorized to resolve possible conflicting requirements involving directives.

(f) Upon receipt of a new or revised directive, the Contractor shall review it for consistency with the other terms of this contract and for impacts on funding, manpower and other provisions of the contract. If the Contractor considers the directive to be consistent with the other terms of this contract and it can be implemented within existing funds, manpower, and other provisions of the contract and the implementation will not have a negative impact on the cost, schedule, or other obligations of the Contractor, the Contractor shall establish an implementation schedule, and so advise the CO within 30 calendar days of receipt. In the event the Contractor considers the directive to be inconsistent with the other terms of this contract or the requirements of the directive cannot be implemented within existing funding, manpower, and other provisions of the contract, the Contractor shall so advise the CO within 30 calendar days of receipt. Such notice shall include the basis for the claimed inconsistency and the projected cost of implementation in excess of current funding, manpower, and other provisions of the contract. After evaluation of the Contractor's position, the CO shall issue

direction to the Contractor, pursuant to the applicable Changes clause in this contract, concerning appropriate implementation of the directive.

(g) The Contractor will, at least quarterly, notify DOE of those directives obtained from the DOE Paperless Directive System as described in (d) above. The Contractor cognizant personnel will review these directives and recommend for concurrence disposition of the directives to DOE-Hanford.

(h) Upon agreement between the Contractor and DOE, the directive will be implemented as outlined in a Contractor Management Summary or Implementation Plan, whichever is appropriate, and the directive added to Attachment J.1, List of Applicable DOE Directives of the contract and issued by the CO. The same process will be utilized for deletion of directives.

(i) The Contractor shall incorporate the substance of this clause with respect to applicable directives, excluding any reference to the Changes clause, in subcontracts for performance of work at the site and as directed by the CO.

H.41 PERFORMANCE GUARANTEE AGREEMENT – Not Applicable

The Contractor's parent organization(s) or all member organizations if the Contractor is a joint venture, limited liability company, or other similar entity, shall guarantee performance of the contract as evidenced by the Performance Guarantee Agreement incorporated in the contract in Section J, Attachment J.10.

If the Contractor is a joint venture, limited liability company, or other similar entity where more than one organization is involved, the parent(s) or all member organizations shall assume joint and severable liability for the performance of the contract. In the event any of the signatories to the Performance Guarantee Agreement enters into proceedings related to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish written notification of the bankruptcy to the Contracting Officer.

H.42 RESPONSIBLE CORPORATE OFFICIAL

The Contractor has provided a guarantee of performance from its parent company(s) in the form set forth in the Section J, Attachment J.10 entitled, "Performance Guarantee Agreement." The individual signing the "Performance Guarantee Agreement" for the parent company(s) should be the Responsible Corporate Official.

The Responsible Corporate Official is the person who has sole corporate (parent company(s)) authority and accountability for Contractor performance. DOE may contact, as necessary, the single Responsible Corporate Official identified below regarding Contract performance issues.

Responsible Corporate Official:
Name: Steve Moore
Position: President/CEO
Company/Organization: Wastren Advantage, Inc.
Address: 1571 Shyville Road, Piketon, Ohio 45661
Phone: (740) 443-7924

Facsimile: (740) 443-7979
Email: steve.moore@wastrenadvantage.com

Should the Responsible Corporate Official or their contact information change during the period of the Contract, the Contractor shall promptly notify the Contracting Officer in writing of the change.

Identified below is each member of the Corporate Board of Directors that will have corporate oversight. DOE may contact, as necessary, any member of the Corporate Board of Directors, who is accountable for corporate oversight of the Contractor organization and key personnel.

Corporate Board of Directors: - Not Applicable

Name:
Position:
Company/Organization:
Address:
Phone:
Facsimile:
Email:

Should any change occur to the Corporate Board of Directors or their contact information during the period of the Contract, the Contractor shall promptly notify the Contracting Officer in writing of the change.

H.43 PERFORMANCE EVALUATION AND MEASUREMENT PLAN (PEMP)

To the extent not set forth elsewhere in the contract:

(a) The Government shall establish a Performance Evaluation and Measurement Plan (PEMP) upon which the determination of the total available award fee amount earned shall be based. The PEMP will address the quality of the contractor's performance in delivery of contract requirements. The quality expectations will be specified in the contract directly, in the PEMP, or by reference. A copy of the PEMP shall be provided to the Contractor no later than thirty (30) days prior to the scheduled start date of the evaluation period.

(b) The PEMP will set forth the criteria upon which the Contractor will be evaluated relating to the quality objectives selected for evaluation. Such criteria may include subjective criteria. The PEMP shall also set forth the method by which the total available award fee amount will be allocated and the amount earned determined.

(c) The PEMP may, consistent with the contract statement of work, be revised during the period of performance. The contracting officer will notify the contractor of such unilateral changes at least thirty (30) calendar days prior to the start of the evaluation to which the change will apply.

(d) The Contractor shall submit a year-end Annual Self-Assessment Report no later than ten (10) calendar days after the end of an evaluation period, which is a self-assessment of the Contractor's annual performance relative to elements of the

PEMP. This appraisal shall include comprehensive supporting data to an adequate depth to enable DOE to perform independent verification and analysis. DOE may perform independent evaluations, may seek additional input from other relevant entities, and may request additional data as deemed necessary.

H.44 OBSERVANCE OF HOLIDAYS

The following days shall be observed as holidays:

- New Year's Day
- Washington's Birthday
- Memorial Day
- July 4th
- Labor Day
- Thanksgiving Day
- The Friday after Thanksgiving
- Christmas Eve
- Christmas Day

H.45 ENERGY EMPLOYEES OCCUPATIONAL ILLNESS COMPENSATION PROGRAM ACT (EEOICPA)

The Contractor shall provide support of the EEOICPA established under Title XXXVI of the *National Defense Authorization Act of 2001* (Public Law 106-398). The Contractor shall provide records in accordance with the Section I Clause entitled, *DEAR 970.5204-3, Access to and Ownership of Records* in support of EEOICPA claims and the claim process under the EEOICPA.

The Contractor shall:

(a) Verify employment and provide other records which contain pertinent information for compensation under the EEOICPA. The Contractor shall provide this support for itself and any named subcontractors' employees.

(b) Provide reports as directed by the U.S. Department of Energy (DOE), such as costs associated with EEOICPA.

(c) Provide an EEOICPA point-of-contact; this employee shall attend meetings, as requested by the U.S. Department of Energy Richland Operations Office (DOE-RL).

(d) Locate, retrieve and provide a minimum of two (2) copies of any personnel and other program records as requested.

(e) Perform records research needed to complete the Department of Labor (DOL) claims or to locate records needed to complete the claims.

(f) Perform/coordinate records declassification activities required for the processing of claims forms.

(g) Keep Federal Compensation Program Act (FCPA) information current on EEOICPA claims activities.

(h) Ensure costs information is input to the FCPA electronic reporting system by the 10th of each month.

(i) Ensure all EEOICPA claims received are completed and returned to DOE-RL within 45 calendar days of the date entered in the FCPA electronic reporting system.

The FCPA electronic reporting system will be provided to the Contractor.

H.46 PARTNERING

In order to most effectively accomplish this Contract, the Government proposes to form a cohesive partnership with the Contractor. It is a way of doing business based upon trust, dedication to common goals, and an understanding and respect of each other's expectations and values. The process creates a teambuilding environment which fosters better communication and problem solving, and a mutual trust between the participants. These key elements create a climate in which issues can be raised, openly discussed, and jointly settled, without getting into an adversarial relationship. In this way, partnering is a mindset, and a way of doing business. It is an attitude toward working as a team, and achieving successful project execution. This endeavor seeks an environment that nurtures team building cooperation, and trust between the Government and the Contractor. The partnership strives to draw on the strengths of each organization in an effort to achieve a quality project done right the first time, within budget, and on schedule.

Participation in the partnership will be totally voluntary by the parties. Any cost associated with effectuating this partnership will be agreed to by both parties during Contract performance. The U.S. Army Corps of Engineers has championed partnering and their guidelines will be utilized in organizing partnering meetings and establishing a partnering agreement.

H.47 OFFICIAL USE ONLY INFORMATION

(a) Official Use Only (OUO) information is certain unclassified information that may be exempt from public release under the Freedom of Information Act and has the potential to damage governmental, commercial, or private interests if disseminated to persons who do not need to know the information to perform their jobs or other DOE authorized activities.

(b) The Contractor shall comply with the Contractor Requirements Documents (CRDs) of DOE O 471.3, Identifying and Protecting Official Use Only Information, and DOE M 471.3-1, Manual for Identifying and Protecting Official Use Only Information, to determine whether unclassified documents created and/or handled in the performance of this contract are OUO information, and ensure that documents determined to contain OUO information are marked appropriately.

H.48 EMPLOYEE TRAINING AND QUALIFICATIONS

The Contractor is responsible for ensuring that all of their employees meet the required training and qualifications to perform their duties under this contract. However, in the event retraining costs are incurred as a direct result of the impact of workforce reductions from other Hanford Contractors, the Contractor may be entitled to an equitable adjustment.

PART II –CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.01	**52.202-1**	**DEFINITIONS (NOV 2013)**
I.02	**52.203-3**	**GRATUITIES (APR 1984)**
I.03	**52.203-5**	**COVENANT AGAINST CONTINGENT FEES (APR 1984)**
I.04	**52.203-6**	**RESTRICTIONS ON SUBCONTRACTOR CONTRACTOR SALES TO THE GOVERNMENT (SEPT 2006)**
I.05	**52.203-7**	**ANTI-KICKBACK PROCEDURES (OCT 2010)**
I.06	**52.203-8**	**CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)**
I.07	**52.203-10**	**PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)**
I.08	**52.203-12**	**LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (OCT 2010)**
I.09	**52.203-13**	**CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT (APR 2010)**
I.10	**52.203-14**	**DISPLAY OF HOTLINE POSTER(S) (DEC 2007)** **(b) (3)** DOE IG Hotline Poster: http://energy.gov/sites/prod/files/igprod/documents/Hotline_poster.pdf
I.11	**52.203-17**	**CONTRACTOR EMPLOYEE WHISTLEBLOWER RIGHTS AND REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS (SEPT 2013)**
I.12	**52.204-4**	**PRINTED OR COPIED DOUBLE-SIDED ON POSTCONSUMER FIBER CONTENT PAPER (MAY 2011)**
I.13	**52.204-7**	**SYSTEM FOR AWARD MANAGEMENT (JUL 2013)**
I.14	**52.204-9**	**PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL (JAN 2011)**
I.15	**52.204-10**	**REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS (JUL 2013)**
I.16	**52.204-13**	**SYSTEM FOR AWARD MANAGEMENT MAINTENANCE (JUL 2013)**
I.17	**52.209-6**	**PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (AUG 2013)**
I.18	**52.209-9 UPDATES OF INFORMATION REGARDING RESPONSIBILITY MATTERS (JUL 2013)** (a) The Contractor shall update the information in the Federal Awardee Performance and Integrity Information System (FAPIIS) on a semi-annual basis, throughout the life of the contract, by posting the required information in the System for Award Management database via https:// www.acquisition.gov.	

	(b) As required by section 3010 of the Supplemental Appropriations Act, 2010 (Pub. L. 111-212), all information posted in FAPIIS on or after April 15, 2011, except past performance reviews, will be publicly available. FAPIIS consists of two segments— (1) The non-public segment, into which Government officials and the Contractor post information, which can only be viewed by— (i) Government personnel and authorized users performing business on behalf of the Government; or (ii) The Contractor, when viewing data on itself; and (2) The publicly-available segment, to which all data in the non-public segment of FAPIIS is automatically transferred after a waiting period of 14 calendar days, except for— (i) Past performance reviews required by subpart 42.15; (ii) Information that was entered prior to April 15, 2011; or (iii) Information that is withdrawn during the 14-calendar- day waiting period by the Government official who posted it in accordance with paragraph (c)(1) of this clause. (c) The Contractor will receive notification when the Government posts new information to the Contractor's record. (1) If the Contractor asserts in writing within 7 calendar days, to the Government official who posted the information, that some of the information posted to the non-public segment of FAPIIS is covered by a disclosure exemption under the Freedom of Information Act, the Government official who posted the information must within 7 calendar days remove the posting from FAPIIS and resolve the issue in accordance with agency Freedom of Information procedures, prior to reposting the releasable information. The contractor must cite 52.209-9 and request removal within 7 calendar days of the posting to FAPIIS. (2) The Contractor will also have an opportunity to post comments regarding information that has been posted by the Government. The comments will be retained as long as the associated information is retained, i.e., for a total period of 6 years. Contractor comments will remain a part of the record unless the Contractor revises them. (3) As required by section 3010 of Pub. L. 111-212, all information posted in FAPIIS on or after April 15, 2011, except past performance reviews, will be publicly available. (d) Public requests for system information posted prior to April 15, 2011, will be handled under Freedom of Information Act procedures, including, where appropriate, procedures promulgated under E.O. 12600.	
I.19	**52.209-10**	**PROHIBITION ON CONTRACTING WITH INVERTED DOMESTIC CORPORATIONS (MAY 2012)**
I.20	**52.210-1**	**MARKET RESEARCH (APR 2011)**
I.21	**52.215-2**	**AUDIT AND RECORDS—NEGOTIATION (OCT 2010)**
I.22	**52.215-8**	**ORDER OF PRECEDENCE—UNIFORM CONTRACT FORMAT (OCT 1997)**

I.23	**52.215-11**	**PRICE REDUCTION FOR DEFECTIVE CERTIFIED COST OR PRICING DATA -MODIFICATIONS (AUG 2011)**
I.24	**52.215-13**	**SUBCONTRACTOR CERTIFIED COST OR PRICING DATA – MODIFICATIONS (OCT 2010)**
I.25	**52.215-14**	**INTEGRITY OF UNIT PRICES (OCT 2010)**
I.26	**52.215-15**	**PENSION ADJUSTMENTS AND ASSET REVERSIONS (OCT 2010)**
I.27	**52.215-17**	**WAIVER OF FACILITIES CAPITAL COST OF MONEY (OCT 1997)**
I.28	**52.215-18**	**REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (JUL 2005)**
I.29	**52.215-19**	**NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)**
I.30	**52.215-21**	**REQUIREMENTS FOR CERTIFIED COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA – MODIFICATIONS – (OCT 2010)**
I.31	**52.215-22**	**LIMITATIONS ON PASS-THROUGH CHARGES-IDENTIFICATION OF SUBCONTRACT EFFORT (OCT 2009)**
I.32	**52.215-23**	**LIMITATION ON PASS - THROUGH CHARGES (OCT 2009)**
I.33	**52.216-7**	**ALLOWABLE COST AND PAYMENT (JUNE 2013)**
I.34	**52.216-11 COST CONTRACT – NO FEE (APR 1984)** (a) The Government shall not pay the Contractor a fee for performing this contract. (b) After payment of 80 percent of the total estimated cost shown in the Schedule, the Contracting Officer may withhold further payment of allowable cost until a reserve is set aside in an amount that the Contracting Officer considers necessary to protect the Government's interest. This reserve shall not exceed one percent of the total estimated cost shown in the Schedule or $10,000, whichever is less.	
I.35	**52.217-8 OPTION TO EXTEND SERVICES (NOV 1999)** The Government may require continued performance of any services within the limits and at the rates specified in the contract. These rates may be adjusted only as a result of revisions to prevailing labor rates provided by the Secretary of Labor. The option provision may be exercised more than once, but the total extension of performance hereunder shall not exceed 6 months. The Contracting Officer may exercise the option by written notice to the Contractor within 30 days of the end of the contract period.	
I.36	**52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)** (a) The Government may extend the term of this Contract by written notice to the Contractor within 30 days; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 60 days before the Contract expires. The preliminary notice does not commit the Government to an extension. (b) If the Government exercises this option, the extended Contract shall be considered to include this option clause. (c) The total duration of this Contract, including the exercise of any options under this clause, shall not exceed five (5) years.	

I.37	**52.219-6**	**NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (NOV 2011)**
I.38	**52.219-8**	**UTILIZATION OF SMALL BUSINESS CONCERNS (JUL 2013)**
I.39	**52.219-14**	**LIMITATIONS ON SUBCONTRACTING (NOV 2011)**
I.40	**52.219-28**	**POST-AWARD SMALL BUSINESS PROGRAM RE-REPRESENTATION (JUL 2013)**
I.41	**52.222-1**	**NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)**
I.42	**52.222-2**	**PAYMENT FOR OVERTIME PREMIUMS (JULY 1990)**
I.43	**52.222-3**	**CONVICT LABOR (JUNE 2003)**
I.44	**52.222-17**	**NONDISPLACEMENT OF QUALIFIED WORKERS (JAN 2013)**
I.45	**52.222-21**	**PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)**
I.46	**52.222-26**	**EQUAL OPPORTUNITY (MAR 2007)**
I.47	**52.222-35**	**EQUAL OPPORTUNITY FOR VETERANS (SEP 2010)**
I.48	**52.222-36**	**AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (OCT 2010)**
I.49	**52.222-37**	**EMPLOYMENT REPORTS VETERANS (SEP 2010)**
I.50	**52.222-40**	**NOTIFICATION OF EMPLOYEE RIGHTS UNDER THE NATIONAL LABOR RELATIONS ACT (DEC 2010)**
I.51	**52.222-41**	**SERVICE CONTRACT ACT OF 1965 (NOV 2007)**
I.52	**52.222-42 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (MAY 1989)** In compliance with the Service Contract Act of 1965, as amended, and the regulations of the Secretary of Labor (29 CFR Part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332. *This Statement is for Information Only: It is not a Wage Determination* **Employee Class Monetary Wage—Fringe Benefits** _____ _____ _____ _____ _____ _____ _____ _____	
I.53	**52.222-43**	**FAIR LABOR STANDARDS ACT AND SERVICE CONTRACT ACT - PRICE ADJUSTMENT (MULTIPLE YEAR AND OPTION CONTRACTS) (SEP 2009)**
I.54	**52.222-50**	**COMBATING TRAFFICKING IN PERSONS (FEB 2009)**

I.55	**52.222-54**	**EMPLOYMENT ELIGIBILITY VERIFICATION (AUG 2013)**
I.56	**52.223-2**	**AFFIRMATIVE PROCUREMENT OF BIOBASED PRODUCTS UNDER SERVICE AND CONSTRUCTION CONTRACTS (SEP 2013)**
I.57	**52.223-3**	**HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT I (JUL 1995)**
I.58	**52.223-5**	**POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (MAY 2011) – ALT I (MAY 2011)**
I.59	**52.223-6**	**DRUG-FREE WORKPLACE (MAY 2001)**
I.60	**52.223-10**	**WASTE REDUCTION PROGRAM (MAY 2011)**
I.61	**52.223-15**	**ENERGY EFFICIENCY IN ENERGY-CONSUMING PRODUCTS (DEC 2007)**
I.62	**52.223-16**	**IEEE 1680 STANDARD FOR THE ENVIRONMENTAL ASSESSMENT OF PERSONAL COMPUTER PRODUCTS (DEC 2007)**
I.63	**52.223-17**	**AFFIRMATIVE PROCUREMENT OF EPA-DESIGNATED ITEMS IN SERVICE AND CONSTRUCTION CONTRACTS (MAY 2008)**
I.64	**52.223-18**	**ENCOURAGING CONTRACTOR POLICIES TO BAN TEXT MESSAGING WHILE DRIVING (AUG 2011)**
I.65	**52.223-19**	**COMPLIANCE WITH ENVIRONMENTAL MANAGEMENT SYSTEMS (MAY 2011)**
I.66	**52.224-1**	**PRIVACY ACT NOTIFICATION (APR 1984)**
I.67	**52.224-2**	**PRIVACY ACT (APR 1984)**
I.68	**52.225-1**	**BUY AMERICAN ACT – SUPPLIES (FEB 2009)**
I.69	**52.225-13**	**RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JUNE 2008)**
I.70	**52.227-1**	**AUTHORIZATION AND CONSENT (DEC 2007)**
I.71	**52.227-2**	**NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (DEC 2007)**
I.72	**52.227-14**	**RIGHTS IN DATA—GENERAL (DEC 2007) - ALT I, ALT II, ALT III (DEC 2007)**
I.73	**52.227-17**	**RIGHTS IN DATA —SPECIAL WORKS (DEC 2007)**
I.74	**52.227-23**	**RIGHTS TO PROPOSAL DATA (TECHNICAL) (JUN 1987)**
I.75	**52.228-5**	**INSURANCE – WORK ON A GOVERNMENT INSTALLATION (JAN 1997)**
I.76	**52.228-7**	**INSURANCE – LIABILITY TO THIRD PERSONS (MAR 1996)**
I.77	**52.229-3**	**FEDERAL , STATE, AND LOCAL TAXES (FEB 2013)**
I.78	**52.232-1**	**PAYMENTS (APR 1984)**
I.79	**52.232-7**	**PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR HOUR CONTRACTS (AUG 2012)**

I.80	**52.232-8**	**DISCOUNTS FOR PROMPT PAYMENT (FEB 2002)**
I.81	**52.232-9**	**LIMITATION ON WITHHOLDING OF PAYMENTS (APR 1984)**
I.82	**52.232-11**	**EXTRAS (APR 1984)**
I.83	**52.232-17**	**INTEREST (OCT 2010)**
I.84	**52.232-18**	**AVAILABILITY OF FUNDS (APR 1984)**
I.85	**52.232-23**	**ASSIGNMENT OF CLAIMS (JAN 1986)**
I.86	**52.232-25**	**PROMPT PAYMENT (JUL 2013) – ALT I (FEB 2002)**
I.87	**52.232-33**	**PAYMENT BY ELECTRONIC FUNDS TRANSFER – SYSTEM FOR AWARD MANAGEMENT (JUL 2013)**
I.88	**52.233-1**	**DISPUTES (JUL 2002) – ALT I (DEC 1991)**
I.89	**52.233-3**	**PROTEST AFTER AWARD (AUG 1996) – ALT I (JUN 1985)**
I.90	**52.233-4**	**APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM (OCT 2004)**
I.91	**52.237-2**	**PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION (APR 1984)**
I.92	**52.237-3**	**CONTINUITY OF SERVICES (JAN 1991)**
I.93	**52.242-1**	**NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)**
I.94	**52.242-13**	**BANKRUPTCY (JULY 1995)**
I.95	**52.243-1**	**CHANGES – FIXED PRICE (AUG 1987) – ALT I (APR 1984)**
I.96	**52.243-2**	**CHANGES – COST REIMBURSEMENT (AUG 1987) - ALT I (APR 1984)**
I.97	**52.243-3**	**CHANGES – TIME-AND-MATERIALS OR LABOR-HOURS (SEP 2000)**
I.98	**52.244-2 SUBCONTRACTS (OCT 2010) – ALT 1 (JUN 2007)** (a) *Definitions*. As used in this clause— “Approved purchasing system” means a Contractor’s purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR). “Consent to subcontract” means the Contracting Officer’s written consent for the Contractor to enter into a particular subcontract. “Subcontract” means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the prime contract or a subcontract. It includes, but is not limited to, purchase orders, and changes and modifications to purchase orders. (b) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modifications or unpriced	

	delivery orders), and only if required in accordance with paragraph (c) or (d) of this clause. (c) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that— (1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or (2) Is fixed-price and exceeds— (i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified acquisition threshold or 5 percent of the total estimated cost of the contract; or (ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the simplified acquisition threshold or 5 percent of the total estimated cost of the contract. (d) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts: _____ _____ _____ (e)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (b), (c), or (d) of this clause, including the following information: (i) A description of the supplies or services to be subcontracted. (ii) Identification of the type of subcontract to be used. (iii) Identification of the proposed subcontractor. (iv) The proposed subcontract price. (v) The subcontractor's current, complete, and accurate certified cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions. (vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract. (vii) A negotiation memorandum reflecting— (A) The principal elements of the subcontract price negotiations; (B) The most significant considerations controlling establishment of initial or revised prices; (C) The reason certified cost or pricing data were or were not required; (D) The extent, if any, to which the Contractor did not rely on the subcontractor's certified cost or pricing data in determining the price objective and in negotiating the final price; (E) The extent to which it was recognized in the negotiation that the subcontractor's certified cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and the subcontractor; and the effect of any such defective data on the total price negotiated; (F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and (G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered. (e)(2) If the Contractor has an approved purchasing system and consent is not required under paragraph (c), or (d) of this clause, the Contractor nevertheless shall notify the Contracting Officer reasonably in advance of entering into any (i) cost-plus fixed- Fee subcontract, or (ii) fixed-price subcontract that exceeds either the simplified acquisition threshold or 5 percent of

	the total estimated cost of this contract. The notification shall include the information required by paragraphs (e)(1)(i) through (e)(1)(iv) of this clause. (f) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination— (1) Of the acceptability of any subcontract terms or conditions; (2) Of the allowability of any cost under this contract; or (3) To relieve the Contractor of any responsibility for performing this contract. (g) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement type subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i). (h) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement from the Government. (i) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3. (j) Paragraphs (c) and (e) of this clause do not apply to the following subcontracts, which were evaluated during negotiations: __TestAmerica Laboratories, Inc._____ _____ _____	
I.99	**52.244-6**	**SUBCONTRACTS FOR COMMERCIAL ITEMS (DEC 2013)**
I.100	**52.245-1**	**GOVERNMENT PROPERTY (APR 2012) ALT I. (APR 2012)**
I.101	**52.245-9**	**USE AND CHARGES (APR 2012)**
I.102	**52.246-25**	**LIMITATION OF LIABILITY—SERVICES (FEB 1997)**
I.103	**52.248-1**	**VALUE ENGINEERING (OCT 2010)**
I.104	**52.249-2**	**TERMINATION FOR THE CONVENIENCE OF THE GOVERNMENT (FIXED PRICE) (APR 2012)**
I.105	**52.249-6**	**TERMINATION (COST REIMBURSEMENT) (MAY 2004) – ALT IV (SEP 1996)**
I.106	**52.249-8**	**DEFAULT (FIXED-PRICE SUPPLY AND SERVICE) (APR 1984)**
I.107	**52.249-14**	**EXCUSABLE DELAYS (APR 1984)**
I.108	**52.251-1**	**GOVERNMENT SUPPLY SOURCES (APR 2012)**
I.109	**52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)**	

	This Contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es): https://www.**acquisition**.gov/far/	
I.110	**52.253-1**	**COMPUTER GENERATED FORMS (JAN 1991)**
I.111	**DEAR 952.202-1 DEFINITIONS (FEB 2011)** (a) As prescribed in 902.201, insert the clause at 48 CFR 52.202-1, Definitions, in all contracts. The following shall be added to the clause as paragraph (c): (c) When a solicitation provision or contract clause uses a word or term that is defined in the Department of Energy Acquisition Regulation (DEAR) (48 CFR chapter 9), the word or term has the same meaning as the definition in 48 CFR 902.101 or the definition in the part, subpart, or section of 48 CFR chapter 9 where the provision or clause is prescribed in effect at the time the solicitation was issued, unless an exception in (a) applies.	
I.112	**DEAR 952.203-70 WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)** (a) The Contractor shall comply with the requirements of "DOE Contractor Employee Protection Program" at 10 CFR Part 708 for work performed on behalf of DOE directly related to activities at DOE-owned or-leased sites. (b) The Contractor shall insert or have inserted the substance of this clause, including this paragraph (b), in subcontracts at all tiers, for subcontracts involving work performed on behalf of DOE directly related to activities at DOE-owned or leased sites.	
I.113	**DEAR 952.204-2 SECURITY (MAR 2011)** (a) *Responsibility*. It is the Contractor's duty to protect all classified information, special nuclear material, and other DOE property. The Contractor shall, in accordance with DOE security regulations and requirements, be responsible for protecting all classified information and all classified matter (including documents, material and special nuclear material) which are in the Contractor's possession in connection with the performance of work under this contract against sabotage, espionage, loss or theft. Except as otherwise expressly provided in this contract, the Contractor shall, upon completion or termination of this contract, transmit to DOE any classified matter or special nuclear material in the possession of the Contractor or any person under the Contractor's control in connection with performance of this contract. If retention by the Contractor of any classified matter is required after the completion or termination of the contract, the Contractor shall identify the items and classification levels and categories of matter proposed for retention, the reasons for the retention, and the proposed period of retention. If the retention is approved by the Contracting Officer, the security provisions of the contract shall continue to be applicable to the classified matter retained. Special nuclear material shall not be retained after the completion or termination of the contract. (b) *Regulations*. The Contractor agrees to comply with all security regulations and contract requirements of DOE as incorporated into the contract. (c) *Definition of Classified Information*. The term *Classified Information* means information that is classified as Restricted Data or Formerly Restricted Data under the Atomic Energy Act of 1954, or information determined to require protection against unauthorized disclosure under Executive Order 12958, *Classified National Security Information,* as amended, or prior executive orders, which is identified as *National Security Information*.	

	(d) *Definition of Restricted Data*. The term *Restricted Data* means all data concerning design, manufacture, or utilization of atomic weapons; production of special nuclear material; or use of special nuclear material in the production of energy, but excluding data declassified or removed from the Restricted Data category pursuant to 42 U.S.C. 2162 [Section 142, as amended, of the Atomic Energy Act of 1954]. (e) *Definition of Formerly Restricted Data*. The term *"Formerly Restricted Data"* means information removed from the Restricted Data category based on a joint determination by DOE or its predecessor agencies and the Department of Defense that the information-- (1) relates primarily to the military utilization of atomic weapons; and (2) can be adequately protected as National Security Information. However, such information is subject to the same restrictions on transmission to other countries or regional defense organizations that apply to Restricted Data. (f) *Definition of National Security Information*. The term "*National Security Information*" means information that has been determined, pursuant to Executive Order 12958, Classified National Security Information, as amended, or any predecessor order, to require protection against unauthorized disclosure, and that is marked to indicate its classified status when in documentary form. (g) *Definition of Special Nuclear Material*. The term "s*pecial nuclear material*" means-- (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which, pursuant to 42 U.S.C. 2071 [section 51 as amended, of the Atomic Energy Act of 1954] has been determined to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material. (h) *Access authorizations of personnel.* (1) The Contractor shall not permit any individual to have access to any classified information or special nuclear material, except in accordance with the Atomic Energy Act of 1954, and the DOE's regulations and contract requirements applicable to the particular level and category of classified information or particular category of special nuclear material to which access is required. (2) The Contractor must conduct a thorough review, as defined at 48 CFR 904.401, of an uncleared applicant or uncleared employee, and must test the individual for illegal drugs, prior to selecting the individual for a position requiring a DOE access authorization. (i) A review must-- verify an uncleared applicant's or uncleared employee's educational background, including any high school diploma obtained within the past five years, and degrees or diplomas granted by an institution of higher learning; contact listed employers for the last three years and listed personal references; conduct local law enforcement checks when such checks are not prohibited by state or local law or regulation and when the uncleared applicant or uncleared employee resides in the jurisdiction where the Contractor is located; and conduct a credit check and other checks as appropriate. (ii) Contractor reviews are not required for an applicant for DOE access authorization who possesses a current access authorization from DOE or another Federal agency, or whose access authorization may be reapproved without a federal background investigation pursuant to Executive Order 12968, Access to Classified Information (August 4, 1995), Sections 3.3(c) and (d). (iii) In collecting and using this information to make a determination as to whether it is appropriate to select an uncleared applicant or uncleared employee to a position requiring an access authorization, the Contractor must comply with all applicable laws, regulations, and Executive Orders, including those-- (A) governing the processing and privacy of an individual's information, such as the Fair Credit Reporting Act, Americans with Disabilities Act (ADA), and Health Insurance Portability and Accountability Act; and (B) prohibiting discrimination in employment, such as under the ADA, Title VII and the Age Discrimination in Employment Act, including with respect to pre- and post-offer of employment disability related questioning.

	(iv) In addition to a review, each candidate for a DOE access authorization must be tested to demonstrate the absence of any illegal drug, as defined in 10 CFR 707.4. All positions requiring access authorizations are deemed *testing designated positions* in accordance with 10 CFR part 707. All employees possessing access authorizations are subject to applicant, random or for cause testing for use of illegal drugs. DOE will not process candidates for a DOE access authorization unless their tests confirm the absence from their system of any illegal drug. (v) When an uncleared applicant or uncleared employee receives an offer of employment for a position that requires a DOE access authorization, the Contractor shall not place that individual in such a position prior to the individual's receipt of a DOE access authorization, unless an approval has been obtained from the head of the cognizant local security office. If the individual is hired and placed in the position prior to receiving an access authorization, the uncleared employee may not be afforded access to classified information or matter or special nuclear material (in categories requiring access authorization) until an access authorization has been granted. (vi) The Contractor must furnish to the head of the cognizant local DOE Security Office, in writing, the following information concerning each uncleared applicant or uncleared employee who is selected for a position requiring an access authorization-- A. The date(s) each Review was conducted; B. Each entity that provided information concerning the individual; C. A certification that the review was conducted in accordance with all applicable laws, regulations, and Executive Orders, including those governing the processing and privacy of an individual's information collected during the review; D. A certification that all information collected during the review was reviewed and evaluated in accordance with the Contractor's personnel policies; and E. The results of the test for illegal drugs. (i) *Criminal liability*. It is understood that disclosure of any classified information relating to the work or services ordered hereunder to any person not entitled to receive it, or failure to protect any classified information, special nuclear material, or other Government property that may come to the Contractor or any person under the Contractor's control in connection with work under this contract, may subject the Contractor, its agents, employees, or Subcontractors to criminal liability under the laws of the United States (see the Atomic Energy Act of 1954, 42 U.S.C. 2011 et seq.; 18 U.S.C. 793 and 794). (j) *Foreign Ownership, Control, or Influence.* (1) The Contractor shall immediately provide the cognizant security office written notice of any change in the extent and nature of foreign ownership, control or influence over the Contractor which would affect any answer to the questions presented in the Standard Form (SF) 328, *Certificate Pertaining to Foreign Interests*, executed prior to award of this contract. In addition, any notice of changes in ownership or control which are required to be reported to the Securities and Exchange Commission, the Federal Trade Commission, or the Department of Justice, shall also be furnished concurrently to the Contracting Officer. Contractors are encouraged to submit this information through the use of the online tool at https://foci.td.anl.gov. When completed the Contractor must print and sign one copy of the SF 328 and submit it to the Contracting Officer. (2) If a Contractor has changes involving foreign ownership, control, or influence, DOE must determine whether the changes will pose an undue risk to the common defense and security. In making this determination, DOE will consider proposals made by the Contractor to avoid or mitigate foreign influences. (3) If the cognizant security office at any time determines that the Contractor is, or is potentially, subject to foreign ownership, control, or influence, the Contractor shall comply with such instructions as the Contracting Officer shall provide in writing to protect any classified information or special nuclear material.

	(4) The Contracting Officer may terminate this contract for default either if the Contractor fails to meet obligations imposed by this clause or if the Contractor creates a foreign ownership, control, or influence situation in order to avoid performance or a termination for default. The Contracting Officer may terminate this contract for convenience if the Contractor becomes subject to foreign ownership, control, or influence and for reasons other than avoidance of performance of the contract, cannot, or chooses not to, avoid or mitigate the foreign ownership, control, or influence problem. (k) *Employment announcements.* When placing announcements seeking applicants for positions requiring access authorizations, the Contractor shall include in the written vacancy announcement, a notification to prospective applicants that reviews, and tests for the absence of any illegal drug as defined in 10 CFR 707.4, will be conducted by the employer and a background investigation by the Federal government may be required to obtain an access authorization prior to employment, and that subsequent reinvestigations may be required. If the position is covered by the Counterintelligence Evaluation Program regulations at 10 CFR 709, the announcement should also alert applicants that successful completion of a counterintelligence evaluation may include a counterintelligence-scope polygraph examination. (l) *Flow down to subcontracts.* The Contractor agrees to insert terms that conform substantially to the language of this clause, including this paragraph, in all subcontracts under its contract that will require subcontractor employees to possess access authorizations. Additionally, the Contractor must require such subcontractors to have an existing DOD or DOE facility clearance or submit a completed SF 328, *Certificate Pertaining to Foreign Interests*, as required in 48 CFR 952.204-73, Facility Clearance, and obtain a foreign ownership, control and influence determination and facility clearance prior to award of a subcontract. Information to be provided by a subcontractor pursuant to this clause may be submitted directly to the Contracting Officer. For purposes of this clause, Subcontractor means any subcontractor at any tier and the term "Contracting Officer" means the DOE Contracting Officer. When this clause is included in a subcontract, the term "Contractor" shall mean subcontractor and the term "contract" shall mean subcontract.
I.114	**DEAR 952.204-75 PUBLIC AFFAIRS (DEC 2000)** (a) The Contractor must cooperate with the Department in releasing unclassified information to the public and news media regarding DOE policies, programs, and activities relating to its effort under the contract. The responsibilities under this clause must be accomplished through coordination with the Contracting Officer and appropriate DOE public affairs personnel in accordance with procedures defined by the Contracting Officer. (b) The Contractor is responsible for the development, planning, and coordination of proactive approaches for the timely dissemination of unclassified information regarding DOE activities onsite and offsite, including, but not limited to, operations and programs. Proactive public affairs programs may utilize a variety of communication media, including public workshops, meetings or hearings, open houses, newsletters, press releases, conferences, audio/visual presentations, speeches, forums, tours, and other appropriate stakeholder interactions. (c) The Contractor's internal procedures must ensure that all releases of information to the public and news media are coordinated through, and approved by, a management official at an appropriate level within the Contractor's organization. (d) The Contractor must comply with DOE procedures for obtaining advance clearances on oral, written, and audio/visual informational material prepared for public dissemination or use.

	(e) Unless prohibited by law, and in accordance with procedures defined by the Contracting Officer, the Contractor must notify the Contracting Officer and appropriate DOE public affairs personnel of communications or contacts with Members of Congress relating to the effort performed under the contract. (f) In accordance with procedures defined by the Contracting Officer, the Contractor must notify the Contracting Officer and appropriate DOE public affairs personnel of activities or situations that may attract regional or national news media attention and of non-routine inquiries from national news media relating to the effort performed under the contract. (g) In releases of information to the public and news media, the Contractor must fully and accurately identify the Contractor's relationship to the Department and fully and accurately credit the Department for its role in funding programs and projects resulting in scientific, technical, and other achievements.
I.115	**DEAR 952.204-77 COMPUTER SECURITY (AUG 2006)** (a) Definitions. (1) Computer means desktop computers, portable computers, computer networks (including the DOE Network and local area networks at or controlled by DOE organizations), network devices, automated information systems, and or other related computer equipment owned by, leased, or operated on behalf of the DOE. (2) Individual means a DOE Contractor or subcontractor employee, or any other person who has been granted access to a DOE computer or to information on a DOE computer, and does not include a member of the public who sends an e-mail message to a DOE computer or who obtains information available to the public on DOE Web sites. (b) Access to DOE computers. A Contractor shall not allow an individual to have access to information on a DOE computer unless- (1) The individual has acknowledged in writing that the individual has no expectation of privacy in the use of a DOE computer; and (2) The individual has consented in writing to permit access by an authorized investigative agency to any DOE computer used during the period of that individual's access to information on a DOE computer, and for a period of three years thereafter. (c) No expectation of privacy. Notwithstanding any other provision of law (including any provision of law enacted by the Electronic Communications Privacy Act of 1986), no individual using a DOE computer shall have any expectation of privacy in the use of that computer. (d) Written records. The Contractor is responsible for maintaining written records for itself and subcontractors demonstrating compliance with the provisions of paragraph (b) of this section. The Contractor agrees to provide access to these records to the DOE, or its authorized agents, upon request. (e) Subcontracts. The Contractor shall insert this clause, including this paragraph (e), in

	subcontracts under this contract that may provide access to computers owned, leased or operated on behalf of the DOE.
I.116	**DEAR 952.208-70 PRINTING (APR 1984)** The Contractor shall not engage in, nor subcontract for, any printing (as that term is defined in Title I of the U.S. Government Printing and Binding Regulations in effect on the effective date of this Contract) in connection with the performance of work under this Contract. Provided, however, that performance of a requirement under this Contract involving the duplication of less than 5,000 copies of a single unit, or no more than 25,000 units in the aggregate of multiple units, will not be deemed to be printing. A unit is defined as one sheet, size 8½ by 11 inches one side only, one color. A requirement is defined as a single publication document. (1) The term "printing" includes the following processes: composition, plate making, presswork, binding, microform publishing, or the end items produced by such processes. (2) If fulfillment of the Contract will necessitate reproduction in excess of the limits set forth above, the Contractor shall notify the Contracting Officer in writing and obtain the Contracting Officer's approval prior to acquiring on DOE's behalf production, acquisition, and dissemination of printed matter. Such printing must be obtained from the Government Printing Office (GPO), a Contract source designated by GPO or a Joint Committee on Printing authorized federal printing plant. (3) Printing services not obtained in compliance with this guidance will result in the cost of such printing being disallowed. (4) The Contractor will include in each of his subcontracts hereunder a provision substantially the same as this clause including this paragraph (4).
I.117	**DEAR 952.209-72 ORGANIZATIONAL CONFLICTS OF INTEREST (AUG 2009) – ALT I (AUG 2009)** (a) Purpose. The purpose of this clause is to ensure that the Contractor (1) is not biased because of its financial, contractual, organizational, or other interests which relate to the work under this contract, and (2) does not obtain any unfair competitive advantage over other parties by virtue of its performance of this contract. (b) Scope. The restrictions described herein shall apply to performance or participation by the Contractor and any of its affiliates or their successors in interest (hereinafter collectively referred to as "Contractor") in the activities covered by this clause as a prime Contractor, subcontractor, cosponsor, joint venturer, consultant, or in any similar capacity. For the purpose of this clause, affiliation occurs when a business concern is controlled by or has the power to control another or when a third party has the power to control both. (1) Use of Contractor's Work Product. (i) The Contractor shall be ineligible to participate in any capacity in Department contracts, subcontracts, or proposals therefore (solicited and unsolicited) which stem directly from the Contractor's performance of work under this contract for a period of six (6) months after the completion of this contract. Furthermore, unless so directed in writing by the Contracting Officer, the Contractor shall not perform any advisory and assistance services work under this contract on any of its products or services or the products or services of another firm if the Contractor is or has been substantially involved in their development or marketing. Nothing in this subparagraph shall preclude the Contractor from competing for follow-on contracts for advisory and assistance services. (ii) If, under this contract, the Contractor prepares a complete or essentially complete statement of work or specifications to be used in competitive acquisitions, the Contractor shall be

	ineligible to perform or participate in any capacity in any contractual effort which is based on such statement of work or specifications. The Contractor shall not incorporate its products or services in such statement of work or specifications unless so directed in writing by the Contracting Officer, in which case the restriction in this subparagraph shall not apply. (iii) Nothing in this paragraph shall preclude the Contractor from offering or selling its standard and commercial items to the Government. (2) Access to and use of information. (i) If the Contractor, in the performance of this contract, obtains access to information, such as Department plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. 552a), or data which has not been released or otherwise made available to the public, the Contractor agrees that without prior written approval of the Contracting Officer it shall not— (A) use such information for any private purpose unless the information has been released or otherwise made available to the public; (B) compete for work for the Department based on such information for a period of six (6) months after either the completion of this contract or until such information is released or otherwise made available to the public, whichever is first; (C) submit an unsolicited proposal to the Government which is based on such information until one year after such information is released or otherwise made available to the public; and (D) release such information unless such information has previously been released or otherwise made available to the public by the Department. (ii) In addition, the Contractor agrees that to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. 552a), or other confidential or privileged technical, business, or financial information under this contract, it shall treat such information in accordance with any restrictions imposed on such information. (iii) The Contractor may use technical data it first produces under this contract for its private purposes consistent with paragraphs (b)(2)(i) (A) and (D) of this clause and the patent, rights in data, and security provisions of this contract. (c) Disclosure after award. (1) The Contractor agrees that, if changes, including additions, to the facts disclosed by it prior to award of this contract, occur during the performance of this contract, it shall make an immediate and full disclosure of such changes in writing to the Contracting Officer. Such disclosure may include a description of any action which the Contractor has taken or proposes to take to avoid, neutralize, or mitigate any resulting conflict of interest. The Department may, however, terminate the contract for convenience if it deems such termination to be in the best interest of the Government. (2) In the event that the Contractor was aware of facts required to be disclosed or the existence of an actual or potential organizational conflict of interest and did not disclose such facts or such conflict of interest to the Contracting Officer, DOE may terminate this contract for default. (d) Remedies. For breach of any of the above restrictions or for nondisclosure or misrepresentation of any facts required to be disclosed concerning this contract, including the existence of an actual or potential organizational conflict of interest at the time of or after award, the Government may terminate the contract for default, disqualify the Contractor from subsequent related contractual efforts, and pursue such other remedies as may be permitted by law or this contract. (e) Waiver. Requests for waiver under this clause shall be directed in writing to the Contracting

	Officer and shall include a full description of the requested waiver and the reasons in support thereof. If it is determined to be in the best interests of the Government, the Contracting Officer may grant such a waiver in writing. Alternate I In accordance with 909.507-2 and 970.0905, include the following alternate in the specified types of contracts. (f) Subcontracts. (1) The Contractor shall include a clause, substantially similar to this clause, including this paragraph (f), in subcontracts expected to exceed the simplified acquisition threshold determined in accordance with 48 CFR part 13 and involving the performance of advisory and assistance services as that term is defined at 48 CFR 2.101. The terms "contract, " "Contractor," and "Contracting Officer" shall be appropriately modified to preserve the Government's rights. (2) Prior to the award under this contract of any such subcontracts for advisory and assistance services, the Contractor shall obtain from the proposed subcontractor or consultant the disclosure required by 48 CFR 909.507-1, and shall determine in writing whether the interests disclosed present an actual or significant potential for an organizational conflict of interest. Where an actual or significant potential organizational conflict of interest is identified, the Contractor shall take actions to avoid, neutralize, or mitigate the organizational conflict to the satisfaction of the Contractor. If the conflict cannot be avoided or neutralized, the Contractor must obtain the approval of the DOE Contracting Officer prior to entering into the subcontract.
I.118	**DEAR 952.217-70 ACQUISITION OF REAL PROPERTY (MAR 2011)** (a) Notwithstanding any other provision of the contract, the prior approval of the Contracting Officer shall be obtained when, in performance of this contract, the Contractor acquires or proposes to acquire use of real property by: (1) Purchase, on the Government's behalf or in the Contractor's own name, with title eventually vesting in the Government. (2) Lease for which the Department of Energy will reimburse the incurred costs as a reimbursable contract cost. (3) Acquisition of temporary interest through easement, license or permit, and the Government funds the entire cost of the temporary interest. (b) Justification of and execution of any real property acquisitions shall be in accordance and compliance with directions provided by the Contracting Officer. (c) The substance of this clause, including this paragraph (c), shall be included in any subcontract occasioned by this contract under which property described in paragraph (a) of this clause shall be acquired.
I.119	**DEAR 952.223-72 RADIATION PROTECTION AND NUCLEAR CRITICALITY (APR 1984)** The Contractor shall take all reasonable precautions in the performance of work under this contract to protect the safety and health of employees and of members of the public against the hazards of ionizing radiation and radioactive materials and shall comply with all applicable radiation protection and nuclear criticality safety standards and requirements (including reporting requirements) of DOE. The Contractor shall submit a management program and implementation plan to the Contracting Officer for review and approval within 30 days after the effective date of this contract or modification. In the event that the Contractor fails to comply with said standards and requirements of DOE, the Contracting Officer may, without

	prejudice to any other legal or contractual rights of DOE, issue an order stopping all or any part of the work. Thereafter, a start order for resumption of the work may be issued at the discretion of the Contracting Officer. The contractor shall make no claim for an extension of time or for compensation or damages by reason of or in connection with such work stoppage.
I.120	**DEAR 952.223-75 PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)** Individual occupational radiation exposure records generated in the performance of work under this contract shall be subject to inspection by DOE and shall be preserved by the Contractor until disposal is authorized by DOE or at the option of the Contractor delivered to DOE upon completion or termination of the contract. If the Contractor exercises the foregoing option, title to such records shall vest in DOE upon delivery.
I.121	**DEAR 952.223-78 SUSTAINABLE ACQUISITION PROGRAM (OCT 2010)** (a) Pursuant to Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, and Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, the Department of Energy (DOE) is committed to managing its facilities in an environmentally preferable and sustainable manner that will promote the natural environment and protect the health and well being of its Federal employees and contractor service providers. In the performance of work under this contract, the Contractor shall provide its services in a manner that promotes the natural environment, reduces greenhouse gas emissions and protects the health and well being of Federal employees, contract service providers and visitors using the facility. (b) Green purchasing or sustainable acquisition has several interacting initiatives. The Contractor must comply with initiatives that are current as of the contract award date. DOE may require compliance with revised initiatives from time to time. The Contractor may request an equitable adjustment to the terms of its contract using the procedures in the Changes clause of the contract. The initiatives important to these Orders are explained on the following Government or Industry Internet Sites: (1) Recycled Content Products are described at http://epa.gov/cpg. (2) Biobased Products are described at http://www.biopreferred.gov/. (3) Energy efficient products are at http://energystar.gov/products for Energy Star products. (4) Energy efficient products are at http://www.femp.energy.gov/procurement for FEMP designated products. (5) Environmentally preferable and energy efficient electronics including desktop computers, laptops and monitors are at http://www.epeat.net the Electronic Products Environmental Assessment Tool (EPEAT) the Green Electronics Council site. (6) Green house gas emission inventories are required, including Scope 3 emissions which include contractor emissions. These are discussed at Section 13 of Executive Order 13514 which can be found at http://www.archives.gov/federal-register/executive-orders/disposition.html.

	(7) Non-Ozone Depleting Alternative Products are at http://www.epa.gov/ozone/strathome.html. (8) Water efficient plumbing products are at http://epa.gov/watersense. (c) The clauses at FAR 52.223-2, Affirmative Procurement of Biobased Products under Service and Construction Contracts, 52.223-15, Energy Efficiency in Energy Consuming Products, and 52.223-17 Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts, require the use of products that have biobased content, are energy efficient, or have recycled content. To the extent that the services provided by the Contractor require provision of any of the above types of products, the Contractor must provide the energy efficient and environmentally sustainable type of product unless that type of product - (1) Is not available; (2) Is not life cycle cost effective or does not exceed 110% of the price of alternative items if life cycle cost data is unavailable (EPEAT is an example of lifecycle costs that have been analyzed by DOE and found to be acceptable at the silver and gold level); (3) Does not meet performance needs; or, (4) Cannot be delivered in time to meet a critical need. (d) In the performance of this contract, the Contractor shall comply with the requirements of Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management, (http://www.epa.gov/greeningepa/practices/eo13423.htm) and Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (http://www.archives.gov/federal-register/executive-orders/disposition.html). The Contractor shall also consider the best practices within the DOE Acquisition Guide, Chapter 23, Acquisition Considerations Regarding Federal Leadership in Environmental, Energy, and Economic performance. This guide includes information concerning recycled content products, biobased products, energy efficient products, water efficient products, alternative fuels and vehicles, non-ozone depleting substances and other environmentally preferable products and services. This guide is available on the Internet at: http://management.energy.gov/documents/AcqGuide23pt0Rev1.pdf. (e) Contractors must establish and maintain a documented energy management program which includes requirements for energy and water efficient equipment, EnergyStar or WaterSense, as applicable and procedures for verification of purchases, following the criteria in DOE Order 430.2B, Departmental Energy, Renewable Energy, and Transportation Management, Attachment 1, or its successor to the extent required elsewhere in the contract. This requirement should not be flowed down to subcontractors. (f) In complying with the requirements of paragraph (c) of this clause, the Contractor(s) shall coordinate its activities with and submit required reports through the Environmental Sustainability Coordinator or equivalent position. Reporting under this paragraph and paragraphs (g) and (h) of this clause is only required if the contract or subcontract offers subcontracting opportunities for energy efficient and environmentally sustainable products or

	services exceeding $100,000 in any contract year. (g) The Contractor shall prepare and submit performance reports, if required, using prescribed DOE formats, at the end of the Federal fiscal year, on matters related to the acquisition of environmentally preferable and sustainable products and services. This is a material delivery under the contract. Failure to perform this requirement may be considered a failure that endangers performance of this contract and may result in termination for default. (h) These provisions shall be flowed down only to first tier subcontracts exceeding the simplified acquisition threshold that support operation of the DOE facility and offer significant subcontracting opportunities for energy efficient or environmentally sustainable products or services. The Subcontractor, if subcontracting opportunities for sustainable and environmentally preferable products or services exceed the threshold in paragraph (f) of this clause, will comply with the procedures in paragraphs (c) through (f) of this clause regarding the collection of all data necessary to generate the reports required under paragraphs (c) through (f) of this clause, and submit the reports directly to the Prime Contractor's Environmental Sustainability Coordinator at the supported facility. The Subcontractor will advise the Contractor if it is unable to procure energy efficient and environmentally sustainable items and cite which of the reasons in paragraph (c) of this clause apply. The reports may be submitted at the conclusion of the subcontract term provided that the subcontract delivery term is not multi-year in nature. If the delivery term is multi-year, the Subcontractor shall report its accomplishments for each Federal fiscal year in a manner and at a time or times acceptable to both parties. Failure to comply with these reporting requirements may be considered a breach of contract with attendant consequences. (i) When this clause is used in a subcontract, the word "Contractor" will be understood to mean "Subcontractor."
I.122	**DEAR 952.226-74, DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)** (a) Definition. Eligible employee means a current or former employee of a contractor or subcontractor employed at a Department of Energy Defense Nuclear Facility (1) whose position of employment has been, or will be, involuntarily terminated (except if terminated for cause), (2) who has also met the eligibility criteria contained in the Department of Energy guidance for contractor work force restructuring, as may be amended or supplemented from time to time, and (3) who is qualified for a particular job vacancy with the Department or one of its contractors with respect to work under its contract with the Department at the time the particular position is available. (b) Consistent with Department of Energy guidance for contractor work force restructuring, as may be amended or supplemented from time to time, the Contractor agrees that it will provide a preference in hiring to an eligible employee to the extent practicable for work performed under this contract. (c) The requirements of this clause shall be included in subcontracts at any tier (except for subcontracts for commercial items pursuant to 41 U.S.C. 403) expected to exceed $500,000.
I.123	**DEAR 952.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM) (FEB 1995)** (a) Definitions. (1) "Invention" means any invention or discovery which is or may be patentable or otherwise protectable under title 35 of the United States Code, or any novel variety of plant which is or

	may be protected under the Plant Variety Protection Act (7 U.S.C. 2321, et seq.). (2) "Made" when used in relation to any invention means the conception of first actual reduction to practice of such invention. (3) "Nonprofit organization" means a university or other institution of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of l954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute. (4) "Practical application" means to manufacture, in the case of a composition or product; to practice, in the case of a process or method; or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that is benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms. (5) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used. (6) "Subject invention" means any invention of the contractor conceived or first actually reduced to practice in the performance of work under this contract, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, 7 U.S.C. 2401(d)) must also occur during the period of contract performance. (7) "Agency licensing regulations" and "agency regulations concerning the licensing of Government-owned inventions" mean the Department of Energy patent licensing regulations at 10 CFR Part 781. (b) Allocation of principal rights. The Contractor may retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 203. With respect to any subject invention in which the Contractor retains title, the Federal Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world. (c) Invention disclosure, election of title, and filing of patent application by Contractor. (1) The Contractor will disclose each subject invention to the Department of Energy (DOE) within 2 months after the inventor discloses it in writing to Contractor personnel responsible for patent matters. The disclosure to DOE shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the

	invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the DOE, the Contractor will promptly notify that agency of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Contractor. U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute. (4) "Practical application" means to manufacture, in the case of a composition or product; to practice, in the case of a process or method; or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that is benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms. (5) "Small business firm" means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used. (6) "Subject invention" means any invention of the contractor conceived or first actually reduced to practice in the performance of work under this contract, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, 7 U.S.C. 2401(d)) must also occur during the period of contract performance. (7) "Agency licensing regulations" and "agency regulations concerning the licensing of Government-owned inventions" mean the Department of Energy patent licensing regulations at 10 CFR Part 781. (b) Allocation of principal rights. The Contractor may retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 203. With respect to any subject invention in which the Contractor retains title, the Federal Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world. (c) Invention disclosure, election of title, and filing of patent application by Contractor. (1) The Contractor will disclose each subject invention to the Department of Energy (DOE) within 2 months after the inventor discloses it in writing to Contractor personnel responsible for patent matters. The disclosure to DOE shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the DOE, the Contractor will promptly notify that agency of the acceptance of any manuscript describing the invention

	for publication or of any on sale or public use planned by the Contractor. (2) The Contractor will elect in writing whether or not to retain title to any such invention by notifying DOE within 2 years of disclosure to DOE. However, in any case where publication, on sale or public use has initiated the l-year statutory period wherein valid patent protection can still be obtained in the United States, the period for election of title may be shortened by DOE to a date that is no more than 60 days prior to the end of the statutory period. (3) The Contractor will file its initial patent application on a subject invention to which it elects to retain title within 1 year after election of title or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The Contractor will file patent applications in additional countries or international patent offices within either 10 months of the corresponding initial patent application or 6 months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order. (4) Requests for extension of the time for disclosure, election, and filing under subparagraphs (c)(l), (2), and (3) of this clause may, at the discretion of the agency, be granted. (d) Conditions when the Government may obtain title. The Contractor will convey to the Federal agency, upon written request, title to any subject invention (1) If the Contractor fails to disclose or elect title to the subject invention within the times specified in paragraph (c) of this clause, or elects not to retain title; provided, that DOE may only request title within 60 days after learning of the failure of the Contractor to disclose or elect within the specified times. (2) In those countries in which the Contractor fails to file patent applications within the times specified in paragraph (c) of this clause; provided, however, that if the Contractor has filed a patent application in a country after the times specified in paragraph (c) of this clause, but prior to its receipt of the written request of the Federal agency, the Contractor shall continue to retain title in that country. (3) In any country in which the Contractor decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on a subject invention. (e) Minimum rights to Contractor and protection of the Contractor right to file. (1) The Contractor will retain a nonexclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the Contractor fails to disclose the invention within the times specified in paragraph (c) of this clause. The Contractor's license extends to its domestic subsidiary and affiliates, if any, within the corporate structure of which the Contractor is a party and includes the right to grant sublicenses of the same scope to the extent the Contractor was legally obligated to do so at the time the contract was awarded. The license is transferable only with the approval of the Federal agency, except when transferred to the successor of that part of the Contractor's business to which the

	invention pertains. (2) The Contractor's domestic license may be revoked or modified by DOE to the extent necessary to achieve expeditious practical application of subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions at 37 CFR Part 404 and agency licensing regulations. This license will not be revoked in that field of use or the geographical areas in which the Contractor has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of DOE to the extent the Contractor, its licensees, or the domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country. (3) Before revocation or modification of the license, DOE will furnish the Contractor a written notice of its intention to revoke or modify the license, and the Contractor will be allowed 30 days (or such other time as may be authorized by DOE for good cause shown by the Contractor) after the notice to show cause why the license should not be revoked or modified. The Contractor has the right to appeal, in accordance with applicable regulations in 37 CFR Part 404 and agency regulations concerning the licensing of Government owned inventions, any decision concerning the revocation or modification of the license. (f) Contractor action to protect the Government's interest. (1) The Contractor agrees to execute or to have executed and promptly deliver to DOE all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Contractor elects to retain title, and (ii) convey title to DOE when requested under paragraph (d) of this clause and to enable the government to obtain patent protection throughout the world in that subject invention. (2) The Contractor agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Contractor each subject invention made under contract in order that the Contractor can comply with the disclosure provisions of paragraph (c) of this clause, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by subparagraph (c)(1) of this clause. The Contractor shall instruct such employees, through employee agreements or other suitable educational programs, on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars. (3) The Contractor will notify DOE of any decision not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than 30 days before the expiration of the response period required by the relevant patent office. (4) The Contractor agrees to include, within the specification of any United States patent application and any patent issuing thereon covering a subject invention, the following statement, "This invention was made with Government support under (identify the contract) awarded by the United States Department of Energy. The Government has certain rights in the

	invention." (g) Subcontracts. (1) The Contractor will include this clause, suitably modified to identify the parties, in all subcontracts, regardless of tier, for experimental, developmental, or research work to be performed by a small business firm or domestic nonprofit organization. The subcontractor will retain all rights provided for the Contractor in this clause, and the Contractor will not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractor's subject inventions. (2) The contractor shall include in all other subcontracts, regardless of tier, for experimental, developmental, demonstration, or research work the patent rights clause at 952.227-13. (3) In the case of subcontracts, at any tier, DOE, subcontractor, and the Contractor agree that the mutual obligations of the parties created by this clause constitute a contract between the subcontractor and DOE with respect to the matters covered by the clause; provided, however, that nothing in this paragraph is intended to confer any jurisdiction under the Contract Disputes Act in connection with proceedings under paragraph (j) of this clause. (h) Reporting on utilization of subject inventions. The Contractor agrees to submit, on request, periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Contractor or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received, by the Contractor, and such other data and information as DOE may reasonably specify. The Contractor also agrees to provide additional reports as may be requested by DOE in connection with any march-in proceeding undertaken by that agency in accordance with paragraph (j) of this clause. As required by 35 U.S.C. 202(c)(5), DOE agrees it will not disclose such information to persons outside the Government without permission of the Contractor. (i) Preference for United States industry. Notwithstanding any other provision of this clause, the Contractor agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any product embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by DOE upon a showing by the Contractor or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. (j) March-in rights. The Contractor agrees that, with respect to any subject invention in which it has acquired title, DOE has the right in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the agency to require the Contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and, if the Contractor, assignee, or exclusive licensee refuses such a request, DOE has the right to grant such a license itself if DOE determines that (1) Such action is necessary because the Contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use; (2) Such action is necessary to alleviate health or safety needs which are not

	reasonably satisfied by the Contractor, assignee, or their licensees; (3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Contractor, assignee, or licensees; or (4) Such action is necessary because the agreement required by paragraph (i) of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement. (k) Special provisions for contracts with nonprofit organizations. If the Contractor is a nonprofit organization, it agrees that (1) Rights to a subject invention in the United States may not be assigned without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions; provided, that such assignee will be subject to the same provisions as the Contractor; (2) The Contractor will share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (when DOE deems it appropriate) when the subject invention is assigned in accordance with 35 U.S.C. 202(e) and 37 CFR 401.10; (3) The balance of any royalties or income earned by the Contractor with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions will be utilized for the support of scientific research or education; and (4) It will make efforts that are reasonable under the circumstances to attract licensees of subject inventions that are small business firms, and that it will give a preference to a small business firm when licensing a subject invention if the Contractor determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided, that the Contractor is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the contractor. However, the Contractor agrees that the Secretary of Commerce may review the Contractor's licensing program and decisions regarding small business applicants, and the Contractor will negotiate changes to its licensing policies, procedures, or practices with the Secretary of Commerce when that Secretary's review discloses that the Contractor could take reasonable steps to more effectively implement the requirements of this subparagraph (k)(4). (l) Communications (1) The contractor shall direct any notification, disclosure, or request to DOE provided for in this clause to the DOE patent counsel assisting the DOE contracting activity, with a copy of the communication to the Contracting Officer. (2) Each exercise of discretion or decision provided for in this clause, except subparagraph (k)(4), is reserved for the DOE Patent Counsel and is not a claim or dispute and is not subject to the Contract Disputes Act of 1978. (3) Upon request of the DOE Patent Counsel or the contracting officer, the contractor shall provide any or all of the following:

	(i) a copy of the patent application, filing date, serial number and title, patent number, and issue date for any subject invention in any country in which the contractor has applied for a patent; (ii) a report, not more often than annually, summarizing all subject inventions which were disclosed to DOE individually during the reporting period specified; or (iii) a report, prior to closeout of the contract, listing all subject inventions or stating that there were none.
I.124	**DEAR 952.242-70 TECHNICAL DIRECTION (DEC 2000)** (a) Performance of the work under this contract shall be subject to the technical direction of the DOE Contracting Officer's Representative (COR). The term "technical direction" is defined to include, without limitation: (1) Providing direction to the Contractor that redirects contract effort, shift work emphasis between work areas or tasks, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to accomplish the contractual Statement of Work. (2) Providing written information to the Contractor that assists in interpreting drawings, specifications, or technical portions of the work description. (3) Reviewing and, where required by the contract, approving, technical reports, drawings, specifications, and technical information to be delivered by the Contractor to the Government. (b) The Contractor will receive a copy of the written COR designation from the Contracting Officer. It will specify the extent of the COR's authority to act on behalf of the Contracting Officer. (c) 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 that— (1) Constitutes an assignment of additional work outside the Statement of Work; (2) Constitutes a change as defined in the contract clause entitled "Changes;" (3) In any manner causes an increase or decrease in the total estimated contract cost, the fee (if any), or the time required for contract performance; (4) Changes any of the expressed terms, conditions or specifications of the contract; or (5) Interferes with the Contractor's right to perform the terms and conditions of the contract. (d) All technical direction shall be issued in writing by the COR. (e) The Contractor must 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 (c)(1) through (c)(5) of this clause, the Contractor must not proceed and must notify the Contracting Officer in writing within five (5) working days after receipt of any such instruction or direction and must request the Contracting Officer to modify the contract accordingly. Upon receiving the notification from the Contractor, the Contracting Officer must— (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 Changes clause of the contract; (2) Advise the Contractor in writing within a reasonable time that the Government will issue a written change order; or (3) Advise the Contractor in writing within a reasonable time not to proceed with the instruction or direction of the COR. (f) A failure of the Contractor and Contracting Officer either to agree that the technical direction is within the scope of the contract or to agree upon the contract action to be taken with respect to the technical direction will be subject to the provisions of the clause entitled "Disputes."
I.125	**DEAR 952.250-70 NUCLEAR HAZARDS INDEMNITY AGREEMENT (JUN 1996)** (a) Authority. This clause is incorporated into this contract pursuant to the authority contained in subsection 170d. of the Atomic Energy Act of 1954, as amended (hereinafter called the Act.) (b) Definitions. The definitions set out in the Act shall apply to this clause. (c) Financial protection. Except as hereafter permitted or required in writing by DOE, the Contractor will not be required to provide or maintain, and will not provide or maintain at Government expense, any form of financial protection to cover public liability, as described in paragraph (d)(2) below. DOE may, however, at any time require in writing that the Contractor provide and maintain financial protection of such a type and in such amount as DOE shall determine to be appropriate to cover such public liability, provided that the costs of such financial protection are reimbursed to the Contractor by DOE. (d)(1) Indemnification. To the extent that the Contractor and other persons indemnified are not compensated by any financial protection permitted or required by DOE, DOE will indemnify the Contractor and other persons indemnified against (i) claims for public liability as described in subparagraph (d)(2) of this clause; and (ii) such legal costs of the Contractor and other persons indemnified as are approved by DOE, provided that DOE's liability, including such legal costs, shall not exceed the amount set forth in section 170e.(1)(B) of the Act in the aggregate for each nuclear incident or precautionary evacuation occurring within the United States or $100 million in the aggregate for each nuclear incident occurring outside the United States, irrespective of the number of persons indemnified in connection with this contract. (2) The public liability referred to in subparagraph (d)(1) of this clause is public liability as defined in the Act which (i) arises out of or in connection with the activities under this contract, including transportation; and (ii) arises out of or results from a nuclear incident or precautionary evacuation, as those terms are defined in the Act. (e)(1) Waiver of Defenses. In the event of a nuclear incident, as defined in the Act, arising out of nuclear waste activities, as defined in the Act, the Contractor, on behalf of itself and other persons indemnified, agrees to waive any issue or defense as to charitable or governmental immunity. (2) In the event of an extraordinary nuclear occurrence which— (i) Arises out of, results from, or occurs in the course of the construction, possession, or operation of a production or utilization facility; or (ii) Arises out of, results from, or occurs in the course of transportation of source material, by-product material, or special nuclear material to or from a production or utilization facility; or (iii) Arises out of or results from the possession, operation, or use by the Contractor or a subcontractor of a device utilizing special nuclear material or by-product material, during the course of the contract activity; or (iv) Arises out of, results from, or occurs in the course of nuclear waste activities, the

	Contractor, on behalf of itself and other persons indemnified, agrees to waive: (A) Any issue or defense as to the conduct of the claimant (including the conduct of persons through whom the claimant derives its cause of action) or fault of persons indemnified, including, but not limited to— 1. Negligence; 2. Contributory negligence; 3. Assumption of risk; or 4. Unforeseeable intervening causes, whether involving the conduct of a third person or an act of God; (B) Any issue or defense as to charitable or governmental immunity; and (C) Any issue or defense based on any statute of limitations, if suit is instituted within 3 years from the date on which the claimant first knew, or reasonably could have known, of his injury or change and the cause thereof. The waiver of any such issue or defense shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action. The waiver shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified. (v) The term extraordinary nuclear occurrence means an event which DOE has determined to be an extraordinary nuclear occurrence as defined in the Act. A determination of whether or not there has been an extraordinary nuclear occurrence will be made in accordance with the procedures in 10 CFR part 840. (vi) For the purposes of that determination, "offsite" as that term is used in 10 CFR part 840 means away from "the contract location" which phrase means any DOE facility, installation, or site at which contractual activity under this contract is being carried on, and any contractor-owned or controlled facility, installation, or site at which the Contractor is engaged in the performance of contractual activity under this contract. (3) The waivers set forth above— (i) Shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action; (ii) Shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified; (iii) Shall not preclude a defense based upon a failure to take reasonable steps to mitigate damages; (iv) Shall not apply to injury or damage to a claimant or to a claimant's property which is intentionally sustained by the claimant or which results from a nuclear incident intentionally and wrongfully caused by the claimant; (v) Shall not apply to injury to a claimant who is employed at the site of and in connection with the activity where the extraordinary nuclear occurrence takes place, if benefits therefor are either payable or required to be provided under any workmen's compensation or occupational disease law; (vi) Shall not apply to any claim resulting from a nuclear incident occurring outside the United States; (vii) Shall be effective only with respect to those obligations set forth in this clause and in insurance policies, contracts or other proof of financial protection; and (viii) Shall not apply to, or prejudice the prosecution or defense of, any claim or portion of claim which is not within the protection afforded under (A) the limit of liability provisions under subsection 170e. of the Act, and (B) the terms of this agreement and the terms of insurance policies, contracts, or other proof of financial protection. (f) Notification and litigation of claims. The Contractor shall give immediate written notice to DOE of any known action or claim filed or made against the Contractor or other person

	indemnified for public liability as defined in paragraph (d)(2). Except as otherwise directed by DOE, the Contractor shall furnish promptly to DOE, copies of all pertinent papers received by the Contractor or filed with respect to such actions or claims. DOE shall have the right to, and may collaborate with, the Contractor and any other person indemnified in the settlement or defense of any action or claim and shall have the right to (1) require the prior approval of DOE for the payment of any claim that DOE may be required to indemnify hereunder; and (2) appear through the Attorney General on behalf of the Contractor or other person indemnified in any action brought upon any claim that DOE may be required to indemnify hereunder, take charge of such action, and settle or defend any such action. If the settlement or defense of any such action or claim is undertaken by DOE, the Contractor or other person indemnified shall furnish all reasonable assistance in effecting a settlement or asserting a defense. (g) Continuity of DOE obligations. The obligations of DOE under this clause shall not be affected by any failure on the part of the Contractor to fulfill its obligation under this contract and shall be unaffected by the death, disability, or termination of existence of the Contractor, or by the completion, termination or expiration of this contract. (h) Effect of other clauses. The provisions of this clause shall not be limited in any way by, and shall be interpreted without reference to, any other clause of this contract, including the clause entitled Contract Disputes, provided, however, that this clause shall be subject to the clauses entitled Covenant Against Contingent Fees, and Accounts, records, and inspection, and any provisions that are later added to this contract as required by applicable Federal law, including statutes, executive orders and regulations, to be included in Nuclear Hazards Indemnity Agreements. (i) Civil penalties. The Contractor and its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to civil penalties, pursuant to 234A of the Act, for violations of applicable DOE nuclear-safety related rules, regulations, or orders. (j) Criminal penalties. Any individual director, officer, or employee of the Contractor or of its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to criminal penalties, pursuant to 223(c) of the Act, for knowing and willful violation of the Atomic Energy Act of 1954, as amended, and applicable DOE nuclear safety-related rules, regulations or orders which violation results in, or, if undetected, would have resulted in a nuclear incident. (k) Inclusion in subcontracts. The Contractor shall insert this clause in any subcontract which may involve the risk of public liability, as that term is defined in the Act and further described in paragraph (d)(2) above. However, this clause shall not be included in subcontracts in which the subcontractor is subject to Nuclear Regulatory Commission (NRC) financial protection requirements under section 170b. of the Act or NRC agreements of indemnification under section 170c. or k. of the Act for the activities under the subcontract. Effective date ( ) See Note II below for instructions related to this section on Effective Date. Relationship to general indemnity ( ) See Note III below for instructions related to this section on Relationship to General Indemnity.
I.126	**DEAR 952.251-70 CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (AUG 2009)** (a) The Contractor shall take advantage of travel discounts offered to Federal Contractor employee travelers by AMTRAK, hotels, motels, or car rental companies, when use of such discounts would result in lower overall trip costs and the discounted services are reasonably available. Vendors providing these services may require the Contractor employee to furnish them a letter of identification signed by the authorized Contracting

	Officer. (b) Contracted airlines. Contractors are not eligible for GSA contract city pair fares. (c) Discount rail service. AMTRAK voluntarily offers discounts to Federal travelers on official business and sometimes extends those discounts to Federal contractor employees. (d) Hotels/motels. Many lodging providers extend their discount rates for Federal employees to Federal contractor employees. (e) Car rentals. Surface Deployment and Distribution Command (SDDC) of the Department of Defense negotiates rate agreements with car rental companies that are available to Federal travelers on official business. Some car rental companies extend those discounts to Federal contractor employees. (f) Obtaining travel discounts. (1) To determine which vendors offer discounts to Government contractors, the Contractor may review commercial publications such as the Official Airline guides Official Traveler, Innovata, or National Telecommunications. The Contractor may also obtain this information from GSA contract Travel Management Centers or the Department of Defense's Commercial Travel Offices. (2) The vendor providing the service may require the Government contractor to furnish a letter signed by the Contracting Officer. The following illustrates a standard letter of identification. OFFICIAL AGENCY LETTERHEAD TO: Participating Vendor SUBJECT: OFFICIAL TRAVEL OF GOVERNMENT CONTRACTOR (FULL NAME OF TRAVELER), the bearer of this letter is an employee of (COMPANY NAME) which has a contract with this agency under Government contract (CONTRACT NUMBER). During the period of the contract (GIVE DATES), AND WITH THE APPROVAL OF THE CONTRACT VENDOR, the employee is eligible and authorized to use available travel discount rates in accordance with Government contracts and/or agreements. Government Contract City Pair fares are not available to Contractors. SIGNATURE, Title and telephone number of Contracting Officer
I.127	**DEAR 970.5204-2 LAWS, REGULATIONS, AND DOE DIRECTIVES (DEC 2000)** (a) In performing work under this contract, the Contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency. A List of Applicable Laws and regulations (List A) may be appended to this contract for information purposes. Omission of any applicable law or regulation from List A does not affect the obligation of the Contractor to comply with such law or regulation pursuant to this paragraph. (b) In performing work under this contract, the Contractor shall comply with the requirements of those Department of Energy directives, or parts thereof, identified in the List of Applicable Directives (List B) appended to this contract. Except as otherwise provided for in paragraph (d) of this clause, the Contracting Officer may, from time to time and at any time, revise List B by unilateral modification to the contract to add, modify, or delete specific requirements. Prior to revising List B, the Contracting Officer shall notify the Contractor in writing of the Department's intent to revise List B and provide the Contractor with the opportunity to assess the effect of the Contractor's compliance with the revised list on contract cost and funding, technical performance, and schedule; and identify any potential inconsistencies between the revised list and the other terms and conditions of the contract. Within 30 days after receipt of the Contracting Officer's notice, the Contractor shall advise the Contracting Officer in writing

	of the potential impact of the Contractor's compliance with the revised list. Based on the information provided by the Contractor and any other information available, the Contracting Officer shall decide whether to revise List B and so advise the Contractor not later than 30 days prior to the effective date of the revision of List B. The Contractor and the Contracting Officer shall identify and, if appropriate, agree to any changes to other contract terms and conditions, including cost and schedule, associated with the revision of List B pursuant to the clause of this contract entitled, "Changes." (c) Environmental, safety, and health (ES&H) requirements appropriate for work conducted under this contract may be 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, such as a tailoring process included in a DOE approved Safety Management System implemented under the clause entitled "Integration of Environment, Safety, and Health into Work Planning and Execution." When such a process is used, the set of tailored (ES&H) requirements, as approved by DOE pursuant to the process, shall be incorporated into List B as contract requirements with full force and effect. These requirements shall supersede, in whole or in part, the contractual environmental, safety, and health requirements previously made applicable to the contract by List B. If the tailored set of requirements identifies an alternative requirement varying from an ES&H requirement of an applicable law or regulation, the Contractor shall request an exemption or other appropriate regulatory relief specified in the regulation. (d) Except as otherwise directed by the Contracting Officer, the Contractor shall procure all necessary permits or licenses required for the performance of work under this contract. (e) Regardless of the performer of the work, the Contractor is responsible for compliance with the requirements of this clause. The Contractor is responsible for flowing down the requirements of this clause to subcontracts at any tier to the extent necessary to ensure the Contractor's compliance with the requirements.
I.128	**DEAR 970.5204-3 ACCESS TO AND OWNERSHIP OF RECORDS (JUL 2005)** (a) Government-owned records. Except as provided in paragraph (b) of this clause, all records acquired or generated by the Contractor in its performance of this contract shall be the property of the Government and shall be 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 the contract. (b) Contractor-owned records. The following records are considered the property of the Contractor and are not within the scope of paragraph (a) of this clause. [The Contracting Officer shall identify which of the following categories of records will be included in the clause.] (1) Employment-related records (such as worker’s compensation files; employee relations records, records on salary and employee benefits; drug testing records, labor negotiation records; records on ethics, employee concerns; records generated during the course of responding to allegations of research misconduct; records generated during other employee related investigations conducted under an expectation of confidentiality; employee assistance program records; and personnel and medical/health-related records and similar files), and non-employee patient medical/health-related records, except for those records described by the contract as being maintained in Privacy Act systems of records. (2) Confidential contractor financial information, and correspondence between the Contractor and other segments of the Contractor located away from the DOE facility (i.e., the Contractor's corporate headquarters); (3) Records relating to any procurement action by the Contractor, except for records that under

	48 CFR 970.5232-3, Accounts, Records, and Inspection, are described as the property of the Government; and (4) Legal records, including legal opinions, litigation files, and documents covered by the attorney-client and attorney work product privileges; and (5) The following categories of records maintained pursuant to the technology transfer clause of this contract: (i) Executed license agreements, including exhibits or appendices containing information on royalties, royalty rates, other financial information, or commercialization plans, and all related documents, notes and correspondence. (ii) The Contractor's protected Cooperative Research and Development Agreement (CRADA) information and appendices to a CRADA that contain licensing terms and conditions, or royalty or royalty rate information. (iii) Patent, copyright, mask work, and trademark application files and related contractor invention disclosures, documents and correspondence, where the Contractor has elected rights or has permission to assert rights and has not relinquished such rights or turned such rights over to the Government. (c) Contract completion or termination. In the event of completion or termination of this contract, copies of any of the contractor-owned records identified in paragraph (b) of this clause, upon the request of the Government, shall be delivered to DOE or its designees, including successor contractors. Upon delivery, title to such records shall vest in DOE or its designees, and such records shall be protected in accordance with applicable federal laws (including the Privacy Act), as appropriate. (d) Inspection, copying, and audit of records. All records acquired or generated by the Contractor under this contract in the possession of the Contractor, including those described at paragraph (b) of this clause, shall be subject to inspection, copying, and audit by the Government or its designees at all reasonable times, and the Contractor shall afford the Government or its designees reasonable facilities for such inspection, copying, and audit; provided, however, that upon request by the Contracting Officer, the Contractor shall deliver such records to a location specified by the Contracting Officer for inspection, copying, and audit. The Government or its designees shall use such records in accordance with applicable federal laws (including the Privacy Act), as appropriate. (e) Applicability. Paragraphs (b), (c), and (d) of this clause apply to all records without regard to the date or origination of such records. (f) Records retention standards. Special records retention standards, described at DOE Order 200.1, Information Management Program (version in effect on effective date of contract), are applicable for the classes of records described therein, whether or not the records are owned by the Government or the Contractor. In addition, the Contractor shall retain individual radiation exposure records generated in the performance of work under this contract until DOE authorizes disposal. The Government may waive application of these record retention schedules, if, upon termination or completion of the contract, the Government exercises its right under paragraph (c) of this clause to obtain copies and delivery of records described in paragraphs (a) and (b) of this clause. (g) Subcontracts. The Contractor shall include the requirements of this clause in all subcontracts that are of a cost-reimbursement type if any of the following factors is present: (1) The value of the subcontract is greater than $2 million (unless specifically waived by the Contracting Officer); (2) The Contracting Officer determines that the subcontract is, or involves, a critical task related to the contract; or (3) The subcontract includes 48 CFR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution, or similar clause.

I.129	**DEAR 970.5223-1 INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO WORK PLANNING AND EXECUTION (DEC 2000)** (a) For the purposes of this clause, (1) Safety encompasses environment, safety and health, including pollution prevention and waste minimization; and (2) Employees include subcontractor employees. (b) In performing work under this contract, the Contractor shall perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment, and shall be accountable for the safe performance of work. The Contractor shall exercise a degree of care commensurate with the work and the associated hazards. The Contractor shall ensure that management of environment, safety and health (ES&H) functions and activities becomes an integral but visible part of the Contractor's work planning and execution processes. The Contractor shall, in the performance of work, ensure that: (1) Line management is responsible for the protection of employees, the public, and the environment. Line management includes those Contractor and subcontractor employees managing or supervising employees performing work. (2) Clear and unambiguous lines of authority and responsibility for ensuring ES&H are established and maintained at all organizational levels. (3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities. (4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed. (5) Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences. (6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures. (7) The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed-upon by DOE and the Contractor. These agreed-upon conditions and requirements are requirements of the contract and binding upon the Contractor. The extent of documentation and level of authority for agreement shall be tailored to the complexity and hazards associated with the work and shall be established in a Safety Management System. (c) The Contractor shall manage and perform work in accordance with a documented Safety Management System (System) that fulfills all conditions in paragraph (b) of this clause at a minimum. Documentation of the System shall describe how the Contractor will— (1) Define the scope of work; (2) Identify and analyze hazards associated with the work; (3) Develop and implement hazard controls; (4) Perform work within controls; and (5) Provide feedback on adequacy of controls and continue to improve safety management. (d) The System shall describe how the Contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System. The System shall also describe how the Contractor will measure system effectiveness. (e) The Contractor shall submit to the Contracting Officer documentation of its System for

	review and approval. Dates for submittal, discussions, and revisions to the System will be established by the Contracting Officer. Guidance on the preparation, content, review, and approval of the System will be provided by the Contracting Officer. On an annual basis, the Contractor shall review and update, for DOE approval, its safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction. Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as maintain the integrity of the entire System. Accordingly, the System shall be integrated with the Contractor's business processes for work planning, budgeting, authorization, execution, and change control. (f) The Contractor shall comply with, and assist the Department of Energy in complying with, ES&H requirements of all applicable laws and regulations, and applicable directives identified in the clause of this contract entitled "Laws, Regulations, and DOE Directives." The Contractor shall cooperate with Federal and non-Federal agencies having jurisdiction over ES&H matters under this contract. (g) The Contractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System. If the Contractor fails to provide resolution or if, at any time, the Contractor's acts or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public, the Contracting Officer may issue an order stopping work in whole or in part. Any stop work order issued by a contracting officer under this clause (or issued by the Contractor to a subcontractor in accordance with paragraph (i) of this clause) shall be without prejudice to any other legal or contractual rights of the Government. In the event that the Contracting Officer issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the Contracting Officer. 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 ordered in accordance with this clause. (h) Regardless of the performer of the work, the Contractor is responsible for compliance with the ES&H requirements applicable to this contract. The Contractor is responsible for flowing down the ES&H requirements applicable to this contract to subcontracts at any tier to the extent necessary to ensure the Contractor's compliance with the requirements. (i) The Contractor shall include a clause substantially the same as this clause in subcontracts involving complex or hazardous work on site at a DOE-owned or-leased facility. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) of this clause. Depending on the complexity and hazards associated with the work, the Contractor may choose not to require the subcontractor to submit a Safety Management System for the Contractor's review and approval.
I.130	**DEAR 970.5223-4 WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2010)** (a) Program Implementation. The Contractor shall, consistent with 10 CFR part 707, Workplace Substance Abuse Programs at DOE Sites, incorporated herein by reference with full force and effect, develop, implement, and maintain a workplace substance abuse program. (b) Remedies. In addition to any other remedies available to the Government, the Contractor's failure to comply with the requirements of 10 CFR part 707 or to perform in a manner consistent with its approved program may render the Contractor subject to: the suspension of contract payments, or, where applicable, a reduction in award fee; termination for default; and suspension or debarment. (c) *Subcontracts*. (1) The Contractor agrees to notify the Contracting Officer reasonably in advance of, but not later than 30 days prior to, the award of any subcontract the Contractor believes may be subject to the requirements of 10 CFR part 707, unless the Contracting Officer

	agrees to a different date. (2) The DOE Prime Contractor shall require all subcontracts subject to the provisions of 10 CFR part 707 to agree to develop and implement a workplace substance abuse program that complies with the requirements of 10 CFR part 707, Workplace Substance Abuse Programs at DOE Sites, as a condition for award of the subcontract. The DOE Prime Contractor shall review and approve each subcontractor's program, and shall periodically monitor each subcontractor's implementation of the program for effectiveness and compliance with 10 CFR part 707. (3) The Contractor agrees to include, and require the inclusion of, the requirements of this clause in all subcontracts, at any tier, that are subject to the provisions of 10 CFR part 707.
I.131	**DEAR 970.5226-3 COMMUNITY COMMITMENT (DEC 2000)** It is the policy of the DOE to be a constructive partner in the geographic region in which DOE conducts its business. The basic elements of this policy include: (1) Recognizing the diverse interests of the region and its stakeholders, (2) engaging regional stakeholders in issues and concerns of mutual interest, and (3) recognizing that giving back to the community is a worthwhile business practice. Accordingly, the Contractor agrees that its business operations and performance under the Contract will be consistent with the intent of the policy and elements set forth above.

PART III - LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

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ATTACHMENT J.1 LIST OF APPLICABLE DOE DIRECTIVES

The Contractor shall comply with the requirements of the DOE Directives identified below. DOE directives may be found at http://www.directives.doe.gov/.

Order Number/Changes	Title
DOE O 130.1 CRD	Budget Formulation
DOE M 140.1-1B, CRD	Interface with the Defense Nuclear Facilities Safety Board
DOE O 142.1, CRD	Classified Visits Involving Foreign Nationals
DOE O 142.2A, Change 1, CRD	Voluntary Offer Safeguards Agreement and Additional Protocol with the International Atomic Energy Agency
DOE M 142.2-1, Change 1, CRD	Manual for Implementation of the Voluntary Offer Safeguards Agreement and Additional Protocol
DOE O 142.3 A, CRD	Unclassified Foreign Visits and Assignments Program
DOE O 150.1A, CRD	Continuity Programs
DOE O 151.1C, CRD	Comprehensive Emergency Management System
DOE O 200.1A CRD	Information Technology Management
DOE O 205.1B, Change 2, CRD (Supp. Rev. 1)	Department of Energy Cyber Security Management
DOE O 206.1, CRD	Department of Energy Privacy Program
DOE O 206.2, CRD	Identity, Credential, and Access Management (ICAM)
DOE O 210.2A ,CRD	DOE Corporate Operating Experience Program
DOE O 221.1A, CRD	Reporting Fraud, Waste, and Abuse to the Office of Inspector General
DOE O 221.2A, CRD	Cooperation with the Office of Inspector General
DOE O 225.1B, CRD	Accident Investigations
DOE O 226.1B, CRD	Implementation of DOE Oversight Policy
DOE O 231.1B, Change 1, CRD	Environment, Safety, and Health Reporting Attachment 1, Step 2a
DOE O 232.2, Change 1, CRD	Occurrence Reporting and Processing of Operations Information

DOE O 241.1B, CRD	Scientific and Technical Information Management
DOE O 243.1B, Change 1, CRD	Records Management Program
DOE O 413.1B CRD	Internal Control Program
DOE O 414.1D, CRD	Quality Assurance
DOE O 422.1, CRD	Conduct of Operations
DOE O 426.2, Change 1, CRD	Personnel Selection, Training, Qualification and Certification Requirements for DOE Nuclear Facilities
DOE O 435.1, Change 1, CRD	Radioactive Waste Management
DOE O 436.1 CRD	Departmental Sustainability
DOE M 441.1-1	Nuclear Material Packaging Manual
DOE O 442.1A, CRD Supplemented Revision 3	Department of Energy Employee Concerns Program
DOE O 442.2, CRD	Differing Professional Opinions for Technical Issues Involving Environmental, Safety, and Health Technical Concerns
DOE O 458.1, CRD	Radiation Protection of the Public and the Environment
DOE O 460.1B CRD	Packaging and Transportation Safety
DOE O 470.4B, Change 1, CRD	Safeguards and Security Program
DOE M 470.4-6 Change 1, CRD	Nuclear Material Control and Accountability
DOE O 471.3, Change 1, CRD	Identifying and Protecting Official Use Only Information
DOE M 471.3-1, Change 1, CRD	Manual for Identifying and Protecting Official Use Only Information
DOE O 471.6, CRD	Information Security
DOE O 473.3, CRD	Protection Program Operations
DOE O 475.1 CRD	Counterintelligence Program
DOE O 551.1D, CRD	Official Foreign Travel
RRD-006, Rev.0	Contractor Support to RL Implementation of DOE Order 470.3A, Design Basis Threat Policy
DOE-0223	RL- Emergency Implementing Procedures
DOE/RL-94-02, Rev 5	Hanford Emergency Management Plan - Section 11.1 - Section 11.1.3 - Section 12.0
DOE/RL 96-68	HASQARD, Revision 3

DOE/RL-2001-36	Revision 1-E to the Hanford Site-wide Transportation Safety Document
MGT-PM-IP-08, Attachment 9.2, R3, CRD	Facility Representative Program

ATTACHMENT J.2 - LIST OF DELIVERABLES

All deliverables shall be provided to the DOE Contracting Officer in an editable electronic format (i.e., rather than PDF) in addition to hardcopy. Omission of any deliverable from the List of Deliverables does not affect the obligation of the Contractor to comply with such requirement.

Deliverable Number	Deliverable	Reference	Frequency
C-01	Transition Plan	C.2.1.9	T,W
C-02	Transition Status Report	C.2.1.9	T
C-03	Performance Status Report	C.1.2.1	M
C-04	Property Management Plan	C.2.1.9	T, W, A
C-05	Property Acquisition and Dispositions – if applicable	C.2.1.6 and Interface Matrix #51	A
C-06	Physical Inventory Report	C.2.1.9	T, W, A
C-07	Integrated Safety Management System Description	C.2.1.3	W, A
C-08	Worker Safety and Health Plan	C.2.1.3 and H.19	T,W, A
C-09	Employee Concerns Plan	C.2.1.10.5 and H.20	A
C-10	Communications Plan	C.2.1.9	T, W, A
C-11	Records Management Plan	C.2.1.7	T, W, A
C-12	Quality Assurance Program Plan	C.2.1.4 and C.2.1.9	W, A
C-13	Service Level Agreements	C.1.2.5	A
C-14	Contractor Notice to Assume Full Responsibility	C.2.1.9	T
C-15	Contractor Assurance System Description	C.2.1.9	T
C-16	Environmental Management System Description	C.2.1.2	A,W
F-01	Corrective Action Plan	F.05	A
H-01	Pension Management Plan	H.02	A, Y
H-02	Benefit Value Study	H.02	A
H-03	Employee Benefits Cost Study	H.02	Y
H-04	Itemization of Costs for Plan Administration	H.02	Y
H-05	Investment Policy Statement	H.02	Y
H-06	Investment Performance Self-Assessment	H.02	Y
H-07	Actuarial Valuation Reports	H.02	Y
H-08	Copy of IRS Form 5500	H.02	Y
H-09	Copy of IRS Form 5300	H.02	Y
H-10	Changes to Pension Plan	H.02	A
H-11	Incumbent Employee Benefit Plans	H.04	A, T
H-12	Report of Settlement	H.06	A

H-13	Workforce Restructuring	H.08	A
H-14	Submission of Payroll Records	H.09	A
H-15	Accident Reports	H.09	A
H-66	Evaluation and Analysis of Workers Compensation Costs	H.09	A
H-17	Notification of Foreign National Participation in Performance of Work	H.13	A
H-18	Job Related Injuries or Illnesses Occurring at DOE Facility	H.19	A
H-19	Notification of Change in Key Personnel Team	H.24	A
H-20	Phase-Out and Phase-In Operations Plan	H.28	T, W, A
H-21	Notice of Violations, Fines, Penalties	H.33	A
H-22	Security Incidents Involving PII	H.37	A
H-23	DOE Directive Implementation Schedule and Notification to CO	H.40	A
H-24	Notification of Corporate Board of Director Changes	H.42	A
H-25	Year End Self-Assessment Report	H.43	Y
H-26	EEOICPA Claims	H.44	A
I-01	OMB Standard Form LLL, Disclosure of Lobbying Activities	I.8, FAR 52.203-12 Limitation on Payments to Influence Certain Federal Transactions (OCT 2010)	A
I-02	Business Ethics Awareness and Compliance Program	I.9 FAR 52.203-13 Contractor Code of Business Ethics and Conduct (APR 2010)	W, A
I-03	Code of Business Ethics and Conduct	I.9 FAR 52.203-13 Contractor Code of Business Ethics and Conduct (APR 2010)	T

I-04	System for Award Management Updates	I.12 FAR 52.204-7 System for Award Management (Jul 2013)	A
I-05	Reporting Executive Compensation and First Tier Subcontract Awards	I.14, FAR 52.204-10 Reporting Executive Compensation and First-Tier Subcontract Awards (JUL 2013)	T, Y
I-06	Update of Publicly Available Information Regarding Responsibility Matters	I.17 FAR 52.209-9 Updates of Information Regarding Responsibility Matters (AUG 2013)	S
I-07	Affirmative Action Plan for Females & Minorities	I.38 FAR 52.222-26 Equal Opportunity (MAR 2007)	T,Y
I-08	Equal Employment Report (EEO-1)	I.38 FAR 52.222-26 Equal Opportunity (MAR 2007)	Y
I-09	Affirmative Action Plan for Veterans & Individuals with Disabilities	I.39 FAR 52.222-35 Equal Opportunity for Veterans (SEP 2010) FAR 52.222-36 Affirmative Action for Workers with Disabilities (OCT 2010)	T,Y
I-10	Employment Reports for Special Disabled Veterans and Veterans of Vietnam Era (Federal Contractor Veterans Employment Report VETS-100)	I.41 FAR 52.222-37 Equal Opportunity for Veterans (SEP	Y

		2010)	
I-11	Material Safety Data Sheet	I.49 FAR 52.223-3 Hazardous Material Identification and Material Safety Data (JAN 1997)	A
I-12	Annual Biobased Purchases Report	I.48 FAR 52.223-2 Affirmative Procurement of Biobased Products Under Service and Construction Contracts (JUL 2012)	Y
I-13	Contractor Electronic Funds Transfer Information Contained in SAM Database	I.76 FAR 52.232-33 Payment By Electronic Funds Transfer-System For Award Management (JUL 2013)	A
I-14	Bankruptcy Notification	I.83 FAR 52.242-13 Bankruptcy (JUL 1995)	A
I-15	Consent to Subcontract	I.86 FAR 52.244-2 Subcontracts (OCT 2010)	A
I-16	Property Management Plans, Systems and Procedures	I.89 FAR 52.245-1 Government Property (APR 2012) ALT I (APR 2012)	A

I-17	Report of Physical Inventory Results	I.89 FAR 52.245-1 Government Property (APR 2012)	Y
I-18	Reports of loss, damage, destroyed or stolen property	I.89 FAR 52.245-1 Government Property (APR 2012) ALT I. (APR 2012)	A
I-19	Final physical completion or termination inventory	I.89 FAR 52.245-1 Government Property (APR 2012) ALT I. (APR 2012)	A
I-20	Release of Information	I.102 DEAR 952.204-75	A
I-21	Cyber Security Program Plan	I.103 DEAR 952.204-77 Computer Security (AUG 2006) ;	T,Y
I-22	Management and Program Implementation Plan	I.106 DEAR 952.223-72 (APR 1984)	A
I-22	Workplace Substance Abuse Program	I.116 DEAR 970.5223-4, Workplace Substance Abuse Programs at DOE Sites (DEC 2010);	T
I-23	Computer Security Incident Reports	DOE O 205.1B	A

Frequency Code	Description
A	As Required
T	During Contract Transition
C	Change to Contractual Agreement
M	Monthly
Q	Quarterly

S	Semi Annually
Y	Yearly or Upon Renewal of Contract
W	Within a Specified Period Following Notice to Proceed

ATTACHMENT J.3 - HANFORD SITE SERVICES AND INTERFACE REQUIREMENTS MATRIX

Services listed in the *Hanford Site Services and Interface Requirements Matrix (*Matrix) shall be performed in accordance with the Section H Clause entitled, *Hanford Site Services and Interface Requirements Matrix*.

All services are provided during the Hanford alternate work schedule (AWS) defined as 7:00 a.m. to 4:30 p.m. Monday through Thursday and 7:00 a.m. to 3:30 p.m. on standard Site Fridays unless otherwise noted. Hanford Site contractors can request work outside of this schedule by providing a statement of work and requesting that scope as a usage-based service.

Note: The terms ASTC and LAT&S refer to the Laboratory Analysis and Testing Services contractor.

Legend for Matrix – The Legend for the primary Matrix users/providers is as follows:

MSC	Mission Support Contract(or)
PRC	Plateau Remediation Contract(or)
TOC	Tank Operations Contract(or)
WTP	Waste Treatment and Immobilization Plant (Contractor)
RCCC	River Corridor Closure Contract(or)
Other Site Users	Examples include: Occupational Health Services Contractor (OHSC), Analytical Services and Testing Contractor (ASTC), Energy Savings Performance Contractor (ESPC), Pacific Northwest National Laboratory (PNNL) [activities located on the Hanford Site], Laundry Services Contractor, DOE, etc.

Types of Interfaces –

1. Information (I): knowledge (data, facts, etc) gathered or supplied
2. Physical (P): systems in tangible contact (i.e., ‘pipe-to-pipe’), or a physical exchange of product or materials
3. Service (S): provision of work for another Contractor

MSC SERVICES AND INTERFACE ACTIVITIES

MSC General Requirements

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
1	**Infrastructure and Services Alignment Plan (ISAP), and the Annual Forecast of Services and Infrastructure** (including the *Hanford Site Services and Interface Requirements Matrix)*	Information	Direct-Funded	Interface	Receive input from site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC

Scope/Cost Allocation

Service Description

ISAP is the strategic plan for right-sizing the infrastructure to support the future Hanford Site mission and the *Annual Forecast of Services and Infrastructure* is a projection of needed utilities, services, and infrastructure from other Hanford Site contractors.

- MSC shall develop, maintain and update an ISAP and the *Annual Forecast of Services and Infrastructure,* which includes the costs for services. Proposed changes in service providers shall include a justification, and a plan forward.
- MSC shall solicit input from Hanford Site contractors/users for the ISAP and the *Annual Forecast of Services and Infrastructure*, including projection of need for services and proposed performance metrics/controlling agreements for the service provider.
- DOE will evaluate contractor/user input prior to approval. The plan will be approved by DOE.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
2	**Hanford Site Interface Management Plan**	Information	Direct-Funded	Interface	Receive input from site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC

Scope/Cost Allocation

Service Description

Hanford Site Interface Management Plan is the controlling agreements that ensure effective control of technical, administrative, and regulatory interfaces.

- MSC shall develop and maintain the *Hanford Site Interface Management Plan.*
- MSC shall collaborate with the Hanford Site contractors/users on the *Hanford Site Interface Management Plan*.
- PRC, TOC, and MSC shall sign the *Hanford Site Interface Management Plan*.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Safety, Security and Environment										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
3	**Protective Forces**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Protective Forces provides security for facilities possessing critical Safeguards and Security interests (e.g., special nuclear material). Coverage is provided 24/7 via the Hanford Patrol.

- MSC shall provide Protective Force operations.
- Hanford Patrol shall provide random and special searches as required.
- Hanford Patrol shall provide Protective Force services for WTP facilities when turned over to TOC.

Usage-Based Services

N/A

Direct-Funded Services

Funded through MSC; provided at no cost to Hanford Site contractors. Hanford Site contractors shall provide facility, operational, and system configuration changes that may affect Protective Force operations.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
4	**Physical Security (PSS) Systems (Nuclear Material, Special Nuclear Material, and Classified Matter)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Physical Security under this activity is for accountable quantities of nuclear and classified materials, including performance testing, intrusion detection, entry/access control, explosive detection, locksmith services, and engineering and maintenance of the physical security and access control systems.

- MSC shall provide Security Representatives for facilities or groups of facilities where there are important safeguards and security (SAS) assets.
- MSC shall develop, or assist in the development of facility asset protection requirements and conduct annual reviews of Asset Protection Agreements.
- MSC shall design security system upgrades for existing facilities with changing requirements and design security systems for new facilities.
- MSC shall provide locksmith support for installation, replacement, and maintenance of locks, keys, and access control systems for the protections of Government property and nuclear materials, including special nuclear materials, classified matter, new facilities and WTP turnover facilities to TOC, etc.
- Hanford Site contractors shall provide the MSC information about SAS arrangements and/or changes prior to new operations commencing, or changing operations or configurations that might alter the performance of existing SAS systems; support the MSC in the development of or update of facility *Asset Protection Agreements*, and requesting locksmith services.

Usage-Based Services

N/A

Direct-Funded Services

Funded through the MSC; provided at no cost to Hanford Site contractors with the exception of physical security upgrades within the facility - these may be shared costs between the MSC and the Hanford Site contractor that has responsibility for the facility.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
5	**Physical Security Systems (Government Property)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC. N/A PNNL

Scope/Cost Allocation

Service Description

Physical security under this activity is for Government property other than nuclear material, special nuclear material, and classified. Physical Security such as fences, locks, etc. through *Asset Protection Agreements*.

- MSC shall develop, or assist in the development of facility asset protection requirements and conduct annual reviews of *Asset Protection Agreements*.
- Hanford Site contractors shall support the MSC in the development of or update of facility *Asset Protection Agreements* and implement those agreements.
- MSC shall provide Technical and Engineering Security services as required for the design and/or turnover of new facilities.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration; Hanford Site contractors bear costs of physical security upgrades. If used by PNNL off Hanford Site, they pay full-cost.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
6	**Information Security - (Operations Security (OPSEC)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC (only DOE)

Scope/Cost Allocation

Service Description

The OPSEC Program helps ensure that sensitive information is protected from compromise and secured from unauthorized disclosure, and provides management with necessary information required for sound risk management decisions concerning the protection of sensitive information.

- MSC shall implement a Hanford Site-wide program; assure conformity of implementation with OPSEC standards and requirements; conduct assessment(s) of all Hanford Site facilities having Category I special nuclear material (SNM) (or credible roll-up to Category I SNM); conduct reviews of all Hanford Site facilities that have the potential to process or store classified or sensitive information; and conduct the *Annual Site OPSEC Threat Assessment* and prepare the annual *OPSEC Plan*.
- Hanford Site contractors shall implement their internal OPSEC responsibilities, participate and support Hanford Site-wide OPSEC Working and Awareness groups; provide support to the MSC OPSEC assessments; and support the *Annual Site OPSEC Threat Assessment* and preparation of the annual *OPSEC Plan*.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
7	**Information Security - Classified Matter Protection and Control (CMPC); Classification, Declassification and UCNI Program**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	N/A

Scope/Cost Allocation

Service Description

The CMPC Program establishes control and accountability requirements for classified matter, marking of classified matter, reproduction, receipt and transmission, and destruction; and, physical protection requirements for classified matter in storage.

- MSC shall provide a centralized CMPC, Classification, Declassification and Unclassified Controlled Nuclear Information (UCNI) Program that includes operation and management of the Classified Document Control Center and management of classified information in the records holding area.
- MSC shall provide trained and authorized personnel to conduct inquiries for incidents of security concern, maintain the reporting database, and assist the contractor in report writing as required.
- Hanford Site contractors shall be responsible for maintaining an updated list of security containers, locations and custodians; support investigation of any incidents of potential or actual compromise of classified; and nominate a sufficient number of Derivative Classifiers and Reviewing Officials who shall be trained and approved by the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the burden of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
8	**Information Security - Official Use Only (OUO)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	N/A

Scope/Cost Allocation

Service Description

The OUO Program establishes controls to protect sensitive unclassified information as OUO.

- MSC shall manage, integrate, and oversee implementation of a common Hanford Site-wide OUO program to ensure conformity of implementation by performing Hanford Site contractors and coordination of OUO education and awareness.
- Hanford Site contractors shall manage and implement an OUO information program consistent with the common Hanford Site-wide OUO information program.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost of Program administration; Hanford Site contractors /users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
9	**Personnel Security – Badging**	Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC. N/A for PNNL

Scope/Cost Allocation

Service Description

A DOE security badge is utilized for all DOE and contractor personnel to gain access to DOE-owned or -leased facilities or areas where DOE-sponsored work is ongoing.

- MSC shall provide badging service for the Hanford Site, which includes manufacture, issuance, destruction, control, and accountability for DOE Standard, Hanford Specific, Temporary, and Personal Identify Verification badges.
- MSC shall coordinate and initiate "STOP ACCESS" procedures, and control and issue private vehicle passes for Property Protection Areas.
- Hanford Site contractors shall obtain badging service from MSC; participate in "STOP ACCESS" program; and obtain vehicle passes from MSC.

Usage-Based Services

N/A

Direct-Funded Services

Funded through MSC; provided at no cost to Hanford Site contractors. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
10	**Personnel Security – Access Authorization (Security Clearance) Processing Program**	Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC, N/A for PNNL

Scope/Cost Allocation

Service Description

The Access Authorizations (Security Clearances) Program involves processing, granting, and allowing individuals to retain an access authorization when their official duties require access to classified information or matter, or special nuclear material (SNM).

- MSC shall process all security clearances in support of Hanford Site contractors. These activities include requesting, obtaining, maintaining, downgrading and terminating security clearances, including "Special Access" privileges (e.g., SIGMA). The clearance processing program shall include reviews of each requested clearance action to ensure adequate justification exists and that reporting requirements are met.
- Hanford Site contractors shall request and obtain personnel security clearances, including “Special Access” from the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
11	**Personnel Security – Human Reliability Program (HRP)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	N/A	N/A	N/A	N/A

Scope/Cost Allocation

Service Description

The Human Reliability Program (HRP) on the Hanford Site is designed to ensure that individuals who occupy positions affording access to special nuclear material and classified materials programs meet the highest standards of reliability and physical and mental suitability.

- MSC shall coordinate and track all Hanford Site drug and alcohol testing; MSC shall notify the PRC of drug and alcohol testing results.
- MSC shall administer the HRP program, including initial and refresher training.
- PRC shall identify HRP positions, submit requests to MSC for enrollment in the Hanford Site HRP, and execute their portion of the HRP consistent with the Hanford Site HRP, as administered by the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
12	**Personnel Security – Workplace Substance Abuse Programs (WSAP)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC, N/A for PNNL

Scope/Cost Allocation

Service Description

The WSAP is responsible for maintaining a workplace free from the use of illegal drugs, and is applicable to DOE contractors and their sub-contractors in testing-designated positions performing work at Sites owned or controlled by DOE under the authority of the Atomic Energy Act of 1954.

- MSC shall administer the WSAP and maintain the procedures for testing and databases.
- MSC shall notify the respective Hanford Site contractor of drug and alcohol testing results.

Hanford Site contractors shall identify individuals in testing-designated positions and execute the program per the MSC procedure.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
13	**Personnel Security – Foreign National Visits and Assignments (FNVA)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC (N/A PNNL)

Scope/Cost Allocation

Service Description

FNVA pertains to unclassified (and potentially classified) foreign national access to the DOE Hanford Site for information and technologies.

- MSC shall process security plans for foreign visitors to Hanford Security areas, coordinate all FNVA requests, and submit to the appropriate contractor FNVA authority for approval.
- Hanford Site contractors shall notify the MSC of potential foreign visitor or assignment, and prepare and submit security plans to MSC for processing of the visit/assignment.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of Program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
14	**Cyber Security – (Classified and Unclassified Cyber Security)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	N/A

Scope/Cost Allocation

Service Description

Classified/Unclassified Cyber Security Program identifies and protects classified, unclassified and sensitive information generated, processed and stored for the Hanford Site.

- MSC shall provide a Hanford Site Classified Information Systems Security Officer; develop a Hanford Master Classified Information Systems Security Plan; ensure that all classified systems are certified and accredited; and implement the classified cyber security training program.
- MSC shall implement a centralized Hanford unclassified computer security program.
- Hanford Site contractors shall manage and execute classified and unclassified cyber security responsibilities consistent with DOE requirements and the MSC centralized program.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
15	**Nuclear Material Controls and Accountability (MC&A)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	N/A

Scope/Cost Allocation

Service Description

The MC&A Program provides control and accountability of nuclear materials within DOE.

- MSC shall manage and conduct a centralized MC&A program for all accountable quantities of nuclear material on the Hanford Site, and approve all implementing procedures of Hanford Site contractors.
- Hanford Site contractors shall support MSC in preparation and maintenance of a *Hanford Site-wide MC&A Plan*, administration of treaty related activities, performance of occurrence investigation and reporting, and scheduling of periodic inventories.
- Hanford Site contractors shall implement MC&A requirements per the *Hanford Site-wide MC&A Plan*. Hanford Site contractors are required to implement facility specific requirements.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the burden of Program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
16	**SAS Program Management – Safeguards and Security (SAS) Awareness**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC. N/A for PNNL.

Scope/Cost Allocation

Service Description

SAS Awareness Program is used to inform Hanford Federal and contractor employees, subcontractors, and visitors of their SAS responsibilities and to promote continuing awareness of good security practices.

- MSC shall provide SAS Awareness training for all Hanford Federal and contractor employees, subcontractors, and visitors; and conduct security training for all permanently badged employees on an initial and annual frequency to maintain appropriate levels of awareness.
- Hanford Site contractors shall comply with the requirements of the Hanford Security Awareness program, as administered by the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost of Program administration; Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
17	**SAS Program Management**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	Receive service from and provide input to MSC. N/A for PNNL.

Scope/Cost Allocation

Service Description

SAS Program Management provides formal organized process for planning, performing, assessing, and improving the secure conduct of work in accordance with risk-based protection strategies.

- MSC shall establish, manage, integrate and execute the processes and services that comprise the SAS Program Management, such as Program Planning, Oversight, and Administration; Security Conditions (SECON); Site Safeguard and Security Plan (SSSP); Vulnerability Assessments; Design Basis Threat; and safeguards and security training.
- Hanford Site contractors shall coordinate and interface with MSC on SAS Program Management regarding SAS technical, cost, and schedule performance; comply with SECON activities; support the Site Safeguards and Security Plan (SSSP) development, etc.
- Hanford Site contractors shall manage their internal SAS Program Management activities.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost of Program administration Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
18	**Site Training Services and HAMMER**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory for standardized training All other services under this activity are Optional	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Optional	Optional	Receive service from and provide input to MSC (Optional for PNNL)

Scope/Cost Allocation

Service Description

Site Training Services provides training facility, curriculum, and training delivery services to Federal, contractor, and subcontractor employees in support of the Hanford and PNNL missions consistent with the DOE, local, state, and Federal workforce training requirements.

- MSC shall provide Hanford Site workers (and PNNL, as requested) mandatory standardized training as listed below and optional training as requested to support maintaining a qualified workforce, develop the Annual Training Needs Forecast and Plan, and operate the HAMMER facility.
- MSC shall maintain the employee training records for training provided by MSC.
- MSC shall perform mask fit services for Hanford Site contractors.
- Hanford Site contractors shall provide training priorities, training needs, and input regarding standardized training programs.

Mandatory Standardized Training

1. Hazardous Waste Operations and Emergency Response (HAZWOPER) Training
2. Lockout/tagout of hazardous energy
3. Permit required confined space entry
4. Chronic Beryllium Disease Prevention Program (CBDPP.
5. Respiratory protection program
6. Hoisting and rigging
7. Fall protection
8. Electrical safety
9. Radiation Safety (e.g., Radiological Worker I and II and Radiological Control Technician training).
10. Criticality Safety
11. Hanford General Employee Training

Usage-Based Services

Site training services, including maintenance of employee training records for training provided by MSC and mask-fit services are usage-based services reimbursed by the user.

Direct-Funded Services

HAMMER base operations for the facility are at no cost to Hanford Site contractors for DOE-EM funded Work Scope.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
19	**Fire & Emergency Response Services (Fire Prevention, Fire Suppression, Fire Investigations; Emergency Rescue; Emergency Medical Service and Patient Transport; Incident Command; and Hazardous Material and Chemical/ Biological/Radiological Emergency Response)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC (includes Energy Northwest.) May include Non-Hanford Site areas designated by DOE

Scope/Cost Allocation

Service Description

Fire and Emergency Response Services provide fire prevention, fire suppression, fire investigations; emergency rescue; emergency medical service and patient transport; incident command; and hazardous material and chemical/biological/radiological emergency response for the Hanford Site and those non-Hanford Site areas designated by DOE.

- MSC shall provide 24/7 fire-related protection of human life, property, and facilities; and operates basic and advanced life support emergency medical services.
- MSC shall act as the Site Incident Command Agency for all fires and hazardous/radiological materials emergencies on the Hanford Site.
- Hanford Site contractors shall support facility access to the MSC fire services personnel, and notify the Fire Department of work activities, events, incidents, etc., that may require Fire Services involvement and/or response (e.g., medical assistance, hazardous or radiological emergency help, etc.).
- The MSC will provide support for HFD participation in drills and exercises.

Usage-Based Services

N/A

Direct-Funded Services

- Funded through the MSC; provided at no cost to Hanford Site Contractors.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other ~~Site Users~~ Contracts
20	**Fire & Emergency Response Services (Fire Protection System Inspection, Testing, and Maintenance)**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC (RFAR only)	Receive service from and provide input to MSC	Receive service from and provide input to MSC. The only service applicable to PNNL is Fire Protection Systems Testing in DOE owned facilities on the Hanford Site.

Scope/Cost Allocation

Service Description

Fire and Emergency Response Services also includes fire protection system inspection, testing, and maintenance of existing and new fire systems for the Hanford Site, including backflow prevention devices.

- MSC shall provide a Fire Marshal with authority for fire protection system inspection, testing, and maintenance; respiratory protection services; building inspections; ignitable and reactive waste site inspections; pre-fire planning; etc.
- Hanford Site contractors shall be required to use certain mandatory Fire Services from the MSC contractor in performance of this work scope (e.g., fire systems inspection, testing, etc.) consistent with the MSC.

Usage-Based Services

Hanford Site contractors are required to provide their own hardware projects.

Direct-Funded Services

MSC is direct-funded to maintain fire alarm systems for each Hanford Site contractor.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
21	**Emergency Operations (Centralized Hanford Site Emergency Preparedness**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site	Receive service from and provide	Receive service from and provide	Receive service from and provide	Receive service from and provide	Receive service from and provide

	Program)				contractors	input to MSC	input to MSC	input to MSC	input to MSC	input to MSC

Scope/Cost Allocation

Service Description

Emergency Operations consists of the Hanford Site-wide Emergency Preparedness (EP) Program, which includes operation of the Emergency Operations Center (EOC), Joint Information Center (JIC), requirements for hazards surveys and hazards assessments, training of EOC staff, Hanford Site-wide exercises, and facility-specific plans and procedures for EP development, training, drills and assessments.
MSC shall:

- Coordinate, integrate, and maintain a centralized Hanford Site EP Program.
- Provide instruction in accordance with DOE/RL-94-02, *Hanford Emergency Management Plan* to all Hanford Site contractors and their subcontractors.
- Conduct or support emergency management surveillances and assessments and work with the Hanford Site contractors for corrective action implementation.
- Establish procedures and provide direction and coordination for the Hanford Site Occurrence Reporting Program.

Usage-Based Services

N/A
Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs. MSC shall provide support for the Unified Dose Assessment Center (UDAC). Hanford Site contractors shall develop, maintain, and execute an Emergency Management Program as described in DOE/RL-94-02, *Hanford Emergency Management Plan* for facilities and waste sites under their control.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
22	**Emergency Operations (Event Reporting; and Emergency Operations Center Shift Center)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Event Reporting is provided to ensure that DOE is kept fully informed about events that could adversely affect the health and safety of the public or the workers, the environment, the intended purpose of the facilities, or the credibility of the DOE.

- MSC shall operate the Hanford Site-wide Emergency Operations Center (EOC) Shift Office.
- Hanford Site contractors shall report their environmental, safety, and health events and related information directly to DOE and to the EOC Shift Office.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
23	**Site Safety Standards (Common Safety Processes)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Receive service from and provide input to MSC	N/A

Scope/Cost Allocation

Service Description

Site Safety Standards are to be used by Hanford Site contractors to ensure common processes for worker safety.

- MSC shall obtain affected Hanford Site contractor approval and establish common safety processes on the Hanford Site as listed below.
- MSC shall maintain a site-wide web-based system with input from other Hanford contractors for sharing operating experiences and lessons learned with a focus on preventing recurrence of safety or reliability events, and to share good work practices in accordance with DOE O 210.2.
- MSC, PRC, and TOC shall work collaboratively and build coalitions with Hanford Site contractors and workers to continue to build a strong and enduring safety culture. Based on input from Hanford Site contractors and workers, the MSC with the PRC and TOC shall identify DOE opportunities to enhance and measure the Hanford safety culture.
- MSC shall manage and administer Hanford Site safety activities/initiatives, such as, Annual Safety Exposition, Hanford Worker Electrical Safety Board, etc., as approved by DOE.
- Affected Hanford Site contractors shall approve common safety standards and develop internal implementing procedures, and participate in Hanford Site safety activities/initiatives, where appropriate, as administered by MSC.
    1. **Common Safety Processes.**Lockout/tagout of hazardous energy
    2. Permit required confined space entry.
    3. Chronic Beryllium Disease Prevention Program (CBDPP).
    4. Respiratory protection program.
    5. Hoisting and rigging
    6. Fall protection.
    7. Electrical safety.
    8. Industrial hygiene exposure records including the generation, common database, and storage.
    9. Employee job task analysis (EJTA) as being implemented on the Hanford site at the present time.
    10. Excavation permits with emphasis on the existing Hanford site system for obtaining excavation permits.
    11. Hazardous Chemical Reporting: Community Right-to-Know with the MSC responsible for obtaining data from other Hanford site contractors, compiling and submitting the required data.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
24	**Radiological Assistance (RAP)**	Information / Service	Direct-Funded	Mandatory	**Provide service**	Provide staff to MSC	Provide staff to MSC	N/A	N/A	N/A

Scope/Cost Allocation

Service Description

RAP provides first-responder radiological response capabilities 24/7 for the Hanford Site and Region 8 (states of Alaska, Oregon, and Washington).

- MSC shall maintain and implement a first-responder radiological assistance that includes plans, procedures, resources and 24/7 response capabilities for Region 8 in support of the DOE Regional Response Coordinator and provide equipment.
- PRC and TOC shall provide qualified personnel, technical expertise, and support to the DOE Region 8 RAP to ensure maintenance and staffing of emergency teams with the ability to respond under the direction of DOE National Nuclear Security Administration (NNSA) and the U.S. Department of Homeland Security.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration to include travel, equipment, and RAP specific training. PRC and TOC provide personnel and bear personnel costs associated with RAP participation. PNNL also provides personnel to RAP, but is funded through MSC.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
25	**Environmental Regulatory Management (Site-wide permits, permit applications, and reports; Site-wide NEPA documents; Site-wide environmental reports; Site-wide (environmental) Quality Assurance standards; allocation of permit limits)**	Information / Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Environmental Regulatory Management ensures a Site-wide environmental program which is compliant with applicable laws, regulations, DOE directives and the Section H Clause entitled, *Environmental Responsibility*.
MSC shall establish and provide site-wide management, administration, integration, permitting and compliance in coordination with other Hanford Site contractors. The MSC shall obtain concurrence from affected Hanford Site contractors for Site-wide environmental documents. MSC performs all near-field monitoring activities for the Hanford Site, including near-field monitoring required by a facility specific permit.
Hanford Site contractors shall:

- Provide input for the Site-wide Environmental Management System (EMS) Program Management Plan.
- Integrate their environmental permitting and regulatory compliance activities with the Hanford site-wide permitting and compliance framework maintained by the MSC.
- Provide appropriate and timely input to the MSC and other designated Hanford Site contractors for regulatory required Site-wide environmental reports and metrics for their facilities and activities.
- Support MSC in their Site-wide environmental regulatory management roles.
- Provide legally and regulatory required air and liquid effluent and near facility environmental monitoring; collect, compile, and/or integrate air and liquid effluent monitoring data from operations and activities under their control.
- Provide appropriate environmental data for its facility and operable units to support Hanford Site assessments and preparation of the annual Hanford Site Environmental Report. Obtain unit specific permit modifications in coordination with the MSC.
- Inform MSC if any near-field monitor(s) are required as part of contractor's facility monitoring.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
26	**Seismic Monitoring Services**	Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Seismic Monitoring Services are required to operate the Hanford Site seismic network and provide report activities as needed. This information is utilized for operational facilities, to support new facility design and for emergency operations activities.

- MSC shall maintain seismic sensors and systems, monitor seismic activity and report seismic activities on the Hanford Site.
- MSC shall provide seismic information to Hanford Site contractors upon request.
- Hanford Site contractors shall request and provide requirements for services when necessary.

Usage-Based Services

N/A

Direct-Funded Service

- Service scope as defined above.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
27	**Hanford Environmental Oversight (HEO)**	Information	Direct-Funded	Interface	**Provide service** to site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC

Scope/Cost Allocation

Service Description

HEO provides program management, coordination and integration of Public Safety and Resource Protection (PSRP) functions. HEO also provides technical and administrative support to DOE associated with the PSRP program including Natural Resource Trustee activities.

- MSC shall provide annual updates of the *Hanford Site National Environmental Policy Act (NEPA) Characterization Report*.
- Hanford Site contractors shall provide to MSC appropriate environmental data for its facility and operable units to support Hanford Site assessments and preparation of the *Hanford Site NEPA Characterization Report*.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
28	**Meteorological and Climatological Services**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

The Hanford Meteorological Monitoring System includes 30 monitoring stations on the Hanford Site and provides accurate and timely weather information that enable safe conduct of activities and emergency response.

- MSC shall provide all standard, weather-related information for Hanford Site contractors, providing detailed around-the-clock, easily retrieved and understood, real time meteorological data. This includes forecasts, heat indices, historical information, etc.
- MSC shall maintain and operate the Hanford Meteorological Monitoring system. MSC may be requested to provide special-use information by Site contractors.

Usage-Based Services

Special-use information requested by Site contractors

Direct-Funded Services

MSC bears the cost burden of program administration, Hanford Site contractors shall request and provide requirements for service.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
29	**Environmental Surveillance**	Information / Service	Combination of Usage-Based and Direct-Funded	Interface	Receive input from and provide information to site contractors	Receive information from and provide input to MSC	Receive information from and provide input to MSC	Receive information from and provide input to MSC	Receive information from and provide input to MSC	Receive information from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Environmental Surveillance consists of far-field multimedia environmental monitoring to measure the concentration of radionuclides and chemicals in environmental media and assess the integrated effects of these materials on the environment and the public.

- MSC shall assess impacts and risks of contaminants on human health in order to prepare the annual *Hanford Site Environmental Report* and the *Hanford Site Environmental Surveillance Master Sampling Schedule*; and align the surface environmental surveillance with the needs of the environmental clean-up, restoration, and assessment activities at the Hanford Site.
- MSC shall assess impacts and risks of Hanford contaminants on human health and the environment in support of Hanford cleanup activities as requested. Data and analysis shall be made available to the Hanford risk assessment activities.
- Hanford Site contractors shall provide appropriate input to support MSC preparation of the annual Hanford Site Environmental Report and Hanford Site Environmental Surveillance Master Sampling Schedule.

Usage-Based Services

Hanford Site contractors bear request for services costs.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors /users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
30	**Ecological Monitoring and Compliance – Site Wide**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Ecological Monitoring and Compliance is to achieve compliance with ecological resource-related legal and regulatory requirements; Biota is monitored to access the abundance, vigor, or condition, and distribution on the Hanford Site.

MSC shall:

- Assess the impacts to biological resources from Hanford Site operations and legacy contaminants to the environment and monitor the abundance, vigor, and distribution of plant and animal populations on the Hanford Site. This includes baseline surveys of protected biological resources, species, and habitats within key areas of the Hanford Site where the majority of routine operations and clean-up are conducted.
- Conduct ecological compliance reviews for Hanford Site contractors.
- Ecological reviews that are required to be conducted outside the Hanford alternate work schedule will not charge overtime to OHC projects.

Hanford Site contractors shall:

- Allow access to the Ecological Monitoring and Compliance activity for the purpose of collecting information and samples.
- Provide ecological information to the MSC from their sampling activities such as CERCLA/RCRA risk assessments.

Usage-Based Services

Ecological reviews are a usage-based service.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/ users bear internal implementation costs
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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
31	**Cultural and Historic Resource Program**	Information / Service	Combination of Direct-Funded and Usage-Based	Service - Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Provide input to MSC	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

The Cultural and Historic Resource Program administers the program for protecting Hanford Site cultural and historic resources, and documents and addresses any real or potential Site-wide issues and their impacts; and assures compliance with associated laws, DOE directives, and legally-binding agreements.

- MSC shall monitor and support the resource protection activities of Hanford Site contractors; coordinate surveys performed to document the occurrence of protected resources; evaluate and document impacts to protected resources; perform NHPA Section 106 Reviews for Hanford Site contractors; maintain, establish procedures for and manage Hanford Site cultural and historic resource site files (hard copy and electronic) and associated compliance project files for all such work that occurs at the Hanford Site; and curate files and artifacts in accordance with 36 CFR 79.
- Hanford Site contractors shall provide information to the MSC necessary to perform NHPA Section 106 Reviews for their scope of work, and provide to MSC information and materials to support MSC execution of the *Comprehensive Land Use Plan's* (CLUP) *Cultural & Historic Resource Program Plan*. In particular, mission contractors (who meet 36 CFR 61 standards and guidelines) shall utilize the MSC project records and files for background research.

Usage-Based Services

Cultural reviews are a usage-based service. Hanford Site contractors bear request for services costs.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors/users bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
32	**Radiological Site Services (RSS)**	Information / Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC

Scope/Cost Allocation

Service Description

Radiological Site Services (RSS) is a documented set of comprehensive and integrated radiological support programs which provide the technical support, dosimetry, data, and records necessary to demonstrate compliance with required radiological monitoring and to verify the adequacy of Site radiological control programs in protecting the health and safety of workers, the public, and the environment. The RSS includes the Hanford External Dosimetry Program (HEDP), the Hanford Internal Dosimetry Program (HIDP), the Hanford Radiological Instrumentation Program (HRIP), and the Hanford Radiological Records Program (HRRP).

MSC shall provide:

- DOELAP accredited external dosimetry services, including technical support, documentation, and dosimeter preparation and processing, based on the types and quantities of external dosimetry required by all key customers.
- DOELAP accredited internal dosimetry services, including technical support, documentation, and analyses, based on the types and quantities of internal dosimetry required by all key customers
- Calibration, maintenance, and repair services as defined in ANSI 323-1978 for a broad range of portable and semi-portable radiological instrumentation, including technical support and documentation, based on the types and quantities of portable and semi-portable radiological instrumentation calibration, maintenance, and repair services required by all key customers.
- Services to maintain, manage, and procure parts or replacements for the existing Hanford Site pool of radiological instruments, including developing processes for necessary replacement, as required by all key customers.
- Performance testing as defined in ANSI 323A-1997, or other standards as requested, to verify instruments continue to meet operational requirements.
- Management and preservation of current and former radiation monitoring records for DOE (and predecessor agencies) employees, Hanford contractors, sub-contractors, and visitors, including records of existing and past Hanford Site radiation dosimetry policies and practices.

On an as-requested basis, MSC will provide dosimetry and bio-assay scheduling, dosimeter distribution, and other services commonly associated with “Dosimetry Operations.” These services will be fully defined in the SOW and agreed upon by the requesting party and MSC.

Hanford Site contractors shall request, and provide requirements for, service.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A Return to top

Site Infrastructure and Utilities										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
33	**Analytical Services (Chemical and Low-Level Radiological Analysis)**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Optional	Optional	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Analytical Services performs chemical and low-level radiological analysis on a variety of sample media. These services are performed at the Hanford Waste Sampling and Characterization Facility (WSCF).

- MSC shall operate the WSCF.
- Hanford Site contractors shall request analytical services as needed

Usage-Based Services

- Sample analysis is a usage-based service reimbursed by the user

Direct-Funded Services

- WSCF Laboratory fixed costs for maintaining the facility in a ready-to-serve capacity are at no cost to Hanford Site contractors.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
34	**Biological Controls**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Biological Controls is a service to control noxious weeds, industrial weeds, other vegetation, and animal pests. The program controls vegetation on approximately 2,000 acres, traps and removes animals, and eliminates insect infestations.

- MSC shall provide a Hanford Site-wide biological control program.
- Hanford Site contractors shall request support as needed.

Usage-Based Services

Hanford Site contractors may request additional services beyond direct funded basic service as a usage-based service

Direct-Funded Services

Basic service funded through MSC; provided at no cost to Hanford Site contractors.
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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
35	**Crane and Rigging**	Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Optional	Receive service from and provide input to MSC as applicable (Optional for PNNL)

Scope/Cost Allocation

Service Description

The Crane and Rigging is a centralized pool of equipment and manpower for the Hanford Site. The MSC shall:

- Provide a mobile crane pool, a regulated and non-regulated guzzler; coordinate rental and movement of cranes, preventative maintenance inspections and scheduling of necessary repairs; assemble, erect, and dissemble scaffolding and supervises crane crews.
- Manage, and schedule operations involving movable cranes and Crane and Rigging services.
- Maintain and operate cranes, rigging equipment and cable fabrication equipment.
- Chair the Site Hoisting and Rigging Committee.
- Maintain the Hanford Site Hoisting and Rigging Manual (HSHRM) and Hanford Site Hoisting and Rigging intranet web site
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
36	**Facility Services**	Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive (limited) service from and provide input to MSC	N/A	N/A	Receive service from and provide input to MSC as applicable (N/A for PNNL)

Scope/Cost Allocation

Service Description

Facility Services is a central maintenance function for non-radiological facilities.

- MSC shall provide management and administrative oversight for all requested facility activities, including planning and directing the work. MSC shall provide for the following facility services in support of the Hanford Site projects and contractors: facility painting, sign painting, carpentry, refrigerated equipment service, insulation, pipefitting, electrical, sheet metal, instrumentation, cement finishing, glazier work, custodial, locksmith, movers, equipment calibration, and HVAC maintenance and repair.
- PRC and other Site users shall request and provide requirements for service.
- TOC shall only receive Refrigerated Equipment Service, floor service, and Movers Service from and provide input to MSC.

Usage-Based Services
Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
37	**Motor Carrier Services**	Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Optional	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Motor Carrier Services provides a centralized pool of vehicles and drivers for the on-site or local transportation of freight including hazardous material at the Hanford Site, including radioactive materials and radioactive/mixed waste.

- MSC shall:
  - Manage, schedule, and conduct motor carrier services.
  - Maintain and operate a centralized pool of vehicles and drivers for the on-site and limited local transportation of freight including hazardous and radioactive materials at the Hanford Site.
  - Act as the Hanford Site motor carrier similar to a commercial motor carrier.
  - Provide compressed gas shipments.
  - Pick up at local vendors as directed by their customers.
  - The Hanford Site contractor will prepare freight for shipment (packaging the freight) and provided associated documentation or direct a pick up of freight from a particular Site contractor or vendor.
  - The preferred method for shipment of freight to other DOE site or to commercial vendor(s) is using a commercial motor carrier.
  - Upon mutual agreement, the Contractor may provide a limited number of specialized vehicles to Other Hanford Site Contractors to support the efficient management of resources. Any vehicles provided by the MSC will remain in the MSC Fleet Maintenance Programs.

- Hanford Site contractors who are customers of this service prepare the waste for transport including shipper/receiver agreement documents, transportation documents for packaging, transportation and receipt by the receiving facility.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
38	**Fleet Services**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Optional	Receive service from and provide input to MSC as applicable

Scope/Cost Allocation

Service Description

Fleet Services administers and manages a fleet of motorized vehicles and equipment including, but not limited to sedans, pickups, vans, busses, ambulances, tractors, flatbeds, dump trucks, tool vans, utility maintenance vans, cab and chassis, trailers, forklifts, cranes, generators, compressors, excavators, frontend loaders, dozers, wreckers, and fuel tankers.

- MSC shall provide management and coordination, statistical usage tracking, and reporting on GSA-leased vehicles and DOE-owned vehicles/equipment; perform vehicle and equipment repair and modification services as required (e.g., in the 200 Area); and perform record-keeping, vehicle assignment, ensuring vehicle utilization, and excess/disposal of fleet vehicles and parts. Some vehicles are designated as "regulated" due to contamination and are required to be serviced within radiologically-controlled areas.
- MSC shall provide and execute the DOE approval of equipment/vehicle procurements when necessary.
- Hanford Site contractors shall request and provide requirements for service and those using Fleet Services shall provide report input such as the *Transportation Management Scorecard*.

Usage-Based Services

Fleet facilities maintenance, operations support, consumables, fuel delivery, maintenance, parts, and labor for the DOE fleet.

- Vehicle maintenance services, including inventory of or access to parts normally used for routine maintenance.
- Routine preventive maintenance and inspections in accordance with manufacturer specifications, GSA schedules, and OSHA safety regulations
- Vehicle and equipment corrective maintenance, as required to maintain performance and air quality standards.
- Performance of GSA non-reimbursable services, such as in-the-field service calls (including towing).
- Major component repair and reconstruction of failed major operating and drive train components.
- Auto body, glass and upholstery repair services.
- Performance of customer-specified non-maintenance mechanical support, vehicle and equipment modifications, auxiliary equipment installation and transfer, accident damage repair, and special fabrication services.
- Purchase and distribution of bulk fuel to heavy equipment located in the field.

Direct-Funded Services

- Management of the process for the acquisition, control, assignment, and disposal of DOE fleet equipment and GSA vehicles and associated property, which includes general and special purpose equipment.
- Administration of the GSA lease.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
39	**Railroad Services**	Physical / Service	Usage-Based	Optional	**Coordinate service**	Request service from MSC	Request service from MSC	Request service from MSC	Request service from MSC	Request service from MSC

Scope/Cost Allocation

Service Description

The Hanford railroad system consists of approximately 40 miles of Class II track and one signal crossing between Horn Rapids Road and the 200W Area.

- MSC determines requirements for future use on the Hanford Site and coordinates with Hanford Site contractors, projects, and off-Site entities prior to and during any on-site rail movements, including placement of "flaggers" at necessary intersections, taking proper security actions, and making Hanford Site notifications.
- Upon DOE direction, MSC shall maintain and operate the rail system on the Hanford Site.
- Hanford Site contractors shall request and provide requirements for service to the MSC.

Usage-Based Services

Service scope as defined above

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
40	**Roads & Grounds**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC per ICD 12 - Roads	Receive service from and provide input to MSC	Receive service from and provide input to MSC (except PNNL off Hanford Site)

Scope/Cost Allocation

Service Description

Roads and Grounds consist of road maintenance, 24/7 snow removal, traffic management, and common grounds maintenance service for the Hanford Site.

Usage-Based Services

- Hanford Site contractors may request additional services for facility specific services, such as, snow removal on sidewalks.

Direct-Funded Services

- MSC shall maintain primary and secondary Hanford Site roadways, to include patching/paving, striping, and other services; perform maintenance of common grounds; and make recommendations to restrict access and make the appropriate notifications of restricted access or closure to DOE and other Hanford Site contractors in the event that roads are unsafe for travel. MSC shall remove snow at primary and secondary roads and at designated facilities, parking lots, and walkways (per the Hanford Snow Removal Plan).
- Maintain the common grounds to ensure public/worker safety and environmental integrity within the 200, 300, and 600 Areas. Activities in this area include perimeter fence/sign maintenance at the Site boundaries; lawn and landscape care; annual inspection and maintenance of gravel pits; general area cleanup; sweeping sidewalks; washing buildings; sweeping general purpose facility parking lots and repairing bumper blocks.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
41	**Electrical Transmission, Distribution, & Energy Management**	Physical / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service**	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC per ICD 11 - Electricity	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Electrical Transmission, Distribution, & Energy Management is the management function of the high voltage electrical utility consisting of a system for providing power to the facilities at the Hanford Site.

- MSC externally supplies electrical power to Hanford Site contractors.
- MSC shall coordinate with other Hanford Site contractors to obtain the following:
  - Energy cost and consumption data for the *Annual Energy Conservation Performance Report*.
  - Energy cost and consumption data for the quarterly Hanford Site energy cost and consumption date entry to EMS4 database.
  - Facility shut down constraints and impacts due to fuel reductions for the *Emergency Conservation Plan.*
  - Facility electrical load information for the annual electrical load forecast.
  - Other facility electrical or energy information, as needed.
- Hanford Site contractors shall provide input for EMS4 database, annual Energy Conservation Performance Report, Emergency Conservation Plan, and annual electrical load forecast.
- Hanford Site contractors may enter into a service-provider relationship with the MSC and/or other utility providers for the operation, maintenance, and/or closure of all or part of their internal utility systems.
- Hanford Site contractors shall protect Hanford Site systems against disruption and damage during performance of work and support Hanford Site utility operations, maintenance, and closure of a service where appropriate.

Notes:

- The interface point between the MSC electrical distribution system and the Hanford Site contractors' facilities electrical system is routinely the connection at the secondary side of the building service transformer (MSC also owns the electrical meters). However, there may be some facilities where the systems interface is located at a different connection point. The interface points are identified on the electrical utility switching system diagram drawings.
- The 300 Area electrical substation and electrical distribution system will be owned by the RCCC. The RCCC may request MSC to operate and maintain the 300 Area substation and distribution system on a work order basis. Upon completion of the RCCC, or as directed by DOE, the substation/distribution system may be reassigned to the MSC.

Usage-Based Services

Direct, mission-related upgrade projects are sub-contracted by MSC and paid by the requesting Hanford Site contractor.

Direct-Funded Services

Basic service funded through MSC; provided at no cost to Hanford Site contractors

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
42	**Water System**	Physical / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC per ICD 01 – Raw Water and ICD 02 – Potable Water	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

The Water System function is a water utility service (the geographic areas to be served are the 100, 600, and 200 Areas). The 300 Area and 100N Area water systems are within the scope of the RCCC, along with the 30-inch concrete line supplying the 100F and 100H Areas, and all distribution piping connecting to the concrete main water lines supplying the 100F, 100H, 100D, 100N, and 100B Areas.

- MSC shall manage the water system in accordance with agreements negotiated with the Hanford Site contractor being served and in accordance with guidance documents cited in state regulations for water systems; and maintain the existing *Water System Master Plan*. The Plan shall document a strategy for managing repairs, life extensions, replacements, and deactivations for facilities and equipment for the water systems within the scope of this contract over a ten year planning horizon.
- MSC shall provide a "purveyor" (per the Washington Administrative Code and other state regulations) for MSC water systems.
- MSC shall be responsible for all aspects of the water distribution system only up to and including the first off-valve or demarcation point outside the customer's facility or complex of facilities. The customer or facility maintains all responsibility for lines downstream of this agreed-upon point. On side-by-side multiple valve isolations and backflow assemblies, the facility assumes responsibility from the discharge side of the downstream isolation valve. For WTP, the demarcation point is the premise isolation backflow prevention at the fence line. For PFP, the demarcation point is the premise isolation backflow assembly.
- MSC shall perform, as requested, backflow preventer testing, water system contaminant monitoring management, and pipeline sanitization for other Hanford Site contractors (e.g., water systems outside of MSC):
- Hanford Site contractors shall input to the *Water System Master Plan* and negotiate agreements for water utility service.
- PRC shall identify priority water line upgrades which would prevent further ground water degradation; MSC shall perform priority water line upgrades to prevent further ground water degradation.
- Upon completion of the RCCC, or at the direction of DOE, the 300 Area water system may be reassigned to the MSC.

Note: The 100K Area and 400 Area Water Systems will be operated and maintained by the PRC.

Usage-Based Services

Direct, mission-related upgrade projects are paid for by the Site contractor requiring the upgrade. For water systems outside of the MSC, water system contaminant monitoring management is a usage-based service reimbursed by the user. Water permits for Hanford Site contractors' new facilities is a usage-based service.

Direct-Funded Services

Hanford Site-wide water upgrades and Basic Service are funded through MSC; provided at no cost to site contractors.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
43	**Sewer Systems**	Physical Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Optional	Receive service from and provide input to MSC	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

- Sewer system operations provide sewer pumper truck services and collection of sewage through piping for treatment and disposal in subsurface soil absorption systems. The geographic areas to be served are the 600 Area and 200 Area. The 100N Area sanitary sewer system, -100 B Area, C Area, D Area, F Area, H Area, and the 200 Area ERDF sanitary sewer holding tanks, and the 300 Area sanitary sewer system are within the scope of the RCCC. MSC shall operate the Hanford Site sanitary sewer systems, including compliance sampling; maintenance of support structures, systems, and components; and performance of sewer administration duties in accordance with the State of Washington sanitary sewer regulations.
- MSC shall update the existing *Sewer System Master Plan*. The Plan shall document a strategy for managing repairs, life extensions, replacements, and deactivations for facilities and equipment for the sewer systems within the scope of this contract over a ten year planning horizon and shall be updated every two (2) years.
- Hanford Site contractors shall provide input to the *Sewer System Master Plan*.
- Legacy facilities that are returned to service will be treated as a base, unless special circumstances require facility upgrades.

Notes:
- The 100N Area sanitary sewer system, 100 B Area, C Area, D Area, F Area, H Area, and the 200 Area ERDF sanitary sewer holding tanks, and the 300 Area sanitary sewer system are excluded from the scope of this Contract. These sewer systems are within the scope of the RCCC. Upon completion of the RCCC, or at the direction of DOE, utilities assigned to the RCCC, may be reassigned to the MSC.
- The 100K Area and 400 Area sanitary sewer systems will be operated and maintained by the PRC.

Usage-Based Services

Direct, mission-related upgrade projects are paid for by the Hanford Site contractor requiring the upgrade. Hanford Site contractors are responsible for facility-specific upgrades or new facilities sewer tie-ins under their control. Sewer permits for Hanford Site contractor new construction or project upgrades are a usage-based service.

Direct-Funded Services

Hanford Site-wide sewer upgrades and basic service are funded through MSC; provided at no cost to Hanford Site contractors.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
44	**Sanitary Waste Management and Disposal**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Optional	Receive service from and provide input to MSC	Receive service from and provide input to MSC (PNNL on Hanford Site)

Scope/Cost Allocation

Service Description

Sanitary Waste Management and Disposal function consists of waste collected from on-site dumpsters and transport to off-site landfills for disposal. MSC shall pick-up, inspect, and dispose of non-radioactive, non-hazardous dry waste.

- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Delivery and disposal of sanitary waste for roll off boxes is a usage-based service reimbursed by the user.

Direct-Funded Services

- Management and oversight of Hanford sanitary, inert, and demolition waste landfills that are currently in operation or closed.
- Delivery of and disposal of sanitary waste for dumpsters is provided at no cost to Hanford Site contractors

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Site Business Management										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
45	**Land-Use Planning and Management**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory (only for site selection and excavation permits)	**Provide service**	Request service from MSC and provide input	Request service from MSC and provide input	Request service from MSC and provide input per ICD 09 – Land for Siting	Request service from MSC and provide input	Receive service from and provide input to MSC, as applicable

Scope/Cost Allocation

Service Description

Land-Use Planning and Management consists of land-use planning (for the Hanford Site, in general and specific parcels) and management (including day-to-day implementation of the *Comprehensive Land Use Plan [CLUP]*).

- MSC shall perform management of real property at the Hanford Site for DOE and coordinate the use of real property among Hanford Site contractors. MSC shall perform a range of real property activities, such as conducting land-use planning for areas and specific parcels; conducting reviews and integrating land-use requests for all new facilities, infrastructure systems, land improvements, or change of land use; conducting land management activities, including day-to-day implementation of the CLUP; managing land use requirements and beneficial reuse of land; and conducting real estate activities in the out-grant and disposal of real property or interests therein.
- MSC shall implement the CLUP as directed or interpreted by DOE. MSC shall assess the need for updating the existing or developing new Area Management Plans and Resource Management Plans. In coordination with other Hanford Site contractors, the MSC shall develop new plans and update existing plans where applicable.
- MSC shall administer and manage the Site Selection and Excavation Permit process.
- MSC shall monitor and assess the use of real property to assure compliance with restrictions, such as institutional controls.
- MSC shall manage real property by reviewing property uses, reclassifying land use and facilities, investigating and characterizing land, monitor misuse of property or encroachments, identifying orphan or unknown land uses (e.g., non-pristine land, hazards, and waste sites), dispositioning non-permitted activities; and tracking and documenting land-use occurrences and activities.
- Hanford Site contractors shall support the land-use planning and management program as administered by the MSC, including providing input to the Ten Year Site Plan (TYSP).
- MSC shall develop the TYSP for the Hanford Site in coordination with other Site contractors.

Usage-Based Services

Excavation permits are provided as a usage-based service.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs. Return to top

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
46	**Long-term Stewardship**	Information/ Service	Direct-Funded	Interface	Provide service and receive input from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC per ICD 09 – Land for Siting	Deliver input to MSC	N/A

Scope/Cost Allocation

Service Description

Long-term stewardship (LTS) includes all engineered and non-engineered institutional controls designed to contain or to prevent exposures to any potential residual contamination and waste, such as surveillance activities, record-keeping activities, inspections, groundwater monitoring, ongoing pump and treat activities, cap repair, maintenance of entombed buildings or facilities, maintenance of other barriers and containment structures, access control, and posting signs.

- Other prime contractors' role is to provide input to the MSC by preparing an LTS Transition and Turnover Package (TTP) in accordance with the approved TTP template.
- MSC shall provide for integrated planning of LTS for the entirety of the Hanford Site.
- MSC shall prepare and maintain the *Hanford Long-Term Stewardship Program Plan and Long-Term Surveillance and Maintenance Plans*.
- MSC shall coordinate with DOE-RL and Hanford Site contractors to compile the results of the annual Hanford Site-wide institutional controls assessment, and to conduct the Hanford Site-wide *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) 5-year reviews including comment response, interim documentation, and lessons learned.
- MSC shall execute LTS for those portions of the Site assigned to the MSC.
- Hanford Site contractors provide information for the *Hanford Long-Term Stewardship Program Plan*, Long-Term Stewardship Surveillance and Maintenance Plans, *Annual NEPA Mitigation Action Plan Accomplishments*, *IC Plan*, CERCLA 5-year reviews, *Site Transition Plans*, and annual site-wide institutional controls assessment.
- Hanford Site contractors will coordinate with the Hanford LTS Program Plan and provide input to the LTS Transition and Turnover Packages for a given parcel or segment of land to DOE and concurrently to the MSC.
- Hanford Site contractors shall coordinate with the MSC in development of CERCLA RODs including institutional controls to achieve consistency with the LTS Plan.
- Hanford Site contractors shall provide information for the Hanford Site Institutional Controls Plan (ICP) in accordance with Hanford Site CERCLA Records of Decision, Hanford Site RCRA post closure plans, and RCRA Permit Corrective Action Modifications.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Cost for sites transferred (post-remediated) to MSC are the responsibility of the MSC. Hanford Site contractors bear internal implementation costs. Transition costs are the responsibility of the respective Hanford Site contractor

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
47	**Facility Information Management System (FIMS)**	Information	Direct-Funded	Interface	Receive input from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC, as applicable

Scope/Cost Allocation

Service Description

DOE uses FIMS as the Complex-wide real property database for real property which provides an inventory and management tool that assists with planning and managing real property assets. FIMS is centrally managed at DOE Headquarters.

- MSC shall manage the local effort for FIMS, meeting specific, annual reporting requirements and shall be responsible for collecting data from Hanford Site contractors in order to meet all mandatory reporting requirements.
- Hanford Site contractors deliver FIMS data and input to the *Comprehensive Data/Site Management Strategy* for spatial data

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
48	**Hanford Site Structures List and Hanford Waste Site Assignment List**	Information	Direct-Funded	Interface	Receive input from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC per ICD 09 – Land for Siting	Deliver input to MSC	Deliver input to MSC

Scope/Cost Allocation

Service Description

The *Hanford Site Structures List (List)* and *Hanford Site Assignment List* Is the integrated, central inventory of Hanford facilities, structures, and waste sites. DOE Hanford uses these lists for integrated planning of baselines, cost-estimating, reporting DOE Gold Chart metrics, establishing assignment of responsibility for each facility and waste site to site contractors, support to FIMS, HSTD (Hanford Site Technical Data Base), Caretaker, and WIDS. This activity provides for maintenance, configuration control, and upgrading of the Lists.

- MSC shall maintain the *Hanford Site Structures List* and *Hanford Waste Site Assignment List* serving as Administrator of the data, and is responsible for the platform for the data and Site-wide reporting.
- MSC shall be responsible for the Site-wide configuration control process, and shall be responsible for collecting data from Hanford Site contractors in order to meet all mandatory reporting requirements.
- Proposed changes in assignment of facilities must be ratified by DOE.

Hanford Site contractors deliver facilities, structures, and wastes site data and input to the *Hanford Site Structures List* and *Hanford Waste Site Assignment List*.
The Hanford Site contractors shall provide data and support to the MSC, for the Hanford Sites contractor's facilities, waste sites and activities, to support maintenance of the *Hanford Site Structures List* and *Hanford Waste Site Assignment List*, Hanford Site contractors supplying information/ data are responsible for data quality.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
49	**Condition Assessment Surveys (CAS)**	Information	Direct-Funded	Interface	Receive input from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC

Scope/Cost Allocation

Service Description

CAS is used to assess the current material condition of its facilities, structures, systems, and equipment, and documents maintenance deficiencies. The assessment information for each assessed item is entered into the Condition Assessment Information System (CAIS), which provides an estimate of maintenance upgrade costs.

- MSC shall manage the Hanford Site CAS/CAIS and provide for the administration of and execution of the CAS inspection program in order to accurately evaluate the existing state of specific facilities and identifying the deferred maintenance liability.
- MSC shall coordinate all of the necessary inspection activities with the various site contractors that have eligible facilities for CAS inspections.
- MSC shall make the CAS data available to the mission contractors.
- Hanford Site contractors shall enable access to MSC for conducting on-site condition assessments.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
50	**Geospatial Information Management**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Receive service from and provide input to MSC, as applicable

Scope/Cost Allocation

Service Description

Geospatial Information (relates the visualization, measurement, and analysis of features or phenomena that occur on the earth) supports the execution of requirements for worker health, land use planning, emergency response, etc., and is available to all Hanford Site contractors.

- MSC shall develop and implement a comprehensive *Hanford Geospatial Information Strategy and Implementation Plan (H-GIS)* to ensure that all spatial data, information and documentation required for accomplishing the Hanford Site missions are captured, managed, and preserved.
- The MSC shall provide general and business-specific Hanford Site maps, and act as a central geospatial clearinghouse to coordinate, capture, manage, and share geospatial information, including management of the Hanford Geographical Information System (HGIS).
- Hanford Site contractors deliver data to MSC and input to *Comprehensive Data/Site Management Strategy* for spatial data.

Usage-Based Services

Hanford Site contractors may request business-specific map services as a usage-based service.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
51	**Property Systems/-Acquisition & Materials Management**	Information / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	Optional	Optional	Receive service from and provide input to MSC, as applicable (PNNL DOE-EM owned equipment)

Scope/Cost Allocation

Service Description

Property Systems/Acquisition & Materials Management consists of Site-wide processes and procedures for centralized personal property management functions, such as recycling of precious metals and processing equipment that is no longer needed through the excess property system. Tracking of all DOE-owned, contractor-managed property (site-wide) is accomplished by means of decentralized data entry into the primary property management site-wide database (Sunflower Asset Management System [SAMS]). The Program also manages the centralized storage and staging of equipment and inventory through the use of various on-Site warehouses.

- MSC shall provide a Site-wide Personal Property Systems and Materials Management Program that provides for tracking of accountable personal property, management of the property management database (Sunflower Asset Management System [SAMS], including providing Site-wide property management reports) and other related systems; central recycling; excess property dispositioning; and equipment transfers and loans.
- MSC shall manage the (on-site) "stores" inventory warehouses. As required, the MSC shall provide for delivery of inventory items to on-Site locations managed by other contractors. MSC shall manage the supply chain, and evaluate Site-wide demand, usage trends, and programmatic requirements to act as lead in the reduction of existing line item site inventory to the lowest achievable levels.\
- Hanford Site contractors deliver input to MSC to include warehouse requirement needs, Property Information Data Systems (PIDS) data, and Contractor Balanced Scorecard Report data; and deliver property no longer required.

Usage-Based Services

Hanford Site contractors bear costs associated with delivery of excess materials to the central recycling and turn-over of excess property for disposition.

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
52	**Hanford Site Pension Plan (HSPP)** **Hanford Site Savings Plan (HSSP)** **Hanford Employee Welfare Trust (HEWT)**	Information	Direct-Funded	Interface	Sponsor and receive input from Pension and Savings Committee	Sponsor and deliver input to Pension and Savings Committee	Sponsor and deliver input to Pension and Savings Committee	Sponsor and deliver input to Pension and Savings Committee, HSPP only	Sponsor and deliver input to Pension and Savings Committee	PNNL Sponsor and deliver input to Pension and Savings Committee

Scope/Cost Allocation

Service Description

- MSC shall provide administration for the HSPP, HSSP, and HEWT.
- Hanford Site participating sponsors provide funding and deliver input to the Pension and Savings Committee whose decisions are provided to the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Contributions are allocated to the participating sponsors (Hanford Site contractors).

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
53	**External Affairs**	Information / Service	Direct-Funded	Interface	**Provide service** and receive support from Site contractors	Support MSC	Support MSC	Support MSC	Support MSC	Support MSC as applicable

Scope/Cost Allocation

Service Description

External Affairs includes assistance to DOE in its programs to communicate with outside entities for Hanford Site tours.

- MSC shall work with DOE to strategize, plan, arrange logistics for and conduct or support Hanford Site tours and visits to projects/facilities by external parties as requested.
- MSC shall provide transportation, badging coordination, working with other Site contractors, as needed, and providing guides/speakers, handouts, and refreshments, as appropriate or as requested.
- Hanford Site contractors shall provide technical staff support to MSC when their facilities or waste sites are visited, to include guides/speakers, and handouts, when the tour involves respective Hanford Site contractor workscope.
- MSC shall support DOE's management of the Hanford web site.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
54	**External Reviews**	Information	Direct-Funded	Interface	Receive support from Site contractors	Support MSC	Support MSC	Support MSC	Support MSC	Support MSC as applicable

Scope/Cost Allocation

Service Description

External Reviews provides support to DOE during audits and assessments from outside entities having oversight responsibility for DOE-RL and DOE-ORP and their contractors. These entities include the Defense Nuclear Facilities Safety Board, the Government Accountability Office, the DOE Office of Inspector General, and other governmental and Department of Energy oversight organizations, such as the Office of Health, Safety, and Security and Office of Enforcement.

- The MSC shall support DOE-RL and DOE-ORP in hosting staff from auditing and assessing organizations, providing or coordinating required presentations, responding to information requests, and by providing required subject matter experts to respond to questions and information requests.
- Hanford Site contractors shall provide support to MSC, as directed by DOE, in their External Reviews responsibilities.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
55	**Courier Services**	Service	Usage-Based	Optional	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Courier services for the Hanford Site includes delivery and pickup of miscellaneous items, such as calibrated instruments, medical samples, equipment to be repaired, and essential (time-sensitive, critical) documents.

- MSC shall provide transportation of priority or time-sensitive documents, medical samples or supplies (i.e., serum, blood samples, medical records, etc.), calibrated instruments, new or used office machines to and from repair facilities, and pickup and shredding of classified documents.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
56	**Reproduction Services**	Service	Usage-Based	Service - Large Volume: Mandatory. Convenience Copiers: Optional	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Optional	Optional	Optional service (except DOE)

Scope/Cost Allocation

Service Description

Reproduction Services provides large volume document reproduction services and manages the convenience copier contract. Reproduction includes duplication of paper ,digitally transmitted documents, and engineering drawings; high volume copying services; color copies; forms reproduction; special bindings; tabbing, etc.

- MSC shall provide printing, duplicating, binding, and reproduction services for the Hanford Site.
- Hanford Site contractors shall be responsible for identifying convenience copier locations to the MSC and for costs incurred to utilize equipment provided through the MSC copier contract.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
57	**Multi-media Services**	Service	Usage-Based	Optional Standards: Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Multi-media Services provides for the development, production, or acquisition of photos, videotapes, movies, audio productions, and other similar types of media.

- MSC multi-media organization shall be a centralized resource for the Hanford Site. The contractor shall establish the standards and written procedures that shall be used by all Hanford Site contractors and DOE to inventory photographs, videos, etc, identified as records. The standards/procedures shall direct that all photos, videos, etc. taken or acquired are indexed, and that the images/photos are merged into a Hanford Site archive or clearinghouse.
- MSC shall conduct aerial photography of the Hanford Site (e.g., monthly), as directed by DOE.
- Whether using MSC, or procuring outside services, Hanford Site contractors shall:
  - Comply with Hanford Site multi-media standards
  - Provide multi-media records to the MSC.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
58	**Mail Services**	Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Receive service from MSC, as applicable	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Mail Services for the Hanford Site includes delivery to major building/locations and relies on the serviced organization/company to deliver mail to individuals within their respective organizations

- MSC shall provide for basic mail services, including postage fees, pickup and delivery of interplant and U.S. Postal mail to customers. The work scope includes the pickup, routing and delivery of interplant mail (i.e., mail that does not leave the Hanford Site).
- MSC shall distribute and pickup mail at defined locations in the contractor's facilities.
- Hanford Site contractors shall be responsible for mail distribution to contractor staff within their facility.

Usage-Based Services

N/A

Direct-Funded Services

Service as described above.
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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
59	**Site Forms Management**	Service	Direct-Funded	Optional	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	N/A	Receive service from MSC (only DOE)

Scope/Cost Allocation

Service Description

Site Forms Management consists of a centralized and configuration-controlled forms management program that applies consistent design and utilizes the use of electronic forms in gathering of electronic record information to electronic records systems.

- MSC shall administer the Hanford Site forms management system and process, and design electronic forms for interactive use, as well as, conventional hard copy forms. MSC shall develop/design/revise/approve electronic and hard copy forms, eliminate obsolete or duplicate forms, maintain Site forms historical records, and maintain the system for centralized configuration management of site electronic and conventional hard copy forms. Development of forms shall be coordinated with the sponsor and its users.
- Hanford Site contractors may request and provide requirements for service.
- Hanford Site contractors are allowed to create and maintain unique forms relevant solely to their internal use, unless otherwise prohibited by Site policy.

Usage-Based Services

N/A

Direct-Funded Services
Service as described above.

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Information Resources / Content (Records) Management (IR/CM)										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
60	**Strategic Planning & Program Management**	Information	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Optional	Optional	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Strategic Planning & Program Management assesses the current IR/CM technology infrastructure, systems, applications, and business practices and provides recommendations for improving the scalability and reducing the life-costs over the current approach.

- MSC shall develop a *Computing and Telecommunications Strategic Plan.*
- PRC and TOC shall provide input to the *Computing, Telecommunications, and Content (Records) Management Strategic Plan*.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
61	**Telephone Services**	Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Optional	Optional	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Telephone Services function consist of the Hanford Site Telephone Exchange activities that encompass voice, data, special circuits, 9-1-1 support, and attendant/operator services to Hanford Site programs, projects, and support organizations.

- MSC shall provide and maintain telecommunications capability and capacity sufficient to meet the needs of the Hanford site, encompassing those systems required to maintain data transmissions, including local, state, national, and international subscribers; data and network circuits; off-premise stations; telephone service to offsite offices occupied by Hanford Site end-users; alerting systems; and other miscellaneous voice and data circuits.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
62	**Pager Services**	Service	Usage-Based	Optional, except Emergency Response, which is Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Receive service from MSC	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Pager Services provides the electronic network and devices for Hanford Site paging.

- MSC shall provide maintenance, operations and account administration of the Government-owned Hanford Site pager infrastructure and commercial pager services, including site, regional and national paging services.
- MSC shall provide system designs, integration, maintenance, frequency management, associated engineering services, and support to manage regional, international, and nonstandard inventory for pager replacement parts.
- Hanford Site contractors may request and provide requirements for service.

Usage-Based Services

Service as described above

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
63	**Radio Services for Crafts**	Service	Usage-Based	Optional	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Receive service from MSC	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Radio Services for Crafts provides radio communication infrastructure and licensing.

- MSC shall provide engineering, maintenance and operations of non-emergency radio communication services, including associated infrastructure.
- MSC shall manage radio spectrum licensing and design, engineering integration, operations and maintenance, installation, upgrade and required system calibration services, and registration of radio frequencies with the National Telecommunications and Information Administration.
- Hanford Site contractors shall request and provide requirements for service. If procuring radios, the contractor must comply with Hanford Site specifications.
- Equipment (radios, antennas, etc.) costs are the responsibility of the Hanford Site contractor.

Usage-Based Services

Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
64	**Radio Services for Emergency Services**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Receive service from MSC	Receive service from MSC, as applicable

Scope/Cost Allocation

Service Description

Radio Services for Emergency Services provides radio communication infrastructure and licensing.

- MSC shall provide engineering, maintenance and operations of radio communication services, including two-way, fire dispatch, safety and emergency preparedness, security systems and infrastructure.
- MSC shall manage radio spectrum licensing and design, engineering integration, operations and maintenance, installation, upgrade and required system calibration services, and registration of radio frequencies with the National Telecommunications and Information Administration.
- Hanford Site contractors shall:
  - Follow Hanford Site radio frequency policy and use the MSC for radio spectrum licensing; and
  - Request and provide requirements for service.

Usage-Based Services

Equipment (radios, antennas, etc.) costs are the responsibility of the Hanford Site contractor.

Direct-Funded Services

Service as described above.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
65	**Network Services**	Service	Usage-Based	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	Optional	Optional	Optional, except DOE

Scope/Cost Allocation

Service Description

Network Services consist of the Hanford Local Area Network (HLAN) information infrastructure used by DOE-RL, DOE-ORP and Hanford Site contractors for intranet and internet services.

- MSC shall operate and maintain the HLAN information/communication infrastructure including Application Hosting Services, Internet Support, Maintenance and Software License Management, Technology Support for Hardware and Software, network management and maintenance, desktop/user services, hardware maintenance, work station acquisition, redeployment and retirement, engineering and configuration, software distribution, and streaming video engineering services. The MSC will also provide HLAN infrastructure maintenance.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Service as described above

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
66	**Information Systems**	Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from MSC	Receive service from MSC	N/A	Optional	Optional except DOE

Scope/Cost Allocation

Service Description

Information Systems provide integrated business, technical, and project information systems including management and performance of steady state operations, maintenance, development and enhancements for Hanford Site data systems, and support to project and business functions.

- MSC provides database management, video-teleconferencing (VTC) support services, software and systems engineering, system development, systems operations and maintenance (O&M), software testing, software configuration management, and application hosting services.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Hanford Site contractors may request additional services as a usage-based service.

Direct-Funded Services

Service as described above.
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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
67	**Federal Records Inventory and Schedule Management**	Information / Service	Combination of Usage-Based and Direct-Funded	Site-wide System – Mandatory Inventory & Scheduling Service - Optional	**Provide service** to and receive input from Site contractors	Deliver input to MSC	Deliver input to MSC	Optional	Deliver input to MSC	Deliver input to MSC, except PNNL

Scope/Cost Allocation

Service Description

Inventory and Schedule Management provides the Hanford Site-wide RIDS database for inventorying and scheduling all Federal records for MSC and for designated contractors including those documenting the missions, programs, projects and all administrative functions. This work addresses all records (and non-records) originated or held by any of the covered contractors and includes records in all media, including electronic systems, databases, spreadsheets, microform, photo/negatives, hard copy paper, and all other formats and media.

- MSC shall provide Hanford Site-wide RIDS database for Hanford Site Federal records.
- Other Hanford Site contractors shall provide RIDS database information.

Usage-Based Services

Optional service beyond the basic service described above

Direct-Funded Services

Service as described above

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
68	**Major Collection Management**	Service	Direct-Funded	Mandatory	**Receive input** from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC (Optional)	Optional	Deliver input to MSC, except PNNL

Scope/Cost Allocation

Service Description

Major Collection Management provides continued maintenance of significant collections of records. Examples of major collections include engineering drawings, photographs/negatives, videotapes, etc.

- MSC shall ensure that records in identified collections are indexed, authenticated, metadata complete, and are accessible to those that have a business requirement.
- Hanford Site contractors shall meet the requirements of Major Collection Management as administered by the MSC.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
69	**Long-Term Records Storage**	Service	Direct-Funded	Mandatory	**Provide service** to site contractors	Receive service from and provide input to MSC	Receive service from and provide input to MSC	N/A	Optional	Receive service from and provide input to MSC

Scope/Cost Allocation

Service Description

Long-Term Records Storage provides for physical storage of over 110,000 cubic feet of records in various hard copy medium (paper, photographs, video, tapes, etc.).

- MSC shall provide program administration and long-term physical storage for paper and other hard copy media records and maintain information systems to manage that collection.
- Hanford Site contractors shall coordinate with MSC for pickup of records.

Usage-Based Services

N/A

Direct-Funded Services

Service as described above.

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Portfolio Management										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
70	**Hanford Portfolio Planning, Analysis & Performance Assessment (Integrated Hanford Life-Cycle Clean-up Plan; [Hanford] Programmatic Risk Management Plan; P6 schedules, and State of the Site briefing)**	Information	Direct-Funded	Interface	**Receive input** from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC, except PNNL and DOE

Scope/Cost Allocation

Service Description

Hanford Portfolio Planning, Analysis & Performance Assessment consists of support to DOE-RL and DOE-ORP in maintaining the *Integrated Hanford Life-Cycle Clean-up Plan* that optimizes the mission life-cycle, enabling DOE to ensure cost and schedule efficiency while adequately anticipating and managing programmatic risk.

- MSC shall perform Hanford Site portfolio integration, provide simulation and optimizing analysis tools, and coordinate and assist with integrated scheduling and performance evaluation.
- MSC shall develop an Integration Issues Management Plan, provide Hanford Portfolio Planning, develop and maintain an Integrated Hanford Life-Cycle Clean-up Plan, and shall evaluate project and program performance against the Integrated Hanford Life-cycle Baseline.
- Hanford Site contractors shall provide information to the MSC as necessary to complete the Hanford Portfolio Planning, Analysis & Performance Assessment activities.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
71	**Project Acquisition and Support**	Information	Direct-Funded	Interface	**Receive Critical Decision data and information from PRC and TOC**	Deliver data and info. to MSC	Deliver data and info. to MSC	N/A	N/A	N/A

Scope/Cost Allocation

Service Description

Project Acquisition and Support includes project initiation, design, construction, and/or procurement services to DOE and as an optional service to Hanford Site contractors.

- As directed by DOE, MSC shall provide the means to enable DOE to perform its project owner management responsibilities, in the areas of planning and procurement actions for new projects, by supporting the Critical Decision (CD) 0 through CD-1/2 phase of new project life-cycles and, when requested, act as project lead in support of the CD-3 and 4 phase of new projects.
- Hanford Site contractors shall provide Critical Decision data and information to the MSC as directed by DOE.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
72	**Independent Assessment and Analysis**	Information	Direct-Funded	Interface	**Receive input** from Site contractors	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC	Deliver input to MSC, except PNNL and DOE

Scope/Cost Allocation

Service Description

Independent Assessment and Analysis provides to DOE a capability for ensuring that work is being accomplished in accordance with ESH&Q requirements, or to accomplish special DOE studies and obtain recommendations on an as needed basis to resolve technical and regulatory issues.

- As directed by DOE, MSC shall provide specialty technical expertise, on a task-order basis, for areas such as project management, project control, cost estimating and scheduling, environmental, safety, quality and health, quality assurance, criticality, nuclear safety, radiological control, fire protection, environmental protection, regulatory compliance, Integrated Safety Management System, etc., and conduct independent analyses and generate technical assessment reports as needed in these areas.
- Hanford Site contractors shall provide data and facility access to the MSC as required by the Independent Assessment and Analysis activity.

Usage-Based Services

N/A

Direct-Funded Services

MSC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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PRC SERVICES AND INTERFACE ACTIVITIES

Solid and Liquid Waste Stabilization and Disposition

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
73	**Waste forecast system - Solid Waste Information and Tracking System (SWITS) and Solid Waste Integrated Forecast Technical Database (SWIFT)**	Information	Direct-Funded	Interface	Provide data to PRC	**Receive data** from Site contractors	Provide data to PRC	Provide data to TOC	Provide data to PRC	Provide data to PRC, except DOE

Scope/Cost Allocation

Service Description

Waste forecast system identifies future quantities of hazardous and radioactive waste generation for wastes managed by the contract.

- PRC shall operate and maintain SWITS and SWIFT, and make available to other Site contractors.
- Hanford Site contractors shall provide waste generation data.

Usage-Based Services

N/A

Direct-Funded Services

PRC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
74	**Low Level Waste (LLW) and Mixed Low Level Waste (MLLW) Treatment, Storage, and Disposal**	Physical	Combination of Usage-Based and Direct-Funded	Mandatory	N/A	**Receive waste**	Package and deliver to PRC	Provide waste to TOC	Package and deliver to PRC	Package and deliver to PRC, except DOE

Scope/Cost Allocation

Service Description

This activity provides for LLW and MLLW Treatment, Storage, and Disposal.

- PRC shall perform waste unloading, receipt, storage, and disposal of LLW and MLLW.
- Hanford Site contractors prepare waste, including packaging and treatment, and provide for waste transport.

Usage-Based Services

- Waste generators provide funding for packaging, treatment, transport (including unloading), storage, and disposal.
- RCCC only pays for treatment, packaging, and transport.
- TOC pays WTP waste disposal costs.

Direct-Funded Services

PRC provides ready-to-serve capability.

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WIPP CORE CHARACTERIZATION PROJECT SERVICES AND INTERFACE ACTIVITIES

Transuranic Waste Characterization and Certification

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	WIPP Core Characterization Project (CCP)	MSC	PRC	TOC	WTP	RCCC	Other Contracts
75	**Transuranic (TRU) and Transuranic Mixed Waste (TRUM) Packaging, Characterization, Certification, and Transportation**	Information / Physical / Service	Combination of Usage-Based and Direct-Funded	Mandatory	**Performs all Hanford TRU Waste Characterization and Certification activities.**	N/A	**Provides support to CCP characterization and certification activities. Receives waste from site users.**	Package and deliver TRU to PRC	N/A	Package and deliver TRU to PRC	Except DOE, package and deliver TRU to PRC.

Scope/Cost Allocation

<u>Service Description</u>

This activity provides for TRU and TRUM certification and loading waste for shipment to the Waste isolation Pilot Plant (WIPP).

- PRC shall receive waste from contractors, provides interim storage if required, certifies waste for shipment, prepares payloads, and loads waste for shipment to WIPP or other DOE Sites.
- Hanford Site contractors shall conduct and budget for packaging (if required by WAC) and transporting waste to PRC, and certify for WIPP and load waste for shipment to WIPP or other DOE Sites.
- CCP will provide, operate, and maintain RTR equipment, drum assay equipment, large box NDE/NDA equipment (if needed), and mobile loading equipment.
- CCP will operate and maintain the Hanford Super-HENC equipment for Standard Waste Box (SWB) assay.
- CCP will operate the Shipping and Receiving Bay within WRAP for TRUPACT loading. PRC will operate and maintain the balance of the WRAP facility.
- CCP will provide the equipment for and perform head space gas sampling (HSGS) and analysis.
- CCP will establish and implement appropriate ESH&Q programs to support CCP activities.
- PRC will perform initial (in-field) assay of retrieved waste, as necessary, to segregate TRU from non-TRU waste.
- PRC will perform all waste repackaging activities.
- PRC will provide facility records, packaging records, and other documents necessary for CCP to prepare waste certification packages.
- PRC will provide the necessary public release clearances for CCP generated documents.
- PRC will provide the infrastructure to support installation and operation of the CCP-provided RTR equipment, drum assay equipment, and mobile loading equipment.
- PRC will provide the facility and infrastructure to support the installation and operation of the large box NDE/NDA equipment, if needed.
- PRC will provide mobile crane and crane operator support for CCP mobile loading equipment.

	• PRC shall receive TRU waste from other site users and provide interim storage if required. • PRC will identify ESH&Q interfaces with CCP. • Other Hanford Generators of TRU waste will provide TRU waste to PRC that complies with WIPP waste acceptance criteria. **Usage-Based Services** • Waste generators provide funding to PRC for the increment of work resulting from their waste. • RCCC pays only for TRU treatment and packaging, and TRU transport to PRC. **Direct-Funded Services** PRC provides ready-to-serve capability for TRU waste receipt, storage, and repackaging. Return to top

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
76	**Industrial and Radioactive Liquid Effluents Treatment and Disposal and Industrial Liquid Effluents Retention and Transfer**	Physical	Direct-Funded	Mandatory	N/A	**Receive from TOC, WTP and RCCC**	Deliver to PRC	Deliver to PRC	Deliver to PRC	Deliver to PRC or RCCC as applicable, except DOE

Scope/Cost Allocation

Service Description

This activity provides for treatment and disposal of radioactive liquid effluents in the 200 Area and retention and transfer of industrial liquid effluents in the 300 Area.

- PRC shall operate the Effluent Treatment Facility (ETF), Liquid Effluent Retention Facility (LERF), 200 Area Treated Effluent Disposal Facility (TEDF), and the State Approved Land Disposal Site (SALDS) to receive, treat, and dispose of industrial and radioactive liquid effluents from Site contractors in the 200 Areas. RCCC is responsible for overall management of the 300 Area combined sanitary/process sewer (CS) that discharges to the City of Richland Publicly Owned Treatment Works and administrative duties associated with Permit No. CR-IU010.
- PRC shall operate the 300 Area Retention Transfer System (RTS) to receive, and retain industrial liquid effluents from Site contractors in the 300 Area and discharge compliant effluent to the CS. Hanford Site contractors shall send waste to PRC and RCCC facilities.
- RCCC shall administer the 300 Area Effluent Discharge Permit,

Usage-Based Services

N/A

Direct-Funded Services

Funded through PRC; provided at no cost to Hanford Site contractors. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
77	**Immobilized High Level Waste (IHLW) Interim Storage**	Physical	Combination of Usage-Based and Direct-Funded	Mandatory	N/A	**Receive from TOC**	Transport to PRC	Provide filled IHLW canisters for TOC transport	N/A	N/A

Scope/Cost Allocation

Service Description

This activity provides for storage of IHLW.

- PRC shall operate and maintain the Canister Storage Building.
- TOC and PRC shall coordinate on modifications of the CSB for receipt of the IHLW.

Usage-Based Services

Modifications to CSB or construction of other storage capability funded by TOC.

Direct-Funded Services

PRC funds ready to serve operations of the CSB.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
78	**Immobilized low activity waste (ILAW) Disposal**	Physical	Combination of Usage-Based and Direct-Funded	Mandatory	N/A	**Receive from TOC and dispose**	Deliver to PRC	Deliver to TOC	N/A	N/A

Scope/Cost Allocation

Service Description

This activity provides for disposal of ILAW.

- PRC shall operate the Integrated Disposal Facility and receive/dispose waste.
- TOC shall prepare and provide for transportation of ILAW to the IDF for disposal.

Usage-Based Services

Waste generators provide funding to PRC for the increment of work resulting from their waste.

Direct-Funded Services

PRC provides ready-to-serve capability

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Groundwater and Vadose Zone Project										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
79	**Groundwater/Vadose Zone Integration**	Information / Service	Direct-Funded	Mandatory	Deliver to PRC	**Receive from Site contractors**	Deliver to PRC	N/A	Deliver to PRC	N/A

Scope/Cost Allocation

Service Description

The Groundwater/Vadose Zone Integration activity maintains and controls site-wide data and models used for groundwater/vadose zone analysis and coordinates site-wide groundwater/vadose zone activities.

- PRC shall conduct the groundwater/vadose zone integration project.
- Hanford Site contractors shall participate in PRC periodic planning and coordination meetings; and deliver modeling and risk assessment information. Mission contractors shall provide comments on the annual update to the *Integrated Plan and Schedule for all soil and groundwater work*, and the annual *Groundwater Monitoring Report*.
- Hanford Site contractors shall supply groundwater analysis requirements and reporting of risk assessment data and analysis, input for the Fiscal Year Integrated Groundwater Monitoring Plan for the Hanford Site, comments on the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Groundwater and Deep Vadose Zone Remediation Activity Progress Reports.
- Hanford Site contractors shall provide data/information to PRC on self-performed drill and sample soil borings that yield additional vadose zone characterization data.

Usage-Based Services

N/A

Direct-Funded Services

PRC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
80	**Hanford Environmental Data Integration**	Information Service	Direct-Funded	Mandatory and Interface	N/A	**Receive from TOC,RCCC, and other site contractors**	Deliver input to PRC	N/A	Deliver input to PRC	Deliver input to PRC, except DOE

Scope/Cost Allocation

Service Description

This activity provides for maintenance, configuration control, and upgrading of key Hanford Site environmental assessment databases.

- The PRC shall serve as Data Manager for the following information systems:
  - Hanford Environmental Information System (HEIS);
  - Sample Data Tracking (SDT) System;
  - Hanford Well Information System (HWIS);
  - Waste Information Data System (WIDS).
- The Hanford Site contractors shall provide data and support to the PRC, for the Hanford Sites contractor's facilities and activities, to support maintenance of the above listed Hanford-wide environmental databases. Hanford Site contractors supplying information/ data are responsible for data quality.

Usage-Based Services

N/A

Direct-Funded Services

PRC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
81	**Hanford Site Well Drilling and Decommissioning**	Information	Direct-Funded	Interface	Coordinate with PRC	Coordinate with TOC, RCCC, MSC, and other Site contractors	Coordinate with PRC	N/A	Coordinate with PRC	Coordinate with PRC

Scope/Cost Allocation

Service Description

This activity includes drilling and decommissioning of Hanford Site wells.

- PRC shall coordinate with the mission contractors during the installation and maintenance of wells for the groundwater monitoring well network and maintain and implement the *Hanford Site Well Decommissioning Plan.*
- Hanford Site contractors shall provide input for the *Hanford Site Well Decommissioning Plan.*

Usage-Based Services

N/A

Direct-Funded Services

PRC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Spent Nuclear Fuel										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
82	**Special Nuclear Fuel (SNF) FragmentsTransportation**	Physical	Direct-Funded	Mandatory	N/A	**Receive from RCCC**	N/A	N/A	Transfer to PRC	N/A

Scope/Cost Allocation

Service Description

SNF fragments are safely stored.

- RCCC shall package SNF fragments and transport to PRC.
- PRC shall receive packaged SNF fragments from RCCC.

Usage-Based Services

N/A

Direct-Funded Services

PRC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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TOC SERVICES AND INTERFACE ACTIVITIES

Base Operations

Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
83	**Tank Farm Projects Double Shell Tank (DST) System Management**	Information	Direct-Funded	Interface	N/A	N/A	Integrate with WTP	Deliver input to TOC	N/A	N/A

Scope/Cost Allocation

Service Description

DST System Management maintains acceptable waste feed specifications for future waste feed delivery to the WTP while also maximizing use of available DST space to facilitate single-shell tank waste retrieval and any in-tank treatment to preserve tank integrity and improve waste feed characteristics.

- TOC shall integrate with the WTP contractor, develop the *Integrated Waste Feed Delivery Plan*, and the *River Protection Project System Plan*, and operate the DST system.
- WTP shall provide input for feed delivery integration.

Usage-Based Services

N/A

Direct-Funded Services

TOC bears the cost burden of program administration.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
84	**Vent and Balance**	Service	Usage-Based	Mandatory	Receive service from TOC	Receive service from TOC	**Provide service** to PRC, RCCC, and MSC	Optional	Optional	N/A

Scope/Cost Allocation

Service Description

Vent and Balance provides as a variable service, testing of ventilation and filters, and ventilation balance to maintain established flows and pressures on systems. Specifics include ventilation stack flow testing, fume hood flow testing, high efficiency particulate air (HEPA) filter vacuum testing/certification and HEPA filter efficiency testing.

- TOC shall perform cost-effective/efficient Vent and Balance services (primarily HEPA filter testing and replacement) for RPP facilities and for the balance of the Hanford Site.
- PRC, MSC, and RCCC (optional user) shall request and provide requirements for service.

Usage-Based Services

Service as described above

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
85	**Analytical Laboratory Support** ***(Landlord Services for 222-S Laboratory Complex)***	Service	Direct-Funded	Mandatory	N/A	N/A	**Provide service** to LAS&T	N/A	N/A	N/A LAS&T receives service from TOC

Scope/Cost Allocation

Service Description

Analytical Services are performed by the Laboratory Analytical Services and Testing Contractor (LAS&T), a separate prime contractor to DOE-ORP, while laboratory facility operations and maintenance are performed by the contractor.

- TOC shall operate and maintain the 222-S Laboratory Complex to support analysis activities performed by the LAS&T.
- LAS&T will provide input and coordination to support operations.

Usage-Based Services

N/A

Direct-Funded Services

Funded through TOC; provided at no cost to Hanford Site contractors.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contractors
86	**Analytical Integrated Planning (*222-S Laboratory Complex*)**	Information	Direct-Funded	Interface	N/A	Provide data to TOC	Integrate data	Provide data to TOC	N/A	N/A LAS&T provide data to TOC

Scope/Cost Allocation

Service Description

Analytical Integrated Planning provides integrated Site-wide analysis plans, data quality objectives, and process and analytical technology support.

- TOC shall interface with the LAS&T to develop sample analysis rates and waste generation estimates.
- Hanford Site contractors shall use integrated planning products to plan sample analysis expenditures.
- Hanford Site contractors shall provide input to support sample analysis planning.

Usage-Based Services

N/A

Direct-Funded Services

TOC bears the cost burden of program administration. Hanford Site contractors bear internal implementation costs.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
87	**Tank Closure and Waste Management Environmental Impact Statement (EIS) and Record of Decision (ROD)**	Information	Direct-Funded	Interface	Deliver input to DOE-ORP	Deliver input to DOE-ORP	Deliver input to DOE-ORP	N/A	N/A	N/A

Scope/Cost Allocation

Service Description

Tank Closure and Waste Management EIS and ROD is a regulatory requirement supporting Hanford Site closure activities. DOE is currently preparing the Tank Closure and Waste Management (TC & WM) Environmental Impact Statement (EIS). The TC & WM EIS is evaluating options for managing and disposing of waste, supplemental treatment, tank closure and establishing final end states for the Fast Flux Test Facility (FFTF) at Hanford. These decisions are expected to be applied to the related programs after 2009.

- DOE-ORP will develop the *Tank Closure and Waste Management EIS and ROD.*
- Hanford Site contractors shall provide input to the *Tank Closure and Waste Management EIS and ROD.*

Usage-Based Services

N/A

Direct-Funded Services

Hanford Site contractors bear the cost of their respective resources for this activity.

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Waste Treatment and Immobilization Plant Support										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
88	**WTP Support**	Information / Service	Direct-Funded	Mandatory and Interface	Provide services to WTP	Provide services to WTP	Coordinate and provide services to WTP	Receive service from and provide input to TOC	N/A	N/A

Scope/Cost Allocation

Service Description

WTP interface provides support for WTP construction.

- MSC, PRC, and TOC will participate with WTP in the revision and approval of WTP Interface Control Documents (ICDs).
- TOC shall be responsible for coordinating, planning, and paying for the WTP contractor's requirements for infrastructure, utility, and service support from the MSC and PRC as identified in the J.3 Hanford Site Services and Interface Requirements Matrix.
- ICDs identify interface requirements, technical and service gaps, and document issues in order to support efficient and timely construction, startup, commissioning, and operation of WTP. ICDs do not represent contractual obligations between the executing parties or the government.
- WTP shall maintain WTP Interface Control Documents.

  WTP ICDs include:
  - ICD 1, *Raw Water*
  - ICD 2, *Potable Water*
  - ICD 3, *Radioactive Solid Wastes*
  - ICD 5, *Non-Radioactive, Non-Dangerous Liquid Effluents*
  - ICD 6, *Radioactive Dangerous Liquid Effluents*
  - ICD 9, *Land for Siting*
  - ICD 11, *Electricity*
  - ICD 12, *Roads*
  - ICD 14, *Immobilized High-Level Waste*
  - ICD 15, *Immobilized Low-Activity Waste*
  - ICD 19, *Low-Activity Waste Feed*
  - ICD 23, *Waste Treatability Samples*
  - ICD 28, *Pit 30 Aggregate Supply for Construction*
  - ICD *29, Waste Sodium*

Usage-Based Services

N/A

Direct-Funded Services

Hanford Site contractors bear internal costs associated with WTP ICD participation, review and approval.

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OTHER DOE DIRECT-CONTRACTED SERVICES										
Interface Number	**Interface Title**	**Interface Type**	**Cost Type**	**Service Type**	**MSC**	**PRC**	**TOC**	**WTP**	**RCCC**	**Other Contracts**
89	**Janitorial Service**	Service	General and Administrative (G&A) cost for each contract.	Optional	Receive service	Receive service	Receive service	N/A	Receive service	Receive service

Scope/Cost Allocation

Service Description

The Janitorial Service Contractor provides janitorial services for certain buildings in the 600, 700 and 1100 Areas of the DOE-RL, Richland, Washington. Services include light cleaning, high cleaning, and special services, as needed.

Usage-Based Services

N/A

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
90	**Laundry Service**	Service	Fee for service.	Optional	Receive service	Receive service	Receive service	Optional	Receive service	Receive service

Scope/Cost Allocation

Service Description

The Laundry Service Contractor provides for commercial laundry and decontamination services for government-owned protective clothing, non-regulated items, and regulated face pieces. This service includes periodic batch pick-up and drop-off at site locations.

Usage-Based Services

N/A

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
91	**Occupational Medicine Service**	Service	Fee for Service	Mandatory	Receive service	Receive service	Receive service	N/A	Receive service	Optional service OHSC – Provides service to site contractors

Scope/Cost Allocation

Service Description

The Occupational Health Services Contractor (OHSC), under a separate prime contract to DOE-RL, provides occupational health services through health risk management and occupational health services to personnel at Hanford. The contractor has the lead to coordinate Health Risk Management program teams with the Site in identifying and analyzing the hazards that Hanford personnel face in the work environment and brings an awareness of health and safety issues to DOE, Hanford Site contractors, and others.
The contractor provides the following, but is not limited to these types of services: medical monitoring and qualification examinations, including the controlled substances/alcohol testing program (mandatory use); diagnosis of occupational injury or illness; monitored care; legacy health issues; employee counseling and health promotion; occupational health process improvement; human reliability testing; records management; emergency and disaster preparedness; health care cost management; field/facility visits; case management; records and data extraction; other occupational medicine services; reporting; and supporting transition.

Usage-Based Services

N/A

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
92	**Personnel Security Services**	Information / Service	DirectFunded by DOE	Mandatory	Receive service from and provide input to PSSC	Receive service from and provide input to PSSC	Receive service from and provide input to PSSC	N/A	Receive service from and provide input to PSSC	Receive service from and provide input to PSSC (N/A for PNNL) PSSC – Provide service to site contractors

Scope/Cost Allocation

Service Description

The Personal Services Security Contractor (PSSC) currently provides technical and administrative support expertise for the implementation of the DOE Personnel Security Program, including clearance and special access processing, adjudication of investigative reports, human reliability programs, and other personnel security related programs. The contractor also provides transcription services, screening and processing classified mail, operation of the vault, visitor control and security education for both employees and visitors located in the Federal Office Building (FOB), and management of several personnel security-related databases.

Usage-Based Services

N/A

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
93	**Research, development, and demonstration**	Service	Usage-Based	Optional	Receive service	Receive service	Receive service	Receive service	Receive service	Receive service **PNNL – Provide service to site contractors**

Scope/Cost Allocation

Service Description

PNNL is one of five Office of Science multi-program laboratories that conduct research and development activities. Some of the programs conducted at PNNL are part of the DOE Office of Science laboratory system and require no integration with the Hanford DOE Office of Environmental Management programs; however, many of the research and technology development programs have direct relevance to the Hanford cleanup mission. As applicable, the contractor is encouraged to utilize the scientific and technical capabilities available from PNNL and work directly with PNNL to maximize the benefit to Hanford from the National research and development program.

Usage-Based Services

.Service as described above.

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
94	**Sample Analysis *(highly radioactive)***	Service	Fee for Service	Mandatory	N/A	Receive services from LAS&T	Receive services from LAS&T	N/A	N/A	N/A **LAS&T - Provide services** to TOC and PRC

Scope/Cost Allocation

Service Description

Analytical Services are performed by the Laboratory Analytical Services and Testing Contractor (LAS&T) under a separate prime contract to DOE-ORP. LAS&T is responsible for providing analysis of highly radioactive samples in support of Hanford Site projects. These services will be performed in the 222-S Laboratory Complex located in the 200 Area of the Hanford Site.
The LAS&T is responsible for: receiving samples, which are potentially highly radioactive; preparing samples, which are potentially highly radioactive for analysis; recording and tracking all samples and related waste materials; performing chemical and radionuclide analyses using necessary quality control and quality assurance; reporting the results and archive sample remainders as required by the customer; and providing Standards Laboratory services for the Hanford Site.
Service users will develop annual Service Level Agreements upon which Fee for Service will be based.

Usage-Based Services

N/A

Direct-Funded Services

N/A

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
95	**Steam Services**	Service	Direct-Funded	Mandatory	Receive service	Receive service	Receive service	N/A	Receive service	Receive service **ESPC - Deliver service** to site contractors

Scope/Cost Allocation

Service Description

The Energy Savings Performance Contractor (ESPC), under a separate prime contract, currently includes steam service to support heating and other operations at the Site and air compressors for twenty 300 Area facilities. The ESPC can also propose additional energy conservation measures. These may include, but are not limited to, lighting system upgrades; pumping system upgrades; automation; heating, ventilation, and air conditioning upgrade; and addition of utility monitoring and control systems.

Usage-Based Services

N/A

Direct-Funded Services

RCCC & TOC "advance" pay from their DOE funding allocations. MSC & PRC costs are funded by DOE-RL directly to the ESPC from PBS-40.

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Interface Number	Interface Title	Interface Type	Cost Type	Service Type	MSC	PRC	TOC	WTP	RCCC	Other Contracts
96	**Waste Disposal - CERCLA remediation Low Level (LLW) and Contact-handled and Remote-handled (CH/RH) Mixed Low Level (MLLW)**	Physical	Usage-Based	Mandatory	Deliver to RCCC	Deliver to RCCC	Deliver to RCCC	Deliver to RCCC	**Receive from Site contractors**	Optional

Scope/Cost Allocation

Service Description

- RCCC performs treatment, storage, and disposal of *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) LLW and CH/RH-MLLW.
- Hanford Site contractors shall request and provide requirements for service.

Usage-Based Services

Hanford Site contractors budget for waste treatment and disposal; deliver waste to ERDF.

Direct-Funded Services

N/A

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ATTACHMENT J.4 - APPLICATIONS, PERMITS, AND NOTICES OF CONSTRUCTION

The following is a list of applications, permits, and Notices of Construction (NOCs) the lab currently complies with:

Liquid Effluents:

- SWDP ST4511, Site-wide Hydrotest, Maintenance, and Construction Discharges, Site-wide Cooling Water and Condensate Discharges and Site-wide Industrial Stormwater Discharges to Engineered Land Disposal Structures

- HNF-SD-W049H-ICD-001, 200 Area Treated Effluent Disposal Facility Interface Control Document

Air Emissions:

- Hanford Site Air Operating Permit, 00-05-006
- NOC, State of Washington Department of Ecology, Letter, July 13, 1992, Approval of the Notice of Construction for the Environmental Hot Cell Expansion
- NOC, State of Washington Department of Health, AIR 08-904, September 8, 2008, *License to Operate the 222-S Laboratory*

Waste Treatment, Storage, Disposal:
The 222-S Laboratory Complex is an interim status Treatment, Storage, and Disposal Facility and does not have a RCRA Permit. An application (DOE/RL-91-27) for a RCRA, Part B, Final Status Treatment, Storage, and Disposal Facility Permit has been submitted to the State of Washington Department of Ecology. The Part A, Form 3, Dangerous Waste Permit Application~~,~~ for the 222-S Dangerous and Mixed Waste Treatment, Storage, and Disposal Unit must be complied with. Applicable conditions of the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion WA7890008967 Revision 8C, as amended, must also be complied with.

Waste Analysis Plan
A draft Waste Analysis Plan for the Low-Level Burial Grounds is currently being discussed with the Washington State Department of Ecology

ATTACHMENT J.5 - DEPARTMENT OF LABOR WAGE DETERMINATIONS

J.5.1 Wage Determination No.: 2005-2569Rev No.15 Dated 06/19/2013

>

WD 05-2569 (Rev.-15) was first posted on www.wdol.gov on 06/25/2013
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REGISTER OF WAGE DETERMINATIONS UNDER THE SERVICE CONTRACT ACT By direction of the Secretary of Labor	U.S. DEPARTMENT OF LABOR EMPLOYMENT STANDARDS ADMINISTRATION WAGE AND HOUR DIVISION WASHINGTON D.C. 20210
Diane C. Koplewski Division of Director Wage Determinations	Wage Determination No.: 2005-2569 Revision No.: 15 Date Of Revision: 06/19/2013

States: Oregon, Washington

Area: Oregon Counties of Baker, Grant, Harney, Malheur, Morrow, Umatilla, Union, Wallowa, Wheeler
Washington Counties of Benton, Franklin, Walla Walla, Yakima

Fringe Benefits Required Follow the Occupational Listing

OCCUPATION CODE - TITLE	FOOTNOTE	RATE
01000 - Administrative Support And Clerical Occupations		
01011 - Accounting Clerk I		13.61
01012 - Accounting Clerk II		15.27
01013 - Accounting Clerk III		17.08
01020 - Administrative Assistant		22.41
01040 - Court Reporter		18.59
01051 - Data Entry Operator I		13.38
01052 - Data Entry Operator II		14.60
01060 - Dispatcher, Motor Vehicle		18.77
01070 - Document Preparation Clerk		12.94
01090 - Duplicating Machine Operator		12.94
01111 - General Clerk I		13.10
01112 - General Clerk II		14.30
01113 - General Clerk III		16.05
01120 - Housing Referral Assistant		20.52
01141 - Messenger Courier		11.95
01191 - Order Clerk I		12.44
01192 - Order Clerk II		13.57
01261 - Personnel Assistant (Employment) I		17.21
01262 - Personnel Assistant (Employment) II		19.25
01263 - Personnel Assistant (Employment) III		21.47
01270 - Production Control Clerk		26.54
01280 - Receptionist		12.83
01290 - Rental Clerk		15.00
01300 - Scheduler, Maintenance		16.45
01311 - Secretary I		16.45
01312 - Secretary II		18.40
01313 - Secretary III		20.52
01320 - Service Order Dispatcher		18.84
01410 - Supply Technician		22.80
01420 - Survey Worker		17.33
01531 - Travel Clerk I		14.84
01532 - Travel Clerk II		15.95
01533 - Travel Clerk III		17.09
01611 - Word Processor I		15.07
01612 - Word Processor II		16.91
01613 - Word Processor III		18.91
05000 - Automotive Service Occupations		

05005 - Automobile Body Repairer, Fiberglass	18.71
05010 - Automotive Electrician	18.82
05040 - Automotive Glass Installer	17.82
05070 - Automotive Worker	17.82
05110 - Mobile Equipment Servicer	15.82
05130 - Motor Equipment Metal Mechanic	19.80
05160 - Motor Equipment Metal Worker	17.82
05190 - Motor Vehicle Mechanic	19.80
05220 - Motor Vehicle Mechanic Helper	14.82
05250 - Motor Vehicle Upholstery Worker	16.81
05280 - Motor Vehicle Wrecker	17.82
05310 - Painter, Automotive	18.82
05340 - Radiator Repair Specialist	17.82
05370 - Tire Repairer	14.44
05400 - Transmission Repair Specialist	19.80
07000 - Food Preparation And Service Occupations	
07010 - Baker	17.23
07041 - Cook I	13.97
07042 - Cook II	15.66
07070 - Dishwasher	9.89
07130 - Food Service Worker	10.88
07210 - Meat Cutter	17.51
07260 - Waiter/Waitress	12.54
09000 - Furniture Maintenance And Repair Occupations	
09010 - Electrostatic Spray Painter	20.54
09040 - Furniture Handler	13.45
09080 - Furniture Refinisher	20.54
09090 - Furniture Refinisher Helper	16.17
09110 - Furniture Repairer, Minor	18.34
09130 - Upholsterer	20.54
11000 - General Services And Support Occupations	
11030 - Cleaner, Vehicles	11.95
11060 - Elevator Operator	11.95
11090 - Gardener	16.89
11122 - Housekeeping Aide	13.41
11150 - Janitor	16.03
11210 - Laborer, Grounds Maintenance	12.77
11240 - Maid or Houseman	9.88
11260 - Pruner	11.97
11270 - Tractor Operator	15.28
11330 - Trail Maintenance Worker	12.77
11360 - Window Cleaner	18.02
12000 - Health Occupations	
12010 - Ambulance Driver	16.83
12011 - Breath Alcohol Technician	17.22
12012 - Certified Occupational Therapist Assistant	23.78
12015 - Certified Physical Therapist Assistant	24.27
12020 - Dental Assistant	16.96
12025 - Dental Hygienist	43.92
12030 - EKG Technician	26.27
12035 - Electroneurodiagnostic Technologist	26.27
12040 - Emergency Medical Technician	16.83
12071 - Licensed Practical Nurse I	15.49
12072 - Licensed Practical Nurse II	17.33
12073 - Licensed Practical Nurse III	19.33
12100 - Medical Assistant	14.85
12130 - Medical Laboratory Technician	16.01
12160 - Medical Record Clerk	13.99
12190 - Medical Record Technician	15.65
12195 - Medical Transcriptionist	17.58
12210 - Nuclear Medicine Technologist	36.58
12221 - Nursing Assistant I	10.06

12222 - Nursing Assistant II		11.31
12223 - Nursing Assistant III		12.34
12224 - Nursing Assistant IV		13.85
12235 - Optical Dispenser		17.33
12236 - Optical Technician		16.27
12250 - Pharmacy Technician		15.67
12280 - Phlebotomist		13.85
12305 - Radiologic Technologist		26.57
12311 - Registered Nurse I		29.51
12312 - Registered Nurse II		36.10
12313 - Registered Nurse II, Specialist		36.10
12314 - Registered Nurse III		43.68
12315 - Registered Nurse III, Anesthetist		43.68
12316 - Registered Nurse IV		52.36
12317 - Scheduler (Drug and Alcohol Testing)		21.34
13000 - Information And Arts Occupations		
13011 - Exhibits Specialist I		20.38
13012 - Exhibits Specialist II		25.26
13013 - Exhibits Specialist III		30.90
13041 - Illustrator I		20.38
13042 - Illustrator II		25.26
13043 - Illustrator III		30.90
13047 - Librarian		27.96
13050 - Library Aide/Clerk		14.18
13054 - Library Information Technology Systems Administrator		25.26
13058 - Library Technician		18.10
13061 - Media Specialist I		18.22
13062 - Media Specialist II		20.40
13063 - Media Specialist III		22.73
13071 - Photographer I		16.41
13072 - Photographer II		18.36
13073 - Photographer III		22.74
13074 - Photographer IV		27.81
13075 - Photographer V		33.65
13110 - Video Teleconference Technician		17.69
14000 - Information Technology Occupations		
14041 - Computer Operator I		19.45
14042 - Computer Operator II		21.76
14043 - Computer Operator III		24.28
14044 - Computer Operator IV		26.98
14045 - Computer Operator V		29.87
14071 - Computer Programmer I	(see 1)	22.85
14072 - Computer Programmer II	(see 1)	
14073 - Computer Programmer III	(see 1)	
14074 - Computer Programmer IV	(see 1)	
14101 - Computer Systems Analyst I	(see 1)	
14102 - Computer Systems Analyst II	(see 1)	
14103 - Computer Systems Analyst III	(see 1)	
14150 - Peripheral Equipment Operator		19.45
14160 - Personal Computer Support Technician		26.98
15000 - Instructional Occupations		
15010 - Aircrew Training Devices Instructor (Non-Rated)		30.62
15020 - Aircrew Training Devices Instructor (Rated)		37.04
15030 - Air Crew Training Devices Instructor (Pilot)		44.39
15050 - Computer Based Training Specialist / Instructor		30.62
15060 - Educational Technologist		37.11
15070 - Flight Instructor (Pilot)		44.39
15080 - Graphic Artist		21.49
15090 - Technical Instructor		28.36
15095 - Technical Instructor/Course Developer		32.54
15110 - Test Proctor		21.49

15120 - Tutor	21.49
16000 - Laundry, Dry-Cleaning, Pressing And Related Occupations	
16010 - Assembler	10.90
16030 - Counter Attendant	10.90
16040 - Dry Cleaner	13.76
16070 - Finisher, Flatwork, Machine	10.90
16090 - Presser, Hand	10.90
16110 - Presser, Machine, Drycleaning	10.90
16130 - Presser, Machine, Shirts	10.90
16160 - Presser, Machine, Wearing Apparel, Laundry	10.90
16190 - Sewing Machine Operator	14.71
16220 - Tailor	15.67
16250 - Washer, Machine	11.84
19000 - Machine Tool Operation And Repair Occupations	
19010 - Machine-Tool Operator (Tool Room)	23.95
19040 - Tool And Die Maker	29.01
21000 - Materials Handling And Packing Occupations	
21020 - Forklift Operator	14.88
21030 - Material Coordinator	26.54
21040 - Material Expediter	26.54
21050 - Material Handling Laborer	13.19
21071 - Order Filler	13.22
21080 - Production Line Worker (Food Processing)	14.88
21110 - Shipping Packer	13.22
21130 - Shipping/Receiving Clerk	13.22
21140 - Store Worker I	11.35
21150 - Stock Clerk	16.17
21210 - Tools And Parts Attendant	14.88
21410 - Warehouse Specialist	14.88
23000 - Mechanics And Maintenance And Repair Occupations	
23010 - Aerospace Structural Welder	25.78
23021 - Aircraft Mechanic I	24.50
23022 - Aircraft Mechanic II	25.78
23023 - Aircraft Mechanic III	27.31
23040 - Aircraft Mechanic Helper	17.80
23050 - Aircraft, Painter	22.96
23060 - Aircraft Servicer	20.21
23080 - Aircraft Worker	21.45
23110 - Appliance Mechanic	22.36
23120 - Bicycle Repairer	14.44
23125 - Cable Splicer	34.15
23130 - Carpenter, Maintenance	22.89
23140 - Carpet Layer	20.37
23160 - Electrician, Maintenance	30.09
23181 - Electronics Technician Maintenance I	26.22
23182 - Electronics Technician Maintenance II	28.08
23183 - Electronics Technician Maintenance III	29.95
23260 - Fabric Worker	20.20
23290 - Fire Alarm System Mechanic	24.83
23310 - Fire Extinguisher Repairer	18.63
23311 - Fuel Distribution System Mechanic	25.43
23312 - Fuel Distribution System Operator	19.09
23370 - General Maintenance Worker	19.13
23380 - Ground Support Equipment Mechanic	24.50
23381 - Ground Support Equipment Servicer	20.21
23382 - Ground Support Equipment Worker	21.45
23391 - Gunsmith I	18.63
23392 - Gunsmith II	21.74
23393 - Gunsmith III	24.83
23410 - Heating, Ventilation And Air-Conditioning Mechanic	21.57
23411 - Heating, Ventilation And Air Contditioning	22.70

Mechanic (Research Facility)	
23430 - Heavy Equipment Mechanic	25.42
23440 - Heavy Equipment Operator	23.61
23460 - Instrument Mechanic	26.61
23465 - Laboratory/Shelter Mechanic	23.29
23470 - Laborer	12.28
23510 - Locksmith	20.45
23530 - Machinery Maintenance Mechanic	25.56
23550 - Machinist, Maintenance	22.78
23580 - Maintenance Trades Helper	16.87
23591 - Metrology Technician I	26.61
23592 - Metrology Technician II	28.00
23593 - Metrology Technician III	29.66
23640 - Millwright	30.04
23710 - Office Appliance Repairer	22.32
23760 - Painter, Maintenance	19.88
23790 - Pipefitter, Maintenance	29.30
23810 - Plumber, Maintenance	27.84
23820 - Pneudraulic Systems Mechanic	24.83
23850 - Rigger	24.83
23870 - Scale Mechanic	21.74
23890 - Sheet-Metal Worker, Maintenance	25.26
23910 - Small Engine Mechanic	19.59
23931 - Telecommunications Mechanic I	25.46
23932 - Telecommunications Mechanic II	26.79
23950 - Telephone Lineman	23.94
23960 - Welder, Combination, Maintenance	21.15
23965 - Well Driller	24.83
23970 - Woodcraft Worker	24.83
23980 - Woodworker	18.63
24000 - Personal Needs Occupations	
24570 - Child Care Attendant	10.04
24580 - Child Care Center Clerk	13.63
24610 - Chore Aide	11.35
24620 - Family Readiness And Support Services Coordinator	13.44
24630 - Homemaker	14.44
25000 - Plant And System Operations Occupations	
25010 - Boiler Tender	27.31
25040 - Sewage Plant Operator	23.29
25070 - Stationary Engineer	27.31
25190 - Ventilation Equipment Tender	20.58
25210 - Water Treatment Plant Operator	23.29
27000 - Protective Service Occupations	
27004 - Alarm Monitor	22.01
27007 - Baggage Inspector	17.55
27008 - Corrections Officer	23.96
27010 - Court Security Officer	25.24
27030 - Detection Dog Handler	22.01
27040 - Detention Officer	23.96
27070 - Firefighter	25.75
27101 - Guard I	17.55
27102 - Guard II	22.01
27131 - Police Officer I	28.67
27132 - Police Officer II	31.84
28000 - Recreation Occupations	
28041 - Carnival Equipment Operator	15.64
28042 - Carnival Equipment Repairer	16.71
28043 - Carnival Equpment Worker	11.72
28210 - Gate Attendant/Gate Tender	14.01
28310 - Lifeguard	11.90
28350 - Park Attendant (Aide)	15.66

28510 - Recreation Aide/Health Facility Attendant		11.35
28515 - Recreation Specialist		19.27
28630 - Sports Official		12.47
28690 - Swimming Pool Operator		22.22
29000 - Stevedoring/Longshoremen Occupational Services		
29010 - Blocker And Bracer		27.81
29020 - Hatch Tender		27.81
29030 - Line Handler		27.81
29041 - Stevedore I		25.82
29042 - Stevedore II		29.78
30000 - Technical Occupations		
30010 - Air Traffic Control Specialist, Center (HFO)	(see 2)	35.77
30011 - Air Traffic Control Specialist, Station (HFO)	(see 2)	24.66
30012 - Air Traffic Control Specialist, Terminal (HFO)	(see 2)	27.16
30021 - Archeological Technician I		16.14
30022 - Archeological Technician II		18.43
30023 - Archeological Technician III		24.07
30030 - Cartographic Technician		25.48
30040 - Civil Engineering Technician		24.78
30061 - Drafter/CAD Operator I		16.14
30062 - Drafter/CAD Operator II		18.43
30063 - Drafter/CAD Operator III		20.55
30064 - Drafter/CAD Operator IV		24.77
30081 - Engineering Technician I		16.35
30082 - Engineering Technician II		18.35
30083 - Engineering Technician III		20.53
30084 - Engineering Technician IV		25.43
30085 - Engineering Technician V		31.11
30086 - Engineering Technician VI		38.46
30090 - Environmental Technician		22.34
30210 - Laboratory Technician		23.90
30240 - Mathematical Technician		22.36
30361 - Paralegal/Legal Assistant I		17.77
30362 - Paralegal/Legal Assistant II		22.02
30363 - Paralegal/Legal Assistant III		26.94
30364 - Paralegal/Legal Assistant IV		32.59
30390 - Photo-Optics Technician		22.36
30461 - Technical Writer I		22.20
30462 - Technical Writer II		27.15
30463 - Technical Writer III		32.85
30491 - Unexploded Ordnance (UXO) Technician I		22.74
30492 - Unexploded Ordnance (UXO) Technician II		27.51
30493 - Unexploded Ordnance (UXO) Technician III		32.97
30494 - Unexploded (UXO) Safety Escort		22.74
30495 - Unexploded (UXO) Sweep Personnel		22.74
30620 - Weather Observer, Combined Upper Air Or Surface Programs	(see 2)	20.55
30621 - Weather Observer, Senior	(see 2)	20.75
31000 - Transportation/Mobile Equipment Operation Occupations		
31020 - Bus Aide		11.43
31030 - Bus Driver		16.99
31043 - Driver Courier		12.52
31260 - Parking and Lot Attendant		10.69
31290 - Shuttle Bus Driver		13.65
31310 - Taxi Driver		11.88
31361 - Truckdriver, Light		13.65
31362 - Truckdriver, Medium		14.80
31363 - Truckdriver, Heavy		21.02
31364 - Truckdriver, Tractor-Trailer		21.02
99000 - Miscellaneous Occupations		
99030 - Cashier		10.64
99050 - Desk Clerk		9.81

99095 - Embalmer	24.57
99251 - Laboratory Animal Caretaker I	12.19
99252 - Laboratory Animal Caretaker II	13.28
99310 - Mortician	24.57
99410 - Pest Controller	21.01
99510 - Photofinishing Worker	11.95
99710 - Recycling Laborer	16.23
99711 - Recycling Specialist	19.82
99730 - Refuse Collector	14.49
99810 - Sales Clerk	12.30
99820 - School Crossing Guard	14.43
99830 - Survey Party Chief	23.63
99831 - Surveying Aide	14.85
99832 - Surveying Technician	20.32
99840 - Vending Machine Attendant	16.41
99841 - Vending Machine Repairer	20.45
99842 - Vending Machine Repairer Helper	16.41

ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: $3.81 per hour or $152.40 per week or $660.40 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 5 years, 4 weeks after 10 years, and 5 weeks after 20 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year, New Year's Day, Martin Luther King Jr's Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4174)

THE OCCUPATIONS WHICH HAVE NUMBERED FOOTNOTES IN PARENTHESES RECEIVE THE FOLLOWING:

1) Does not apply to employees employed in a bona fide executive, administrative, or professional capacity as defined and delineated in 29 CFR 541. (See CFR 4.156)

2) AIR TRAFFIC CONTROLLERS AND WEATHER OBSERVERS - NIGHT PAY & SUNDAY PAY: If you work at night as part of a regular tour of duty, you will earn a night differential and receive an additional 10% of basic pay for any hours worked between 6pm and 6am. If you are a full-time employed (40 hours a week) and Sunday is part of your regularly scheduled workweek, you are paid at your rate of basic pay plus a Sunday premium of 25% of your basic rate for each hour of Sunday work which is not overtime (i.e. occasional work on Sunday outside the normal tour of duty is considered overtime work).

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordinance, explosives, and incendiary materials. This includes work such as screening, blending, dying, mixing, and pressing of sensitive ordance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives.

Demilitarization, modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only applicable to work that has been specifically designated by the agency for ordance, explosives, and incendiary material differential pay.

** UNIFORM ALLOWANCE **

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of $3.35 per week (or $.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations", Fifth Edition, April 2006, unless otherwise indicated. Copies of the Directory are available on the Internet. A links to the Directory may be found on the WHD home page at http://www.dol.gov/esa/whd/ or through the Wage Determinations On-Line (WDOL) Web site at http://wdol.gov/.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall

be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

1) When preparing the bid, the contractor identifies the need for a conformed occupation(s) and computes a proposed rate(s).

2) After contract award, the contractor prepares a written report listing in order proposed classification title(s), a Federal grade equivalency (FGE) for each proposed classification(s), job description(s), and rationale for proposed wage rate(s), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.

3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).

4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.

5) The contracting officer transmits the Wage and Hour decision to the contractor.

6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

J.5.2 - Wage Determination No.: CBA-2012-5191 Rev No. 3 Dated 11/11/2013
(Cover Page Below)

REGISTER OF WAGE DETERMINATION UNDER
THE SERVICE CONTRACT ACT
By direction of the Secretary
of Labor

U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON D.C. 20210

Wage Determination No.: CBA-2012-5191
Revision No.: 3
Date Of Last Revision: 11/11/2013

Diane Koplewski
Director

Division of
Wage Determinations

State: Washington

Area: Benton

Employed on U.S. Department of Energy, Office of River Protection contract for the scope of this contract, awarded to Advanced Technologies and Laboratories, is to perform the Analytical Services production functions of receiving, handling, analyzing, storing samples, performing special tests and reporting the results of these analyses and tests to the contractors of Department of Energy Offices at the Hanford Nuclear Site near Richland, Washington. These functions will be performed through a contract with the DOE Office of River Protection at the 222-S Laboratory located in 200 West.

Collective Bargaining Agreement between contractor: Advanced Techologies and Laboratories, Inc., and union: Hanford Atomic Metal Trades Council, effective 11/11/2013 through 11/10/2018 and amended on 11/11/2013.

In accordance with Section 2(a) and 4(c) of the Service Contract Act, as amended, employees employed by the contractor(s) in performing services covered by the Collective Bargaining Agreement(s) are to be paid wage rates and fringe benefits set forth in the current collective bargaining agreement and modified extension agreement(s).

ATTACHMENT J.6 - HANFORD 222-S LABORATORY DOCUMENTED SAFETY ANALYSIS

In accordance with Section C requirements, the following documents are incorporated and provided in separate PDF files:

Documented Safety Analysis:

Technical Safety Requirements:

222-S Laboratory Documented Safety Analysis

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U.S. Department of Energy Contract DE-AC27-08RV14800

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Abstract: This document provides the Documented Safety Analysis for the 222-S Laboratory.

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222-S Laboratory Documented Safety Analysis

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Prepared for the U.S. Department of Energy
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ACRONYMS

10 CFR	Title 10 *Code of Federal Regulations*
AC	Administrative Control
AIChE	American Institute of Chemical Engineers
ALARA	as low as reasonably achievable
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ATL	Advanced Technologies and Laboratories International, Inc.
ATS	Analytical Technical Services
BBI	Best Basis Inventory
CAM	continuous air monitor
CED	committed effective dose
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSU	Chemical Storage Unit
CW	collocated worker
CWC	Central Waste Complex
DBA	design basis accident
DBE	design basis earthquake
DE-Ci	dose equivalent curies
DEF	dose equivalent factor
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSA	Documented Safety Analysis
ETF	Effluent Treatment Facility
FFTF	Fast Flux Test Facility
FHA	Fire Hazards Analysis
FRP	fiberglass reinforced pipe
HEPA	high-efficiency particulate air (filter)
HMS	Hanford Meteorological Station
HVAC	heating, ventilation, and air conditioning
ICRP	International Commission on Radiological Protection
ISMS	Integrated Environment, Safety, and Health Management System
LCO	Limiting Condition for Operation
LCS	Limiting Control Setting
LLW	low-level waste
MAR	material at risk
MCM	minimum critical mass
MOI	maximum offsite individual
NDA	nondestructive assay
NEC	National Electrical Code
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
OCC	occupational
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl

PFP	Plutonium Finishing Plant
PHA	Preliminary Hazards Analysis
PNNL	Pacific Northwest National Laboratory
PVC	polyvinyl chloride
QA	quality assurance
RAD	radiological
RCRA	Resource Conservation and Recovery Act
REDOX	reduction-oxidation (facility)
SAA	Satellite Accumulation Area
SARAH	*Hanford Safety Analysis and Risk Assessment Handbook*
SL	Safety Limit
SMP	Safety Management Program
SR	Surveillance Requirement
SSC	structures, systems, and components
TED	total effective dose
TEDF	Treated Effluent Disposal Facility
TPQ	Threshold Planning Quantity
TRU	transuranic (waste)
TSD	Treatment, Storage, and Disposal
TSR	Technical Safety Requirements
TWINS	Tank Waste Information Network System
UBC	Uniform Building Code
VCP	vitrified clay pipe
WDOE	Washington State Department of Ecology
WRPS	Washington River Protection Solutions, LLC

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EXECUTIVE SUMMARY

Facility Background and Mission

The 222-S Laboratory Complex, located in the 200 West Area of the Hanford Nuclear Reservation, provides analytical chemistry services for the Hanford Site projects, operations, and environmental cleanup activities. Laboratory personnel complete organic, inorganic, and radioisotope analysis of liquid and solid samples brought to the laboratory by the Hanford Site customers. Currently, the 222-S Laboratory long-term mission is to support the Hanford Site environmental cleanup and restoration activities.

Facility Overview

Between 1950 and 1951 the 222-S Laboratory was constructed adjacent to the plutonium reduction-oxidation (REDOX) facility in the 200 West Area on the Central Plateau of the Hanford Site. The laboratory and office space have been progressively enlarged and upgraded as the mission warranted. The 222-S Laboratory Complex consists of the 222-S Laboratory Building, which provides analytical chemistry services for the Hanford Site, and the auxiliary buildings that support the chemistry mission.

The Hanford Site is a 1,517 km^2 (586 mi^2) tract of semiarid land located within the Pasco Basin of the Columbia Plateau in southeastern Washington State. Facilities and activities at the Hanford Site are consolidated in operating areas scattered across the site and occupy approximately 6% of the total site area. The site is bounded on the north by the Saddle Mountains, on the east by the Columbia River, on the south by the Yakima River, and on the west by the Rattlesnake Hills.

The 222-S Laboratory and auxiliary buildings, located in the southwest portion of the 200 West Area of the Hanford site, are collectively a Hazard Category 3 nonreactor nuclear facility. 222-S Laboratory is exposed to a potential hazard from radioactive and toxicological release by the Plutonium Finishing Plant (PFP). The laboratory is within the emergency planning zone of the PFP and is connected to the Patrol Operations Center, which would communicate emergencies via the Site emergency notification system. The PFP is located approximately 3 km (1.9 mi) northwest of 222-S Laboratory. Previously, the mission of PFP was to produce weapons-grade plutonium metal. Currently, the mission is to place the remaining plutonium in a stabilized form (e.g., plutonium oxide) in preparation for the eventual decontamination and decommissioning of the facility. Other facilities in the 200 West Area with ongoing operations that have a potential for affecting 222-S Laboratory include the high-level radioactive waste storage tanks, Environmental Restoration Disposal Facility, Central Waste Complex (CWC), T Plant, and low-level burial grounds.

Policy that complies with applicable U.S. Department of Energy (DOE) Orders and the Code of Federal Regulations is established. The 222-S Laboratory has procedures as the means to comply with the Orders and regulations.

Facility Hazard Classification
Hazards that can contribute to the uncontrolled release of radioactive or hazardous materials (called hazardous conditions) are systematically and comprehensively identified through the Hazard Analysis process (Section 3.3). The identified set of potential uncontrolled releases is subject to a candidate selection process. This process identifies candidate representative accidents, which are the starting point for the Accident Analysis (Section 3.4). Results of the accident analysis and the hazard analysis are used to support the Control Decision Process (Section 3.3.2.3.2). This process identifies safety-related controls and classifies safety-related structures, systems, and components (SSCs). The controls are allocated to all hazardous conditions identified by the Hazard Analysis.

The 222-S Laboratory will be operated as a Hazard Category 3 nuclear facility by maintaining radioactive material inventories below Category 2 threshold quantities provided in DOE-STD-1027-92. Facility inventory limits are used to maintain the total inventory in the facility below the dose equivalent curies used to calculate the dose consequences identified in the accident analysis, which is below the Hazard Category 2 thresholds.

Safety Analysis Overview
Facility operations consistent with its mission to receive, analyze, store, report, and discharge radioactive materials is reviewed for the identification of all hazards and energy sources. A hazard is defined to be an energy source or harmful material (radioactive or hazardous). The following hazards were not considered for further detailed analysis in the hazard evaluation:

- Hazards routinely encountered and/or accepted by the public
- Hazards controlled by regulations and/or one or more national consensus standards
- General radiological hazards subject to Title 10, *Code of Federal Regulations* Part 835, "Occupational Radiation Protection" (10 CFR 835)
- Hazards likely to be found in homes, general retail outlets, and associated with open-road transportation subject to U.S. Department of Transportation regulation.

However, these types of industrial and radiological hazards are included in the evaluation of hazards.

From the Preliminary Hazards Analysis (PHA) a wide-ranging set of hazardous conditions is formulated that could lead to release of radioactive or hazardous materials from contained locations within the facility vessels and piping. Based on this, a list of candidate representative accidents is selected that can be considered to represent and bound all hazardous conditions. From this candidate list, accidents are defined and analysis performed to quantitatively determine safety impacts.

Six accident groups were identified using this approach. These groups are discussed along with the bounding hazardous condition for each group in Section 3.3.2.3.5. Chemical releases are

provided for completeness but they are not considered part of the candidate representative accident selection.

- Fire/Explosion
- Storage Tank Failure/Leaks
- Container Handling Accidents
- Container Overpressure Accidents
- Confinement System Failure
- Natural Phenomena/External Events

A building-wide fire is selected as the bounding accident for the 222-S Laboratory. Such a fire can be started by a failure of a compressed cylinder of flammable gas or gas line in a laboratory room. The building-wide fire scenario is assumed to result from the spread of either a local fire or a local deflagration and resulting fire.

The expectation for Hazard Category 3 facilities, according to the direction presented in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH), is the establishment of an inventory limit based on quantification of unmitigated risk from bounding scenarios.

Organizations

Washington River Protection Solutions LLC (WRPS) is the prime contractor to DOE responsible for managing the 222-S Laboratory. The 222-S Laboratory organization has the responsibility for the operation of the laboratory including programs such as maintenance, waste management, occupational health and safety, radiological control, and process development. Advanced Technologies and Laboratories International, Inc. (ATL) has the responsibility for routine management of the analytical chemistry services at the 222-S Laboratory.

The 222-S Laboratory Documented Safety Analysis (DSA) was prepared by a team of operating and technical staff from the 222-S Laboratory, the Pacific Northwest National Laboratory (PNNL), and nuclear safety personnel of WRPS.

Safety Analysis Conclusions

The operation of the 222-S Laboratory will have no impact on members of the public, collocated workers, and environment, and minimal impact on operating personnel during normal operations. No safety-class or safety-significant SSCs were identified by the hazard and accident analysis. Adherence to the Technical Safety Requirements (TSR) ensures that the facility will be operated within the established risk guidelines.

Documented Safety Analysis Organization

The structure and content of this DSA parallels the format delineated in DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*.

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1.0 SITE CHARACTERISTICS

1.1 Introduction

This chapter provides a summary of U.S. Department of Energy (DOE) Hanford Site Characteristics relative to the 222-S Laboratory as specified by DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, Chapter 2. Much of the information in this section is general for the Hanford Site; however, it has been tailored to reflect information relevant to the 222-S Laboratory operations and activities. This chapter conforms to the direction presented in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH).

The U.S. Army Corps of Engineers selected the Hanford Site in 1943 for the production of nuclear weapons material. Current activities on the Hanford Site focus on environmental restoration, waste management, and technology research. The Hanford Site utilizes access control points at the entrance roads for reasons of national security as well as health and safety considerations.

The natural characteristics of the Hanford Site have been researched continually and documented since the early 1940s. Information about local winds and diffusion estimates are based on measurements at the Hanford Meteorological Station (HMS). Data specific to the WRPS nuclear facilities include nearby industrial, transportation, and military facilities; subsurface hydrology; potential impacts of river flooding; and seismic hazards.

Between 1950 and 1951 the 222-S Laboratory was constructed adjacent to the plutonium reduction-oxidation (REDOX) facility in the 200 West Area on the Central Plateau of the Hanford Site. The laboratory and office space have been progressively enlarged and upgraded as the mission warranted. The 222-S Laboratory Complex consists of the 222-S Laboratory Building, which provides analytical chemistry services for the Hanford Site, and the auxiliary buildings that support the chemistry mission. The laboratory and support facilities are individually described in Chapter 2.0.

1.2 Requirements

The Hanford Site was designed, built, and operated using a range of different requirements since 1943. Current requirements for design, construction, and operation of Tank Operations Contractor (TOC) nuclear facilities are specified by Contract DE-AC27-08RV14800.

Current requirements for the evaluation of hazards are contained in DOE O 420.1B, *Facility Safety*, and Title 10 *Code of Federal Regulations* Part 830 (10 CFR 830) Subpart B, “Safety Basis Requirements.”

1.3 Site Description

This section describes the overall Hanford Site, the area boundaries, and presents demographic information for the area based on 1990 and 2000 census data. The site covers a large area so specific distances used in hazard categorization and accident analyses for facilities vary depending on the facility's location within the Hanford Site. Much of the current information is

obtained from reference document PNNL-6415, *Hanford Site National Environmental Policy Act (NEPA) Characterization*. The parameters specific to the 222-S Laboratory accident analysis are described here and in Chapter 2.0.

1.3.1 Geography

The Hanford Site is a 1517-km^2 (586 square mile) tract of semiarid land located within the Pasco Basin of the Columbia Plateau in southeastern Washington State. Facilities and activities at the Hanford Site are consolidated in operating areas scattered across the site and occupy approximately 6% of the total site area. The site is bounded on the north by the Saddle Mountains, on the east by the Columbia River, on the south by the Yakima River, and on the west by the Rattlesnake Hills. The Site extends into Benton, Franklin, Grant, and Adams Counties. State Highways 24, 240, and 243 pass through the Hanford Site. Figures 1-1 through 1-3 show the location of the Hanford Site within the state of Washington, a Hanford Site map, and a detailed map of the 200 West Area.

The Hanford Patrol controls access to the Hanford Site for DOE and only persons authorized by DOE are allowed to enter. Although the public may travel on the Columbia River and State Route 240, both of which allow passage in close proximity to the facilities inside the Site boundary, the Benton County Sheriff's Department in cooperation with the Hanford Patrol may restrict such travel; thus, these routes are not considered public.

The hazard and accident analysis for the 222-S Laboratory considers the closest Offsite Public to be 13.0 km (8.1 miles) directly west of the laboratory.

1.3.2 Demography

This section summarizes data on current regional and transient population. Only DOE authorized public, workers, contractors, and visitors are permitted within the site boundary. There are no residents within the Hanford Site boundary and the population distribution in the area surrounding the site is not uniform.

The larger communities nearest the site include Richland, Kennewick, Pasco, West Richland, Benton City, Prosser, Sunnyside, Grandview, and Mesa. The city of Richland is the closest of the large population centers to the 222-S Laboratory and is approximately 37.0 km (23 miles).

1.4 Environmental Description

This section summarizes the meteorological, hydrological, and geological information pertaining to the 222-S Laboratory and other facilities located on the Hanford Site.

1.4.1 Meteorology

The Hanford Site is located in a semiarid region of southeastern Washington State. The region's climate is greatly influenced by the Pacific Ocean, the Cascade Mountain Range to the west, and other mountain ranges located to the north and east. The Pacific Ocean moderates temperatures throughout the Pacific Northwest and the Cascade Range generates a rain shadow that limits rain and snowfall in the eastern half of Washington State. The Cascade Range also serves as a source of cold air drainage, which has a considerable effect on the wind regime on the Hanford Site.

Mountain ranges to the north and east of the region shield the area from the severe winter storms and frigid air masses that move southward across Canada.

Data for the Hanford Site are compiled at the HMS. The HMS is located on Hanford's 200 Central Plateau, just outside the northeast corner of 200 West Area and about 4 km (3 mi) west of the 200 East Area. Meteorological measurements have been made at the HMS since late 1944. Prior to the establishment of the HMS, local meteorological observations were made at the Old Hanford Townsite (1912 through late 1943) and in Richland (1943-1944). A climatological summary for Hanford is documented in PNNL-13469, *Climatological Data Summary 2000 with Historical Data*.

To accurately characterize meteorological differences across the Hanford Site, the HMS operates a network of automated monitoring stations. These stations, which currently number approximately 30, are located throughout the site and in neighboring areas (Figure 1-4). A 124-m (408 ft) instrumented meteorological tower operates at the HMS. A 60-m (197 ft) instrumented tower operates at each of the 100-N, 300, and 400 Area meteorology-monitoring sites, (Figure 1-5). Most of the other network stations use short-instrumented towers with heights of about 9.1 m (30 ft). Data are collected and processed at each monitoring site, and key information is transmitted to the HMS every 15 minutes. This monitoring network has been in full operation since the early 1980s.

Information concerning local winds and diffusion estimates are based on measurements at the HMS. Meteorological parameters measured in the area of the Hanford Site are documented in PNNL-11107, *Climatological Data Summary, 1995 with Historical Data*, and in PNNL-13469, *Hanford Site Climatological Data Summary 2000 with Historical Data*. In December 1944, the HMS and its 125-meter (410 ft) instrumented tower became operational. In 1982, the instruments on the tower were replaced with equipment that met applicable U.S. Nuclear Regulatory Commission requirements. Temperature, relative humidity, precipitation, atmospheric pressure, solar radiation, cloud cover, and visibility are measured or observed at regular intervals at the HMS.

Prevailing wind directions near the surface on Hanford's Central Plateau are from the northwest in all months of the year (Figure 1-4). Winds from the northwest occur most frequently during the winter and summer. Winds from the southwest also have a high frequency of occurrence on the Central Plateau. During the spring and fall, there is an increase in the frequency of winds from the southwest and a corresponding decrease in winds from the northwest.

Stations that are relatively close together can exhibit significant differences in wind patterns. For example, the stations at Rattlesnake Springs and the 200 West Area are separated by about 5 km (3 mi), yet the wind patterns at the two stations are very different (see Figure 1-4). Care should be taken when assessing the appropriateness of the wind data used in estimating environmental impacts. When possible, wind data from the closest representative station should be used for assessing local dispersion conditions. The wind patterns measured at the #7 (West Area) and #19 (PFP) stations are very similar and are considered to be the most representative of wind patterns at the 222-S Laboratory.

1.4.2 Hydrology

The Hanford Site is situated within the Columbia River drainage basin. Two major rivers within the drainage basin, the Columbia and the Yakima, border the Hanford Site. Columbia River flow near the Hanford Site has been measured since 1917. These data show an average discharge of 3400 m^3/s (120,067 ft^3/s). Data gathered from the mouth of the Yakima River show an average discharge of 99 m^3/s (3496 ft^3/s).

The flow of the Columbia River adjacent to the Hanford Site is regulated by operation of the Priest Rapids Dam. The maximum historical flood recorded on the unregulated Columbia River occurred in 1894, causing a peak discharge at what is now the Hanford Site estimated at 21,000 m^3/s (741,594 ft^3/s). Under regulated conditions, the peak discharge below the Priest Rapids Dam for the 100-year flood is calculated to be 12,500 m^3/s (441,425 ft^3/s).

The most severe flood of the Yakima River was recorded in 1933 and had a peak discharge of 1900 m^3/s (67,097 ft^3/s). Floods of this size are expected about once every 170 years. The 100-year flood plain for the Yakima River indicates that floodwaters reach only the very southern portions of the Hanford Site and would not affect the 222-S Laboratory.

1.4.3 Geology

The Hanford Site lies within the Pasco Basin that is part of the Columbia Basin subprovince of the Columbia Intermontane Physiographic Province. The Pasco Basin comprises thick layers of basalt interspersed with layers of sedimentary material. Principal geologic units beneath the Hanford Site include, in ascending order, the Columbia River Basalt Group, the Ringold formation, and the deposits informally referred to as the Hanford formation. Major topographic relief forms include several east-to-southeast trending ridges, which are the surface manifestations of anticlinal folding of the underlying basalt.

The Columbia River Basalt Group is composed of numerous basaltic lava flows. The rate of eruption of these lava flows slowed with time, allowing sediment to be deposited before the next basalt flow covered the landscape. These sediments now form water-bearing interbeds between many of the most recent basalt flows. Deposition of these sediments continued after eruption of the basalt flows ceased, creating the Ringold formation. This formation generally consists of an alternating sequence of sand and gravel main-channel river deposits and muddy overbank and lake deposits. In places, these layers are unconsolidated, while in others they are weakly to moderately cemented. The Ringold Formation was deposited some 8.5 to 3.9 million years ago. Deposition of the Ringold formation was followed by a period of nondeposition and erosion, which removed varying amounts of the sediment throughout the Pasco Basin. At the same time, the Plio-Pleistocene unit caliche and gravel and the wind blown sand and silt of the early "Palouse" soil were deposited in the western portion of the basin.

1.5 Natural Phenomena Threats

This section identifies the natural phenomena with potential for adverse impacts on the safe operation of 222-S. For each natural phenomenon, information is presented on frequency of occurrence, magnitude, and the design considerations that reduce impacts. The natural phenomena presented in this section are severe weather, floods, earthquakes, snow, rain, volcanic activity, and range fires.

Severe weather includes dust storms, high winds, thunderstorms, lightning strikes, and tornadoes. The most frequent severe weather phenomenon at the Hanford Site and the one with the greatest impact on normal operations is the dust storm. Dust storms occur when winds greater than 29 km/h (18 mph) re-suspend dust from various sources into the air. The HMS reports that dust storms occur at the Hanford Site with an average frequency of eight times a year. During these times, visibility is reduced to 9.7 km (6 miles) or less. Restricted visibility, blowing dust, and the potential to clog high-efficiency particulate air (HEPA) and other filters are the main hazards associated with these storms.

Extreme winds and the associated wind pressures on facilities and structures constitute the major severe weather hazard to safe operation of the facilities. The maximum-recorded peak wind gust at 15 m (49 ft) above ground level is 129 km/h (80 mph), which occurred in January 1972. Uniform design and evaluation guidelines based on these wind data have been developed for protection against extreme wind hazards at Hanford Site facilities and are used to determine the design criteria for new SSCs. The standard architectural-civil design criteria, DOE-STD-1020-2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, established the wind load design requirements.

The average year has 10 thunderstorm days. Thunderstorms are considered severe weather when accompanied by wind gusts greater than 90 km/h (56 mph) and/or hail with diameter equal to or greater than 1.9 cm (0.75 in.). Although very rare, severe weather thunderstorms have occurred at the Hanford Site. Other than the impact of rain, high wind speeds have the potential to adversely affect the facilities. The principal hazard associated with the thunderstorms is wild range fire due to lightning strikes.

Tornadoes are very rare in the vicinity of the Hanford Site. The DOE no longer requires design criteria to be established for tornadoes for nonreactor facilities on the Hanford Site.

Three scenarios for possible flooding on the Hanford Site are breach of Grand Coulee Dam, blockage of the Columbia River, and intense precipitation.

The maximum postulated flood scenario results from a hypothetical 50% breach of Grand Coulee Dam on the Columbia River, upstream from the Hanford Site. This scenario is calculated to result in an inundation of the Hanford Site with floodwaters to an elevation of about 148 m (486 ft) above mean sea level in the vicinity of B and C Reactors (Figure 1-6).

The elevation of the 222-S Laboratory is approximately 198 m (650 ft) above mean sea level. Floodwaters that rise to an elevation of only 148 m (486 ft) above sea level will not approach the laboratory.

The potential for massive landslides resulting in blockage along the Columbia River is judged to be bounded by the 50% breach of the Grand Coulee Dam case.

The location of the 222-S Laboratory near the top of the 200 Area plateau, in addition to the grading and drainage features that are provided, ensures that precipitation, even from a

downpour as severe as 30 cm (12 in.) in 24 h, would infiltrate the ground or drain off toward the Columbia River without significant flooding. Adverse impacts from less severe local precipitation run-on and run-off are not expected. The laboratory is not sited in a wetlands or coastal high-hazard area.

The Columbia Plateau experiences seismic activities that are relatively shallow in nature and of low to moderate intensities. A seismic network installed on the Hanford Site in 1969 shows that the majority of seismic events have magnitudes of less than 3.5 and occur at depths of less than 4 km (2.5 mi). These are considered to be shallow micro earthquakes and may consist of as many as 100 events lasting from a few days to several months.

The largest known earthquake in the region occurred in 1936 near Milton Freewater, Oregon. The estimated surface-wave magnitude of this earthquake was 5.7 to 5.8. Other events occurred near Umatilla, Oregon, in 1893; near the Saddle Mountains in 1918; near Corfu, Washington, in 1973; and near College Place, Washington, in 1979. All of these events measured less than 4.5 in intensity.

A seismic event is the most significant natural phenomenon affecting safety, because it has the greatest potential for resulting in common-cause failures. For most facilities, the primary seismic hazard is the earthquake ground motion. Other potentially adverse affects of earthquakes stem from fault displacement, liquefaction, seismically induced slope instability, and ground settlement; however, the geologic conditions favorable to these hazards are not present at Hanford or 200 W facilities.

For the high-hazard facility-use category, the design basis earthquake (DBE) is specified in the seismic guidelines as the maximum horizontal ground surface acceleration, with an annual probability of exceedance of 2.0E+04 (return period of 5000 years). This corresponds to a peak horizontal acceleration of 0.20g. For the moderate- and low-hazard facility-use categories, the seismic guidelines specify the DBE loading as the maximum horizontal ground surface acceleration with an annual probability of exceedance of 1.0E+03 (return period of 1000 years). This corresponds to a peak horizontal acceleration of 0.12g for the 200 West Area. Seismic design criteria are then applied to the facilities on the basis of the safety classifications of SSCs.

All new aboveground structures and components are designed to withstand snow loading in accordance with ANSI A58.1-1982, *Minimum Design Loads for Buildings and Other Structures*. The following criteria are used:

- Ground snow load-73 kg/m^2 (15 lb/ft^2), and
- Minimum roof load-98 kg/m^2 (20 lb/ft^2).

Because Hanford facilities are located in a semiarid region, the snow loading bound the rain loading.

The Hanford Site is in a region subject to ashfall from volcanic eruptions. The three major volcanic peaks closest to the Site are Mt. Adams, about 100 mi away; Mt. Rainier, about 110 mi away; and Mt. St. Helens, about 130 mi away. Important historical ashfalls affecting this

location were from eruptions of Glacier Peak about 12,000 years ago, Mt. Mazama about 6000 years ago, and Mt. St. Helens about 8000 years ago. The most recent ashfall resulted from the May 18, 1980, eruption of Mt. St. Helens. Volcanic ash loading design criteria of 117.2 kg/m^2 (24 lb/ft^2) is applicable only to the design of safety-class SSCs.

The major factors that protect the 222-S Laboratory from hazards associated with range fires are (1) grading, maintenance, and continuous housekeeping to minimize combustible material; (2) fire breaks by the roadways; and (3) location close to the 200 Area Fire Station. (The fire station can respond to 200 West Area calls within 10 minutes.) The Hanford Fire Department has firefighting equipment on hand to deal with range fires and has experience protecting Hanford Site facilities from fire damage. For these reasons, adverse impacts in excess of the bounding accident scenarios are not anticipated.

The most severe range fire documented on the Hanford Site occurred in 1984. The fire burned approximately two-thirds of the total land area and threatened some Hanford Site facilities; however, because of the grading, maintenance, housekeeping, fire breaks, and the efforts of the Hanford Fire Department, facilities were protected, and there was no significant damage, project economic loss, or programmatic impact.

Another large range fire occurred in June and July 2000 and swept through the Hanford Site. It burned approximately 655 km^2 (250 mi^2).

Hazards from other natural phenomena (e.g., surge and seiche flooding, tsunami flooding, and ice flooding) were considered not credible or were determined to have no potential for impact.

1.6 External Human Generated Threats

The regional highway network traversing the Hanford Site (State Highways 24 and 240) has restricted access roadways. Commercial trucks that deliver gas, diesel fuel, and chemicals use these highways and Hanford Site roads. Because of the distance from these roads to the laboratory, the impact of a highway accident involving toxic and hazardous chemicals would be less severe than the bounding chemical or toxic material accident occurring in the 200 Areas.

The nearest airport to the Hanford site is the Richland Airport, a small general utility airport. Commercial air carriers use the Tri Cities Airport in Pasco, Washington, located southeast of Hanford facilities. The probability of a commercial aircraft adversely affecting the Hanford facilities is considered remote, given the relatively low volume of air traffic at the airport and the distance between the airports and Hanford facilities.

1.7 Nearby Facilities

No industrial refineries, oil storage facilities, or other major commercial facilities are located close to Hanford facilities. A vehicle refueling station is located adjacent to the 200 East Area approximately 5 km (3 mi) from 200 West Area. The nearest natural gas transmission pipeline is about 48 km (30 mi) away. The distance between these facilities and 222-S Laboratory makes any adverse impact to the laboratory from explosions or fire at these installations nonexistent.

The closest nearby facility which poses significant hazard to the 222-S Laboratory is the REDOX facility located approximately 100 m north of 222-S Laboratory. It is unoccupied and is scheduled for decontamination and decommissioning (D&D). The primary concern with the building, as reported in the REDOX documented safety analysis, is a roof collapse in a seismic event with a peak ground acceleration of greater than 0.03g. The radiological consequences resulting from the seismic event with the cover blocks installed, current configuration would result in a committed effective dose (CED) of 13 rem to the laboratory personnel in the 222-S Laboratory Building and up to 74 rem to personnel working between REDOX and the laboratory. The seismic analysis assumed that the coverblocks were in place, and they are designated as safety-significant Design Features and controlled through configuration management to ensure the cover blocks are not removed. If the cover blocks were not in place during a seismic event causing the roof to collapse, the CED to laboratory personnel is postulated to exceed 1000 rem.

The Plutonium Finishing Plant (PFP) is a nonreactor nuclear facility that poses a significant potential hazard to the 222-S Laboratory Complex from radioactive and toxicological material releases. The PFP is located approximately 3 km (1.9 mi) northeast of the 222-S Laboratory. Previously, the mission of PFP was to produce weapons-grade plutonium metal. Currently, the mission is to place the remaining plutonium in a stabilized form (e.g., plutonium oxide) in preparation for the eventual D&D of the facility. The 222-S Laboratory is within the emergency planning zone of the PFP and is connected to the Patrol Operations Center, which would communicate emergencies via the site emergency notification system. Other facilities in the 200 East and 200 West Areas with ongoing operations that have a potential for affecting the 222-S Laboratory Complex include the high-level radioactive waste storage tanks, Environmental Restoration Disposal Facility, 242 A Evaporator, Central Waste Complex (CWC), T Plant, low-level burial grounds, and Waste Encapsulation Storage Facility.

Emergency planning and response guidance for the 222-S Laboratory is contained within ATS-MP-1036, *Building Emergency Plan for the 222 S Laboratory Complex*. Neighboring facilities are notified of an event at 222-S Laboratory by activation of the sitewide "crash-phone" system or the Hanford Site emergency alerting system. Occupants of other facilities will respond in accordance with the respective organization emergency plans.

The only operating commercial nuclear power reactor in the Pacific Northwest is on the Hanford Site. The Energy Northwest Columbia Generating Station, a boiling water reactor with a design power level of 3323 MWt (thermal) and 1180 MWe (electrical), is located north of the 300 Area, east of the 400 Area and southeast of the 200 Areas. The operations of this reactor pose no significant risk to the 222-S Laboratory.

The southeastern boundary of the U.S. Army Yakima Training Range, used for military maneuvers and weapons training, is located 13 km (8 mi) from the 200 West Area. Live firing of weapons with explosive warheads is directed into an impact area within the center boundary; therefore, the U.S. Army states that no safety threat exists for people living adjacent to the Yakima Firing Center or for those living on the east bank of the Columbia River (DOA 1989, *Yakima Firing Center Proposed Land Acquisition*). Accordingly, the firing center is assumed to pose no threat to the 222-S Laboratory operations or personnel.

1.8 Validity of Existing Environmental Analyses

No significant discrepancies have been identified between the site characteristic assumptions made in this chapter and those made in the Hanford Environmental Impact Statements: DOE/EIS 0113, *Final Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes*; and DOE/EIS 0200-F, W*aste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*.

1.9 References

ANSI A58.1-1982, *Minimum Design Loads for Buildings and Other Structures*, American National Standards Institute, New York, New York.

10 CFR 830, Title 10, *Code of Federal Regulations*, Part 830, *Nuclear Safety Management*, as amended.

10 CFR 830, Title 10, *Code of Federal Regulations*, Part 830, Subpart B, "Safety Basis Requirements," as amended.

DE-AC27-08RV14800, 2008, *Tank Operations Contract*, Section J-2, "Requirement Sources and Implementing Documents," as amended, U.S. Department of Energy, Office of River Protection, Richland, Washington.

DOA, 1989, Yakima Firing Center Proposed Land Acquisition, U.S. Department of the Army, I Corps and Ft. Lewis, Washington.

DOE/EIS 0113, 1987, *Final Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic, and Tank Wastes*, U.S. Department of Energy, Washington, D.C.

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DOE-STD-1020-2002, 2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, U.S. Department of Energy, Washington, D.C.

DOE-STD-3009-94, 2002, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, Change Notice No. 2, U.S. Department of Energy, Washington, D.C.

HNF-8739, Rev 0, *Hanford Safety Analysis and Risk Assessment Handbook*, Fluor Hanford, Inc., Richland, Washington.

PNNL-6415, 2001, Rev. 13, *Hanford Site National Environmental Policy Act (NEPA) Characterization*, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-11107, 1996, *Climatological Data Summary, 1995 with Historical Data*, D. J. Hoitink and K. W. Burk, Pacific Northwest National Laboratory, Richland, Washington.

PNNL-13469, 2001, *Hanford Site Climatological Data Summary 2000 With Historical Data*, Pacific Northwest National Laboratory, Richland, Washington.

ATS-MP-1036, 2006, *Building Emergency Plan for the 222 S Laboratory Complex*, CH2M HILL Hanford Group, Inc., Richland, Washington.

FIGURE 1-1. THE HANFORD SITE IN WASHINGTON STATE.

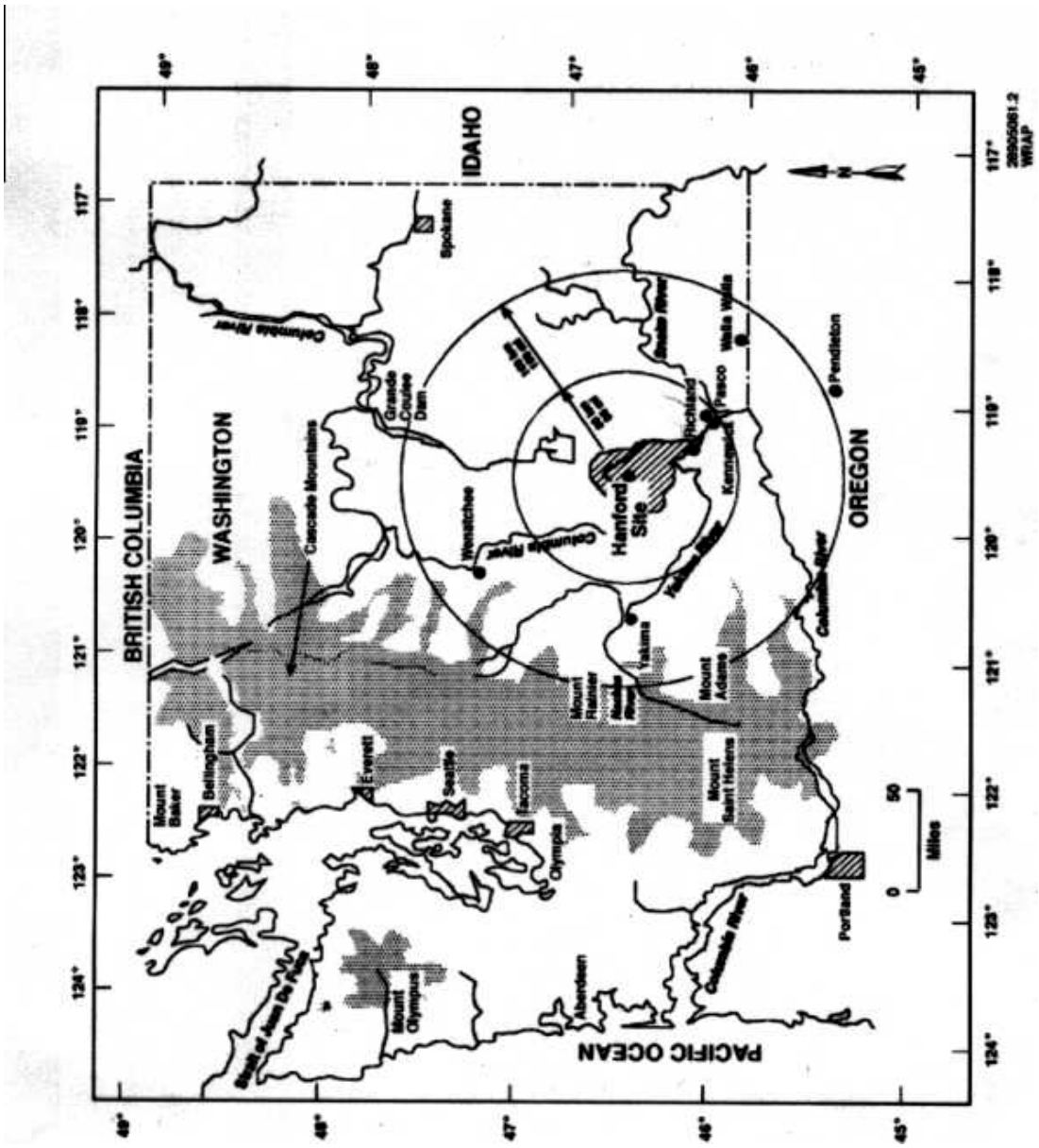


FIGURE 1-2. HANFORD SITE MAP.

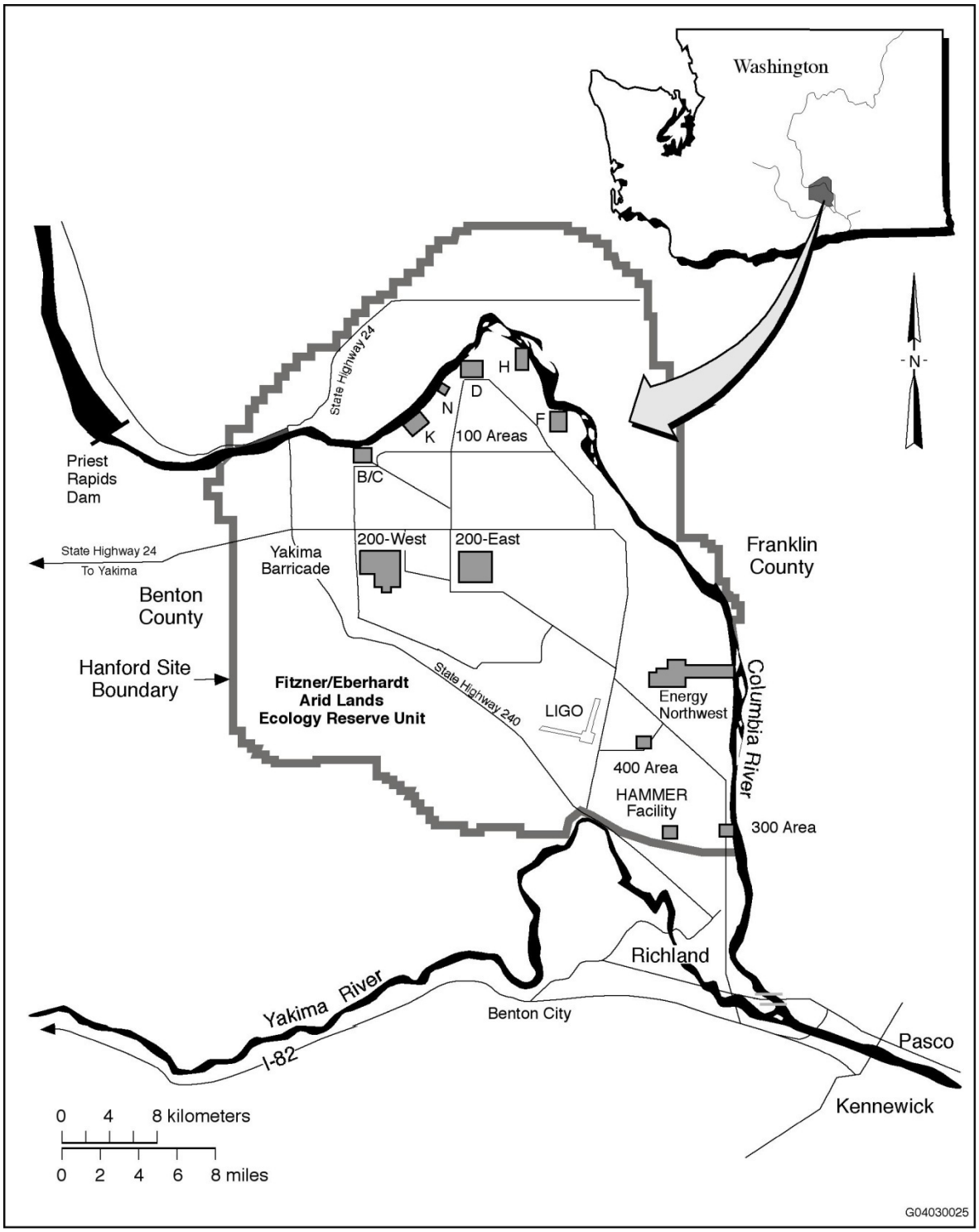


FIGURE 1-3. 200 WEST AREA.

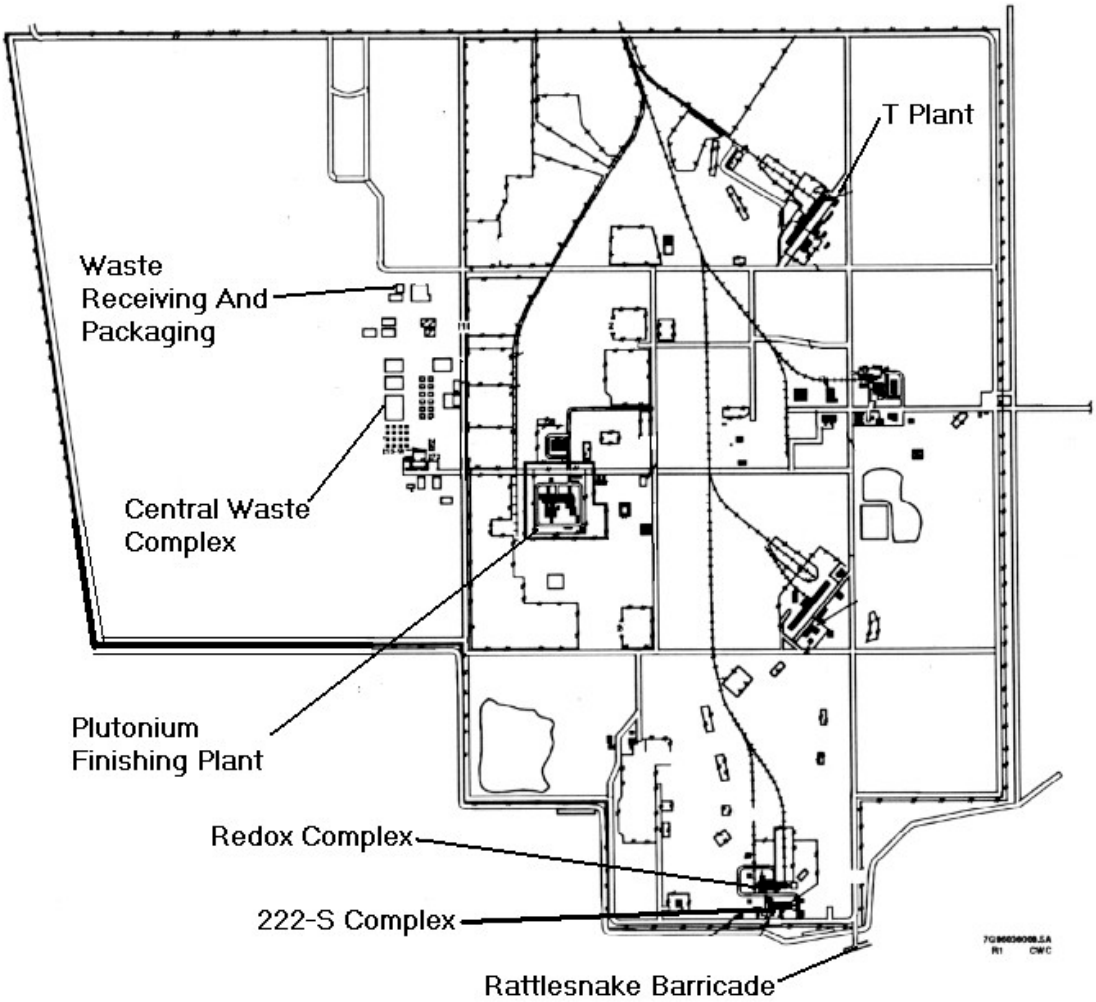


FIGURE 1-4. WIND ROSES AT THE 9.1-M (30 FT) LEVEL OF THE HANFORD METEOROLOGICAL MONITORING NETWORK, 1982 TO 2000.

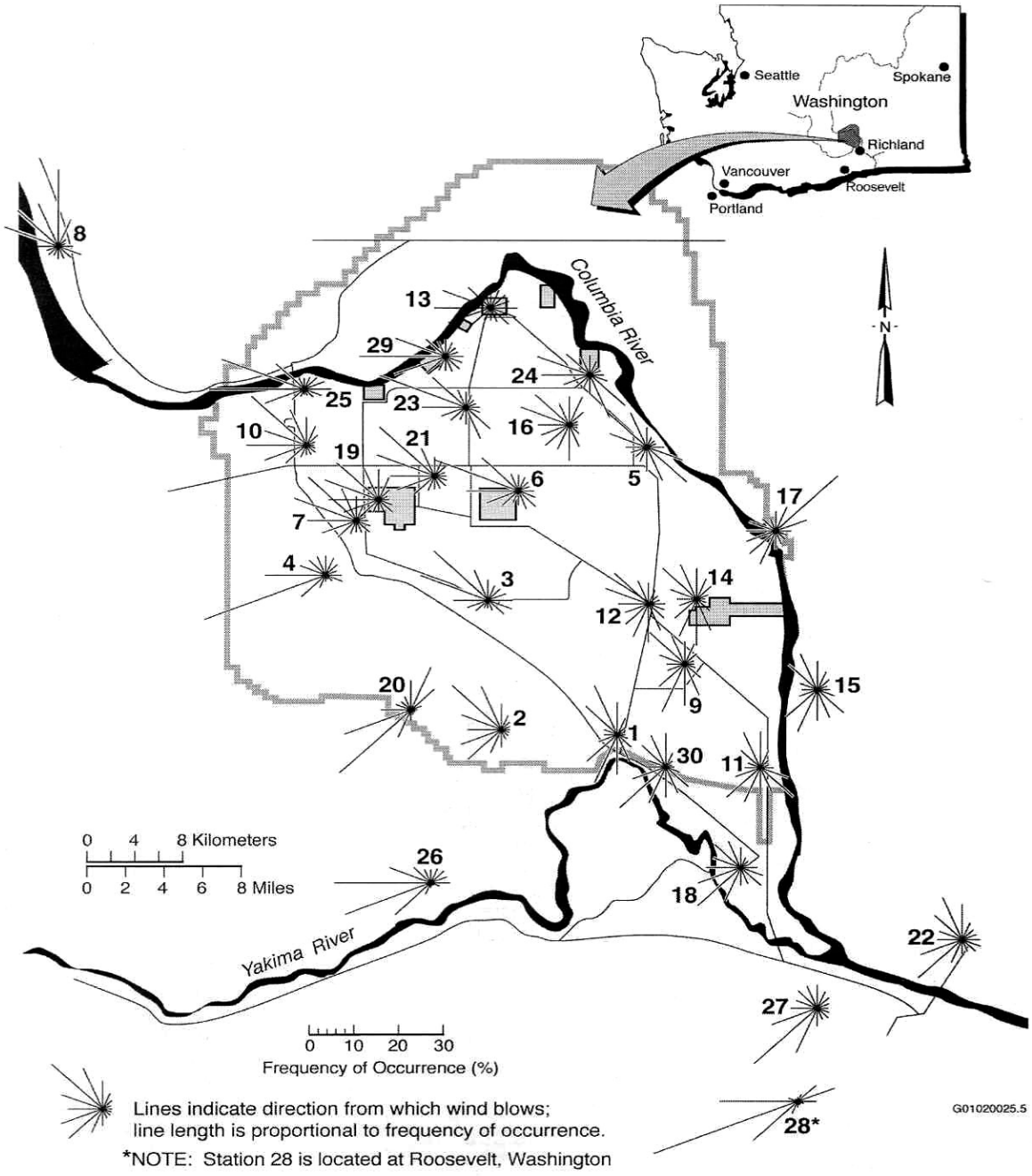


FIGURE 1-5. WIND ROSES AT THE 60-M (197 FT) LEVEL OF THE HANFORD METEOROLOGICAL MONITORING NETWORK, 1986 TO 2000.

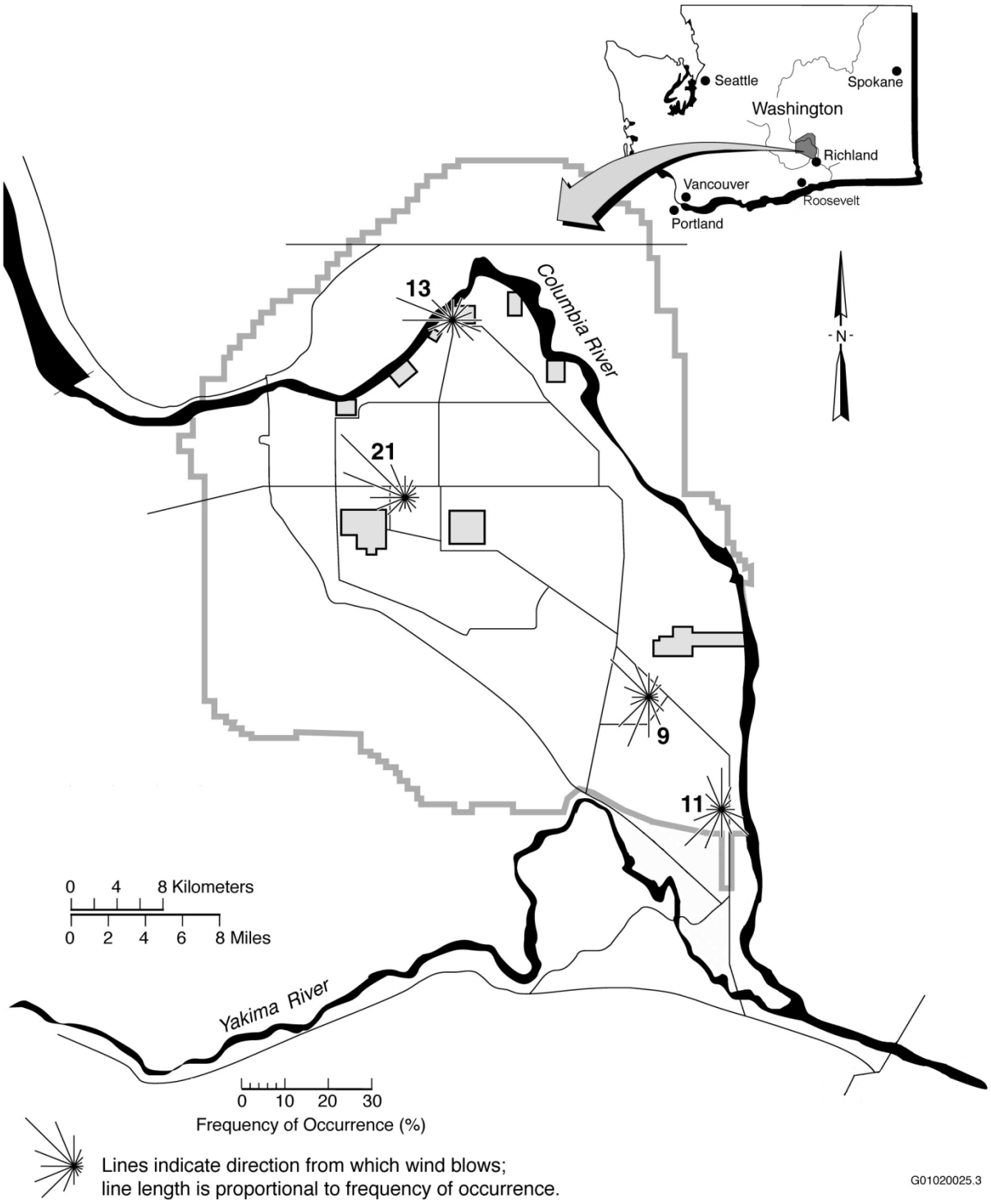
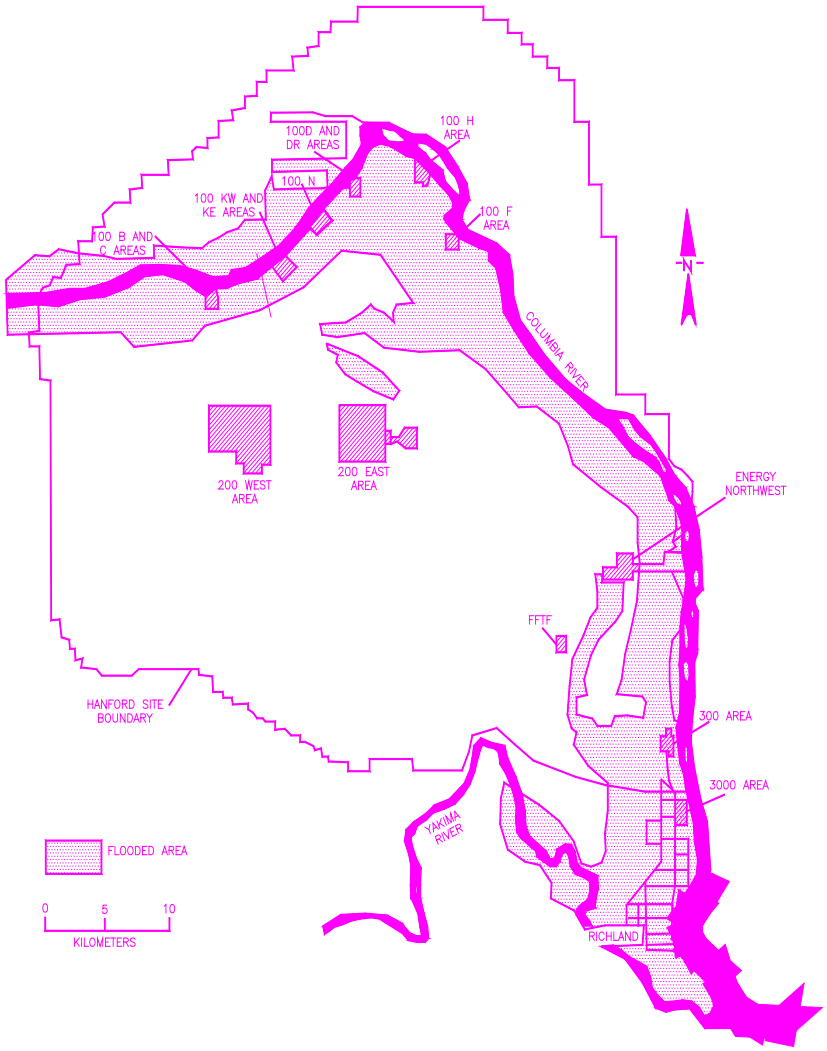


FIGURE 1-6. WORST-CASE HYPOTHETICAL FLOOD OF THE COLUMBIA RIVER.



2.0 FACILITY DESCRIPTION

This chapter describes the facility, its designed mission, and processes to support assumptions used in the hazard and accident analysis. These descriptions focus on all facility features necessary to understand the hazard and accident analysis, not just the safety systems, structures and components (SSCs). This chapter complies with 10 CFR 830 Subpart B, "Safety Basis Requirements," and provides information consistent with the guidance provided in Chapter 2.0, *Facility Description*, of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*. Also, the content of this chapter follows the direction provided in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH).

2.1 Introduction

The 222-S Laboratory is located on the southern edge of the 200 West Area in the Hanford Site adjacent to the plutonium reduction-oxidation (REDOX) facility. In accordance with the direction presented in 10 CFR 830, the 222-S Laboratory is a Hazard Category 3 nonreactor nuclear facility as specified in DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*. The magnitude of the worst-case accident for a DOE nuclear facility categorized as Hazard Category 3, such as the 222-S Laboratory, has the potential for only local significant consequences (10 CFR 830 Subpart B, "Safety Basis Management," Appendix A, Table 1).

2.1.1 Objective

The objective of this chapter is to provide the discussion consistent with the graded approach for a Hazard Category 3 nonreactor nuclear facility that supports the assumptions used in the hazard and accident analysis provided in Chapter 3.0. The discussion includes the requirements for the 222-S Laboratory, a facility overview, facility structure, process description, confinement systems, safety support systems, utility distribution systems, and auxiliary systems and support facilities as they are relevant to current and future operations in relation to the hazards and accident analyses.

2.1.2 Scope

The scope of this chapter includes the process, structures, and operations of the 222-S Laboratory Complex and auxiliary buildings. The auxiliary buildings are used for ventilation and electrical services, bulk material storage, and handling and transferring wastes to an onsite waste handling facility or offsite facilities. The buildings and equipment or systems descriptions are provided in sufficient detail to identify potential accident initiators and allow for the selection of accident mitigative or preventive barriers. A complete listing of the buildings included in the scope of the DSA is shown in the following.

- 222-S Laboratory Building
- 222-S Laboratory Building Annex
- 222-SA Standards Laboratory
- 222-SB Filter Building
- 222-SC Filter Building

- 222-SE Filter Building
- 2716-S Storage Building
- 227-S Conditioned Storage Building
- 212-S Gas Storage Dock
- HS-0065 Chemical Storage Unit
- Waste Handling Facilities (includes 207-SL retention Basin, 225-WB, 218-W-7 Dry Waste Burial Ground, 219-S Waste Handling Facility, 222-SD Solid Waste Handling/Storage System, Bone Yard) and 222-S Laboratory Dangerous and Mixed Waste Storage Areas (HS-0082 and HS-0083)
- Administrative and office buildings (includes 2704-S and 2713-S Buildings and trailers/modular offices used for administrative support of the laboratory), Connex boxes

2.2 Requirements

The codes, standards, regulations, and DOE Orders used to establish the safety basis for the 222-S Laboratory Complex are contained in Contract DE-AC27-08RV14800.
Title 10 CFR 830 identifies DOE-STD-3009-94 as the "safe harbor" methodology for the preparation of the safety basis for a Hazard Category 3 nuclear facility such as the 222-S Laboratory. This chapter was prepared in accordance with the requirements of Chapter 2 of DOE-STD-3009-94. Additional guidance for the DSA process is provided in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH).

2.3 Facility Overview

The 222-S Laboratory's overview is a discussion of the facility configuration and the historical, current, and projected future basic processes. The 222-S Laboratory and auxiliary buildings, located in the 200 West Area of the Hanford Nuclear Reservation, Figure 2-1, are collectively a Hazard Category 3 nonreactor nuclear facility that provides analytical chemistry services for the Hanford Site.

Normally, samples are logged into tracking programs as they enter the laboratory. The requested sample analysis may be determined on samples as received, or samples may be diluted prior to analysis. After sample analysis and final results are reported, the liquid waste from the sample is generally transferred to the 219-S Waste Handling Facility for treatment and storage until transferred to tank farms. Radioactive solid waste is packaged and stored in such areas as the 222-S Laboratory Solid Waste Handling/Storage System and Bone Yard until transfer to a Hanford Disposal Site. Mixed waste is accumulated in Satellite Accumulation Areas (SAA) and transferred to 90-Day Accumulation Areas or a Treatment, Storage, and Disposal (TSD) unit until it is transferred out of the facility.

In the individual laboratory rooms, radioactive materials are processed within open-face or arm-ported hoods where inlet-air velocities are maintained to prevent contamination of the laboratory room or personnel within the room.

Other than the radioassay of contained sources in the basement counting room, laboratory technical functions (e.g., analysis of samples) are performed in the first-floor laboratory rooms (Figure 2-2). The size, shape, equipment layout, and work assignments vary from room to room.

However, some general observations can be made that characterize these rooms and the work that is performed in them.

The laboratory work, such as wet chemical analyses, is performed in fume hoods. The laboratory rooms have several hoods, most arranged in rows along the laboratory walls. Ventilation exhaust airflows from the corridors and rooms through the hoods and into the ventilation exhaust air system. The face velocity is high enough to prevent the flow of airborne radioactivity or noxious fumes from the hoods into the laboratory rooms. Many hoods are dedicated to specific activities that are posted on the outside wall of the hoods. Most of the hoods are provided with vacuum and electricity. One or more of the following gases may be available (piped) to the hoods: propane, methane, hydrogen, nitrous oxide, argon, nitrogen, and oxygen. Many of these laboratory rooms have center-island work benches that are provided with water sinks, drains, and storage cupboards. These benches are used for less hazardous work such as weighing reagents and cleaning glassware. The laboratory rooms are equipped, as needed, with standard laboratory equipment such as glassware, balances, reagents in small-quantity containers, clamps, and stands. Bricks are available in the laboratory rooms so small shielded enclosures can be constructed for temporary storage and shielding of small quantities of radioactive materials or shielding for survey equipment.

Normally, highly radioactive material, such as waste tank samples, are subsampled to smaller sample sizes to lower dose rate levels before laboratory processing. These operations are typically performed in hot cells that are equipped for handling larger, more cumbersome, containers of radioactive material. Where analytical techniques allow, samples are diluted to further reduce dose rates.

Other than those systems needed for ensuring radiological safety, the 222-S Laboratory activities are similar to those routinely encountered in many industrial chemical laboratories. The radiological safety systems are considered to be conventional in the nuclear industry.

No laboratory activities are foreseen that cannot be safely terminated either abruptly or within a very short time (a few minutes). Normally, during primary ventilation shutdowns, a minimum amount of ventilation is needed to mitigate the release of airborne radioactive particulates to the laboratory environment. The direct-drive diesel fan is designed to automatically provide this backup ventilation capacity.

Most radioactive materials handled in the laboratory are samples to be analyzed in support of Hanford Site operations (e.g., environmental restoration, waste management, and environmental concerns). In addition, some radioactive materials are used for preparing analytical standards and, on occasion, for bench-scale process testing.

The spectrum of radioactive materials handled in the laboratory is very broad. Dose rates from many low-level samples are at background radiation levels, whereas dose rates from some waste tank samples can be quite high. Analytical work is performed on samples with low dose rates by hands-on handling in fume hoods. High-dose-rate samples are normally subsampled in the hot cells to radiation levels suitable for fume hood work. Liquid samples are normally received at the laboratory in shielded containers (known as pigs) or in polybottles. The pig sample carrier is

made of stainless-steel-encased lead or uranium for shielding and weighs between 45 and 68 kg (100 and 150 lb). Radioactive liquid samples are generally transported within the laboratory in shielded sample carriers.

Waste tank core samples, taken from the double-shell and single-shell waste tanks for waste characterization, are received in specially designed core sample casks. The cask is constructed of stainless-steel encased lead for shielding and weighs approximately 320 kg (700 lb).

The 222-S Laboratory liquid mixed wastes, containing some dissolved solids, are normally transferred to tank farms via the 219-S Waste Handling Facility. A path for disposing of radioactive liquid from the laboratory is through the specially designed "hot" disposal sinks and transfer jets in the decontamination hood 16, located in Room 2-B. The waste flows by gravity from the 2-B drains through welded, corrosion-resistant piping to corrosion-resistant tanks located below ground level in a concrete vault located in 219-S. In addition to the hot sinks, there are hot cell drains so that aqueous hot cell waste can be discharged directly from the hot cells to waste tanks in 219-S. The underground piping from 219-S to the tank farms is an encased fiberglass line to provide double containment and is equipped with leak detection capability. The boundary of the waste transfer piping for the SNL-5350 and SNL-5351 going to the 241-SY tank farm is at the exterior wall of 219-S. This containment meets Washington State Department of Ecology (WDOE) requirements for piping.

The following precautions are observed while handling radioactive liquids within the laboratory.

- Radioactive liquids are transported in closed containers. The containers of liquids with significantly high dose rates are enclosed in shielded containers that may include the following:
  - Pigs
  - Minipigs
  - Sample carriers
  - Core sample casks

- Containers of radioactive liquid are opened only in hoods or hot cells. Containment barriers against airborne radioactive particulates are provided by the walls of the hoods and hot cell, the laboratory ventilation system in the hood and hot cell HEPA filters (inlet and outlet).

- Isolated, high-integrity, corrosion-resistant piping and receiving tanks are the first containment barrier for radioactive aqueous waste in transit to and at the 219-S Waste Handling Facility. All waste lines in the laboratory building are double-contained, welded piping. The underground piping is double contained in stainless-steel casings, and the receiving tanks are enclosed in a concrete vault with stainless-steel liners for secondary containment. The stainless-steel liners provide secondary containment, which meet WDOE requirements. Flow from the laboratory drains to the receiving tanks is by gravity. The waste can be pumped between tanks within the 219-S vault and from the 219-S Waste Handling Facility to the tank farms.

- Laboratory aqueous wastes, with a small potential for being contaminated with hazardous waste or radioactivity, flow by gravity and accumulate in concrete retention basins at the 207-SL retention basin. This waste is released to the Treated Effluent Disposal Facility (TEDF) or the Effluent Treatment Facility (ETF) only after analysis shows that the effluent is within release/acceptance criteria. Through the use of administrative procedures, the potential for hazardous material or radioactive contamination in this waste is low.

2.4 Facility Structure

The 222-S Laboratory was constructed between 1950 and 1951. Since 1951 the building has been modified to increase the laboratory and office space. The modifications were designed and constructed to the applicable codes and standards current at the time the modifications were performed.

The original 222-S Laboratory was designed to meet the codes and standards in place in 1949 (Turnbull 1949). The applicable portions of the following codes were used during facility design and construction efforts: Uniform Building Code (UBC 1949) and all codes recommended by the National Board of Fire Underwriters. Applicable standards from the following organizations also were used: American Society for Testing and Materials, American Institute of Steel Construction, American Welding Society, American Institute of Electrical Engineers, National Electrical Manufacturers' Association, and National Association of Fan Manufacturers. Other design and construction specifications were taken from the applicable Washington State codes, federal specifications, and Hanford Works specifications.

During 1974 the functional design criteria for exhaust ventilation improvements to the 222-S Laboratory Building were developed and approved (Vitro 1974). In compliance with these criteria, the 222-SB Filter Building and connecting ductwork were constructed. Applicable standards and specifications from the following sources were used in the design and construction efforts: American Association of State Highway Officials, American Conference of Government Industrial Hygienists, American Concrete Institute, American Institute of Steel Construction, Air Moving and Conditioning Association, American National Standards Institute (ANSI), American Society of Mechanical Engineers, American Society for Testing and Materials, American Welding Society, National Electrical Manufacturers' Association, National Fire Protection Association (NFPA), Sheet Metal and Air Conditioning Contractors National Association, Steel Structures Painting Council, and Underwriters' Laboratories. Other applicable specifications and criteria that were complied with include federal specifications, Occupational Safety and Health Administration (OSHA) regulations, and Hanford Plant Standards.

During 1980 two buildings were added to the 222-S Laboratory: the 222-SC Filter Building and the 222-S Laboratory Annex. Both buildings were designed to the 1979 Uniform Building Code (UBC 1979), the National Electrical Code (NEC), and other applicable codes and standards (RHO 1979 and 1980).

In September 1980 the 222-SA Standards Laboratory was procured. This facility is a five-wide trailer. The units were purchased from a commercial manufacturer and were designed and

manufactured to all applicable UBC, NEC, and other codes for general purpose modular facility construction (Vitro 1978).

Construction of a new exhaust filter building (222-SE) and a hot cell expansion to the 222-S Laboratory Building was completed in 1994. The 222-SE Filter Building was designed to the applicable requirements (KEH 1992) of DOE Order 6430.1A, *General Design Criteria*, and the UBC for 1991 (UBC 1991). The hot cell expansion was designed to the requirements of Division 11, "Equipment," and Division 13, "Special Facilities" (Sections 1300, "General Requirements," and 1325, "Laboratory Facilities" [including hot laboratories]) of DOE Order 6430.1A and UBC 1991 (WHC-SD-W041-FDC-001, *Functional Design Criteria for the Environmental Hot Cell Expansion*). Both the 222-SE Filter Building and hot cell expansion designs meet or exceed the following requirements:

- Seismic: Important or low-hazard facility, maximum ground acceleration of 0.12g, UCRL-15910, *Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural phenomena Hazards*; Zone 2B, importance factor I = 1.25, UBC (1991).

- Wind: ANSI A58.1, Section 6 (ANSI A58.1); UCRL-15910, basic wind speed of 112.6 km/h (70 mi/h), importance factor I = 1.07 (for 100-year recurrence level), Exposure Category C (UCRL-15910).

- Roof Loads: ANSI A58.1, Section 4 (ANSI 1982); snow loads of 97.6 kPa (20 lb/ft^2) in accordance with ANSI A58.1, *Minimum Design Loads for Buildings and Other Structures*.

2.4.1 Laboratory and Support Facilities

The laboratory and support facilities consist of the 222-S Laboratory Building, which provides analytical chemistry services for the Hanford Site, and the auxiliary buildings that support the mission of 222-S Laboratory. Each of the laboratory and support facilities is described individually in the following paragraphs. Each building is depicted in Figure 2-1.

<u>222-S Laboratory Building</u>--The 222-S Laboratory Building is a two-story building 111.5 m (366 ft) long and 32.6 m (107 ft) wide located in the southeast corner of the 200 West Area.

The first floor of the 222-S Laboratory Building (Figure 2-2) is divided into four general areas. The west end contains the lunch room, offices, and locker rooms, which are maintained free of radioactivity and toxic chemicals. The west central section contains laboratory rooms and service areas for work with radioactive and/or toxic materials. The east central section, commonly referred to as the multi-curie section, contains laboratory rooms, hot cells, and service areas for working with radioactive samples. The east end contains the Hot Cell Facility, room 11A (Figure 2-3). The Hot Cell Facility contains six cells for instrument analysis of high-dose rate samples.

The second floor includes the ventilation supply fans, supply and exhaust ductwork, the ventilation system control room, an electrical shop, a manipulator repair shop, and storage areas (Figure 2-4).

The partial basement includes tunnels containing service piping and vacuum pumps, a counting room, an instrument maintenance shop, and a scanning electron microscopy laboratory (Figure 2-5).

222-SA Standards Laboratory—The 222-SA Laboratory is a five-wide trailer located southeast of the 222-S Laboratory Building. Non-radioactive standard preparation and nonradiological process development was previously performed in this building. The building is no longer routinely used and is planned for removal.

222-SB Filter Building—The 222-SB Filter Building, located south of the 222-S Laboratory Building, houses 96 high-efficiency particulate air (HEPA) filters to provide final filtration for the 222-S Laboratory. Under normal operation of the ventilation system, three electrically powered fans exhaust air from the 222-S Laboratory. Exhaust air leaves the 222-SB Filter Building through the 296-S-21 stack. If exhaust plenum differential pressure becomes too low, supplementary exhaust ventilation will be provided through the 222-SE Filter Building via direct drive diesel powered exhaust fan.

222-SC Filter Building—The 222-SC Filter Building, located north of the 222-S Laboratory Building, contains the second- and third-stage HEPA filtration for hot cells 1-A, 1-E-1, 1-E-2, 1-F, and 11-A-1 through 11-A-6. The hot cells in Rooms 1-A, 1-E, 1-F, and 11-A are serviced by the main building supply and exhaust ventilation. The 222-SC Filter Building houses five parallel pairs of HEPA filters, which provide filtration to hot cell exhaust air before it enters the main exhaust plenum and final filtering in the 222-SB and 222-SE Filter Buildings.

222-SE Filter Building—The 222-SE Filter Building, located south of the 222-S Laboratory Building, is a facility that houses 56 HEPA filters. This building provides redundant backup filtering capabilities for the 222-S Laboratory exhaust utilizing a diesel powered exhaust fan.

212-S Gas Storage Dock—Storage area, located on the south side of the 222-S Laboratory, will accommodate a large number of gas cylinders that support instruments in the laboratory. These docks allow separation of the cylinders into new and used, and into flammables and oxidizers.

Chemical Storage Unit (CSU)—The CSU (HS-0065) is located north of 222-SA Building and was used to provide safe storage of bulk chemicals. The unit is divided into two separate sections. Half of the unit is presently being used as a 90 day accumulation area for hazardous waste. The other half is used for storage of recyclables but may also be used for hazardous waste if necessary. The sections have numerous sump areas to prevent incompatible chemicals/waste from mixing in case of accidental breakage.

CFX Pit—The CFX Pit is located to the south of 222-SB Filter Building. It is a 5.2-m (17 ft) deep pit with a 3.7 m (12 ft) deep tank located therein. This tank was emptied of water and

removed from service in 2012. The tank was previously used for storage and shielding of two ^{252}Cf sources.

2.4.2 Waste Handling Facilities

Those facilities dedicated to the processing, storage, or handling of wastes from the 222-S Laboratory and auxiliary buildings are described in the following paragraphs and are depicted in Figure 2-1.

207-SL Retention Basin—The 207-SL retention basin, located northeast of the 222-S Laboratory, provides temporary hold-up of wastewater with a low potential for having radioactive or hazardous constituents prior to discharge to the Treated Effluent Disposal Facility (TEDF) or the Effluent Treatment Facility (ETF). This facility is comprised of two below-grade 94,635-L (25,000 gal) compartments and three above-grade 75,708-L (20,000 gal) tanks. This facility allows batch collection, sampling, and discharge of the waste, provided the wastewater meets release/acceptance criteria. Water not meeting the release criteria will normally be transferred to the holding tanks and an action plan for disposal will be developed.

225-WB—The 225-WB Building houses the electronic interface to the TEDF.

218-W-7 Dry Waste Burial Ground—The 218-W-7 Dry Waste Burial Ground is located southeast of the 222-S Laboratory Building. This underground tank was removed from service before 1975. It was used primarily for disposal of contaminated dry hood waste generated by the 222-S Laboratory. It is classified as a Regulatory Past Practice (RPP) site in the 200-SW-2 Operable Unit.

219-S Waste Handling Facility—The 219-S Waste Handling Facility, located north of the 11-A hot cell addition to the 222-S Laboratory Building, collects liquid mixed waste generated by the 222-S Laboratory operations. This facility consists of a below-grade containment vault, an operations building, and an attached concrete-walled sample gallery. The containment vault is divided into two sections, called cells A and B, which contain the liquid waste tanks and a moisture deentrainer tank. The waste tanks are vented through the deentrainer and a HEPA filter to the atmosphere via the 296-S-16 stack. The operations building contain the operating gallery, the pipe trench, a chemical addition drum that may be used to prepare waste for transfer and a caustic tank that may be used to neutralize the waste tanks. The concrete sample gallery contains the waste sampling hood, which is vented through HEPA filtration to the atmosphere via the 296-S-23 stack. This area is classified as a Resource Conservation and Recovery Act (RCRA) TSD component.

222-SD Solid Waste Handling/Storage System—The 222-SD Solid Waste Handling/Storage System, located north of the 222-S Laboratory Building, is a concrete-shielded drum storage area. This area is used for temporary storage of radioactive waste drums before transfer to the burial ground.

222-S Dangerous and Mixed Waste Storage Area (DMWSA)—This area consists of two metal storage lockers (HS-0082 and HS-0083), with RCRA compliant secondary containment, sited on a concrete pad north of the 222-S Laboratory Building, which can store drums of radioactive

waste, mixed waste, and nonradioactive dangerous waste. The drums are stored until transferred to an onsite or offsite facility for treatment and disposal.

2.5 Process Description

This section describes individual processes within the facility. Details of basic process parameters, including a summary of the types and quantities of hazardous materials, process equipment, instrumentation, control systems and equipment, and operational considerations associated with individual processes including major interfaces and relationships. The intent is to provide an understanding of the assessment of normal operations, the safety analysis and its conclusions, and insight into the types of operations for which safety management programs are devised.

2.5.1 Toxicological Hazards

The 222-S Laboratory provides analytical chemistry support to many Hanford missions. Reagents are stored for use in a variety of analytical chemistry forms. These reagents are often toxic chemicals; however, the quantities are mostly limited to bench scale applications in analysis and standard preparations. An example of the hazardous chemical inventory of the 222-S Laboratory Building and 222-SA Laboratory is provided in Table 2-1. These chemicals are on at least one of the following lists: 40 CFR 302.4 as Hazardous substances, 40 CFR 355, Appendix A, as Extremely Hazardous substances, 40 CFR 68.130 as regulated toxic and flammable substances or 29 CFR 1910.119, Appendix A, as toxic and highly reactive hazardous chemicals. Table 2-1 indicates that the Threshold Planning Quantities (TPQs) for emergency preparedness are significantly higher than the current inventory of these chemicals and substances. Therefore, the toxicological consequences to the offsite and onsite receptors are not significant and will not be further evaluated. The safety of the facility worker is emphasized through safety meetings, training, the installation of safety equipment (showers, eyewash, etc.), and the implementation of Industrial Health and Safety programs.

2.5.2 Waste Management Systems

This section describes the configuration and operation of the retention basin waste system and the radioactive liquid waste system in the 222-S Laboratory facility.

2.5.2.1 207-SL Retention Basin Waste System

The 222-S Laboratory retention basin, 207-SL, waste system handles water flushes, cooling water, and other liquid waste streams that have a low potential to contain radioactive contaminants or hazardous chemical waste.

Effluents from the 222-S Laboratory, 222-SA Standards Laboratory, and the 219-S operating gallery are routed to the 207-SL retention basin. The effluent is sampled and verified to be within specified limits before transfer to the TEDF.

<u>222-SA Standards Laboratory</u>—Drains from the laboratory sinks, fume hoods, and glass washer discharge to a polyvinyl chloride (PVC) pipe drain that flows to a 757-L (200 gal) lift station pump pit. The collected effluent is automatically pumped to the inlet weir box at the 207-SL retention basin. Water from the kitchen and rest rooms goes to the sanitary sewer.

Table 2-1. Extremely Hazardous Chemicals. (2 sheets)

Listed Chemical Name	CAS Number	Quantity in Laboratory (lb)	Reportable Quantity (lb)	Threshold Planning Quantity (lb)
Acetylene	74-86-2	220		10,000
Aldrin	309-00-2	<0.005	1	500
Ammonia solutions (20% or greater) *as Ammonium hydroxide*	7664-41-7	20	100	500
Aniline	62-53-3	<0.005	5,000	1,000
Arsenous oxide	1327-53-3	<0.005	1	100
Boron trifluoride	7637-07-2	<0.005	1	500
Bromine	7726-95-6	1	1	500
Butane	106-97-8	1.1		10,000
Cadmium oxide	1306-19-0	<0.005	1	100
Carbon disulfide	75-15-0	<0.005	100	10,000
Cellulose nitrate (>12.6% nitrogen)	9004-70-0	0.5		2,500
Chlordane	57-74-9	<0.005	1	1,000
Chloroform	67-66-3	0.68	10	10,000
Cresol, o-	95-48-7	<0.005	1000	1,000
Cumene hydroperoxide	80-15-9	0.1		5,000
Dichloroethyl ether	111-44-4	<0.005	10	10,000
Dimethoate	60-51-5	<0.005	10	500
Dinitrocresol	534-52-1	<0.005	10	10
Dinoseb	88-85-7	<0.005	1,000	100
Disulfoton	298-04-4	<0.005	1	500
Endrin	72-20-8	<0.005	1	500
Ethyl ether	60-29-7	0.125		10,000
Ethyl chloride	75-00-3	<0.005		10,000
Ethylene oxide	75-21-8	<0.005	10	1,000
Ethylenediamine	107-15-3	1.5	5,000	10,000
Formaldhyde	50-00-0	1	100	500
Hexachlorocyclopentadiane	77-47-4	<0.005	10	100
Hydrazine *as hydrazine monohydrate*	302-01-2	6	1	1,000
Hydrogen fluoride	7664-39-3	26	100	100
Hydrogen chloride (conc. ≥37%)	7647-01-0	96		15,000
Hydrogen bromide	10035-10-6	10		5,000
Hydrogen peroxide (conc >52%) as *30% hydrogen peroxide*	7722-84-1	29	1,000	1,000
Hydrogen	1333-74-0	8		10,000
Isobutane	75-28-5	30		10,000
Isodrin	465-73-6	<0.005	1	100
Lindane	58-89-9	<0.005	1	1,000
Mercuric oxide	21908-53-2	0.25	1	500
Mercuric chloride	7487-94-7	0.22	1	500
Methane	74-82-8	150		10,000

Table 2-1. Extremely Hazardous Chemicals. (2 sheets)

Listed Chemical Name	CAS Number	Quantity in Laboratory (lb)	Reportable Quantity (lb)	Threshold Planning Quantity (lb)
Methyl ether	115-10-6	11		10,000
Methyl chloride	74-87-3	<0.01		10,000
Methyl bromide	74-83-9	<0.005	1,000	1,000
Nitric acid	7697-37-2	350	1,000	1,000
Nitroaniline	100-01-6	<0.005		5,000
Nitrobenzene	98-95-3	<0.005	1,000	10,000
Nitrogen dioxide *As fuming nitric acid (conc 90%)*	10102-44-0	0.1	10	100
Nitromethane	75-52-5	0.13		2,500
Nitrosodimethylamine	62-75-9	<0.005	10	1,000
Parathion	56-38-2	<0.005	10	100
Parathion-methyl	298-00-0	<0.05	100	100
Phenol	108-95-2	0.6	1,000	500
Phorate	298-02-2	<0.005	10	10
Phosphorus	7723-14-0	0.1	1	100
Potassium cyanide	151-50-8	1	10	100
Propane	74-98-6	500		10,000
Propyne	74-99-7	5		10,000
Pyrene	129-00-0	<0.005	5,000	1,000
Selenious acid	7783-00-8	<0.005	10	1,000
Sodium cyanide	143-33-9	1	10	100
Sulfuric acid	7664-93-9	150	1,000	1,000
Tellurium	13494-80-9	<0.005	1	500
Thionazin	297-97-2	<0.005	100	500
Trimethylchlorosilane	75-77-4	<0.005	1	1,000
Vanadium pentoxide	1314-62-1	<0.005	1,000	100
Vinyl acetate monomer	108-05-4	<0.05	5,000	1,000
Vinyl chloride	75-01-4	<0.005		10,000
Vinylidene chloride	75-35-4	<0.005		10,000

219-S Waste Handling Facility—Sump 8 from the operating gallery empties into a stainless steel utility drain that runs west out of the 219-S Building to manhole No. 4 where it connects to a fiberglass reinforced pipe (FRP). This FRP runs inside a concrete-encased vitrified clay pipe (VCP) to another FRP running inside a concrete-encased VCP. This line in turn empties into the 207-SL retention basin.

222-S Laboratory Drain System Description—The 222-S Laboratory Building can be divided into two sections; the analytical section occupies the western side of the building, and the multi-curie section occupies the eastern side. The analytical section retention basin effluents go

to two drain lines in the basement tunnels. The multi-curie section retention basin effluents go to two different drain lines in the basement tunnels.

Basement Tunnels—All effluents from the 222-S Laboratory Building to the 207-SL retention basin are discharged through four different lines; a stainless-steel retention basin waste line and carbon-steel coolant and condensate line (no longer in service) for the analytical section, and a stainless-steel retention basin waste line and a carbon steel steam condensate drain (no longer in service) for the multi-curie section.

Cold tunnel sumps 1, 2, 3, 4, 5, and 6 function as floor drains and discharge into the analytical section retention basin waste line. Sump 5 also receives flow from a floor drain in the stairwell outside 222-S, near door No. 19, on the north side of the building. The analytical section retention basin waste, coolant, and condensate lines run north out to manhole No. 6. From the manhole the FRP lines flow to the 207-SL retention basin inlet weir box.

Cold tunnel sump 7 acts as a floor drain in the east end of the cold tunnels but it also receives flow from a floor drain outside door No. 18. Sump 7 discharges to the multi-curie section stainless steel retention basin waste line. The lines exit the north side of the building to manhole No. 5. At manhole No. 5 the lines connect to a FRP going to the 207-SL retention basin inlet weir box.

First-Floor Analytical Section—All laboratory sinks and hood condensate drains, except in Rooms 2-B and 2-B-2, go to the retention basin waste line. The laboratory hood drain in Room 2-B and all drains in 2-B-2 go to the 219-S Waste Handling Facility. All analytical section service sinks go to the analytical section retention basin waste line.

First-Floor Multi-curie Section—Generally, all multi-curie section laboratory sinks and hood condensate drains go to the multi-curie section retention basin waste line.

Second-Floor Equipment Room—The distilled water overflow and drain lines, firewater sprinkler system drain, backflush and drain from the deionized water unit, a floor drain near the deionized water unit, all go to the analytical section coolant and condensate line.
A floor drain on the second floor in area S-1-A goes to the multi-curie section retention basin waste line.

French Drains—A french drain serves as an evaporative cooler drain for the 2716-S Storage Building. The french drains discharge directly into the ground instead of the 207-SL retention basin. The condensate from the evaporative cooler has not entered radiation zones prior to discharge to these drains and, as such, are not considered to have a potential for radiological contamination.

2.5.2.2 Radioactive Liquid Waste System

This section describes the design and operation of the radioactive liquid waste system for the 222-S Laboratory Facility. All waste in this system is generated in the 222-S Laboratory and is classified as low-level waste.

From the laboratory hot sink drains and hot tunnel sumps, radioactive waste flows or are jetted through stainless steel lines to waste tanks in the 219-S Waste Handling Facility. These lines are encased in stainless steel from the point of origin in the 222-S Laboratory Building into the 219-S vault. Waste that is transferred to tank farms is sampled, analyzed, and neutralized prior to the transfer.

Process Description—Radioactive liquid waste that is transferred to the 219-S Waste Handling Facility is generated from several locations throughout the 222-S Laboratory, as follows.

- Decontamination hood No. 16 in Room 2-B, the inductively coupled plasma spectrometers in Room 1-J, and the hot tunnel sump in T-4 are routed through tunnel T-4.

- Room 1-A hot cell, 1-E hot cells (1-E-1 and 1-E-2), 1-F hot cell, and the hot tunnel sumps in T-7, and T-8 are routed through tunnel T-8.

- Room 11-A hot cells are routed to the waste tanks in the 219-S Waste Handling Facility vault via two additional stainless-steel drain lines.

Each of the drain lines is encased in stainless steel from the point of origin in the 222-S Laboratory Building into the 219-S Waste Handling Facility and each is equipped with leak detection.

The 219-S Waste Handling Facility consists of an enclosed, below-grade, concrete vault containing stainless-steel waste tanks; transit building; the pipe trench and operating gallery; and an attached concrete-walled sample gallery. The waste tanks are vented by an electrical exhaust fan, through a deentrainer or demister and a HEPA filter, and to the atmosphere via the 296-S-16 stack.

Any leakage from the active waste tank in cell B is collected in sump 9, and leakage from the waste tanks in cell A is collected in sump 7. Leakage to the sumps will sound an alarm in the 219-S operating gallery and Room 3-B of 222-S. Pumps are used to transfer waste back into the tank system.

Process Technology—The waste level in all tanks is maintained below the high-level limit. Any leakage of waste can be pumped back into the tank system. The high liquid level alarms are normally set at 90% of the maximum tank volume. These limits are set to reduce the potential for overflow and allow for caustic and nitrite additions.

There are several requirements for the composition of liquid waste generated by the 222-S Laboratory. No separable organic phase or emulsions are allowed in the liquid waste. To protect the piping and the tanks, no materials detrimental to 304 stainless steel are allowed in the liquid waste without prior neutralization or thorough flushing of the lines after transfer. Before the waste is transferred to tank farms, it must meet their acceptance criteria.

Process Control—Liquid level indicators monitor for waste leakage. Also, the hot tunnel sumps and the sumps in 219-S have lighted and audible alarms to indicate when the liquid-level limit is exceeded. The alarms for the tanks and the 219-S sumps are located in Room 3-B of the 222-S Laboratory Building and the 219-S operating gallery. The alarms for the hot tunnel sumps are located in the Control Room S-3-D and Room 3-B in the 222-S Laboratory.

2.5.3 Solid Waste Management

Solid waste will be low-level radioactive, mixed, or hazardous waste. Waste segregation techniques are employed to ensure packaged waste does not contain noncompatible waste materials. 222-S Laboratory generated waste materials consists of office paper, used surgeon's gloves, paper towels, tissues, rubber matting, glass vials, metal planchets, reagent bottles, wood, steel, tools, etc. Waste materials will be contaminated with low-level radioactive constituents, radioactive constituents plus hazardous materials (mixed waste), or hazardous materials.

The solid low-level radioactive and mixed wastes are normally packaged for treatment or disposal in standard 55-gallon drums, burial boxes, or other approved containers. The waste containers used to accumulate waste are transferred to 90 Day Accumulation Areas or to a TSD unit prior to shipment. Radioactive contaminated organic liquid is classified as mixed waste and is collected in glass bottles inside the hoods. Hazardous waste, consisting primarily of expired chemicals, reagents, and analytical waste, is accumulated in Satellite Accumulation or in 90-Day Accumulation Areas. The placement of waste materials in 55-gallon drums, surrounded by absorbents, is considered lab packed. The lab-packed waste may be stored in a TSD unit or shipped directly to the offsite disposal facility.

The 222-S Laboratory does not routinely generate transuranic (TRU) waste. Transuranic waste is, without regard to source or form, waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years and concentrations greater than 100 nCi/g. If a waste package is generated that is determined to be TRU, the containment, packaging, characterization, and shipping requirements of the waste receiver will be adhered to.

2.5.4 Environmental Considerations Overview

Effluents from the operation of the 222-S Laboratory including liquid and airborne environmental discharges of low-level radioactive, nonradiological, potentially hazardous, or nonhazardous chemical wastes shall be managed in accordance with the guidelines and requirements of DOE, Washington State, and Federal regulations.

The Hanford Site RCRA permit, WA 7890008967, was issued in August 1994. The 222-S Laboratory is continuing to operate under interim status until the 222-S Laboratory Part B permit is issued and incorporated into the site permit.

2.5.5 Derivation of Material at Risk

2.5.5.1 MAR Type, Form, and Storage Location

The process of receiving, logging, tracking, analyzing, archiving, storing, and disposing of radioactive waste samples is described in Section 2.3. Most samples brought into the 222-S Laboratory for radiochemical analysis are from the tank farms and are liquid, solid liquid

mixtures, or solids. The container holding the sample material is typically transported to the laboratory inside closed transport containers. The contained samples are normally removed from the sealed transport carriers inside hoods or hot cells. A core sample cask is mated with the 11-A hot cell and the stainless steel sampler, about 310 ml volume, is removed. The sample is extruded from the sampler inside the hot cell. Any liquid portion of the core segment is captured in a glass jar during the extrusion, while the solids are usually photographed and scraped from the extrusion tray into a glass jar(s). The glass jars are approximately 250 ml in size and are closed with screw caps. Liquid grab samples from the tank farms, with small amounts of suspended, dissolved, or settled solids are generally received in 125-ml sample containers, but have been received in containers as large as 1 liter. Some liquid samples from processing plants have been received in containers as large as 4 liters. The liquid samples are generally brought into the hot cell or hood where the volume and mass of sample is determined prior to transferring the sample into the storage jars. Samples are stored in the hot cell inside these jars until an aliquot or subsample is retrieved for sample analysis.

Actual sample analysis is completed on small portions of the original sample referred to as an aliquot or sub-sample. The aliquot volume is carefully measured to be small enough to facilitate radiochemical analysis with a priority on as low as reasonably achievable (ALARA) concerns. The quantity of sample material actually outside the confines of the hot cell is very small compared to original sample volumes. Sample analysis procedures may require small aliquots of liquid or solid samples to be dissolved in strong acids or bases (<pH 2.0 or >pH 12.5) or organic solvents, like formaldehyde. The quantity of these extremely hazardous chemicals required to facilitate analysis is very small and is normally used up in the analysis procedure. Aliquots that are mixed with extremely hazardous chemicals and must be stored during the sample analysis constitute a very small portion of the total facility radioactive material. The quantity of extremely hazardous chemicals in the facility is listed in Table 2-1.

Aliquots are normally stored in Room 2-B (sample storage) or in Room 2-E, while sample analysis is being conducted. These areas provide convenient storage for the small quantity aliquot vials; however they are carefully monitored and the room is managed to ensure the radiation dose is minimal. While the bulk of radioactive material is located inside the 11-A hot cell, all other areas may be used to store sample aliquots. After analysis is completed, the aliquots are normally discharged into the 219-S liquid waste system.

2.5.5.2 MAR Composition

An investigation into the radiological inventory residing in the 222-S Laboratory was completed in April 2002 (HNF-10754, *222-S Laboratory Radiological Inventory Comparison with Accident Dose Consequences*). The Best-Basis Inventory (BBI) estimates for radionuclides in the tank waste were chosen to provide radionuclide concentration data for samples being tracked in the facility inventory. The BBI is documented in the Tank Waste Information Network System (TWINS) maintained by the Pacific Northwest National Laboratory (PNNL). The BBI is the result of a team of experts assembled to review all available sample data, model estimates, and derive point estimates that represent the best possible estimate for each tank. These constituents represent greater than 99.9% of the chemical mass and total radioactivity in the tank inventory.

Historically, the laboratory source term included 15 isotopes. Conclusions presented in HNF-10754 indicate that plutonium, americium, cesium, and strontium account for approximately 97% of the dose equivalent curies (DE-Ci) for accident analysis. Therefore, the incremental contribution to dose consequences of all the other isotopes is considered negligible and not included in this DSA. The components of MAR for the accident analysis include the plutonium isotopes, ^{238}Pu, ^{239}Pu, ^{240}Pu, ^{241}Pu and ^{242}Pu; ^{241}Am, ^{137}Cs, ^{90}Sr, and ^{90}Y. The ^{90}Y is included because it is in equilibrium with ^{90}Sr and will contribute to the dose consequences.

The 222-S Laboratory does not routinely generate transuranic (TRU) waste; however, future commitments can not preclude having both TRU and low-level waste (LLW) at the facility. Both releases of TRU and LLW are given in terms of DE-Ci values. The DE-Ci concept effectively converts radiological consequences for the inhalation pathway for either individual isotopes or mixes of isotopes to that of ^{239}Pu. For TRU waste, the most abundant of these distributions are 6% (nominal) ^{240}Pu and 12% (nominal) ^{240}Pu. The majority of waste containing plutonium will be waste containing contamination from weapons-grade plutonium (6% ^{240}Pu) produced in Plutonium Finishing Plant (PFP) processing. However, significant contributions from other distributions come from reprocessed N Reactor fuel used for power generation (typically about 12% ^{240}Pu) and Fast Flux Test Facility fuels development (also typically about 12% ^{240}Pu). The majority of TRU waste received from offsite generators is related to breeder reactor fuel production, testing, etc., and should also be nominally 12% ^{240}Pu.

For this DSA the bounding isotopic distribution of the plutonium contaminated waste samples is assumed to be that of 12% (nominal) ^{240}Pu, 20-year aged waste. This is conservative because the 12% distribution has higher potential radiological consequences than 6% ^{240}Pu. The added ^{90}Sr, ^{90}Y, and ^{137}Cs provide a reasonable consideration of the operational dose consequences to the facility worker since the DE-Ci contribution of these isotopes for accident analysis is very small.

2.5.6 Criticality Safety

The 222-S Laboratory complex contains less than 225 g of TRU with a composition equivalent to 20-year-aged 12% ^{240}Pu fuel and is physically separated from other facilities that contain fissionable materials by at least 6 feet edge to edge. The smallest mass of plutonium that will sustain a nuclear chain reaction under the most ideal conditions, the minimum critical mass, is 530 g. Therefore, at the facility limit of 225 g of TRU, a nuclear excursion is not a credible event. Even if a failure of the facility inventory tracking system allowed the quantity of fissionable material to be twice the limit and accumulate 450 g of TRU, the facility will not have enough mass to sustain a criticality.

A criticality safety program, commensurate with the graded approach for the facility classification as described in procedures, is implemented. The fissionable material inventory will not exceed 225 g of plutonium equivalence, providing assurance that the risk of an inadvertent criticality is not credible. Therefore, a criticality alarm or criticality detection system is not required.

2.6 Confinement Systems

This section describes the sets of structures, systems, and components that perform confinement functions. Specific structures whose function is confinement of radioactivity in normal operation are the hot cells, fume hoods and sample storage units.

Hot cells, also referred to as cubicles or shielded caves, are thick walled enclosures located in Rooms 1-A, 1-E, 1-F, and 11-A. The thick walls provide shielding to permit operations involving samples with a high level of radioactivity. Separate ventilation is provided, and the hot cells are maintained at a negative pressure with respect to the room. Airflow through the hot cells is designed to provide greater than seven air changes per hour.

Fume hoods are facilities for handling samples. A sash window is provided, and the ventilation is designed to provide a hood face velocity for confinement of chemical fumes and radioactive particulates.

The Room 2-B sample storage units consist of shielded compartments with lead plate on the sides and top. These units are used to store samples awaiting analysis. Directional airflow from the storage compartments over the samples minimizes the potential for a spread of contamination from an accidental spill.

2.6.1 Airborne Contamination Control

Two methods are used in the 222-S Laboratory Building to prevent release of airborne radioactivity to the environment or to laboratory work areas. One method, containment, is a physical barrier between the material or atmosphere containing radioactivity and the areas where personnel are permitted. The other method, confinement, depends on the ability of the building ventilation system to channel all air through HEPA filters. There are no design provisions for removing gaseous radioactive or chemical species from the air.

Physical barriers for airborne contamination control may be either partial or total and either single or multiple layer. Examples of total physical containment barriers in the laboratory are tightly closed sample containers and the hot cells. Hoods are examples of confinement barriers.

The laboratory ventilation system normally operates to ensure that

- The air within the worker-occupied areas of the facility is both healthful and comfortable for the facility occupants.
- Areas within the laboratory that are routinely occupied by personnel are maintained free from airborne contamination.
- Airflows from low potential contamination areas towards higher potential contamination areas.

2.6.1.1 Ventilation

The 222-S Laboratory Building ventilation system is designed to ensure that air flows from areas of low contamination potential to areas of high contamination potential and is operated by maintaining zone differential pressures.

The supply system takes in outside air on the second floor of the building. The air is filtered and brought to a temperature normally between 16°C and 27°C (60°F and 80°F). It is then discharged into a main supply plenum from which branch ducts distribute the air throughout the building. Four electrically driven supply fans are installed; normally three are in operation and the fourth is maintained in standby service. Electrical power to the supply fans is provided through the electrical distribution system described in section 2.8.1.

The supply ducts are arranged so that the major air supply enters the offices and corridors and an auxiliary supply enters the laboratory rooms through the perforated ceilings or diffusers. The supply system is set up in this manner so that the airflow will be from the offices, through the corridors, and into the laboratory rooms; i.e., from "cold" areas to areas of potential radioactive contamination.

The major volume of exhaust air from the first floor is exhausted via the laboratory hoods or hot cells (Figure 2-6). Confinement of airborne radioactive particulates or chemical fumes is maintained with an air velocity through the face opening of the hoods. Hoods that do not conform to air velocity requirements are taken out of service. Laboratory hood and auxiliary exhaust air is filtered by a prefilter and single-stage HEPA filter before entering the exhaust ducts. Exhaust air from the basement service tunnels is filtered by a prefilter and single-stage HEPA filter. The individual exhausts are manifolded into a main exhaust duct that leads to the main exhaust plenum. Examination of old duct systems during exhaust system modifications indicated that holdup of radioactive materials was not present in the ductwork.

Building exhaust air is directed through the 222-SB Filter Building, located south of the 222-S Laboratory Building, housing 96 HEPA filters to provide final filtration. Under normal operation of the ventilation system, three electrically powered fans exhaust air from the laboratory. Exhaust air leaves the 222-SB Building through the 296-S-21 stack.

If the electrically powered exhaust fans fail to operate, exhaust ventilation can be provided through the 222-SE Filter Building via a diesel powered exhaust fan. The 222-SE Filter Building houses 56 HEPA filters. This building provides backup filtering capabilities for the building exhaust. The diesel powered exhaust fan provides approximately one-half of the normal exhaust ventilation flow rate and is used during a loss of electricity, fan failure, or during maintenance activities on the 222-SB Filter Building or exhaust fans.

Hot Cell Ventilation—Hot cells are cubicles generally built of steel and high-density concrete capable of reducing radiation dose rates from tens of rems per hour in the cubicle to <10 mrem/h through the outer wall. The hot cells are used for operations that exceed operating limits for the hoods. There are 10 hot cells in the 222-S Laboratory Building: one each in Rooms 1-A and 1-F; two in Room 1-E; and six in Room 11-A.

The main building exhaust ventilation services the hot cells. Supply air to the hot cells is pulled through a single HEPA filter before entering the cell. This is to reduce contamination if reverse flow (from the cell to the room) should occur and to reduce dust loading on the first stage of exhaust HEPA filtration. Exhaust air from the cells passes first through a HEPA filter located as

close as practical to the cell to avoid contaminating ductwork. The exhaust air then passes through the 222-SC Filter Building where it goes through two more stages of HEPA filters and then is ducted to the 222-SB Filter Building where it passes through one final stage of filtration before being exhausted to atmosphere. In the event that the diesel fan is in operation, the final HEPA filtration will be through the 222-SE Filter Building. In total, four stages of HEPA filtration are provided for the hot cell exhaust. Figure 2-6 shows the airflow path for the hot cell exhaust.

The hot cell ventilation operates to provide a differential pressure between room and cubicle operating areas, and airflow through the hot cells sufficient to provide adequate air dilution.

Laboratory Fume Hood Ventilation—The laboratory fume hoods are designed to provide confinement boundary for analytical operations. The laboratory fume hood contamination levels are maintained ALARA. A sash window is provided, and the ventilation is designed to provide a hood face velocity for confinement of chemical fumes and radioactive particulates.

Counting Room Ventilation—The Counting Rooms (B-1-A, B-1-F, and B-1-G) and the scanning electron microscope Room (B-1-B) located in the basement are supplied by a ventilation system separate from the main 222-S Laboratory system. Most of the air is circulated through two stages of HEPA filtration with a small portion lost through louvered doors to the stairwell and used as supply ventilation air for the sample storage stairwell.

This system has air conditioners that maintain the air in the counting room at temperatures desired for the proper operation of counting room instruments.

The 219-S Ventilation System—Two separate ventilation systems are used for contaminated areas in the 219-S Waste Handling Facility: an exhaust system for the vault storage tanks and an exhaust system for the sample gallery.

Exhaust air from the venting of the 219-S vault waste tanks is discharged through the 296-S-16 stack. A moisture de-entrainer and a single HEPA filter provide filtration.

During sample gallery use, ventilation air is exhausted from the sample gallery via an exhaust hood over the sample station, which is connected to an exhaust fan that maintains flow across the open portion of the hood. The exhaust air goes through double HEPA filtration and is discharged through the 296-S-23 stack.

The operating gallery has no significant contamination; therefore, no inlet or exhaust HEPA filtration is provided.

2.7 Safety Support Systems

This section identifies and describes the principal systems that perform safety support functions (i.e., safety functions that are not part of specific processes). The text presents the purpose of each system and provides an overview of each system, including principal components, operations, and control function. The section is designed to organize the presentation of information, not to designate any special class of equipment.

2.7.1 Fire Protection

This section describes the fire protection systems for the 222-S Laboratory. The fire protection systems at the 222-S Laboratory are tested, inspected, and maintained in compliance with TFC-ESHQ-FP-STD-04, *Fire Protection System Testing, Inspection, and Maintenance.* HNF-SD-CP-FHA-003, 2*22-S Laboratory Fire Hazard Analysis*, presents a complete discussion of the fire hazards and fire-related concerns in the 222-S Laboratory Complex.

Raw and Sanitary Water System—The first-floor sprinkler system in the 222-S Laboratory Building, except for Room 11-A, is supplied with raw water which enters on the north side of the facility. This is the only raw water supply to the 222-S Laboratory Building. Raw water is used primarily for the first-floor sprinkler system and a fire hydrant. Sanitary water is used for all the other sprinkler systems and six fire hydrants.

Fire Protection and Alarm Control Panel—The 222-S Laboratory Building is equipped with a fire protection and alarm control panel. It was designed to meet NEC NFPA 70 requirements.

The system's detection devices (ionization, photoelectric, or thermal) are uniquely addressable, and their sensitivity can be measured by the system's control circuitry.

The system is designed so that alarm operation has first priority over all other modes of operation. Should the system lose commercial power, the battery backup will maintain the system. The Hanford Fire Department must reset the system when power is restored.

Fire Alarms—The 222-S Laboratory Building fire alarm pullboxes are located throughout all three floors of the building. The majority are located adjacent to the emergency exits. The building has zones that alarm to the 200 Area Fire Department via the radio fire alarm system. Fire gongs are installed in strategic locations on all three floors of the building.

Fire Protection and Control—The 222-S Laboratory Building is constructed primarily of noncombustible or fire-resistant materials. Fire protection systems at 222-S Laboratory Facility include wet and dry pipe automatic sprinkler systems, special limited water volume suppression systems, fire alarm systems, and some rated fire barriers. The only rated fire walls surround the elevator shaft and interior stairway. Applicable fire extinguishing capability is provided for each laboratory area depending on the type of fire potential existing therein. Portable fire extinguishers are provided at various locations within the building.

There are seven fire hydrants (risers) located around 222-S. The first-floor sprinkler system and one fire hydrant are supplied with raw water. The second-floor sprinkler system, the Rooms 11-A and 11-A hot cells, the annex sprinkler system, and six fire hydrants are supplied by sanitary water.

Hot cells 1-E-2 and 11A plus the gloveboxes in Room 1C are equipped with sprinklers supplied by a limited volume pressurized water fire system.

2716-S Storage Building—This facility is a metal building with a partitioned off area that is used for handling and repackaging of hazardous wastes. The remainder of the building provides long-

and short-term storage capability for laboratory materials. It is protected with a dry-pipe automatic sprinkler system, heat detectors, a manual pullbox, and a portable fire extinguisher. The fire alarm system will alarm at the 222-S Laboratory Building and send a signal to the 200 Area Fire Station.

227-S Conditioned Storage Building - 227-S is a pre-engineered metal storage building containing several storage racks and a fenced in area used for controlled items. The building is protected throughout by a wet automatic fire sprinkler system and alarming system. The fire alarm system will alarm at the 222-S Laboratory Building and send a signal to the 200 Area Fire Station.

2.7.2 Air Monitoring

Vacuum Air Sampling System—The vacuum air sampling system currently provides air to open-face, filter-paper record, fixed-head air samplers located in some laboratory rooms, and service tunnels of the 222-S Laboratory Building. Air samples from each location are analyzed for alpha and/or beta-gamma radioactivity. The analyses are reviewed by radiological control personnel to ensure that the radioactive concentration of the air at various locations remains ALARA.

Air Monitoring—Beta-gamma continuous air monitor (CAM) units and alpha CAM units may be found in the 222-S Laboratory Building. The CAMs are placed in the various locations based on the potential for airborne radioactivity as determined by Radiological Control.

The gaseous effluent from the main 296-S-21 stack of the 222-S Laboratory Building is continuously sampled. The samples are analyzed to determine the quantity of alpha and beta radioactivity released to the atmosphere.

Gaseous effluent from the 296-S-16 stack, which exhausts the 219-S Waste Handling Facility waste tanks, is periodically sampled and analyzed to determine the quantity of alpha and beta radioactivity released to the atmosphere.

The gaseous effluent from the 296-S-23 stack, which exhausts the 219-S Waste Handling Facility sample gallery, is not sampled or monitored. Nondestructive assay (NDA) is performed every two years as the method for periodic confirmatory measurements as required by the Hanford Site Air Operating Permit to verify low emissions of radionuclides.

2.7.3 Safety Shower and Eyewash Locations

The 222-S Laboratory is equipped with safety showers at various locations if an inadvertent exposure to hazardous chemicals occurs. Eyewash stations are installed at most safety shower locations. Safety showers and eyewashes are installed in accordance with applicable OSHA, RCRA, and American Society of Mechanical Engineers (ASME) requirements ASME NQA-1-1989, *Quality Assurance Program Requirements for Nuclear Facilities*.

The 222-SA Laboratory is equipped with combination safety showers/eyewashes at four locations, and 219-S is equipped with two safety showers.

2.7.4 Survey Instrumentation

Survey instruments for detecting radioactive contamination are set at step-off pad locations in hallways and exits from designated laboratory rooms. The instruments permit early detection of personnel contamination and minimize the potential for spread of contamination to "clean" zones.

2.7.5 Safety Communications and Controls

The 222-S Laboratory communication systems consist of the following:

- Plant, cellular, or outside telephone system
- Internal paging system
- Emergency audible alarm system
- Fire alarm system

The plant, cellular, or outside telephone systems are commercial telephones that provide outside communication for all primary control locations and offices. The plant and outside systems are also tied to the area "CRASH" alarm system.

The 222-S Laboratory Public Address system provides internal paging and communication within the 222-S Laboratory.

2.7.6 Liquid Level Alarm Systems

High-liquid-level alarms are installed in the 207-SL retention basin, 219-S tanks, and 219-S sumps. When the liquid reaches a predetermined height, an annunciator light is activated locally and in Room 3-B of 222-S Laboratory Building. High-liquid-level alarms are also installed in the hot tunnel sumps and the cold (regulated) tunnel sumps. The hot tunnel sumps alarm in the S-3-D Control Room and Room 3-B, and the cold tunnel sumps alarm locally and in Room 3-B. These alarms, when activated, are acknowledged by 222-S Laboratory operating personnel who then take appropriate corrective action. During maintenance or outages of an alarm, increased surveillance frequencies can be invoked to ensure these parameters are not exceeded.

2.8 Utility Distribution Systems

2.8.1 Electrical Service

13.8-kV lines C8-L3 and C8-L4 from 251-W substation normally supply electrical service to the 222-S Laboratory. This voltage is transformed down to 480V by two 1000-kVA transformers. These transformers feed 480V to the main breakers F8X336 and F8X337 in the 222-S Laboratory substation. The 222-S Laboratory substation normally operates in a split-bus configuration with main breakers F8X336 and F8X337 normally closed and bus tie breaker F8X338 open.

In the event of a loss of power to one of the 13.8-kV feeders, the main breaker on the affected line will normally open and bus tie breaker F8X338 will normally close reestablishing power to

the facility. This configuration will remain until power is available on the affected line and electricians manually return the system to the original configuration.

In the event of a loss of power to both 13.8-kV feeders, both main breakers will normally open and remain in this condition until at least one source becomes available, at which time the respective main breaker will close. The bus tie breaker F8X338 will close 5 seconds later, reestablishing power to the facility. This configuration will remain until power is available on the remaining line and electricians manually return the system to the original configuration.

2.8.2 Water

Water supply to the 200 West area comes from pumps taking water from the Columbia River near B-Reactor. Water is pumped from the 181-B (River Pump house) to the 182-B Export Water Reservoir/Pump house. From the 182-B pump house the water is pumped to the Export Distribution System. Pumps at D-Reactor serve as redundant backup to the B-Reactor pump facilities. The original installation provided one 24-inch diameter export water supply to the 200 West water treatment plant. In the late 1990s, a 12-inch-diameter underground water pipe was installed connecting the 200 West sanitary water system with the 200 East sanitary water system. More recently, an 18-inch-diameter pipe was installed to provide a second export water pipe to the 200 West area.

The primary water supply for the laboratory area consists of two underground 12 -inch mains, one sanitary water and one raw water. Both sanitary and raw water supplies are the far south end loops of the 200 West water systems. These loops originate at the 200 Area water treatment plant located near the intersection of Beloit Avenue and 20th Street. Both water supply loops run along the north side of 222-S Laboratory Building. A sanitary water pipe loops around 222-S Laboratory Building to supply fire suppression systems and fire hydrants. About two thirds of this loop is 6-in. pipe and the remaining third is 12-in. pipe.

Two raw water supply lines and two sanitary water supply lines normally feed the 222-S Laboratory Complex from the 200 W water utilities. Both of the raw water lines are valved and tied together and both of the sanitary water lines are valved and tied together on the north side of the facility to provide two looped feeds. Water supply duration for sprinkler systems is based on ENS-ENG-IP-05, *ORP Fire Protection Program*. Section 6.5.1 requires "Fire flows shall be available for a minimum of 2 hr except that a minimum 4-hr supply shall be provided for large buildings, buildings with special public or physical hazards, multiple building sites, or groups of combustible buildings." The 200 West water supply systems, raw and sanitary, are capable of providing a 4-hr flow duration of combined fire suppression and building operational uses.

The raw water supply is the source of water for the majority of the 222-S Laboratory Building first floor fire sprinkler system and provides make-up and flush water for the processes at the 219-S Waste Handling Facility.

The sanitary water feed line for the building is connected to the feed line from water utilities on both the east and west ends of the 222-S Laboratory Building to provide a loop around the

facility. The sanitary water supply provides the source for the fire suppression systems in 222-SA, 2716-S, 227-S, the systems in 222-S Laboratory that are not supplied by raw water, and the fire hydrants around the facility that are not supplied by raw water. In addition, it provides the complex with domestic water, safety shower water, and the feed for the 222-S Laboratory process water.

2.9 Auxiliary Systems and Support Facilities

This section provides other supporting information that facilitates the conceptual model of the facility as it pertains to the hazard and accident analysis.

222-S Laboratory Building Annex—The 222-S Laboratory Building Annex, which is attached to the south side of the 222-S Laboratory Building, houses the maintenance shop, instrument shop, gas dock, and the counting room filter building.

227-S Conditioned Storage Building- 227-S is a pre-engineered metal storage building, located south of the 222-S Laboratory Building, containing several storage racks and a fenced in area used for controlled material storage items.

2716-S Storage Building—The 2716-S Storage Building, located south of the 222-S Laboratory Building, is a metal building with an area partitioned off that can be used to accumulate hazardous waste and to package hazardous materials for recycle. It provides both long- and short-term storage capability for laboratory materials and contains no radioactive materials.

Connex Boxes—Connex boxes are located around the facility and are utilized for the storage of maintenance materials, laundry, rags, various spare parts and other equipment.

Administrative and Office Buildings—There are administrative and office buildings located within the 222-S Laboratory Complex (Figure 2-1). There are three office buildings, 2704-S, 2713-S and 2705-S. The others are trailers (or modular offices), MO -037, -291, -648, and -409. All of these buildings are used primarily as office buildings for the administrative support of the laboratory operations. Although these Administrative Buildings are within the 222-S Complex, they do not create any hazardous conditions or consequences to 222-S or the other auxiliary or support buildings.

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FIGURE 2-1. 222-S LABORATORY COMPLEX.

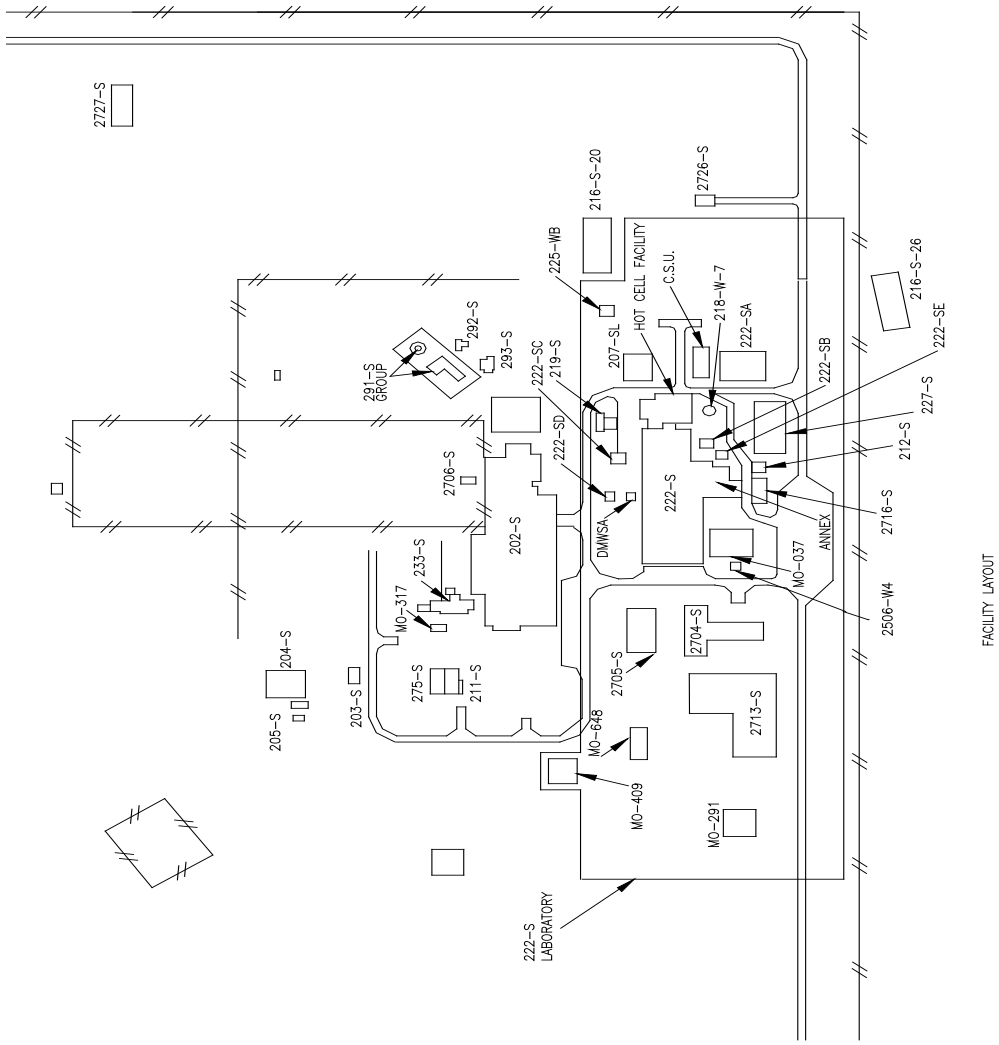


FIGURE 2-2. 222-S LABORATORY LAYOUT OF THE FIRST FLOOR.

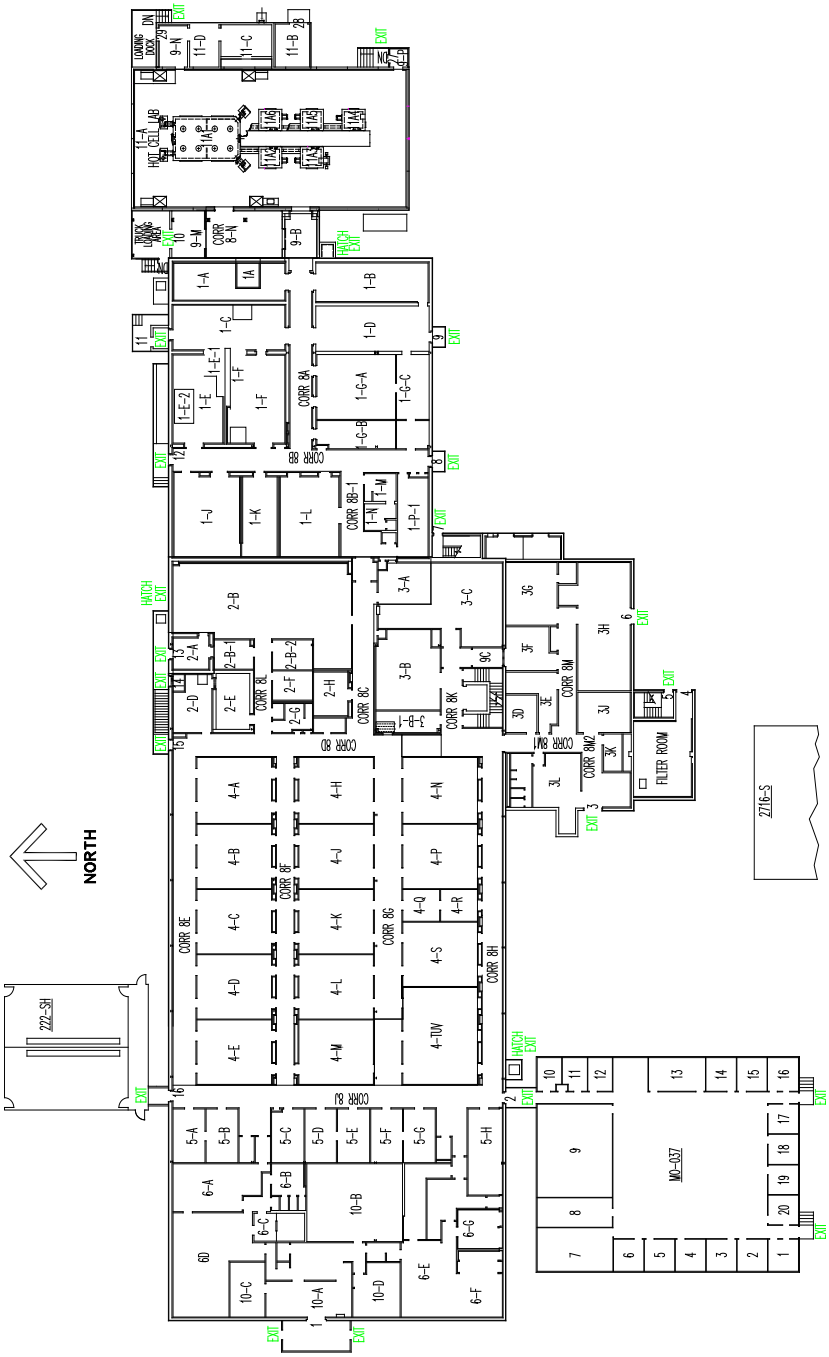


FIGURE 2-3. 222-S LABORATORY LAYOUT OF THE 11A HOT CELL.

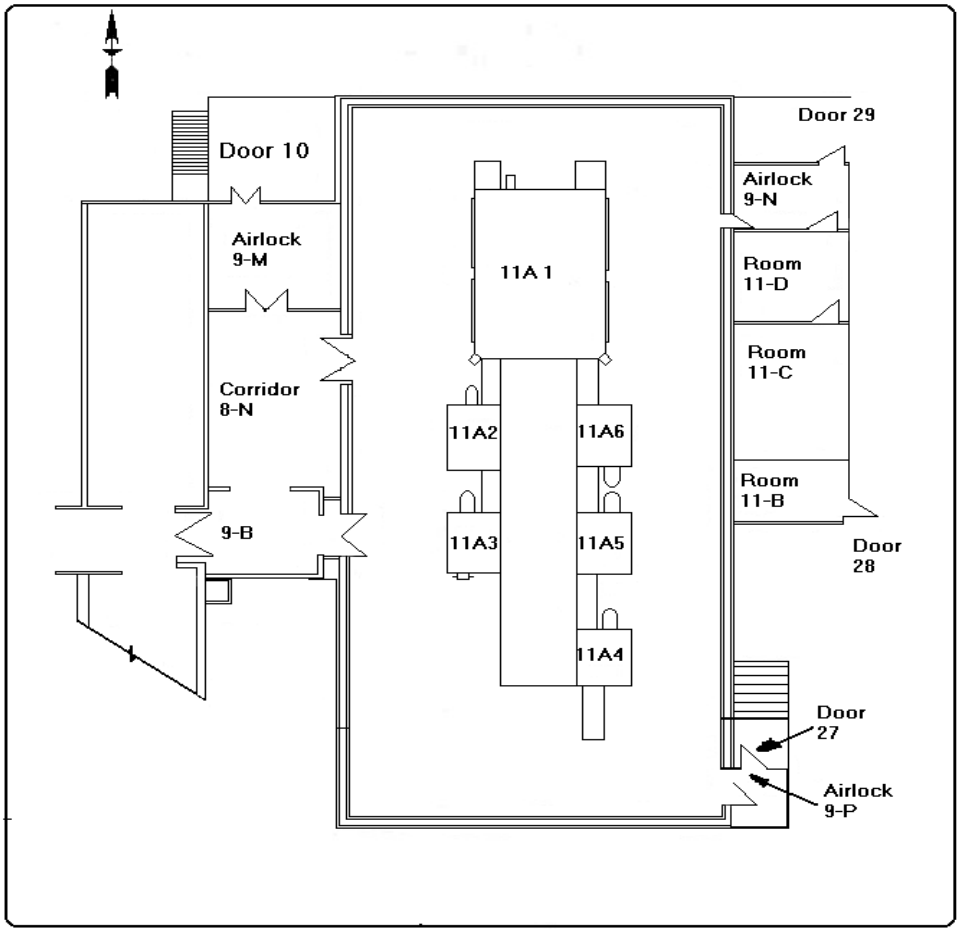


FIGURE 2-4. 222-S LABORATORY LAYOUT OF THE SECOND FLOOR.

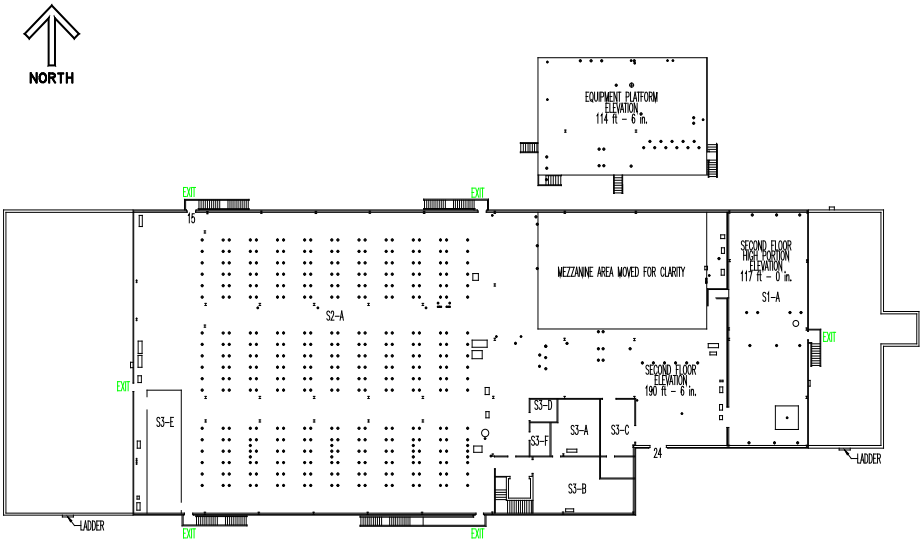


FIGURE 2-5. 222-S LABORATORY LAYOUT OF THE BASEMENT/TUNNEL.

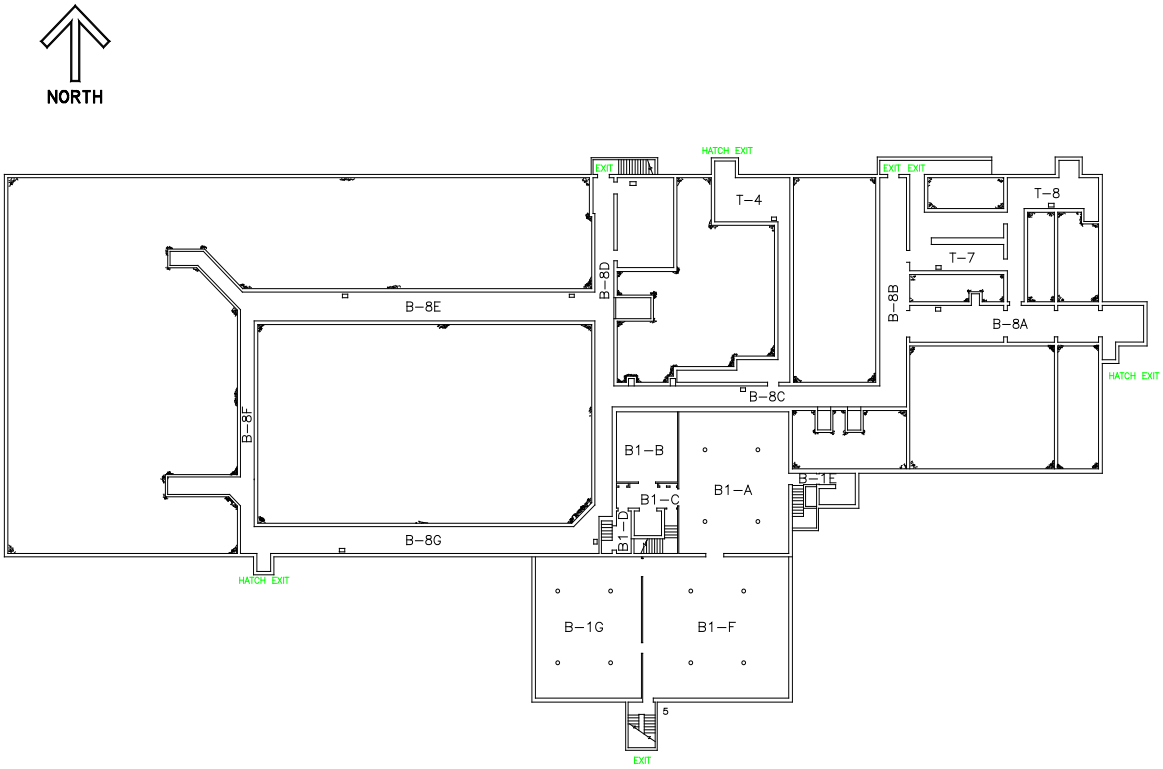
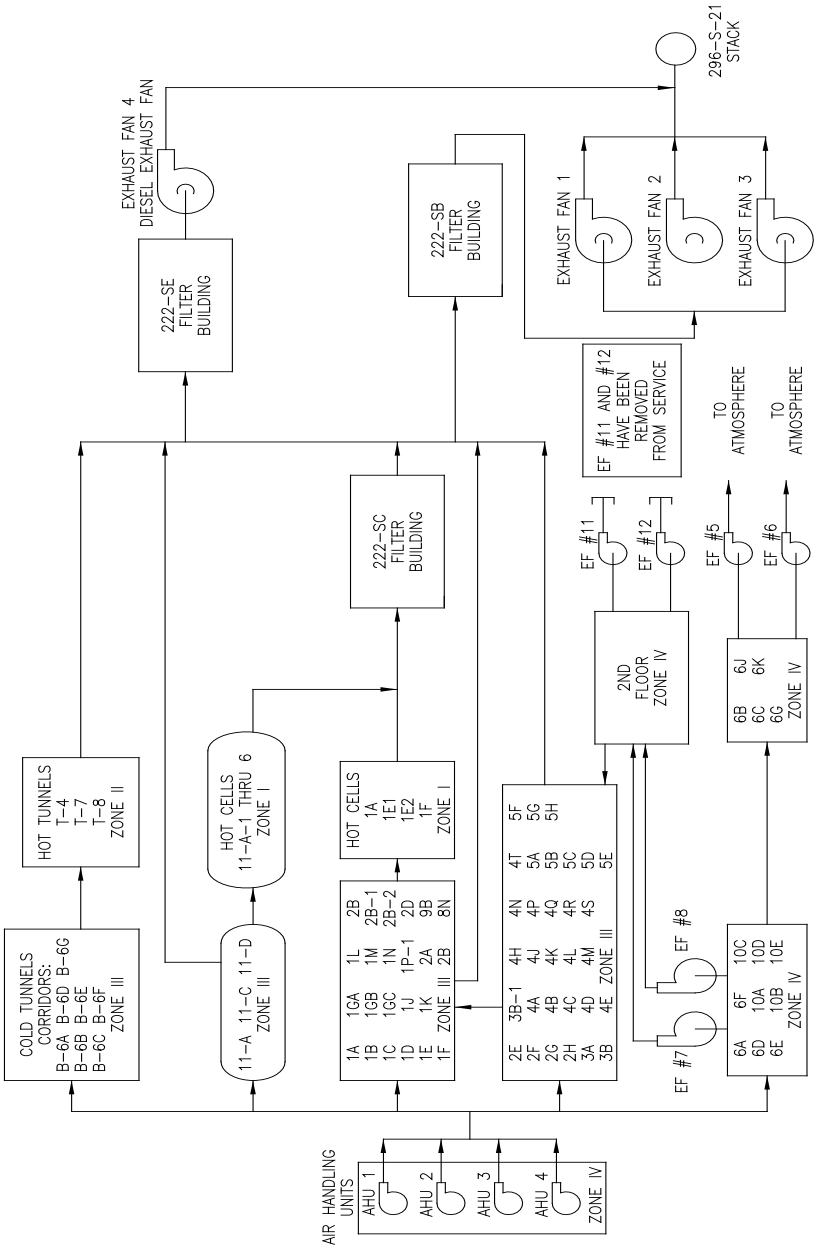


FIGURE 2-6. 222-S LABORATORY BUILDING VENTILATION SYSTEM.



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3.0 HAZARD AND ACCIDENT ANALYSIS

This chapter presents the methodology and results for the hazard and accident analysis for the 222-S Laboratory Complex.

3.1 Introduction

A flow diagram of the DSA safety analyses process is illustrated in Figure 3-1. This process is designed to meet the guidance in DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*. This chapter conforms to the direction presented in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH). The safety analyses process is applied with a graded approach. The 222-S Laboratory Complex is a Hazard Category 3 facility. Therefore, some aspects of the process do not require the same level of rigor as for Category 1 and Category 2 nuclear facilities.

The safety analysis process consists of the following major elements.

- Hazard Analysis
  - Hazard Identification
  - Hazard Evaluation
  - Candidate Accident Selection
- Accident Analysis
  - Accident Analysis (Unmitigated)
  - Accident Analysis (Mitigated)
- Final Hazard Categorization
- Control Decision Process

Hazards that can contribute to the uncontrolled release of radioactive or hazardous materials (called hazardous conditions) are systematically and comprehensively identified through the Hazard Analysis (Section 3.3). The set of potential uncontrolled releases identified is subject to a candidate selection process. This process identifies candidate representative accidents, which are the starting point for the accident analysis (Section 3.4). Results of the accident analysis and the hazard analysis are used to support the control decision process. This process identifies safety-related controls and classifies safety-related structures, systems, and components (SSCs). The controls (including safety management programs) are allocated to all hazardous conditions identified by the hazard analysis.

Results of the accident analysis also support determination of the final hazard categorization (Section 3.3.2.2).

The expectation for Hazard Category 3 facilities, according to HNF-8739, SARAH, is the establishment of an inventory limit based on quantification of unmitigated risk from bounding scenarios so that the only Technical Safety Requirement (TSR) needed is inventory control. However, all steps of the safety analysis process are required in some level of detail. In general,

quantitative accident analysis is not necessary for Hazard Category 3 facilities, and controls are derived from the hazard evaluation. For 222-S Laboratory the dose consequences of the worst-case accident are quantified.

3.2 Requirements

The requirements for the hazard and accident analysis are contained in Title 10, *Code of Federal Regulations* Part 830 (10 CFR 830), Subpart B, "Safety Basis Management." Recommended practices for hazard screening, accident selection, and accident analysis are included in DOE-STD-3009-94. Additional guidance is presented in HNF-8739.

3.3 Hazard Analysis

This section presents the methods used and the results obtained for the hazards analysis. As shown in Figure 3-1, the hazard analysis consists of three activities:

- Hazard Identification
- Hazard Evaluation
- Candidate Accident Selection

A description of these activities is provided in the following sections.

3.3.1 Methodology

This section presents the methodology used to identify and characterize hazards and to perform a systematic evaluation of basic accidents.

3.3.1.1 Hazard Identification

Identification of all hazards and energy sources is performed by using the checklist provided in Appendix A and marking those that apply to the facility. A hazard is defined as an energy source or harmful material (radioactive or hazardous).

Any hazards identified from the checklist that meet one of the following criteria were not considered for further detailed analysis in the hazard evaluation:

- Hazards routinely encountered and/or accepted by the public
- Hazards controlled by regulations and/or one or more national consensus standards
- General radiological hazards subject to 10 CFR 835, "Occupational Radiation Protection"
- Hazards likely to be found in homes, general retail outlets, and associated with open-road transportation subject to U.S. Department of Transportation regulation.

However, for completeness, these types of industrial and radiological hazards are included in this section along with the safety management programs that address them. A Hazard Description and Protection Form, Appendix B, is used to complement Appendix A. This form provides a specific description of the types of hazards and lists the potential consequences. The use of this form is discussed in Section 3.3.2.1.

3.3.1.1.1 Material at Risk (MAR)

During the development of this DSA, it was determined that a quantity of TRU that provides a reasonably bounding accident dose consequences without undue conservativeness could be obtained from ANS/ANSI 8-3, Criticality Accident Alarm System. ANS/ANSI 8-3 states:

> The need for criticality alarm systems shall be evaluated for all activities in which the inventory of fissionable materials in individual unrelated areas exceeds 700 g of U-235, 500 g of U-233, 450 g of Pu-239 or 450 g of any combination of these three isotopes.

The fissionable material inventory in the 222-S Laboratory does not challenge the conditions of ANSI/ANS-8.3, but the criticality safety practice of a double batching consideration provides a basis for a total inventory of 225 g of transuranic (TRU) waste. The chosen quantity of ^{90}Sr, ^{90}Y, and ^{137}Cs for the accident analysis is a conservative amount, based on the Best Basis Inventory (BBI) presented in HNF-10754, *222-S Laboratory Radiological Inventory Comparison with Accident Dose Consequences*, and bounds current operations and estimated future commitments.

The dose equivalent factor (DEF) is the ratio of the 50-year total effective dose (TED) from a quantity (Ci) of each isotope to that for an equivalent quantity of ^{239}Pu, or equivalently the ratio of the dose conversion factor (DCF) for the isotope to that of ^{239}Pu. By definition, 1 Ci of ^{239}Pu = 1 dose equivalent curie (DE-Ci). The current direction from the U.S. Department of Energy (Klein 2002) is to use the International Commission on Radiological Protection (ICRP) 68, *Dose Coefficients for Intakes of Radionuclides by Workers,* dose conversion models to calculate dose for workers and ICRP 71/72, *Age-Dependent Doses to the Members of the Public from Intake of Radionuclides: Parts 4 and 5, Complication of Ingestion and Inhalation Coefficients*, should be applied to the maximum offsite individual (MOI). Table 3-1 presents the facility inventory and DE-Ci conversion.

3.3.1.2 Hazard Evaluation

The hazard evaluation technique was selected from the AIChE handbook, *Guidelines for Hazard Evaluation Procedure*s. For the 222-S Laboratory Complex, a Preliminary Hazards Analysis (PHA) study was used to identify potential hazardous conditions and estimate their potential harm. A decomposition of facility mission into activities that can occur at specified locations is made to support the PHA.

A wide-ranging set of significant hazardous conditions was formulated that could lead to release of radioactive or hazardous materials from contained sources within the 222-S Laboratory Complex. A hazardous condition is defined as a condition or combination of conditions that result in an uncontrolled release of radioactive or hazardous material. The following format was used while postulating the hazardous conditions:

> "*Release of* (material type) *to* (a location) *from* (a source) *due to* (a cause)."

Table 3-1. Material at Risk and Dose Equivalent Curies.

Isotope	Mass Fraction of 12% Fuel	Isotope Mass (g)	Isotope (Ci)	ICRP 68 For Collocated Workers			ICRP 71/72 for Maximum Offsite Individual		
				Dose Conversion Factor [a] (Sv/Bq)	DE-Ci Factor	DE-Ci	Dose Conversion Factor [a] (Sv/Bq)	DE-Ci Factor	DE-Ci
^{238}Pu	0.0008	0.18	3.08	3.0E-05	0.94	2.89	4.6E-05	0.92	2.84
^{239}Pu	0.8395	188.89	11.71	3.2E-05	1.00	11.71	5.0E-05	1.00	11.71
^{240}Pu	0.1297	29.18	6.62	3.2E-05	1.00	6.62	5.0E-05	1.00	6.62
^{241}Pu	0.011	2.48	254.93	5.8E-07	0.02	4.62	9.0E-07	0.02	4.62
^{242}Pu	0.0003	0.07	2.65E-04	3.1E-05	0.97	2.6E-04	4.8E-05	0.96	2.54E-04
^{241}Am	0.0175	3.94	13.51	2.7E-05	0.84	11.34	4.2E-05	0.84	11.34
^{90}Sr		12.95	1800	3.0E-08	9.4E-04	1.69	3.6E-08	7.2E-04	1.30
^{90}Y		3.3E-03	1800	1.7E-09	5.3E-05	0.11	1.5E-09	3.0E-05	0.05
^{137}Cs		7.31	633	6.7E-09	2.1E-04	0.13	4.6E-09	9.2E-05	0.058
Total	0.9988					39.11			38.54

[a] Absorption values from RPP-5924, *Radiological Source Terms for Tank Farms Safety Analysis*.

The only exception to this format was the recording of radiation protection and occupational issues that were raised as result of postulating uncontrolled releases. They were recorded if they could result in excessive exposure of personnel to radioactive/hazardous material or injury; therefore they were not described as a release.

The PHA also developed an estimate of the risk. The risk for a hazardous condition was determined by estimating the likelihood that such a condition would develop and by estimating the consequence if it did.

A PHA is a systematic brainstorming process using a multi-disciplinary team of knowledgeable individuals. Results are captured on PHA worksheets, which are described in Section 3.3.1.2.1. Because these assessments are to be qualitative in nature, the expertise and experience of the team is of primary importance in establishing the credibility of the analysis. Facility personnel representing the operations, engineering, nuclear safety, radiation protection, fire protection, industrial safety, and environmental safety organizations should participate in the PHA process.

The PHA sessions start with development of preparatory information: (1) evaluation of facility operational history, (2) hazard and energy source identification, (3) definition of the MAR, and (4) decomposition of process into activities. Based on this information, brainstorming of hazardous conditions is performed. All tasks related to each activity as well as the failure of associated personnel, equipment, and systems are considered.

3.3.1.2.1 PHA Worksheet Description

The worksheets in Appendix C are used to capture the information resulting from the PHA sessions. The worksheets contain a series of columns where information should be filled in for each identified hazardous condition.

- Identifier—The identifier is a unique code for each hazardous condition (or radiation protection or occupational safety entries). It contains an indication of the facility and activity related to the entry.
- Activity—The activity assessed for hazardous conditions.
- MAR—A description of the type and location of the material inventory considered for release in each entry. The analysis uses a reasonably conservative description of this MAR for determining potential consequences.
- Hazardous Condition—A brief description of the uncontrolled release of material including the location of the release and the condition of the release.
- Candidate Causes—A brief description of the cause of the uncontrolled release, generally an identification of the initiating event for the release.
- Immediate Consequences—A brief description of the physical consequences of the hazardous condition that indicates the form of the release and how personnel are affected.

- Candidate Controls—Engineering features or administrative controls that currently exist or might be implemented as preventive or mitigative features.
- Frequency Category—Categorization used in estimating the frequency of the hazardous condition.
- Consequence Category—Categorization used in estimating the consequence of the hazardous condition.

  S1—Consequence for the facility worker.
  S2—Consequence at the collocated worker (CW).
  S3—Consequence for the MOI.

- Risk Class Bins—Risk class based on frequency and consequence from Table 3-6.

3.3.1.2.2 Likelihood Category Definitions

The likelihood of each hazardous condition was estimated by assigning one of the categories defined in Table 3-2.

Table 3-2. Frequency Category Definitions.

	Frequency Category	Category Description	Nominal Range of Likelihood
F3	Anticipated	For abnormal events expected to occur in the lifetime of a facility (spills, fires)	1E-2 to 1
F2	Unlikely	For events not expected to occur during the lifetime of a facility (but collectively an event from this category may occur)	1E-4 to 1E-2
F1	Extremely unlikely	For events that are extremely unlikely (design-basis accidents)	1E-4 to 1E-6
F0	Beyond extremely unlikely	For situations for which no credible scenario can be identified	<1E-6

3.3.1.2.3 Consequence Category Definitions

The health and safety consequence of each hazardous condition was estimated by assigning one of the categories defined in Table 3-3.

The environmental consequence of each hazardous condition was estimated by assigning one of the categories listed in Table 3-4.

Table 3-3. Consequence Category Definitions.

	Consequence Category	Public (MOI) - S3	Collocated Worker - S2	Facility Worker - S1
A	High	Significant amounts of radioactive or hazardous material reach site boundary (>25 rem TED or >ERPG- 2/TEEL-2)	Significant amounts of radioactive or hazardous material reach workers at 100 m (>100 rem TED or >ERPG-3/TEEL-3)	Prompt fatality or serious injury
B	Moderate	Some amount of radioactive or hazardous material reaches site boundary >1 rem TED or >ERPG-1/TEEL-1	Some amount of radioactive or hazardous material reach workers at 100 m (>25 rem TED or >ERPG-2/TEEL-2)	Significant radiological or chemical exposure (immediate but reversible health effects)
C	Low	Small amounts of radioactive or hazardous material reaches site boundary (<moderate consequences >none)	Small amounts of radioactive or hazardous material reach workers at 100 m (<moderate consequences >none)	<Moderate consequences >none
D	None	No impact on public	No impact on 100-m worker	No impact on facility worker

Table 3-4. Environmental Consequence Category Definitions.

E0	No significant environmental consequence
E1	Localized discharge
E2	Significant discharge onsite
E3	Offsite discharge or discharge to groundwater

3.3.1.2.4 Overall Assessment Assumptions

The following are the overall assumptions used during the course of the PHA.

- The frequency of a hazardous condition is estimated assuming controls (engineered or administrative) are absent. It does not include the likelihood contribution of control failures. It might include the combination of more than one frequency contributor if required to create (be an initiator for) the hazardous condition.
- Consequence is estimated assuming controls (engineered or administrative) are absent. Passive controls that do not need to be “protected” are credited.
- No leak path reduction factor is assumed. If some material that is contained in buildings, structures, and vessels can be released, it is assumed that all the material (available for release as a result of certain damage or failure) is released.
- Only one hazardous condition was postulated for each type of natural phenomenon and external event identified. The hazardous condition chosen is considered to represent the greatest risk.

3.3.1.2.5 Candidate Representative Accident Selection

From the PHA a wide-ranging set of hazardous conditions is formulated that could lead to a release of radioactive or hazardous materials from contained locations within the facility vessels and piping. Based on this, a list of candidate representative accidents is selected that represent and bound all hazardous conditions HNF-12648, *Candidate Representative Accidents for the*

222-S Laboratory Complex. From this candidate list, accidents are defined and analysis performed to quantitatively determine safety impacts.

The accident selection process was comprised of the following steps:

- Initial screening
- Assignment of release attribute categories
- Assignment of hazard identification codes
- Sorting of all hazardous conditions by release attribute category, and then within a release attribute category by hazard identification code
- Allocation of hazardous conditions to accident group
- Selection of representative hazardous condition for each accident group
- Selection of representative accidents.

3.3.1.2.6 Initial Screening

Hazardous conditions that would not result in a release of radioactive or hazardous material are not considered for further detailed analysis. In some cases hazardous conditions that cannot lead to a release of hazardous material but could lead to occupational injury or increased radiation exposure were recorded. For these entries, the letters "OCC" (for occupational) or the letters "RAD" (for radiological) are recorded in the MAR column since there is no MAR. These hazardous conditions are not formulated as a release of radioactive or hazardous material and are not allocated to an Accident Group, but they still warrant consideration in appropriate radiation protection and occupational safety programs. In some cases hazardous conditions were postulated that could result in both a release of radiological or hazardous material to the environment and a nonradiological injury. These hazardous conditions are considered further because release of material is postulated.

3.3.1.2.7 Assignment of Release Attributes Categories

Hazardous conditions are assigned release attributes based on (1) the energy level of the potential accident, (2) the location of the potential release, and (3) the form of the potential release. Assignment in each of these areas creates a combination that forms the release attribute category. This categorization provides an initial rough grouping of hazardous conditions that lead to like-kind accident phenomena.

Energy level attribute assignments were made according to the following definitions:

- H - High
- M - Moderate
- L - Low

High level is used for energetic events such as explosions and fires. Moderate level is used for moderate energy events such as spray leaks, drops of dispersible material, breach of ventilation with fans running, and other pressurized releases. Low level is used for low energy events such as leaks from nonpressurized vessels and leaks from nonpressurized (or failed) vent systems.

Release location attribute assignments were made according to the following definitions. For releases into multiple locations, the location that leads to the most severe consequence was used.

- 1 - Atmosphere
- 2 - Ground surface
- 3 - Subsurface

Release form attribute assignments were made according to the following definitions.

- G - Vapor/gas/aerosols
- L - Liquid/slurry
- S - Solid/sludge/particulates

So, for example, an explosion in an evaporator vessel due to flammable gases that have accumulated and ignited would be assigned to the "H-1-L" group. A pipe failure that results in a spray leak in a liquid waste slurry line would be "M-1-L." A slow leak of waste slurry from an evaporator vessel breach that subsequently finds a flow path out of the facility and forms a pool would be "L-2-L." An excavation that breaches a transfer line and does not pool to the surface would be assigned to the "L-3-L" group.

3.3.1.2.8 Assignment of Hazard Identification Codes

Identification of hazards and energy sources was performed during the hazards assessment process by marking hazards present in the facility on the hazard identification checklist provided in HNF-8739. In addition, each hazardous condition is assigned a general hazard code, shown in Table 3-5, that associates it with a class of hazards from the SARAH checklist. In some cases more than one hazard or energy source would be applicable, but the one most associated with the accident phenomena is chosen. For example, a vehicle impact might cause rupture of the gasoline fuel tank, which could cause a fuel pool fire engulfing nearby waste containers. In this case, the hazard is considered to be the gasoline (TP) rather than the linear motion (KE) of the vehicle.

Table 3-5. Hazard Categories from Checklist.

General Hazard ID Code	General Hazard ID Code
1. EE - Electrical energy	9. ME - Mechanical energy
2. LOFE - Loss of electrical	10. RM – Radioactive material
3. TE - Thermal energy	11. CE - Chemical energy
4. TP - Thermal potential energy	12. CM - Chemical materials
5. RE - Radiant energy	13. BIO - Biological
6. AE - Acoustic energy	14. NPH - Natural phenomena
7. KE - Kinetic energy	15. LOTE - Low thermal energy
8. PE - Potential energy	16. OTH - Other

3.3.1.2.9 Sorting Results by Release Attribute Categories and Hazard Codes

The hazardous condition data were sorted by release attribute categories. Within each release attribute category, hazardous conditions were then sorted by the hazard code to provide further differentiation. The resulting sort is the starting point for allocating hazardous conditions to like-kind accident groups.

3.3.1.2.10 Allocation of Hazardous Conditions to Accident Groups

Based on the release attribute categories and hazard code, a set of hazardous conditions is identified that would to lead to like-kind accidents. These sets are examined to confirm that each hazardous condition involves the same phenomena. In some cases more differentiation is needed (e.g., explosions involving waste containers and fire involving waste containers belong to the same release attribute category but need further differentiation). Differentiation is also needed if the cause of the harm mandates the use of controls that are greatly different from other hazardous conditions in the set. However, some sets are combined because less differentiation is needed (low-energy container breaches were combined regardless of the initiator such as drum corrosion, container heatup, and vibration).

In some cases an accident set may consist of only one hazardous condition. This one hazardous condition represents a unique situation.

3.3.1.2.11 Selection of Representative Hazardous Condition for Each Accident Group

For each accident group, a representative but bounding case hazardous condition is selected from the set to help characterize the group. In some cases more than one hazardous condition could be selected if one condition cannot adequately represent the set. A bounding case hazardous condition is defined as one representing the highest risk (frequency and consequence combination).

3.3.1.2.12 Selection of Candidate Representative Accidents

Accident groups whose representative hazardous condition(s) fall into a high risk class bin are candidate representative accidents and require further detailed analysis. If the risk to the MOI (S3) or CW (S2) is assigned to Risk Class I or II as defined in Table 3-6, then it is considered high. Controls in the form of TSRs will need to be identified to reduce the risk to Risk Class III or IV. Equipment associated with these controls will be designated as safety-significant.

Table 3-6. Risk Class Bins.

	Beyond Extremely Unlikely Below 10E-6/yr	**Extremely Unlikely 10E-4-10E-6/yr**	**Unlikely 10E-2-10E-4/yr**	**Anticipated Above 10E-2/yr**
High consequence	III	II	I	I
Moderate consequence	IV	III	II	I
Low consequence	IV	IV	III	III

3.3.1.2.13 Candidate Representative Accident Worksheet Definitions

Hazards assessment information recorded during the PHA on worksheets is presented in Appendix D. The key fields of the worksheet are the following:

- Representative Accident Number—A number identifier that associates the hazardous condition with a representative accident set.
- Release Attribute Category—Categorization that groups hazardous conditions into accident phenomena of like kind.
- Hazard Code—Code applied to each hazardous condition that links it to one of the general classes of hazards in the SARAH hazards and energy sources checklist.
- Identifier—A unique identifier for each hazardous condition (or radiation protection or occupational safety entries). Activity—The activity assessed for hazardous conditions.
- MAR—A description of the type and location of the material inventory considered for release in each entry. The analysis uses a reasonably conservative estimate.
- Hazardous Condition—A brief description of the uncontrolled release of material including the location of the release and the condition of release.
- Candidate Causes—A brief description of the cause of the uncontrolled release; generally an identification of the initiating event for the release.
- Candidate Controls—Engineering features or administrative controls that currently exist or might be implemented as preventive or mitigative features.
- Frequency Category—Categorization used in estimating the frequency of the hazardous condition.
- Consequence Category—Categorization used in estimating the consequence of the hazardous condition.

  S1—Consequence for the facility worker.

  S2—Consequence at the CW.

  S3—Consequence for the MOI.
- Risk Class Bins—Risk class based on frequency and consequence from Table 3-6.

3.3.1.2.14 Selection Assumptions

Key assessment bases and assumptions are the following:

- If a hazardous condition could only occur in one situation, it was considered to be unique.
- Hazardous conditions that were defined so broadly that they could lead to a range of different kinds of accidents were allocated to the highest consequence representative accident set (e.g., flammable gas ignition that could lead to overpressurization, fire, or explosion).
- Within a representative accident set of hazardous conditions, a single hazardous condition was selected (in some cases two were chosen) to be bounding and representative of all others. So all allocated hazardous conditions in that set represent similar or lower risk.

3.3.2 Hazard Analysis Results

3.3.2.1 Hazard Identification

The completed Hazard Identification Checklist is presented in Appendix A and the Hazard Description and Protection Form is presented in Appendix B. As seen from these appendixes, 222-S Laboratory hazards include a wide range of standard industrial hazards as well as hazards associated with the potential release of radioactive or hazardous materials from contained sources within the 222-S Laboratory Complex.

Safety management programs protect the facility worker from the standard industrial types of hazards. The 222-S Laboratory follows the WRPS Integrated Environment, Safety, and Health Management System (ISMS) described in RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor*, which describes the ISMS structure, policies, programs, processes, and implementing mechanisms. Key safety management programs (SMP) supporting worker protection for the 222-S Laboratory Complex, are further explained in Section 3.3.2.3.3.

As described in Section 3.3.1.1, most of these industrial hazards are not considered further in the hazard evaluation because they do not contribute to the consequences of the worst-case accident. Hazards that contribute to an uncontrolled release are important to the development of hazardous conditions in the PHA process presented in Section 3.3.2.2.

3.3.2.2 Hazard Categorization

The 222-S Laboratory is operated as a Hazard Category 3 nonreactor nuclear facility and the nuclear material inventory will be restricted such that the total facility inventory remains below the Category 2 threshold quantities listed in DOE-STD-1027-92. Table 3-7 provides the radioactive material inventory for the 222-S Laboratory and compares it to the Category 2 threshold quantities.

Table 3-7. 222-S Laboratory Inventory of Radioactive Material.

Isotope	Operating Inventory (Ci)	Category 2 Threshold (Ci)	Sum of Fractions
^{238}Pu	3.08	62	4.97E-02
^{239}Pu	11.71	56	2.09E-01
^{240}Pu	6.62	55	1.20E-01
^{241}Pu	254.93	2900	8.79E-02
^{242}Pu	0.000265	55	4.81E-06
^{241}Am	13.51	55	2.46E-01
^{90}Sr	1800	22000	8.18E-02
^{90}Y	1800	22000	8.18E-02
^{137}Cs	633	89000	7.11E-03
Total			0.883

As seen from Table 3-7, the operating inventory of the 222-S Laboratory is below the Category 2 thresholds and the sum of fractions is 0.883. The hazards evaluation and accident analysis presented show no potential for significant offsite or onsite consequences. This is consistent with a Hazard Category 3 designation of the 222-S Laboratory.

3.3.2.3 Hazard Evaluation

The hazard evaluation characterizes the identified hazards in the context of the actual facility and process. The results of the hazard evaluation are (1) identification of the accident scenarios to be evaluated, (2) estimation of the frequency and consequences of these scenarios, (3) description and evaluation of the adequacy of the controls available to prevent or mitigate the accidents, and (4) determination of the need for more detailed accident analysis. HNF-12652 presents the hazard evaluation results including the PHA tables. The PHA tables for the 222-S Laboratory Complex are provided in Appendix C. The PHA is organized by 222-S Laboratory activity or location.

3.3.2.3.1 Planned Design and Operational Safety Improvements

The hazard evaluation did not identify a need for planned design or operational improvement. The consequences of accidents to the facility worker are the result of standard industrial hazards that are mitigated through the implementation of SMPs and ISMS. Consequences to the public receptors for the accidents identified are within guidelines so mitigation through design changes or operational safety improvements are not warranted.

3.3.2.3.2 Defense in Depth

Decisions on classifying SSC as safety-class and safety-significant, selecting required TSR controls, identifying SMP controls, and identifying additional controls specifically for environmental protection are developed with a disciplined methodology and process using established control decision criteria. Applying this control decision process, controls are derived on the basis of control decision criteria, best available information, and the collective expertise and experience of the participating hazard and accident analysis, engineering, operations, and management personnel.

Candidate controls identified in the PHA were used to develop a list of defense-in-depth controls by safety analysis and engineering staff. Both engineered features and administrative controls were considered. Each recommended defense-in-depth control was related to a specific SMP. Table 3-8 shows the SMPs that support the Defense-in-Depth Controls.

The evaluation guidelines for the offsite public (MOI) and CWs (Worker) are presented in SARAH, HNF-8739, and given in Table 3-3. Table 3-6 provides the risk class bins. Based on the accident analysis, no risk to the MOI (S3) or CW (S2) were assigned to Risk Class I or II, thus controls in the form of Safety Class SSCs, Safety Significant SSCs, or TSRs were not considered to reduce the risk to Risk Class III or IV. However, an administrative control on the 222-S Laboratory facility radioactive inventory is required to ensure that it remains Category 3 and the dose consequences from the bounding worst-case accident remain below the guidelines. This is a key control and should be a TSR.

Appendix D provides a listing of the defense-in-depth controls as a specific category in the Candidate Representative Accident Worksheet. The specific control is followed by a short abbreviation that relates the control to the appropriate SMP. Table 3-8 provides the correlation between the short abbreviation in Appendix D to the program that provides defense-in-depth barriers to contain uncontrolled hazardous material or energy releases.

Table 3-8. Safety Management Programs Supporting Defense-in-Depth Controls.

Criticality Safety Program (CS)	DOE O 420.1B, *Facility Safety* ATS-310 Section 1.12, *Criticality Safety Program* ATS-LO-180-107, *222-S Laboratory Radiological Sample Inventory Control* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-49, *Tank Farm Contractor Nuclear Criticality Safety Program*
Radiation Protection Program (RP)	10 CFR 835, *Occupational Radiation Protection* DOE O 5400.5, Chg. 2, *Radiation Protection of the Public and the Environment* HNF-5183, *Tank Farms Radiological Control Manual (TFRCM)* HNF-MP-5184, *Washington River Protection Solutions LLC Radiation Protection Program* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor*
Hazardous Material Protection Programs • Industrial Hygiene (IH) • Occupational Safety (OS) • Industrial Safety (OS) • Environmental Protection (EPROTECT)	10 CFR 851, *Worker Safety and Health Program* 29 CFR 1910, *Occupational Safety and Health Administration* 40 CFR 302, *Designation, Reportable Quantities, and Notification* DOE O 231.1A, *Environment, Safety, and Health Reporting* DOE O 5400.5, Chg. 2, *Radiation Protection of the Public and the Environment* DOE O 5480.4, *Environmental Protection, Safety, and Health Protection Standards* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-34, *Industrial Hygiene Exposure Assessment Strategy* TFC-PLN-47, *Worker Safety and Health Program* TFC-POL-14, *WRPS Safety and Occupational Health* TFC-POL-16, *Integrated Safety Management System Policy*
Radioactive and Hazard-ous Material Waste Management Programs (RWM)	49 CFR 178, *Specifications for Packagings* 49 CFR 173, *Shippers--General Requirements for Shipments and Packagings* DOE O 435.1, Chg. 1, *Radioactive Waste Management* HNF-5183, Tank Farms Radiological Control Manual (TFRCM) RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-33, *Waste Management Basis* TFC-PLN-100, *Requirements Basis Document*

Table 3-8. Safety Management Programs Supporting Defense-in-Depth Controls.

Testing In-Service Surveillance and Maintenance Program • Maintenance (M)	DOE O 433.1B, *Maintenance Management Program for DOE Nuclear Facilities* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* RPP-PLN-39433, *Procurement, Construction, and Acceptance Testing Plan* RPP-PLN-39434, *Construction and Acceptance Testing Program* TFC-CHARTER-01, *Tank Operations Contractor Charter* TFC-PLN-26, *Testing Program Plan* TFC-PLN-29, *Nuclear Maintenance Management Program* TFC-PLN-100, *Requirements Basis Document*
Operational Safety Program • Fire Protection (FP) • Conduct of Operations (CO)	DOE O 420.1B, *Facility Safety* DOE O 422.1, *Conduct of Operations* DOE/RL-94-02, *Hanford Emergency Management Plan* ENS-ENG-IP-05, *ORP Fire Protection Program* HNF-SD-CP-FHA-003, *222-S Laboratory Fire Hazards Analysis* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-05, *Conduct of Operations Implementation Plan* TFC-PLN-13, *Fire Protection Program* TFC-PLN-100, *Requirements Basis Document*
Procedures Development and Training Program • Training (TNF)	DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-61, *Tank Operations Contractor Training and Qualification Plan* TFC-PLN-80, *Procedure Program Description* TFC-PLN-100, *Requirements Basis Document*
Quality Assurance Program (QA)	10 CFR 830, Subpart A, "Quality Assurance Requirements" DOE O 414.1C, *Quality Assurance* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-02, *Quality Assurance Program Description* TFC-PLN-29, *Nuclear Maintenance Management Program* TFC-PLN-100, *Requirements Basis Document* TFC-PLN-112, *Graded Approach to Quality*
Emergency Preparedness Program (EPLAN)	40 CFR 355, "Emergency Planning and Notification" DOE-0233, Emergency Plan Implementing Procedures DOE O 151.1C, *Comprehensive Emergency Management System* DOE/RL-94-02, *Hanford Emergency Management Plan* ATS-MP-1036, *Building Emergency Plan for the 222-S Laboratory Complex* RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Operations Contractor* TFC-PLN-85, *Emergency Management Program* TFC-PLN-100, *Requirements Basis Document*
Management, Organiza-tion, and Institutional	10 CFR 830, Subpart B, "Safety Basis Requirements" RPP-MP-003, *Integrated Environment, Safety, and Health Management*

Table 3-8. Safety Management Programs Supporting Defense-in-Depth Controls.

Safety Provisions • Configuration Management (CM)	*System Description for the Tank Operations Contractor* TFC-CHARTER-01, Tank Operations Contractor Charter TFC-PLN-02, *Quality Assurance Program Description* TFC-PLN-03, *Engineering Program Management Plan* 16 TFC-PLN-05, *Conduct of Operations Implementation Plan* TFC-PLN-17, *Document Control and Records Management Program Description* TFC-PLN-29, *Nuclear Maintenance Management Program* TFC-PLN-47, *Worker Safety and Health Program* TFC-PLN-100, *Requirements Basis Document*

3.3.2.3.3 Worker Safety

As discussed previously, most of the standard industrial hazards are not further considered as the PHA focuses on release of radioactive or hazardous material. The PHA, however, does contain, (as described in Section 3.3.1.2.6) a few hazardous conditions that do not lead to a release of hazardous material but could lead to occupational injury or increased radiation exposure because they were postulated during the PHA sessions. There is no MAR for these hazardous conditions and they are not considered for further analysis. The letters "OCC" (for occupational) or the letters "RAD" (for radiological) are recorded in the MAR column. The consequence category assignment to the CW and the offsite receptor is always Negligible (D).

Some hazardous conditions were postulated that result in both a release of radiological or hazardous material to the environment and a nonradiological injury to the facility worker. These hazardous conditions are further considered because release of material is postulated. The consequence category assignment in some of these cases is High (A) to the facility worker (S1). However, in every case (15 cases) where the consequence assignment is High to the facility worker, the consequences are related to industrial safety. This is supported by explanations recorded in the "Immediate Consequence" column of those hazardous conditions (refer to the PHA table presented in Appendix C). Furthermore, none of the industrial safety-related injuries that were postulated are a result of an event initiated by the nuclear material properties of the released material. Rather, they were related to other phenomena such as explosion of compressed cylinders, temperature or chemical-related overpressure, and falling structural elements degraded by a natural event (i.e., earthquake, tornado, etc.). The safety management programs supporting worker protection and protective controls are listed in Table 3-9.

Hazardous conditions, in which the harm is caused directly by release of nonradiological material such as toxic chemicals, were also not further considered as candidates for a representative accident. These hazardous conditions are not controlled by the DSA as part of the nuclear safety and licensing basis. As seen from the PHA, potential releases of chemicals primarily impact the worker. Small laboratory quantities of toxic, corrosive, and reactive materials are routinely used in research and sample analysis at 222-S. Hazardous material protection programs provide for identification and control of hazardous materials and training of personnel to minimize occupational exposure to hazardous materials. ATS 310, Administration manual (*Analytical Technical Services 222-S Laboratory Administration*) section 4.5, *222-S Laboratory Complex Chemical Hygiene Plan*, is written in accordance with 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories," and

covers all laboratory work areas in which hazardous chemicals are used. This plan sets general principles for work with laboratory chemicals and sets specific precautions for work with materials considered to be extremely hazardous. Table 2-1 provides a representative list of the extremely hazardous chemicals present at 222-S Laboratory and compares them to reportable quantities of 40 CFR 302, "Designation, Reportable Quantities, and Notification," and threshold planning quantities of 40 CFR 355, "Emergency Planning and Notification."

As seen from Table 2-1, the 222-S Laboratory hazardous chemical inventory is very small when compared to the Reportable Quantity and the Threshold Planning Quantity. Hazardous Material Protection Programs and the Chemical Hygiene Plan control risks posed by chemical hazards.

Table 3-9. Safety Management Programs Supporting Worker Protection.

SMP	SMP Protective Controls
Criticality Safety Program (CS) • Training (TNF)	Consists of criticality safety plans and procedures, criticality training, determination of operational nuclear criticality limits, and criticality infraction reporting.
Radiation Protection Program (RP) • ALARA • Training (TNF)	Consists of the ALARA Program, radiological protection training, radiation exposure control, radiological monitoring, radiological protection instrumentation, and radiological protection record keeping.
Hazardous Material Protection Programs • Industrial Hygiene (IH) • Occupational Safety (OS) • Industrial Safety (OS) • Environmental Protection (EPROTECT)	Consists of the Safety and Health procedures, hazardous material training, hazardous material exposure control, hazardous material monitoring, hazardous material instrumentation, hazardous material record keeping, and the hazard communication program.
Radioactive and Hazardous Material Waste Management Programs (RWM)	Consists of compliance to waste acceptance criteria, waste management composite analysis, and performance acceptance.
Testing In-Service Surveillance and Maintenance Program • Maintenance (M)	Consists of initial testing program, in-service surveillance, and maintenance programs.
Operational Safety Program • Fire Protection (FP) • Conduct of Operations (CO)	Consists of conduct of operations and fire protection (combustible loading control, fire fighting capability, and fire fighting readiness).
Procedures Development and Training Program • Training (TNF)	Consists of procedures and training programs.
Quality Assurance Program (QA)	Consists of quality improvement, documents and records, and quality assurance performance.
Emergency Preparedness Program (EPLAN)	Consists of assessment actions, notification, emergency facilities and equipment, protective actions, training and drills, and recovery reentry.
Management, Organization, and Institutional Safety Provisions • Configuration Management (CM)	Consists of review and performance assessment, configuration and document control, occurrence reporting, and safety culture.

3.3.2.3.4 Environmental Protection.

The most severe environmental consequences of the hazards listed in Appendix C is Category E2 (significant discharge onsite) which is consistent with a Hazard Category 3 facility. The E2 consequences are from hazardous conditions that release the total radiological inventory and one scenario that releases 10% of the radiological inventory plus chemicals from 219-S. The frequency assigned to most these hazardous conditions is unlikely, therefore, no design or operational features that reduce the potential for large material releases to the environment are needed.

3.3.2.3.5 Accident Selection

The accident analysis entails the formal quantification of the limited subset of accidents. These accidents represent, as noted in DOE-STD-3009-94 Change 2, "a complete set of bounding conditions." The identification of design basis accidents (DBAs) results from the hazard evaluation ranking of the complete spectrum of facility accidents.

3.3.2.3.5.1 Candidate Representative Accident Selection Results

Using the representative accident selection process described in Section 3.3.1.2.5, all 104 hazardous conditions postulated in the PHA were distilled down into six accident groups. Every hazardous condition was assigned to one of the accident groups. Then a bounding hazardous condition was selected for each accident group. The bounding hazardous condition is the one representing the highest risk (frequency and consequence combination) and provides the starting point for quantitative accident analysis if needed. Appendix D presents the Candidate Representative Accident Worksheet, where hazardous conditions are listed by accident group, from highest risk to the lowest. The first hazardous condition listed is bounding and provides the starting point for quantitative accident analysis if warranted for that group. The accident group number for the bounding hazardous condition is followed by an "X". Chemical releases are provided for completeness but they are not considered part of the candidate representative accident selection.

The following are the six accident groups:

- Fire/Explosion
- Storage Tank Failure/Leaks
- Container Handling Accidents
- Container Overpressure Accidents
- Confinement System Failure
- Natural Phenomena/External Events

The following section describes each of the six accident groups and characterizes all hazardous conditions allocated to that group. As part of the description, the Risk Class Bins are presented for the highest risk conditions in the group for both the CW and the off site receptor. The Risk Class Bin is not determined for the facility worker per guidance in SARAH. Accident groups that fall into Risk Class Bin I or II are candidates for further detailed quantitative analysis. The only accident group meeting that criteria is the fire/explosion accident group.

3.3.2.3.5.2 Fire/Explosion

This accident group encompasses hazardous conditions resulting from a fire or explosion and ranges from local fires (e.g., gloveboxes, loading dock area and waste drums) to building-wide fires. The release of radioactive material is primarily in the form of airborne particulates, which can be passed directly to the environment or released to the building and then to the environment via building leaks or the ventilation system. The cause of the explosions is the leak of flammable gas, such as propane into a laboratory room, inside the 222-S Laboratory Building. Fires can result from flammable chemicals or other combustible material and ignition sources. Explosions can be followed by fire and the assumption is that fires and explosions could breach containers. Combustibles that could be ignited and lead to fire include diesel oil, hydraulic oil, flammable liquids in a glovebox, electrical equipment, and general combustibles. HNF-SD-CP-FHA-003, *222-S Laboratory Fire Hazards Analysis*, presents a complete discussion of the fire hazards and fire related concerns in the 222-S Laboratory Complex.

The MAR is either the local inventory in the vicinity of the fire or the building contents in case of a building-wide fire. The MAR related to a local fire is very specific to the location of the fire. A building-wide fire is limited by the inventory of the 222-S Laboratory Complex and is estimated to be 39.11 DE-Ci.

Based on initial qualitative estimates associated with the representative hazardous conditions for this accident group, consequences range up to high for the facility worker (S1-A), moderate for the CW (S2-B), and low for the offsite receptor (S3-C). The initial frequency assigned to the consequences for the CW and offsite receptor was “unlikely” for the higher risk hazardous condition. According to Table 3-6, this accident fell into the Risk Class Bin II for the CW and Risk Class Bin III for the offsite receptor. Therefore, it met the criteria for a representative accident that should be analyzed in more detail.

A building-wide fire that starts in the 222-S Laboratory Building is selected as the bounding accident for the 222-S Laboratory Complex and is analyzed in more detail in Section 3.4. As shown in that section, the quantitative analysis of the accident indicates that the building-wide fire is in Risk Class Bin III for the CW and the offsite receptor for the “unlikely” and “anticipated” frequency categories; therefore no safety-significant controls are required. The facility worker, S1, is protected from the hazards of a building-wide fire through the implementation of the SMPs. An administrative control on the 222-S Laboratory Facility radioactive inventory is required to ensure that the consequences to the CW, S2, and the offsite public, S3, of this bounding accident remain within the guidelines. The engineering and administrative features identified in the PHA provide defense-in-depth against uncontrolled release of radioactive material that could adversely affect the public, the CW, the facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.3.2.3.5.3 Storage Tank Failure/Leak

This accident group addresses hazardous conditions resulting from spray or pool leaks. It includes various leaks from tanker transfer operations, sampling operations, and vessel failure in the 219-S Waste Handling Facility and 207-SL Retention Basin. The liquid release may be pressurized from a pump or have a modest static head (such as in a tanker). Therefore, some

leaks have the potential for forming aerosols, which may be suspended in the atmosphere. The amount of aerosols created will depend on the pressure, leak size, liquid properties, and leak duration. The release is to the environment.

The MAR is the liquid contents of 219-S tanks that contain mixed waste from laboratory operation or from 207-SL tanks that contain low levels of contaminated waste water. A 219-S tank was assumed to contain 10% (3.91 DE-Ci) of the total radioactive material inventory and have a pH ranging from 0.5 to 12.5.

Consequences associated with the representative hazardous conditions for this accident group range up to low for the facility worker (S1-C), low for the CW (S2-C), and negligible for the offsite receptor (S3-D). The frequency assigned to these consequences for the CW and offsite receptor was "anticipated." According to Table 3-6 this accident falls into the Risk Class Bin III for the CW and does not fall into a Risk Class Bin for the offsite receptor. Therefore, this accident group does not meet the criteria for a representative accident that should be analyzed in more detail. No safety-significant controls are required for this accident category. An administrative control on the 222-S Laboratory Facility radioactive inventory is required. The engineering and administrative features identified in the PHA provide defense-in-depth against uncontrolled release of radioactive material that could adversely affect the public, the collocated worker, facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.3.2.3.5.4 Container Handling Accidents

This accident group addresses hazardous conditions resulting from a spill of liquid or solid contents from a waste container or sample container. It includes container damage due to drops, impacts, crushes, and punctures. Some hazardous conditions are postulated to happen outside, so the release is directly to the environment. Others are postulated to happen inside but are transported to the environment via building leaks or the heating, ventilation, and air conditioning (HVAC).

The MAR is the liquid or solid contents of waste containers and sample containers. The content of waste containers is assumed to be no greater than 8.3E-1 DE-Ci. A realistic average value is 1.7E-2 DE-Ci per container. A sample is assumed to be no greater than 30 g of Pu (4.95 DE-Ci).

Consequences associated with the representative hazardous conditions for this accident group range up to high for the facility worker (S1-A), low for the CW (S2-C), and negligible for the offsite receptor (S3-D). The frequency assigned to the consequences for the CW and offsite receptor was "anticipated." According to Table 3-6, this accident falls into the Risk Class Bin III for the CW and does not fall into a Risk Class Bin for the offsite receptor. Therefore, this accident group does not meet the criteria for a representative accident that should be analyzed in more detail. No safety-significant controls are required for this accident category. An administrative control on the 222-S Laboratory facility radioactive inventory is required. The engineering and administrative features identified in the PHA provide defense-in-depth against uncontrolled release of radioactive material that could adversely affect the public, the CW,

facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.3.2.3.5.5 Container Overpressure Accidents

This accident group addresses hazardous conditions resulting from a spill of liquid or solid contents from a waste container or the 219-S tank due to mixing of incompatible materials and/or gas generation. It assumes that a container is breached due to overpressurization in the container and that the contents are expelled. Some hazardous conditions are postulated to happen outside, so the release is directly to the environment. Others are postulated to happen inside but are transported to the environment via building leaks or the HVAC.

The MAR is the liquid or solid contents of waste containers or the 219-S mixed waste storage tanks. The content of waste containers is assumed to be no greater than 8.3E-1 DE-Ci. A realistic average value is 1.7E-2 DE-Ci per container. A 219-S tank was assumed to contain 10% of the total radioactive material inventory and have a pH ranging from 0.5 to 12.5.

Consequences associated with the representative hazardous conditions for this accident group range up to high for the facility worker (S1-A), low for the CW (S2-C), and negligible for the offsite receptor (S3-D). The frequency assigned to the consequences for the CW and offsite receptor was “anticipated.” According to Table 3-6, this accident falls into the Risk Class Bin III for the person at the facility boundary and does not fall into a Risk Class Bin for the offsite receptor. Therefore, this accident group does not meet the criteria for a representative accident that should be analyzed in more detail. No safety-significant controls are required for this accident category. An administrative control on the 222-S Laboratory facility radioactive inventory is required. The engineering and administrative features identified in the PHA provide defense-in-depth against uncontrolled release of radioactive material that could adversely affect the public, the CW, facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.3.2.3.5.6 Confinement System Failure

This accident group addresses hazardous conditions resulting from a release of hazardous material from a confined location. This includes release of airborne particulates or aerosols from a hood, glovebox, or hot cell due to ventilation failure or breach due to various causes, including a gas cylinder missile. Lastly, this includes building ventilation failure that leads to spread of airborne particulates in the form of loose contamination or release from high-efficiency particulate air (HEPA) filters. Some hazardous conditions are postulated to release directly to the outside environment. Others are postulated to happen inside but are transported to the environment via building leaks or the HVAC.

The MAR in most cases is assumed to be loose contamination (up to 1.04E-2 DE-Ci) or airborne particulates from the maximum inventory that can accumulate on the HEPA filters (5.41E-1 DE-Ci). The content of waste containers is assumed to be no greater than 8.3E-1 DE-Ci. A realistic average value is 1.7E-2 DE-Ci per container.

Consequences associated with the representative hazardous conditions for this accident group range up to high for the facility worker (S1-A), low for the CW (S2-C), and negligible for the offsite receptor (S3-D). The frequency assigned to the consequences for the CW and offsite receptor was "anticipated." According to Table 3-6, this accident falls into the Risk Class Bin III for the CW and does not fall into a Risk Class Bin for the offsite receptor. Therefore, this accident group does not meet the criteria for a representative accident that should be analyzed in more detail. No safety-significant controls are required for this accident category. An administrative control on the 222-S Laboratory facility radioactive inventory is required. The engineering and administrative features identified in the PHA provide defense-in-depth against an uncontrolled release of radioactive material that could adversely affect the public, the CW, facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.3.2.3.5.7 Building Degradation Caused by Natural or External Events

This accident addresses hazardous conditions resulting from a natural or external event that have the potential to degrade a 222-S Laboratory Complex building and release hazardous or radioactive material. A range fire is not considered to be in this accident group because it is not likely to breach building structures and was therefore grouped with hazardous conditions resulting in fire and explosion. Flooding is also not considered to be in this accident group for the same reason and was grouped with hazardous conditions resulting in loss of confinement. For the hazardous conditions assigned to this accident group (extreme winds, volcanic ashfall and heavy snowfall, seismic events, and an airplane crash), it was assumed that the natural or external event breached the facility and had the potential to release the entire hazardous and radioactive material content.

The MAR is assumed to be the 222-S Laboratory radioactive inventory. That inventory is estimated to be 39.11 DE-Ci.

Resulting consequences from this accident range up to high for the facility worker (S1-A), moderate for the CW (S2-B), and low for the offsite receptor (S3-C). The high consequence to the facility worker is a result of potential worker death from falling debris caused by a collapsing part of the structure. In the two cases (seismic event and airplane crash) where the consequence to the CW is moderate, the frequency is considered to be extremely unlikely. In the other cases where the frequency is higher, the consequences are low. The building-wide fire bound the radiological dose consequences of this accident group. No safety-significant controls are required for this accident category. An administrative control on the 222-S Laboratory facility radioactive inventory is required. The engineering and administrative features identified in the PHA provide defense-in-depth against an uncontrolled release of radioactive material that could adversely affect the public, the CW, facility worker, and the environment. However, these features are not designated as safety-significant because the low dose consequences from this Hazard Category 3 facility are below the risk guidelines.

3.4 Accident Analysis

A building-wide fire that is started in the 222-S Laboratory Building is selected as the bounding accident for the 222-S Laboratory Complex. As shown in the PHA, such a fire can result from

failure of a flammable compressed gas cylinder or gas line in a laboratory. The building-wide fire scenario is assumed to result from the spread of either a local fire or a local deflagration and resulting fire. The local fire or local deflagration is assumed to interact with flammable chemicals stored in the laboratory, and the fire is assumed to spread to adjacent laboratory rooms and throughout the 222-S Laboratory facility. Any deflagration is not large enough to cause building-wide damage. It may result in an immediate release of radioactivity in a laboratory hood or room but this release will be small compared to the release resulting from the fire spreading and burning the entire facility. No credit is taken for engineered and administrative controls. The assumed source term is bounding because the entire 222-S Laboratory radiological inventory is exposed to the fire.

3.4.1 Methodology

It is conservatively assumed that the fire impacts the total radiological inventory of the 222-S Laboratory. A bounding airborne release fraction of 5.0E-4 and a respirable fraction of 1.0 are based on the SARAH and DOE-HDBK-3010-94, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities*. The values used are those for accidents involving fire and packaged waste. Packaged waste is defined as contaminated material contained by a noncontaminated barrier (i.e., a noncontaminated barrier such as a plastic bag between the waste and the environment). This category is intended to cover contaminated material in cans, bags, drums, and boxes but does not cover strong containers that result in smaller release fractions. The MAR quantity used in the accident analysis is consistent with the derivation of the MAR presented in Section 3.3.1.1.1.

The worst-case accident scenario for the 222-S Laboratory is not complex, so the dose consequences were hand calculated. The consequences of the building-wide fire was calculated for the 100-m CW and the MOI at the closest Hanford site boundary. The atmospheric dispersion parameters (χ/Q) for these receptors, 1.09E-2 s/m^3 and 1.13E-5 s/m^3, for the CW and MOI respectively, were taken from values derived in RPP-13482, *Atmospheric Dispersion Coefficients and Radiological and Toxicological Exposure Methodology for Use in Tank Farms,* Appendix L. A ground level release was assumed and a building wake model was used. No credit was taken for an elevated release from the fire. Inhalation is the dominant radiation exposure pathway for this accident. The ICRP 68 dose factors were used for the CW. The ICRP 71/72 dose factors were used for the MOI. A standard light breathing rate of 3.33E-4 m^3/s from RPP-13482 was used. The airborne release fraction of 5E-4 and a respirable fraction of 1.0 equate to a total release fraction (RF) of 5E-4. The details and results of the consequence calculations are provided in Table 3-10 and Table 3-11.

3.4.2 Design Basis Accidents

The analysis of DBAs is made to quantify consequences and compare them to evaluation guidelines. The major categories are internally initiated operational accidents (e.g., fires, explosions, spills, criticality); natural phenomena events for the site (e.g., earthquakes, tornadoes) that could affect the facility; and externally initiated, man-made events such as airplane crashes, transportation accidents, adjacent events, etc. The six accident groups presented in Section 3.3.2.3.5.1, whose representative hazardous condition fall into the High Risk Bin (I or II) for the CW or MOI, are candidate representative accidents and require detailed analysis. For the 222-S Laboratory, the building-wide fire is the only hazardous condition that

results in a Risk Bin II and is the only accident condition that warrants further quantitative analysis.

3.4.2.1 Building-Wide Fire

The accident scenario that describes a fire consuming the whole building and exposing the entire radiological inventory for release is an operational accident.

Table 3-10. Bounding Accident Analysis Summary for the Collocated Worker.

Isotope	Operating Inventory (Ci)	Dose Conversion Factor ICRP 68 (Sv/Bq)	Dose Conversion Factor (rem/Ci)[a]	(OI*RF*BR) (Ci-m^3/s)[b]	Dose to the 100 m Collocated Worker (rem)[c]
^{238}Pu	3.08	3.00E-05	1.11E+08	5.08E-07	6.15E-01
^{239}Pu	11.71	3.20E-05	1.18E+08	1.93E-06	2.48
^{240}Pu	6.62	3.20E-05	1.18E+08	1.09E-06	1.40
^{241}Pu	254.93	5.80E-07	2.15E+06	4.21E-05	9.87E-01
^{242}Pu	2.65E-04	3.10E-05	1.15E+08	4.38E-11	5.49E-05
^{241}Am	13.51	2.70E-05	9.99E+07	2.23E-06	2.43
^{90}Sr	1800	3.00E-08	1.11E+05	2.97E-04	3.59E-01
^{90}Y	1800	1.70E-09	6.29E+03	2.97E-04	2.04E-02
^{137}Cs	633	6.70E-09	2.48E+04	1.04E-04	2.81E-02
Total					8.32

[a] Converted ICRP 68 (Sv/Bq) to (rem/Ci) by multiplying (3.7E10 Bq/Ci) x (100 rem/Sv)
[b] Operating Inventory (Ci) x release fraction (5.0E-4) x breathing rate (3.3E-4 m^3/s)
[c] Rem/Ci x (OI*RF*BR) x χ/Q; for the CW χ/Q = 1.09E-02 s/m^3 (RPP-13482, Appendix L)

Table 3-11. Bounding Accident Analysis Summary for the Maximum Offsite Individual.

Isotope	Operating Inventory (Ci)	Dose Conversion Factor ICRP 71/72 (Sv/Bq)	Dose Conversion Factor (rem/Ci)[a]	(OI*RF*BR) (Ci-m^3/s)[b]	Dose to the 13 km Maximum Offsite Individual (rem)[c]
^{238}Pu	3.08	4.60E-05	1.70E+08	5.08E-07	9.76E-04
^{239}Pu	11.71	5.00E-05	1.85E+08	1.93E-06	4.03E-03
^{240}Pu	6.62	5.00E-05	1.85E+08	1.09E-06	2.28E-03
^{241}Pu	254.93	9.00E-07	3.33E+06	4.21E-05	1.58E-03
^{242}Pu	2.65E-04	4.80E-05	1.78E+08	4.38E-11	8.81E-08
^{241}Am	13.51	4.20E-05	1.55E+08	2.23E-06	3.91E-03
^{90}Sr	1800	3.60E-08	1.33E+05	2.97E-04	4.46E-04
^{90}Y	1800	1.50E-09	5.55E+03	2.97E-04	1.86E-05
^{137}Cs	633	4.60E-09	1.70E+04	1.04E-04	2.00E-05
Total					0.0133

[a] Converted ICRP 71 (Sv/Bq) to (rem/Ci) by multiplying (3.7E10 Bq/Ci) x (100 rem/Sv)
[b] Operating Inventory (Ci) x release fraction (5.0E-4) x breathing rate (3.3E-4 m^3/s)
[c] Rem/Ci x (OI*RF*BR) x χ/Q; for the MOI χ/Q = 1.13E-05 s/m^3 (RPP-13482, Appendix L)

3.4.2.1.1 Scenario Development

The building-wide fire is started with the failure of a compressed flammable gas cylinder that is ignited causing a local fire or explosion that spreads through the whole facility. The release of radioactive material is primarily in the form of airborne particulates, which can be passed directly to the environment or released to the building and then to the environment. The complete fire scenario is presented in Section 3.3.2.3.5.2.

3.4.2.1.2 Source Term Analysis

The radioactive material handled in the 222-S Laboratory is primarily waste tank core samples, other radioactive samples from the environmental restoration and waste management program, radioactive analytical standards, and 222-S Laboratory generated waste. Almost the entire inventory of radioactive material is represented by the waste tank core samples and these are primarily stored in the hot cell facility but can be located throughout the 222-S Laboratory. The amount of uncontained waste (samples) at any given time within the 222-S Laboratory Complex is very small. The only appreciable uncontained volumes are samples being prepared for analysis. Sample analysis is completed on small portions of the original delivered sample (i.e., aliquot or subsample). Samples are usually delivered in 125-ml volumes. Aliquot volumes are much smaller and are controlled to be as low as reasonably achievable.

In some cases a flammable solvent is used to strip certain material from the samples (1 to 2 ml quantity). This is collected in small jars to be disposed of en masse. However, the radioactive material content is very small (e.g., no shielding is used). So although the airborne release

fraction (ARF) for boiling aqueous waste is higher than containerized waste, the consequences of release from this waste form are not calculated because it would be an insignificant contributor. The amount of uncontained waste and flammable solvent material is small so an ARF of 5.0E-4 and a respirable fraction of 1.0 assumed for the entire material inventory provide an upper bound estimate of the dose consequences of this accident. It is very conservative for the waste tank core samples and is representative of the other types of samples and waste in 222-S.

The building-wide fire is assumed to impact the entire source term in the facility. Therefore, the accident source term is the same as the MAR defined in Section 3.3.1.1.1. The quantity of TRU, with a composition of 12% ^{240}Pu fuel, is 225 g. The added quantity of ^{90}Sr (12.95 g), ^{90}Y (3.3E-3 g), and ^{137}Cs (7.31 g) is a conservative amount based on the Best Basis Inventory (BBI) presented in HNF-10754. The added consequences to the accident receptors for the added ^{90}Sr, ^{90}Y, and ^{137}Cs is very small; however, the radioactive dose to the facility workers for these isotopes in the waste tank samples warrants consideration.

The conversion of mass to dose equivalent curies is presented in Section 3.3.1.1.1. The 222-S Laboratory source term of 225 g TRU is equivalent to 37.10 DE-Ci calculated with the Dose Conversion Factor from ICRP 71/72 or 0.165 DE-Ci/g of TRU for all public receptors. Calculations of DE-Ci for 225 g of TRU with ICRP 68 for the CW totals 37.24 DE-Ci or 0.166 DE-Ci/g of TRU. These same calculations for the entire MAR in the facility result in 38.54 DE-Ci or 0.156 DE-Ci/g of MAR using ICRP 71/72 and 39.11 DE-Ci or 0.160 DE-Ci/g of MAR using ICRP 68.

The estimated inhalation dose due to a release to the air from 222-S Laboratory at any time for any given inventory can be calculated as follows:

$$D = (Q)(\chi/Q)(BR)(DCF)$$

where

D = inhalation dose
Q = total release ((facility DE-Ci)(5.0E-4))
χ/Q = atmospheric dispersion coefficient
(CW = 1.09E-2 s/m^3, MOI = 1.13E-5 s/m^3)
BR = receptor breathing rate (assumed 3.33E-4 m^3/s)
DCF = dose conversion factor
(CW = 1.18E+8 rem/DE-Ci, and MOI = 1.85E+8 rem/De-Ci)

3.4.2.1.3 Consequence Analysis

The location of the MOI receptor is derived in Section 1.3.1 to be 13.0 km (8.1 miles) from the 222-S Laboratory. The radiological dose consequence of the worst-case building-wide fire was completed by hand calculations and presented in Tables 3-10 and 3-11. The dose consequence to the CW, 100 m, is determined to be 8.32 rem and the dose to the MOI is determined to be 0.0133 rem.

3.4.2.1.4 Comparison to the Evaluation Guideline

As seen from Table 3-11, the consequences to the MOI are in the low consequence category. The consequence to the 100-m CW is 8.32 rem. This is substantially below the 25-rem guideline for a moderate consequence category. In development of the PHA, this accident was originally determined to be in the "unlikely" frequency category. Further assessment has led to the determination that the "unlikely" frequency may not be conservative and this accident would be classified in the "anticipated" frequency category. In either case, "unlikely" or "anticipated", according to Table 3-6 this accident falls into the Risk Class Bin III. No safety-significant controls are required. This is consistent with the Hazard Category 3 designation of the 222-S Laboratory.

3.4.2.1.5 Summary of Safety-Class Structures, Systems, and Components, Specific Administrative Controls and Technical Safety Requirements Controls

The accident results are used to identify safety-class and SSCs TSRs. The objective is to identify the necessary and sufficient safety SSCs and TSRs that lower the risks associated with identified accidents to values that satisfy the evaluation guidelines. The designated controls are required if the dose consequences and frequency to the CW or MOI are determined to be in Risk Bin I or II. The 222-S Laboratory worst-case bounding accident is in Risk Bins III and IV for the CW and MOI, respectively, and therefore do not require safety-class SSCs or safety-significant controls. However, a Specific Administrative Control on the 222-S Laboratory facility radioactive inventory is required to ensure that it does not exceed the dose equivalent curies used to calculate the dose consequences of the bounding accident. This is a key control and should be a TSR.

3.4.3 Beyond Design Basis Accidents

An evaluation of accidents beyond the design basis provides perspective of the residual risk associated with the operation of the facility. Because the worst-case accident scenario for 222-S Laboratory consumes the entire facility and radiological inventory, there is no residual risk and no need for a beyond design basis analysis.

3.5 References

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10 CFR 835, *Code of Federal Regulations*, "Occupational Radiation Protection," as amended.

10 CFR 851, *Code of Federal Regulations*, "Worker Safety and Health Program," as amended.

29 CFR 1910, *Code of Federal Regulations*, "Occupational Safety and Health Administration," as amended.

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TFC-PLN-26, *Testing Program Plan*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

TFC-PLN-29, *Nuclear Maintenance Management Program*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

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TFC-PLN-34, *Industrial Hygiene Exposure Assessment Strategy*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

TFC-PLN-47, *Worker Safety and Health Program*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

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TFC-PLN-61, *Tank Operations Contractor Training and Qualification Plan*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

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TFC-PLN-112, *Graded Approach to Quality*, as amended, Washington River Protection Solutions LLC, Richland, Washington.

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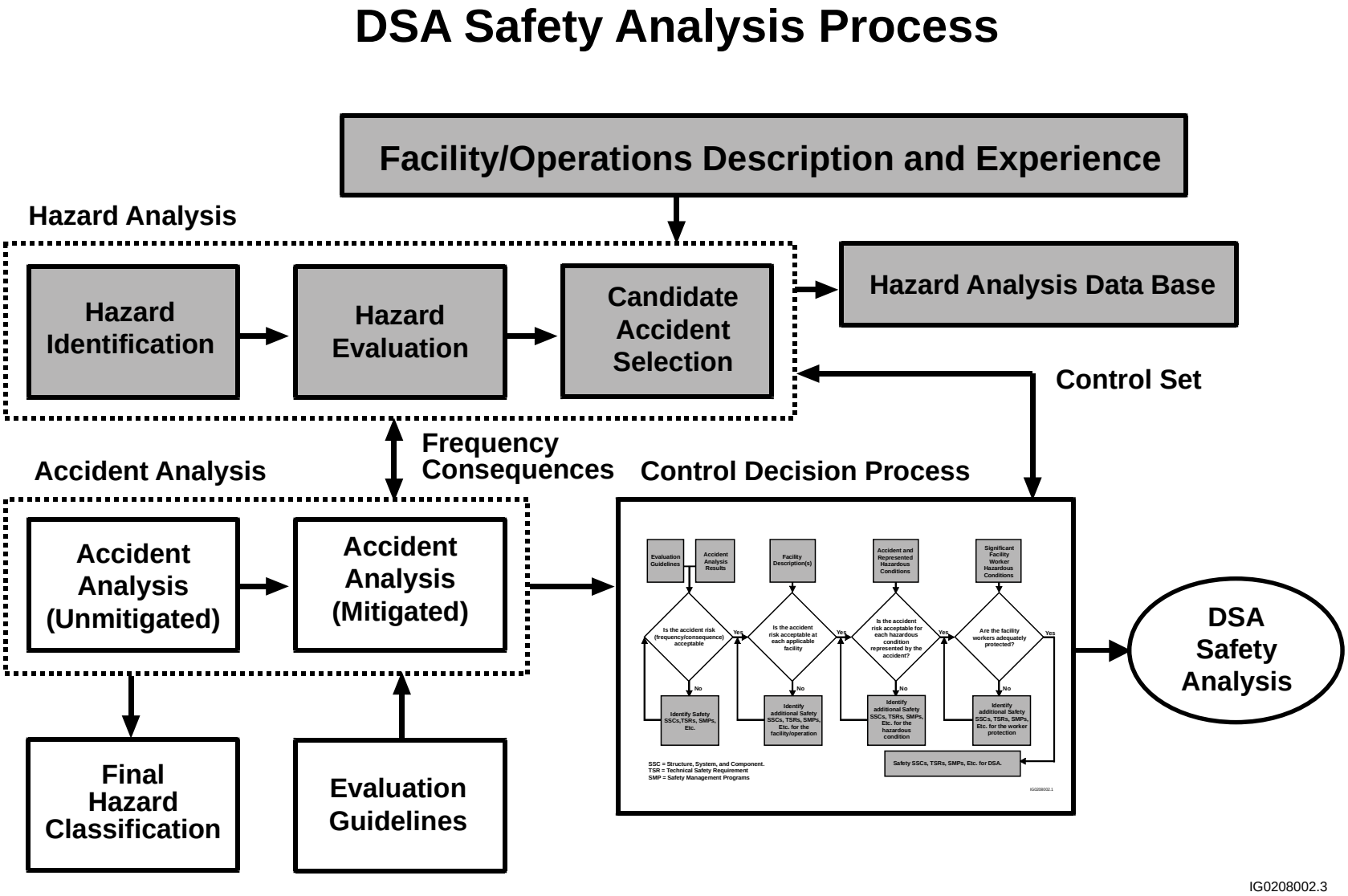
FIGURE 3-1. DSA SAFETY ANALYSIS PROCESS.



4.0 SAFETY STRUCTURES, SYSTEMS, AND COMPONENTS

4.1 INTRODUCTION

This chapter presents and evaluates the adequacy of safety-class structures, systems and components (SSCs), safety-significant SSCs, and Specific Administrative Controls (SAC) by providing for each SSC or SAC its safety functions (as assumed in Chapter 3.0), a brief description, the functional requirements to support the safety functions, an evaluation with respect to the functional requirements as defined through performance criteria, and the associated technical safety requirement (TSR). This chapter concentrates on providing reasonable assurance that the safety function and functional requirements for each SSC or SAC are met.

This chapter complies with Title 10, *Code of Federal Regulations,* Part 830 (10 CFR 830) Subpart B, "Safety Basis Requirements," and provides information consistent with the guidance provided in Chapter 4.0, "Safety Structures, Systems, and Components" of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*.

4.2 REQUIREMENTS

The codes, standards, regulations, and DOE Orders used to establish the safety basis for the 222-S Laboratory are contained in Contract DE-AC27-08RV14800.

10 CFR 830 identifies DOE-STD-3009 as the "safe harbor" methodology for the preparation of the safety basis for a Hazard Category 3 nuclear facility. This chapter has been prepared in accordance with the requirements of DOE-STD-3009-94, Chapter 4.0, Safety Structures, Systems, and Components.

4.3 Safety Class Systems, Structures, and Components

The hazard and accident analysis conducted in Chapter 3.0 did not identify any safety structures, systems, or components that require safety-class designation.

4.4 Safety-significant Systems, Structures, and Components

The hazard and accident analysis conducted in Chapter 3.0 did not identify any safety structures, systems, or components that require safety-significant designation.

4.5 Specific Administrative Controls

4.5.1 Radioactive Materials Inventory

4.5.1.1 Safety Function

The safety function of the radioactive material inventory is to ensure the inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident.

The basis for this control is provided in the accident scenario in Section 3.4. This scenario, which produced the highest dose consequences (bounding worst-case accident scenario), assumed a building-wide fire that consumed the entire facility inventory as shown in Table 3-1

4.5.1.2 SAC Description

This Specific Administrative Control is implemented through HNF-SD-CP-MA-002, *222-S Laboratory Radiological Inventory Program* and implementing procedures. This document describes the methodology and assumptions that provide the basis for tracking, reporting, and demonstrating compliance with the radioactive material inventory limits in the 222-S Laboratory to ensure the facility inventory does not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident. Since this is strictly an inventory control there is no reasonable engineering control alternative such as SSC's. The hazard analysis does not assume a specific time frame to perform this activity.

Radiological material that is received at the laboratory is entered into a sample tracking system or is credited to the facility holdup value which is pre-inventoried. Those samples containing radionuclides that contribute to the radiological MAR of the facility, based on process knowledge of the source, are assigned a conservative inventory value and added to the facility inventory. Fissionable material is inventoried separately, but into the same database. When additional information is acquired, such as weight of the sample, the inventory is adjusted. The radiological material is removed from the inventory after it is removed from the facility or sent to facility waste tanks, where it becomes part of the facility hold-up. A total facility inventory report is normally issued every day except for weekends and holidays, but at least weekly, and the present DE-Ci inventory is reviewed to ensure radioactive materials do not exceed the facility limits.

4.5.1.3 Functional Requirement

The Functional Requirements of the radiological inventory control is to ensure the MAR limit for the facility is less than the derived radioactive material inventory of 39.11 DE-Ci, which produces the worst-case calculated dose to the collocated worker, to ensure that the bounding consequences are not exceeded as analyzed in the DSA.

4.5.1.4 SAC Evaluation

The material at risk (MAR) limit is the underlying assumption for the accident analysis performed in Chapter 3.0. The MAR limit, as stated in dose equivalent curies, protects this assumption and ensures that the consequences determined in the accident scenario are not invalidated thereby placing the facility in formally unanalyzed space.

The Hazard and Accident Analysis do not take credit for personnel actions to mitigate the consequences of the worst-case accident and does not assume a specific time to perform this

activity. However, when radioactive material is received, a minimum of one qualified person is required to maintain radioactive material inventory control. Inventory control is a simple process performed in accordance with reference use procedures. There are no hazardous conditions involved with inputting the information. The personnel who receive radioactive material are qualified and trained on the procedures. Re-qualification is every two years.

The radioactive material is inventoried upon receipt at the 222-S Laboratory. The inventory is input into a verified and validated computer software program or if necessary logged and manually calculated. The 222-S radiological inventory control procedures use conservative DE-Ci values for the radiological materials booked into the inventory system to enhance compliance. The inputs into the system are overviewed to ensure accuracy. There is no required time or distance separation for this action. A report is normally issued daily, except on weekends and holidays, but at least weekly. The reports provide the facility inventory in DE-Ci.

The inventory control program and implementing procedures use a graded approach to ensure inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident. Although conservative values are already used, as the facility inventory reaches set limits, management notification or written approval will be required.

Given the above, this control provides adequate assurance that the inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident.

4.5.1.5 TSR

The Radioactive Material Inventory Control is implemented as a direct action Specific Administrative Control with the following requirements:

The inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident.

4.6 References

DE-AC27-08RV14800, 2008, *Tank Operations Contract*, Section J-2, “Requirement Sources and Implementing Documents,” as amended, U.S. Department of Energy, Office of River Protection, Richland, Washington.

DOE-STD-3009-94, 2006, *Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, Change Notice 3, U.S. Department of Energy, Washington D.C.

10 CFR 830, Title 10 *Code of Federal Regulations* Part 830 Subpart B, “Safety Basis Requirements,” as amended.

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5.0 DERIVATION OF TECHNICAL SAFETY REQUIREMENTS

5.1 Introduction

This chapter builds on the control functions determined to be essential in Chapter 3.0, "Hazard and Accident Analysis," and Chapter 4.0 "Safety Structures, Systems, and Components," for the derivation of Technical Safety Requirements (TSRs). This chapter complies with Title 10, *Code of Federal Regulations*, Part 830 (10 CFR 830) Subpart B, "Safety Basis Requirements," and provides information consistent with the guidance provided in Chapter 5.0, "Derivation of Technical Safety Requirements," of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*. Also, the content of this chapter follows the direction provided in HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook* (SARAH).

As discussed in Chapter 3.0, a hazard categorization process assessed the hazardous material at risk (MAR) for release, unmitigated by any safety features. The TSRs are developed based on a graded approach applied to the hazards and accident analyses and the final Hazard Category 3 designation for the 222-S Laboratory.

The derivation of TSRs consists of summaries and references to pertinent sections of the DSA in which design and administrative features are needed to prevent or mitigate the consequences of accidents. Design and administrative features addressed include ones which (1) provide significant defense-in-depth in accordance with the screening criteria of 10 CFR 830 Subpart B, (2) provide significant worker safety, or (3) maintain consequences of facility operations below Evaluation Guidelines. This chapter contains the following information with sufficient basis from which to derive, as appropriate, any of the following TSR parameters as applicable to 222-S Laboratory operations:

- Safety Limits (SLs)
- Limiting Control Settings (LCSs)
- Limiting Conditions for Operations (LCOs)
- Surveillance Requirements (SRs)
- TSR Administrative Controls (ACs) for specific control features or to specify programs necessary to perform institutional safety functions

The information provided herein is based on a graded approach to classifying the controls in which more emphasis is placed on active engineered features which are covered by LCSs versus ACs that are covered in the AC section of the TSRs.

As identified in Chapter 3.0, facility inventory controls will reduce the potential risk to the public, collocated workers (CW), facility workers, and the environment from uncontrolled releases of radioactive and hazardous material and will ensure facility operations are maintained within the "envelope" bounded by this DSA. Also as evaluated in Chapter 3.0, no systems, structures, or components (SSCs) require designation as safety-class or safety-significant; thus no SLs, LCSs, LCOs, or SRs will be included in the TSRs for the 222-S Laboratory.

5.2 Requirements

The codes, standards, regulations, and DOE Orders used to establish the safety basis for the 222-S Laboratory are contained in Contract DE-AC27-08RV14800.

10 CFR 830 identifies DOE-STD-3009 as the "safe harbor" methodology for the preparation of the safety basis for a Hazard Category 3 nuclear facility. This chapter has been prepared in accordance with the requirements of DOE-STD-3009-94, Chapter 5.0, *Derivation of Technical Safety Requirements*.

The Control Identification Process is described in HNF-8739, the SARAH.

5.3 Technical Safety Requirements Coverage

This section provides assurances that TSR coverage for the 222-S Laboratory is complete. The TSR coverage is necessary for the following:

- SSCs that have been designated safety-class.
- SSCs that have been designated safety-significant.
- ACs or SACs, including safety management programs, are required to ensure that initial conditions and assumptions made in the accident analysis remain correct. These controls maintain consequences of facility operations below Evaluation Guidelines.

The first two bullets refer to safety-class and safety-significant SSCs; however, the hazard and accident analysis did not identify any SSCs that are designated as safety-class or safety-significant so there are no TSRs specifically applied to SSCs.

The third bullet applies to ACs or SACs. The SACs, Table 5-1, which requires TSR coverage, ensures the inventory of radioactive materials does not exceed the inventory used to calculate dose consequences of the analyzed accidents.

5.3.1 Summary of Items Requiring Technical Safety Requirements Coverage

The ACs based on the hazard evaluation are presented in Table 5-1.

Table 5-1. Hazard Evaluation Administrative Control.

Hazard	TSR Control	Specific Administrative Control
Radioactive dose consequence from release of radioactive or hazardous materials	Yes	The total quantity of dose equivalent curies (DE-Ci) must be less than the quantity used to calculate the dose consequences to the collocated worker as a result of the worst-case accident.

Table 5-2 presents the relevant hazard from the hazard evaluation and the safety management programs (Section 3.3.2.3.3), plus the major features of each program that are relied on for protection against that hazard. This information provides a basis for selecting the SMPs that require TSR coverage and/or provides a statement of justification for not committing to an SMP coverage at the TSR level.

Table 5-2. Safety Management Programs Supporting Worker Protection.

Hazard	SMP	TSR Coverage	SMP Protective Controls or Justification for Not Requiring TSR Coverage
Criticality	Criticality Safety Program	No	Fissile material inventory is less than a critical mass and is controlled as a subset of the radiological inventory control. Implementation of a criticality program is required for compliance with WRPS policy.
Release of radioactive materials	Radiation Protection Program	Yes	Consists of the ALARA Program, radiological protection training, radiation exposure control, radiological monitoring, radiological protection instrumentation, and radiological protection record keeping.
Release of hazardous materials	Hazardous Material Protection Programs	No	ALARA considerations for protection from hazardous material are a subset of radiation protection, training, and other safety programs.
Release of radioactive or hazardous materials	Radioactive and Hazardous Material Waste Management Programs	No	Consists of compliance to waste acceptance criteria, waste management composite analysis and performance acceptance. Protection is provided through other safety programs.
Release of radioactive or hazardous material from equipment failure	Testing In-Service Surveillance and Maintenance Program	No	Consists of initial testing program, in-service surveillance, and maintenance programs. The functioning of equipment is not credited for the mitigation of dose consequences from the worst-case accident.
Release of radioactive or hazardous material	Operational Safety Program	Yes	Consists of conduct of operations and fire protection (combustible loading control, fire fighting capability, and fire fighting readiness).
Release of radioactive or hazardous material from a procedure or operator error	Procedures Development and Training Program	Yes	Consists of procedures and training programs.
Release of radioactive or hazardous material from a procedure or operator error	Quality Assurance Program	No	Consists of quality improvement, documents and records, and quality assurance performance. Quality assurance is implemented through contractor level requirements.
Reduce the effectiveness of mitigating the consequence of a release of radioactive or hazardous materials	Emergency Preparedness Program	Yes	Consists of assessment actions, notification, emergency facilities and equipment, protective actions, training and drills, and recovery reentry.
Release of radioactive or hazardous materials from human error	Management, Organization, and Institutional Safety Provisions	Yes	Consists of review and performance assessment, configuration and document control, occurrence reporting, and safety culture.

5.4 Derivation of Facility Modes

The 222-S Laboratory has only one facility mode, OPERATION, and it is described as follows.

OPERATION	Radioactive materials can be received, stored, are present, and shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident. Research, analytical techniques, waste handling, decontamination activities, maintenance, repair, and surveillance activities are authorized throughout the facility and performed under approved procedures or analytical test plans. During backshift and facility closure days, the facility mode is OPERATIONAL when all systems, subsystems, components, and personnel are capable of performing the specified safety and mission functions.

5.5 Technical Safety Requirements Derivation

The hazard and accident analysis are used to identify safety-class and safety-significant SSCs, TSRs, and other controls required for protection of the public, collocated workers, facility workers, and the environment. The necessary safety management programs supporting worker protection are derived in Table 5-2 with supporting information presented in Chapter 3.0, Section 3.3.2.3.3.

5.5.1 Inventory Control

5.5.1.1 Safety Limits, Limiting Control Settings, and Limiting Conditions for Operation

The hazard and accident analysis did not identify safety-class or safety-significant SSCs for inventory control; therefore no SLs, LCSs, or LCOs are required for the safe operation of the facility.

5.5.1.2 Surveillance Requirements

In accordance with Section 5.5.1.1, there are no SLs, LCSs, or LCOs for inventory control so it is not necessary to address testing, calibration, or inspection requirements to maintain safe operation of the facility within SLs, LCSs, and LCOs.

5.5.1.3 Administrative Controls

The hazard and accident analysis determined that one SAC for the radiological inventory is required. Also, an AC for the contractor organization, minimum shift complement, and TSR VIOLATIONS will be implemented.

5.5.1.4 Radioactive Material Inventory Control

The material at risk (MAR) limit is the underlying assumption for the accident analysis performed in Chapter 3.0. The MAR limit, as stated in dose equivalent curies, protects this assumption and ensures that the consequences determined in the accident scenario are not invalidated thereby placing the facility in formally unanalyzed space.

The control will state: "The inventory of radioactive material shall not exceed the dose equivalent curies used to calculate the dose consequences to the collocated worker as a result of the worst-case accident."

The basis for this control is provided in the accident scenario in Section 3.4. This scenario, which produced the highest dose consequences (bounding worst-case accident scenario), assumed a building-wide fire that consumed the entire facility inventory as shown in Table 3-1. Therefore, the MAR limit for the facility must be less than the derived radioactive material inventory of 39.11 DE-Ci, which produces the worst-case calculated dose to the collocated worker, to ensure that the bounding consequences are not exceeded as analyzed in the DSA.

5.6 Design Features

The hazard and accident analysis does not identify design features for safety SSCs. Design features are those features that are not covered elsewhere in the TSRs and which, if altered or modified, would have a significant effect on safety. They are normally passive characteristics of the facility not subject to change by operations personnel; e.g., shielding, structural walls, relative locations of major components, installed poisons, or special materials. Design features are those permanently built-in features critical to safety that do not require, or infrequently require, maintenance or surveillance. Since none of the features of the 222-S Laboratory design were credited in the hazard and accident analysis, there are no "design features for safety" designated for the 222-S Laboratory facility.

5.7 Interface With Technical Safety Requirements From Other Facilities

There are no identified TSRs at other facilities that affect routine operations at the 222-S Laboratory.

5.8 References

DE-AC27-08RV14800, 2008, *Tank Operations Contract*, Section J-2, "Requirement Sources and Implementing Documents," as amended, U.S. Department of Energy, Office of River Protection, Richland, Washington.

DOE-STD-3009-94, 2006, *Preparation Guide for U. S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, Change Notice 3, U.S. Department of Energy, Washington D.C.

10 CFR 830, Title 10 *Code of Federal Regulations* Part 830 Subpart B, "Safety Basis Requirements," as amended.

HNF-8739, *Hanford Safety Analysis and Risk Assessment Handbook*, Fluor Hanford, Inc., Richland, Washington.

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Appendix A

Hazard Identification Checklist

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Hazard Identification Checklist

LOTE Low Thermal Energy	AE Acoustic Energy	BIO Biological	NPH Natural Phenomena
☐ 1 Freeze Seal Equip	☒ 1 Equipment/Platform Vibration	☒ 1 Dead Animals	☒ 1 Earthquakes
☒ 2 Liquid N2 in Dewars	☒ 2 Motors	☒ 2 Animal Droppings	☐ 2 Natural Radiation
☐ 3 Liquid N2 in Tanks	☐ 3 Pumps	☐ 3 Animal Bites	☒ 3 Lightning
☐ 4 Liquid N2 Production	☒ 4 Fans	☒ 4 Insect Bites	☒ 4 Solar/Heat Wave
☒ 5 Loss of HVAC [system impacts]	☒ 5 Compressors	☒ 5 Insect Stings	☒ 5 Range Fire
☒ 6 Loss of HVAC [worker impacts]	☐ 6 Cutting Devices	☒ 6 Allergens	☒ 6 Dust/Sand
☒ 7 Freezers/Chillers	☐ 7 Decon Devices	☒ 7 Toxins	☒ 7 Fog
☐ 8 Other Cryogenic Sys	☐ 8 Other Devices	☐ 8 Bacteria	☐ 8 Heavy Rain
☐ 9 Other Low Ambient Temperatures	☐ 9 Equipment Rooms	☐ 9 Viruses	☐ 9 Flooding [from rain]
	☐ 10 Other Decon & Size Reduction Tools	☐ 10 Sewage	☐ 10 Sediment Transport
		☐ 11 Blood/Body Fluids	☐ 11 Hail
		☐ 12 Medical Waste	☐ 12 Low Temperatures
		☐ 13 Other Animals/Insects	☒ 13 Freeze
		☐ 14 Other Plants	☒ 14 Heavy Snow
		☐ 15 Other Diseases	☒ 15 High Winds
			☐ 16 Tornadoes
			☒ 17 Volcanoes
			☒ 18 Volcanic Ash

OTH Other	KE Kinetic Energy	LOEE Loss of Electrical	CM Chemical Materials
☐ 1 Dust [breathing]	☐ 1 Rail Cars/Trains	☒ 1 Motor Stoppage	☐ 1 Carbon Tetrachloride [hepatotoxins]
☒ 2 N2/He Atmosphere	☐ 2 Excavators/Backhoes	☒ 2 Pump Stoppage	☐ 2 Chloroform [nephrotoxins]
☒ 3 Tanks	☒ 3 Cranes/Crane Loads	☐ 3 Flow Reversal	☒ 3 Mercury [neurotoxins]
☒ 4 Basins	☒ 4 Trucks/Cars	☐ 4 Supply Fan Pressurization	☒ 4 Lead [reproductive toxins]
☒ 5 Manholes	☒ 5 Forklifts/Loaders	☐ 5 Static Air Situation	☐ 5 Strychnine
☒ 6 Pits	☐ 6 Conveyors	☐ 6 Accumulation of Hazardous Vapors	☒ 6 Asbestos [lungs]
☒ 7 Water in Confined Space	☒ 7 Hoists	☐ 7 Accumulation of Asphyxiants	☒ 7 Ceiling Tiles/Insulation
☐ 8 Respirator Fogging	☒ 8 Carts/Dollies	☐ 8 Accumulation of Flammable Gases	☒ 8 Acetone [skin]
☒ 9 Dust [visibility]	☒ 9 Crane Loads [load]	☐ 9 Loss of Air [dry-pipe]	☒ 9 Organic Solvents [eyes]
☐ 10 Glare	☒ 10 Forklifts [load]	☐ 10 Loss of Air [no inert]	☐ 10 Ammonia [mucous membranes]
☐ 11 Aircraft Crash	☐ 11 Conveyors [load]	☐ 11 Reduced PPE Pressure	☐ 11 Carbon Monoxide/ Cyanides [blood]
☐ 12 Offsite Transportation Accident	☒ 12 Hoists [load]	☐ 12 Loss of Heaters [system impacts]	☒ 12 General Carcinogens
☐ 13 Offsite Explosion	☒ 13 Pallet Jacks [load]	☐ 13 Loss of Heaters [worker impacts]	☐ 13 Carbon Tetrachloride [carcinogeneticity]
☐ 14 Major Fire	☒ 14 Carts/Dollies [load]	☐ 14 Misdirected Flow	☒ 14 PCBs
☐ 15 Reservoir Failure	☐ 15 Impact Tools	☐ 15 Loss Instrumentation	☐ 15 Beryllium/Epoxy Resins
☐ 16 Unknown Material	☐ 16 Projectile Tools	☒ 16 Inadequate Light [operations impacts]	☒ 16 Irritants
☐ 17 Unknown Config	☐ 17 Relief Valve Blow-down	☒ 17 Inadequate Light [worker impacts]	☐ 17 Pesticides/Insecticides
☐ 18 Other Inert Atmosphere	☐ 18 Other Vehicles	☒ 18 Loss of Batteries/DC	☐ 18 Herbicides
☒ 19 Other Confined Spaces	☐ 19 Other Man-Powered Devices	☐ 19 Other Loss of Equipment	☒ 19 Asphyxiants
☐ 20 Inadequate Visibility	☐ 20 Other Transports [load]	☐ 20 Other Fan Stoppage	☒ 20 Hazardous Wastes
☐ 21 Other External/Offsite Event	☐ 21 Other Man-Powered Transports [load]	☒ 21 Other Areas Loss of Differential Pressure	☐ 21 Creosote
	☐ 22 Other Decon & Size Reduction Tools	☐ 22 Other Areas Loss of Ventilation	☒ 22 Other Toxins
		☐ 23 Other Loss of Air Pressure	☒ 23 Other Chemical Use
			☒ 24 Other Chemicals

Hazard Identification Checklist

CE Chemical Energy	ME Mechanical Energy	TP Thermal Potential Energy	EE Electrical Energy
☐ 1 Organic Peroxides	☒ 1 Forklift Tines [puncture]	☒ 1 Natural Gas/Propane	☒ 1 Wiring [high voltage]
☒ 2 General Corrosives/Acids	☒ 2 Piston Compressors	☒ 2 Welding/Cutting Gases	☐ 2 Overhead Transmission Lines
☒ 3 Residual Corrosives/Acids	☐ 3 Presses	☒ 3 Methane/Butane	☒ 3 Transformers [high voltage]
☒ 4 Battery Banks	☒ 4 Pinch Points	☒ 4 H2 [lab]	☒ 4 Switchgear [high voltage]
☐ 5 Water Reactives [sodium]	☒ 5 Sharp Edges/Objects	☐ 5 H2 [containers]	☐ 5 Capacitor Banks
☐ 6 Shock Sensitive Chemicals [nitrates]	☒ 6 Drills [puncture]	☐ 6 H2 [process]	☐ 6 Lightning Grids
☒ 7 Peroxides/ Superoxides/Ethers	☒ 7 Sanders/Brushes [wear]	☒ 7 Sewer Gas	☒ 7 Wiring [low voltage]
☐ 8 Electric Squibs	☐ 8 Shears/Pipe Cutters	☐ 8 Carbon Monoxide	☒ 8 Cable Runs
☐ 9 Dynamites/Caps/ Primer Cord	☒ 9 Grinders	☒ 9 HEPA Test Aerosol Fluid	☒ 9 Overhead Wiring
☐ 10 Dusts [explosive]	☒ 10 Vibration [wear]	☒ 10 Other Petroleum Based Products	☒ 10 Underground Wiring
☐ 11 Corrosion/Oxidation	☒ 11 Saws	☒ 11 Vehicle/Equipment Fuel Tanks	☒ 11 Transformers [low voltage]
☐ 12 Sealants/Fixatives	☒ 12 Belts/Hoist Cables [pull/wrap]	☐ 12 Paint/Cleaning/Decon Solvents	☒ 12 Switchgear [low voltage]
☐ 13 Epoxies/Adhesives	☒ 13 Bearings/Shafts [wrap]	☐ 13 Paints/Epoxies/Resins	☒ 13 Service Outlets
☒ 14 Refrigerants/Coolants	☒ 14 Gears/Couplings [pull]	☒ 14 Paper/Wood Products	☐ 14 Diesel Units
☐ 15 Water Treatment Products	☐ 15 Diesel Generators/ Turbines [wrap]	☒ 15 Cloth/Rags	☒ 15 Battery Banks
☒ 16 Decon Chemicals	☐ 16 Pumps [wrap]	☒ 16 Rubber	☒ 16 DC Systems
☒ 17 Miscellaneous Laboratory Chemicals	☒ 17 Fans [wrap]	☐ 17 Size Reduction Tents/Permacons	☒ 17 Motors
☐ 18 Buried Materials	☒ 18 Rotary Compressors [wrap]	☐ 18 Benelex/Lexan/HDPE	☒ 18 Pumps
☒ 19 Other Oxidizers	☒ 19 Centrifuges [wrap]	☒ 19 Rigid Liners/Poly-Liners/Bagging Materials	☒ 19 Fans
☒ 20 Other Reactives	☒ 20 Drills/Rotary Sanders [wrap]	☐ 20 Other Flammable Gases	☒ 20 Compressors
☐ 21 Other Explosive Substances	☒ 21 Grinders [wrap]	☒ 21 Other Laboratory/ Calibration Gases	☒ 21 Heaters
☒ 22 Other Chemicals	☐ 22 Other Transverse Motion Devices	☐ 22 Other Process Off-Gases	☐ 22 Valves/Dampers
☐ 23 Other Bonding Agents	☐ 23 Other Decon & Size Reduction Tools	☐ 23 Other Flammable/ Combustible Liquids	☒ 23 Power Tools
☐ 24 Incompatible Wastes	☐ 24 Other Reciprocating Motion Devices	☒ 24 Gasoline	☒ 24 Instrumentation
☐ 25 High Temperature Wastes	☐ 25 Other Circular Motion Devices	☒ 25 Diesel Fuel	☒ 25 Grounding Grids
	☐ 26 Other Electric Motors	☒ 26 Oils [lube, coolant]	☐ 26 Static Charge
		☒ 27 Grease	☐ 27 Other High Voltage Equipment
		☐ 28 Gasoline [tank]	☒ 28 Other 13.8 kV Equipment
		☐ 29 Diesel Fuel [tank]	☒ 29 Other Low Voltage Equipment
		☐ 30 Other Combustible Solids	☒ 30 Other 480/240/120 Volt Equipment
		☐ 31 Other Plastic Materials	☐ 31 Other Temporary Power Equipment
			☐ 32 Other Electrical Equipment [low voltage]

Hazard Identification Checklist

RE Radiant Energy	RM Radioactive Material	TE Thermal Energy	PE Potential Energy
☐ 1 Calibration Sources	☒ 1 Metals/Oxides/ Residues	☐ 1 Chemical Reactions	☒ 1 Breathing Air/ Compressed Air/O2
☐ 2 Fissile Material Storage/Holdup	☐ 1a Bag	☐ 2 Pu/U Metal	☒ 2 He/Argon/Specialty Gases
☐ 3 Actinide Solutions	☐ 1b Glovebox [exposed]	☒ 3 Pyrophoric Chemicals	☒ 3 Refrigerants/CO2 Bottles
☐ 4 Waste Containers	☐ 1c Can	☐ 4 Petroleum Based Products	☒ 4 Other Bottled Gases
☐ 5 Contamination	☐ 1d Welded Can	☒ 5 Reactive Chemicals	☒ 5 Gas/Air Receivers/ Compressors
☐ 6 Radiography Equipment	☐ 1e Drum	☒ 6 Nitric Acids/Organics	☐ 6 Pressure Vessels
☒ 7 X-Ray Machines	☐ 1f Overpack	☐ 7 Paint/Cleaning/Decon Solvents	☒ 7 Instrument/Plant Air
☐ 8 Electron Beams	☐ 1g Type B Shipping Container	☐ 8 Cutting Torches	☒ 8 Chemical Reaction Vessels/Autoclaves
☒ 9 Ultra-Intense Lasers	☐ 1h Ducting [exposed]	☐ 9 Welding Torches	☐ 9 Furnaces
☐ 10 Accelerators	☐ 1i Plenum [exposed]	☒ 10 Laboratory Burners	☐ 10 Boilers
☐ 11 Electromagnetic Communication Waves	☐ 1j Filter [exposed]	☒ 11 Furnaces	☐ 11 Steam Header/Lines
☒ 12 Radio-Frequency Generators	☐ 1k Cooler	☐ 12 Boilers	☒ 12 Pneumatic Lines
☐ 13 Microwave Frequencies	☐ 1l Hood [exposed]	☒ 13 Heaters	☐ 13 Impact Tools
☒ 14 Electromagnetic Fields	☒ 2 Actinide Solution	☒ 14 Hot Plates	☐ 14 Sand/CO2 Blasting Equipment
☒ 15 Electric Furnaces	☐ 2a Bottle	☒ 15 Lasers	☒ 15 Water Heaters
☒ 16 Computers	☐ 2b Drum	☐ 16 Incinerators/Fire Boxes	☐ 16 Excavators/Backhoes [hydraulics]
☐ 17 Plasma Arc Magnetic Field	☐ 2c Piping	☐ 17 Engine Exhaust Surfaces	☐ 17 Cranes [hydraulics]
☐ 18 Plasma Arc Infrared/ Ultraviolet Light	☐ 2d Tank	☐ 18 Steam Lines	☐ 18 Trucks/Cars [hydraulics]
☐ 19 Welding	☒ 3 Waste [LLW, LLM, TRU, TRM]	☒ 19 Electrical Wiring	☒ 19 Forklifts [hydraulics]
☒ 20 Low Power Lasers	☐ 3a Bag	☒ 20 Lamps/Lighting	☐ 20 Conveyors [hydraulics]
☐ 21 Solid Fissile Material [criticality]	☐ 3b Glovebox [exposed]	☐ 21 Plasma Arc Surfaces	☐ 21 Other Lifts [hydraulics]
☐ 22 Liquid Fissile Material [criticality]	☐ 3c Drum	☐ 22 Welding Surfaces	☐ 22 Hydrolazing Equipment
☐ 23 Containerized Fissile Material [criticality]	☐ 3d Metal Crate	☒ 23 Grinder/Saw Surfaces	☐ 23 Tool Hydraulic Lines
☐ 24 Irradiated Equipment	☐ 3e Pipe Overpack Container	☒ 24 Loss of Ventilation	☐ 24 Coiled Springs
☐ 25 Other Direct Radiation Sources	☐ 3f Overpack	☐ 25 Areas Around Furnaces/Boilers	☐ 25 Stressed Members
☒ 26 Other Radioactive Material	☐ 3g Shipping Cask	☐ 26 Multiple Layers PPE	☐ 26 Torqued Bolts
☐ 27 Other Ionizing Radiation Devices	☐ 3h Ducting [exposed]	☒ 27 Other Pyrophoric Material	☐ 27 Gaskets/Seals/ O'Rings
☐ 28 Other Non-Ionizing Radiation Sources	☐ 3i Plenum [exposed]	☐ 28 Other Spontaneous Combustion Material	☒ 28 Vacuum Systems
☐ 29 Other Electromagnetic Sources	☐ 3j Filter [exposed]	☐ 29 Other Open Flame Sources	☒ 29 Cranes
☐ 30 Other Welding/ Cutting Devices	☐ 3k Hood [exposed]	☐ 30 Other Heating Devices/Systems	☒ 30 Hoists
☐ 31 Other Potential RE Sources	☐ 3l Wooden Crate	☐ 31 Radioisotope Thermal Generators	☒ 31 Ducting/Lights/Piping
☐ 32 Other Critical Masses	☐ 3m Cargo Container	☐ 32 Radioactive Decay	☒ 32 Rollup Doors
	☒ 4 General Contamination	☐ 33 Other High Temperature Items	☒ 33 Elevators
	☐ 5 Contaminated Soils	☐ 34 Other Electrical Equipment	☐ 34 Roofs/Plenums
	☐ 6 Contaminated Water	☐ 35 Other Welding/ Cutting/Grinding Surfaces	☐ 35 Upper Floor Components
	☐ 7 Contaminated Oil/ Antifreeze	☐ 36 Other Friction Heated Surfaces	☐ 36 Tanks [elevated]
	☐ 8 Burial Grounds	☒ 37 Belts [friction]	☐ 37 Radiography Equipment [elevated]
		☒ 38 Bearings [friction]	☐ 38 Steam/Natural Gas Lines
		☒ 39 Gears [friction]	☒ 39 Power Lines/ Transformers
		☒ 40 Power Tools [friction]	☒ 40 Crane Loads
		☒ 41 Motors/Fans [friction]	☒ 41 Truck Loads
		☐ 42 Other High Ambient Temperature Areas	☒ 42 Forklift/Other Lifts Loads

Hazard Identification Checklist

PE (cont'd)	PE (cont'd)	PE (cont'd)	PE (cont'd)
☐ 43 Conveyor Loads	☐ 53 Rail Cars/Trains [in motion]	☐ 63 Other Pressure-Related PE Sources	☒ 73 Other Elevated Equipment/Structures
☒ 44 Hoist Loads	☒ 54 Trucks [in motion]	☐ 64 Other Compressed Gases	☐ 74 Other Elevated Hazardous Materials
☒ 45 Cart Loads	☒ 55 Forklifts/Loaders [in motion]	☐ 65 Other High Pressure Gas Systems	☒ 75 Hand Carried Loads
☐ 46 Stacked Hazardous Materials	☒ 56 Bearings/Rollers/ Shafts	☐ 66 Other High Pressure Decon & Size Reduction Tools	☐ 76 Solutions in Elevated Equipment
☐ 47 Pits/Trenches/ Excavations	☒ 57 Gears/Couplings/ Pivot Joints	☐ 67 Other High Pressure Liquid Systems	☐ 77 Other Elevated Work Surfaces
☒ 48 Roofs/Elevated Doors/Loading Docks	☐ 58 Diesel Generators/ Turbines	☐ 68 Other Vehicle/Transport Device Hydraulics	☐ 78 Other Momentum-Related PE Hazards
☒ 49 Stairs/Elevators	☐ 59 Pumps	☐ 69 Other Decon & Size Reduction Tool Hydraulics	☐ 79 Other Moving Vehicle/Transport Devices
☒ 50 Ladders/Fixed Ladders	☒ 60 Fans/Air Movers	☐ 70 Other Pressurized Systems/Components	☒ 80 Cranes [in motion]
☒ 51 Cherry-Pickers/ Hysters	☒ 61 Rotary Compressors	☒ 71 Fire Suppression Systems	☐ 81 Other Rotating Equipment
☒ 52 Scaffolding/Scissor Jack Scaffolds	☒ 62 Centrifuges	☐ 72 Other Gravity-Related PE Hazards	☒ 82 Other Electric Motors

Appendix B

Hazard Description and Protection Form

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Hazard Description and Protection Form

Hazard/Energy Source	Description	Potential Consequences
Electrical Hazard (EE)		
13.8 kV Distribution System	Building transformers step down 13.8 kV to 480 V power for facility electrical systems	Standard industrial hazard – Shock – Electrocution – Could cause loss of power or initiate a fire
480/208/120 V Distribution System	Numerous switchgear, motor control centers, buses, and wires supply power to equipment	Standard industrial hazard – Shock – Electrocution – Could cause loss of power or initiate a fire
Temporary Power	Temporary power will be brought into facilities to accommodate the removal of installed electrical systems. Temporary power includes “bang boards,” extension cords, generators, diesel generators, battery banks, etc.	Standard industrial hazard – Shock – Electrocution – Could cause loss of power or initiate a fire
12-32 V Direct Current Systems	Batteries for diesel generators, LS/DW, and fire panels and control circuitry for various systems	Standard industrial hazard – Shock – Electrocution – Could cause loss of power or initiate a fire
Low Voltage	Electrical equipment such as motors, pumps, fans, compressors, heaters, flow control devices, power tools, instrumentation, static	Standard industrial hazard – Shock – Electrocution – Could cause loss of power or initiate a fire
Loss of Electrical Energy (LOEE)		
Loss of Equipment	Motors, pumps, fans, heaters, illuminators, instrumentation, system pressure	Standard industrial hazard – Pinch – Crush
Loss of Differential Pressure	Flow reversal, Supply fan pressurized, Static air condition	Standard industrial hazard – Could result in spill, uptake
Loss of Ventilation	Accumulation of hazardous vapors or flammable gases Airborne radioactive material	Standard industrial hazard – Toxic exposure – Asphyxiation

Thermal (TE, TP, LOTE)		
Liquid Argon	Dewars used to produce argon gas volumes for inductively coupled plasma spectrometers	Standard industrial hazard – Could injure workers – Burns – Asphyxiation
Liquid N_2	Dewars of liquid nitrogen are used for cooling gamma spectroscopy detectors	Standard industrial hazard – Could injure workers – Burns – Asphyxiation
Combustible liquids	Various quantities and types including HEPA test aerosol fluid, diesel fuel oil, lubricating oils, gearbox oils, and hydraulic fluids.	Standard industrial hazard – Burns – Chemical exposure – Radiological uptake – Could provide fuel for a fire, which injures workers or releases hazardous material
Flammable liquids	Various quantities and types of solvents used for cleaning or decontamination (typically < liter containers). Fuel for generator, light plants, portable heaters, etc.	Standard industrial hazard – Burns – Chemical exposure – Radiological uptake – Could provide fuel for a fire, which injures workers or releases hazardous material
Flammable/Explosive gases	Acetylene used in conjunction with oxygen for welding and cutting. Propane powered vehicles, heating devices. Propane used for analytical equipment.	Standard industrial hazard – Burns – Chemical exposure – Radiological uptake – Could provide fuel for a fire, which injures workers or releases hazardous material
Hydrogen generation	Certain waste containers, solution bottles, tanks, batteries, etc. Hydrogen generators for gas chromatography instruments.	Standard industrial hazard – Radiological uptake – Could build up and cause overpressure, or ignite to cause an explosion, which injuries workers or release hazardous material
Spontaneous Combustion	Pyrophoric material may be present in some storage areas, holdup in equipment. Petroleum based products, reactive chemicals, nitric acid and organics	Standard industrial hazard – Radiological uptake – Could result in fire that releases hazardous material

Combustible Solids	Wood, plastic, tape, clothing, rags, paint, rubber, benelex/lexan windows, HDPE, Polyliners for waste packaging	Standard industrial hazard – Radiological uptake – Could result in fire that releases hazardous material
Portable lighting	Localized lighting to be used as permanent lighting is removed	Standard industrial hazard – Burns – Could cause fires or melt plastic confinement barriers causing a spill
Open Flames	Oxyacetylene cutting torches are used to cut up equipment, magmafusion, Plasma arc, welding, soldering, laboratory burners. Propane flame used on analytical equipment.	Standard industrial hazard – Burns – Radiological uptake – Contamination – Toxic fume inhalation – Could provide ignition source and fuel for a fire or cause an explosion, which releases hazardous material (spill)
High Temperature Devices	Lasers, furnaces, engine exhaust surfaces, halogen lights, hot plates	Standard industrial hazard – Burns – Toxic Fumes – Could provide ignition source for fire or explosion which releases hazardous material (spill)
Grinding and cutting tools	Various hand tools to be used to size reduce gloveboxes, hoods, tanks etc. (e.g., grinders, chop saw).	Standard industrial hazard – Lacerations – Punctures – Repetitive motion – Radiological uptake – Could injure workers or initiate fire that releases hazardous material
Temporary Heaters	Used for temporary heat to be used for personal comfort and freeze protection	Standard industrial hazard – Burns – Could injure workers or result in a fire that releases hazardous material
High temperature environment	High temperature work environment due to loss or removal of HVAC (cooling) systems. Work in confinement structures requiring multiple layers of PPE	Standard industrial hazard – Heat stress

Radiant Energy (RE & RM)		
Low temperature Environments	Low temperature work environments due to removal of HVAC supply (heating) system	Standard industrial hazard – Cold stress
Calibration and Radiological Monitoring Sources	Pu-239 and Sr-90 Calibration sources and numerous Pu-239 sources in rad monitoring equipment	Radiological hazard – Radiation exposure
Fissile material Storage/Holdup	Various isotopes are handled, packaged, stored and are trapped as holdup in facility	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to drops/impacts, fires, over pressurization or explosions or external events – Could cause criticality
Contaminated water	Low level contaminated water generated from housekeeping activities, spill cleanup, safety shower discharge cleanup	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to spills, explosions
General Contamination	Loose surface contamination and fixed contamination is present throughout facilities and may be under layers of paint	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to spills, explosions
Actinide Solution	Residual solutions stored in tanks, piping systems and bottles	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to spills, explosions
Contaminated Oil and antifreeze	Contamination in remaining oil (e.g., drains, equipment reservoirs) and antifreeze.	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to spills, explosions
Waste Containers	Various isotopes are handled, packaged, staged for shipment or stored.	Radiological hazard – Radiation exposure – Radiological uptake – Contamination – Could be released due to spills, explosions

Ionizing Radiation Devices	Radiological equipment is used for NDT, X-ray machines used for analysis, lasers in analytical equipment	Radiological hazard – Radiation exposure
Non-Ionizing Radiation Sources	Electromagnetic furnaces, computers, welding/cutting devices, ground penetrating radar used to characterize facilities	Radiological hazard – Radiation exposure
Acoustic Energy (AE)		
Equipment rooms, supply fan rooms	Fans, pumps, motors, compressors and other equipment	Standard industrial hazard – Loss of hearing – Does not initiate or impact hazardous material releases
Air compressors	Stationary and portable air compressors (inside and out) to support tools and process equipment.	Standard industrial hazard – Does not initiate or impact hazardous material releases
Kinetic Energy (KE)		
Rotating Equipment	Various types of fans, pumps, air movers, compressors, electric motors	Standard industrial hazard – Pinch – Impact – Puncture – Cut – Could result in loss of confinement
Vehicle/Transport Devices	Forklifts, loaders, cranes, trucks, excavators, backhoes, trucks, carts, dollies, elevator	Standard industrial hazard – Impact – Radiological uptake, exposure – Could injure workers or result in loss of confinement through drop, spill or puncture that releases hazardous material. – Could provide fuel for a fire or cause an explosion, which injures workers or releases hazardous material.
Decontamination and Size Reduction Equipment	High pressure hydraulic oil lines and systems in tools (e.g. shears, cranes, loaders, concrete saws, jackhammers)	Standard industrial hazard – Lacerations – Punctures – Repetitive motion/ergonomics – Radiological uptake – Could initiate spill that releases hazardous material.

Potential Energy (PE)		
Pressurized Gas Bottles	P-10 bottles used by PCM2 detector, welding, Headspace Gas Sampling Analysis, miscellaneous gases.	Standard industrial hazard – Extreme temperatures – Could act as a missile and cause hazardous material release (Spill)
Compressed Air	Compressed air used to operate equipment (e.g., scabblers) and breathing air systems and backup bottles, analytical equipment and process equipment	Standard industrial hazard – Pressure release
Hoisting and Rigging, Lifting equipment	Heavy equipment will be lifted and lowered as part of waste shipping, sample shipping, and equipment installations using cranes, hoists, pallet jacks, lift tables, elevators.	Standard industrial hazard – Impact – Radiological uptake – Could result in spill that releases hazardous material.
Mechanical Energy (ME)		
Crush, Shear, Pinch	Presses, grinders, size reduction tools, forklift, puncture, sharp edges, motors, fans, pumps	Standard industrial hazard
Chemical Energy/Explosives (CE)		
Stock Chemicals	Fixatives, adhesives, paints, and other chemicals used for decommissioning corrosives, acids, reagents, oxidizers used in laboratory sampling.	Chemical/Standard industrial hazard – Chemical exposure – Burns – Asphyxiation – Could be released due to spills, fires, overpressure due to chemical reactions, etc.
Waste Chemicals	Oils and aqueous solutions, chemicals no longer required	Chemical/Standard industrial hazard – Chemical exposure – Burns – Asphyxiation – Could be released due to spills, fires, overpressure due to chemical reactions, etc.
Shock Sensitive Chemicals	Nitrates may be located throughout clean-up activities	Chemical/Standard industrial hazard – Chemical exposure – Burns – Asphyxiation – Could cause explosion

Explosive Substances	H_2, gas	Chemical/Standard industrial hazard – Chemical exposure – Burns – Asphyxiation – Could cause explosion
Legacy Materials	May encounter unknown chemicals Waste packaged prior to 1995	Radiological/Chemical/Standard industrial hazard – Chemical exposure – Radiological uptake – Could result in spill, explosion, fire
Chemical Materials (CM)		
Asbestos	Asbestos containing material throughout facility (e.g., ceiling tiles, walls, pipe insulation, floor tiles)	Chemical/Standard industrial hazard – Asbestos dust inhalation – Could be released due to spills, fires, etc. (No offsite impact)
Lead	Lead containing material throughout facility.	Chemical/Standard industrial hazard – Lead poisoning – Fume inhalation – Could be released due to fire (No offsite impact)
PCBs	PCBs in various parts of the facility (e.g., light ballasts, transformers, samples).	Chemical/Standard industrial hazard – Contamination – Could be released due to spills, fires, etc. (No offsite impact)
Biohazard (BIO)		
Pesticides sprayed in buffer zone	Noxious weed control relies on aerial application of pesticides	Chemical/Standard industrial hazard – Chemical exposure
Animal droppings	May encounter animal and bird droppings.	Standard industrial hazard – Disease
Animals	May encounter dead animals in various places in the facility. Live animals may enter the facility	Standard industrial hazard – Disease – Bites

Natural Phenomena (NPH)		
Lightning	May experience natural phenomena before end of facility life	Radiological/Chemical/Standard industrial hazard – Burns – Shock – Could injure workers or release hazardous material through spills, loss of confinement or resultant fires
High winds, tornadoes, heavy rain, floods, heavy snow, earthquakes, aircraft crash	May experience natural phenomena before end of facility life	Radiological/Chemical/Standard industrial hazard – Bodily injury – Radiological uptake – Could injure workers or release hazardous material through spills or resultant fires
Any Other Hazard (OTH)s		
Oxygen deficient atmospheres	Inert gases present in liquid form (N2 dewars) confined space	Standard industrial hazard – Asphyxiation – Could injure workers
Trenching	Removal of underground piping may require trenching	Standard industrial hazard – Burial – Shock – Pressure release

Appendix C

Preliminary Hazards Analysis 222-S Laboratory Complex

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Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-1	222-S Shipping/ Receiving	Tank Farm core sample (one segment or less per cask, 5.2E-3 DE-Ci)	Release of radioactive and/ or hazardous material to the environment from the loading dock due to container drop/ impact/crush/puncture during shipping/ receiving activities	Operator error; equipment failure	Release of solid or liquid sample to ground; surface/ pool formation; particulate release	Shipping container design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	Three casks per truck, only one unloaded at a time.
222S-222S-2	222-S Shipping/ Receiving	PAS-1 Cask (~5.2E-2 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to PAS-1 Cask shipping container sample container (inner PAS-1 container) drop/impact/crush/ puncture during shipping/ receiving activities	Operator error; equipment failure	Release of solid or liquid sample to ground; surface/pool formation; particulate release	Crane/lifting equipment design; Shipping container design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	PAS-1 Cask is a Type-B shipping container. Potential for worker in-jury from fall/drop of cask. Scenario consists of dropping the carrier as it is being removed from the PAS-1 cask.
222S-222S-3	222-S Shipping/ Receiving	Hardigg Case [Barney box] (~1.56E-2 DE-Ci)	Release of radioactive and/ or hazardous material to the environment from the loading dock due to Hardigg Case shipping container sample container drop/impact/crush/ puncture during shipping/ receiving activities	Operator error; equipment failure	Release of solid or liquid sample to ground; surface/pool formation; particulate release	Crane/lifting equipment design; Shipping container design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	Bounded by PAS-1. Barney box is a Type-A shipping container.
222S-222S-4	222-S Shipping/ Receiving	Contents of a pig approximately 1.04E-2 DE-Ci	Release of radioactive and/ or hazardous material to the environment from the loading dock due to pig drop/impact/ crush/puncture during shipping/receiving activities	Operator error; equipment failure	Release of solid or liquid sample to ground; surface/pool formation; particulate release	Pig container design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	Taken out of over pack on truck. Tank farm samples are highly caustic.
222S-222S-5	222-S Shipping/ Receiving	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/ or hazardous material to the environment from the loading dock due to sample container (various) drop/impact/crush/ puncture during shipping/ receiving activities	Operator error; equipment failure	Release of solid or liquid sample to ground; surface/pool formation; particulate release	Container design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	Includes containers such as carboy.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-6	222-S Shipping/ Receiving	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to sample container (various) overpressurization during shipping/receiving activities	Incompatible materials; gas generation	Release of solid or liquid sample to air and ground; particulate release	Container design	Training; procedures; industrial safety program; rad con program	F3	B	C	D	E1	III	IV	Potential industrial injury from overpressure.
222S-222S-7	222-S Shipping/ Receiving	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to fire involving sample container (various) during shipping/receiving activities	Incompatible mater-ials, gas generation, ignition source; maintenance activity with combustibles present ignites and involves container; handling equipment as a fuel source	Release of particulate to environment	Handling equipment design	Fire protection program; housekeeping; manual fire suppression; training; procedures	F3	C	C	D	E1	III	IV	"Single" container fire. New dock design will enclose this space and have fire suppression.
222S-222S-8	222-S Shipping/ Receiving	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to fire involving transportation vehicle	Equipment failure leads to release of fuel which ignites and involves container	Release of particulate to environment	Truck design	Fire protection program; housekeeping; manual fire suppression; requirement for turning off vehicle when parked; maintenance of vehicle; training; procedures	F3	C	C	D	E1	III	IV	Potential to involve more than one container but 30 g is the maximum that can be received. New dock design will enclose this space and have fire suppression.
222S-222S-9	222-S Shipping/ Receiving	Occupational radiological hazard (RAD)	Occupational exposure due to receiving a higher than normal sample.	Procedure/operator error; mis-identification of sample	Higher than expected external exposure to worker		Training; procedures; rad con program	F3	C	D	D	E0	IV	IV	No release. External exposure to worker.
222S-222S-10	222-S Laboratory Hot Cell Operations	Same as single containers in Shipping/ Receiving	Release of radioactive and/or hazardous material to the room and environment from the container due to container drop/impact/crush/puncture during hot cell loading activities	Operator error; equipment failure	Release of solid or liquid sample to room floor; surface/pool formation; particulate release; transport to environment by vent systems or building leak paths	Handling equipment design	Training; procedures; industrial safety program; rad con program	F3	C	C	D	E1	III	IV	Bounded by Shipping/ Receiving activities.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-11	222-S Laboratory Hot Cell Operations	1.14 DE-Ci	Release of radioactive and/or hazardous material to the hot cell and environment from the container due to sample drop/impact/crush/puncture during hot cell activities (multiple samples involved)	Operator error; equipment failure	Release of hazardous and radioactive material to the hot cell; Leak pathway to room; transport through HVAC and release to environment via stack	Hot cell structure; HVAC & HEPAs; negative dP, handling equipment design; sample bin design	Training; procedures	F3	C	C	D	E1	III	IV	MAR involves 2 bins with 5.7E-1 DE-Ci per bin. E1 and S2-C assigned assuming HVAC w/o HEPAs.
222S-222S-12	222-S Laboratory Hot Cell Operations	39.11 DE-Ci	Release of radioactive and/or hazardous material to the hot cell and environment due to a fire inside the hot cell that involves the entire hot cell structure (multiple locations involved)	Ignition of combust-ible material from electrical services; combination of incompatible chemicals; leak of hydraulic fluid into hot cell from extruder	Release of hazardous and radioactive material to the hot cell environment, room environment via boot failure or window, and potential subsequent transport to the environment via building leaks or through HVAC	Hot cell structure; HVAC and HEPAs; extruder design; fire protection system, hot cell design and segregation of hot cell locations.	Training; procedures; fire protection program	F2	B	B	C	E2	II	III	MAR for this scenario is same as the facility inventory. Hot cell has oil-filled windows.
222S-222S-13	222-S Laboratory Hot Cell Operations	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to a drop/impact/crush/puncture of a waste drum outside of the hot cell during filling or handling	Operator error; equipment failure	Release of hazardous and radioactive material to the room environment and potential subsequent transport to the environment via building leaks or through HVAC; potential industrial injury to worker due to dropped drum	Room HVAC; drum handling equipment design; waste package size limitations; drum design	Training; procedures; rad con program; industrial safety program; maintenance	F3	C	D	D	E0	IV	IV	Industrial hazard due to dropped drum. Mixed waste drum.
222S-222S-14	222-S Laboratory Hot Cell Operations	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to waste drum overpressurization outside of the hot cell during handling	Incompatible materials, gas expansion	Release of hazardous and radioactive material to the room environment and potential subsequent transport to the environment via building leaks or through HVAC; potential serious industrial injury to worker due to drum overpressurization	Room HVAC; drum handling equipment design; waste package size limitations; drum design	Training; procedures; industrial safety program	F3	A	D	D	E0	IV	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-15	222-S Laboratory Hot Cell Operations	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to a fire that involves a waste drum outside of the hot cell during filling or handling	Waste drum that contains incompatible chemicals or that contains combustibles which are ignited	Release of hazardous and radioactive material to the room and potential subsequent transport to the environment via building leaks or through HVAC; Potential industrial injury to worker due to dropped drum	Room HVAC; drum handling equipment design; Waste package size limitations; drum design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-222S-16	222-S Laboratory Hot Cell Operations	Liter quantities of acids, bases, alcohol	Release of hazardous material to the room and environment due to a drop/impact/crush/ puncture of a chemical container outside of the hot cell.	Operator error; handling equipment failure	Release of hazardous material to the room and potential subsequent transport to the environment via building leaks or through HVAC.	Room HVAC; handling equipment design; chemical package size limitations	Training; procedures; industrial safety program; industrial hygiene program	F3	B	D	D	E0	IV	IV	Worker chemical exposure issue.
222S-222S-17	222-S Laboratory Hot Cell Operations	Liter quantities of acids, bases, alcohol	Release of hazardous material to the room and environment due to a drop/impact/crush/puncture of a chemical container inside of the hot cell.	Operator error; handling equipment failure	Release of hazardous material to the hot cell; Leak pathway to room; potential subsequent transport to the environment via building leaks or through HVAC	Hot cell design and ventilation; room HVAC; handling equipment design; chemical package size limitations	Training; procedures; industrial safety program; industrial hygiene program	F3	C	D	D	E0	IV	IV	Less than above due to passive barrier of hot cell.
222S-222S-18	222-S Laboratory Hot Cell Operations	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to errors or equipment failures during maintenance of manipulators	Operator error; handling equipment failure	Worker injury; release of particulate to operating area; transport to environment	Equipment design; transport cart; building structure and vent system	Training; procedures; rad con program; industrial safety	F3	B	D	D	E0	IV	IV	Worker injury; worker exposure.
222S-222S-19	222-S Laboratory Hot Cell Operations	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to failure of hot cell viewing window	Extruder failure; manipulator failure	Release of particulate to operating area; potential transport to environment	Equipment design; hot cell design and ventilation	Training; procedures; rad con program; industrial safety	F3	C	D	D	E0	IV	IV	
222S-222S-20	222-S Laboratory Hot Cell Operations	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	Release of particulate to operating area; potential transport to environment	HVAC system design; backup diesel exhaust fan	Training; procedures	F3	C	D	D	E0	IV	IV	
222S-222S-21	222-S Laboratory Operations	30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to a sample drop/impact/crush/ puncture in lab room.	Operator error; handling equipment failure	Release of hazardous and radiological material to the room. Transport through HVAC and release to environment via stack.	Equipment design; transport cart; building structure and vent system	Training; procedures; rad con program; industrial safety	F3	C	D	D	E0	IV	IV	Handling alpha samples may increase S1 to B.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-22	222-S Laboratory Operations	30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to the fume hood and environment due to a sample drop/impact/ crush/puncture in fume hood	Operator error; handling equipment failure	Release of hazardous and radiological material to the fume hood. Leak pathway to room. Transport through HVAC and release to environment via stack.	Fume hood design and ventilation; equipment design; building structure and vent system	Training; procedures; rad con program; industrial safety	F3	C	D	D	E0	IV	IV	No credit assumed for fume hood for this unmitigated case.
222S-222S-23	222-S Laboratory Operations	Gallon quantities of acids, bases, organics	Release of hazardous material to the Room and environment due to drop/impact/crush/ puncture of chemical container outside of fume hood	Operator error; handling equipment failure	Release of hazardous material to the room. Transport through HVAC and release to environment via stack.	Equipment design; transport cart; building structure and vent system	Training; procedures; industrial hygiene program; industrial safety program	F3	B	D	D	E0	IV	IV	Potential for impact to worker from chemical.
222S-222S-24	222-S Laboratory Operations	Gallon quantities of acids, bases, organics	Release of hazardous material to the fume hood and environment due to drop/impact/ crush/puncture of chemical container inside of fume hood.	Operator error; handling equipment failure	Release of hazardous material to the fume hood. Leak pathway to room. Transport through HVAC and release to environment via stack.	Fume hood design and ventilation; equipment design; building structure and vent system	Training; procedures; industrial hygiene program; industrial safety program	F3	C	D	D	E0	IV	IV	
222S-222S-25	222-S Laboratory Operations	30 g Pu (4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of hazardous and radioactive material to the fume hood, room, and environment due to fire inside fume hood.	Flammable liquids in hood; ignition source	Release of hazardous and radioactive material to the fume hood and lab room. Transport through HVAC and release to environment via stack.	Fume hood design and ventilation	Training; procedures; fire protection program	F3	C	D	D	E0	IV	IV	See gas cylinder failure for lab-wide fire.
222S-222S-26	222-S Laboratory Operations	Multiple hood damage; (up to six hoods or 5.00 DE-Ci); 30 gal chemical inventory	Release of radioactive and/or hazardous material to the room and environment due to failure of compressed gas cylinder in lab resulting in a missile	Operator error; cylinder valve failure; cylinder handling error	Release of hazardous and radioactive material to the room and potential subsequent transport to the environment via building leaks or through HVAC. Potential serious industrial injury to worker due to gas cylinder failure	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	A	C	D	E1	III	IV	One 4.95 DE-Ci sample in one hood, 1.04E-2 DE-Ci in each of the others.
222S-222S-27	222-S Laboratory Operations	OCC	Missile generated from failure of compressed gas cylinder	Operator error; cylinder valve failure; cylinder handling error	Injury or fatality to worker	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	A	D	D	E0	IV	IV	Only addresses occupational industrial hazard.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-28	222-S Laboratory Operations	Lab chemical and rad inventory; approximately 60 gal; 12 hoods (5.06 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Fire or explosion local to one lab.	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Release of hazardous and radioactive material to the lab room and transport to the environment via building leaks or through HVAC, potential serious industrial injury to worker due to explosion	Gas cylinder design; support structure design; fire protection system; Hanford fire department	Training; procedures; industrial safety program; fire protection program	F3	A	C	D	E1	III	IV	One 4.95 DE-Ci sample in one hood, 1.04E-2 DE-Ci in each of the others.
222S-222S-29	222-S Laboratory Operations	39.11 DE-Ci builiding inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Interaction with flammable chemicals. Fire propagates to 222-S Laboratory building-wide fire.	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Release of hazardous and radioactive material to the building and transport to the environment, potential serious industrial injury to worker due to explosion	Gas cylinder design; support structure design; fire protection system; Hanford fire department	Fire protection program; training; procedures; emergency response	F2	A	B	C	E2	II	III	Unmitigated, no credit for fire suppression.
222S-222S-30	222-S Laboratory Operations	OCC	Failure of nitrogen dewars in counting room	Operator error; equipment failure	Injury to worker; freeze burns	Dewar design; support structure design	Training; proce-dures; industrial safety program	F3	B	D	D	E0	IV	IV	
222S-222S-31	222-S Laboratory Operations	OCC	Not applicable; halon system in counting room was removed												
222S-222S-32	222-S Laboratory Operations	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the glovebox and environment due to a sample drop/impact/ crush/puncture in glovebox	Operator error; equipment failure	Release of hazardous and radiological material to the glovebox. Leak pathway to room. Transport through HVAC and release to environment via stack.	Glovebox design and ventilation; equipment design; building structure and vent system	Training; procedures; rad con program; industrial safety	F3	C	D	D	E0	IV	IV	
222S-222S-33	222-S Laboratory Operations	Gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the glovebox and environment due to a chemical container drop/impact/crush/ puncture in glovebox	Operator error; equipment failure	Release of hazardous material to the fume hood. Leak pathway to room. Transport through HVAC and release to environment via stack.	Glovebox design and ventilation; equipment design; building structure and vent system	Training; procedures; industrial hygiene program; industrial safety	F3	C	D	D	E0	IV	IV	
222S-222S-34	222-S Laboratory Operations	30 g of Pu (liquid or solid, 4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the glovebox and environment due to a fire in glovebox	Flammable liquids; ignition source	Release of hazardous and radioactive material to the glovebox and lab room. Transport through HVAC and release to environment via stack.	Glovebox design and ventilation; glovebox fire protection system	Training; procedures; fire protection program	F3	C	D	D	E0	IV	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222S-35	222-S Laboratory Operations	30 g of Pu (liquid or solid, 4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the room and environment due failure of glove or glovebox window in glovebox	Operator error; equipment failure	Release of hazardous and radioactive material to the lab room and exposure to worker	Glovebox design and ventilation; building structure and ventilation system	Training; procedures	F3	C	D	D	E0	IV	IV	Exposure to worker.
222S-222S-36	222-S Laboratory Operations	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to a drop/impact/crush/puncture of a waste drum during filling or handling.	Operator error; equipment failure	Release of hazardous and radioactive material to the room environment and potential subsequent transport to the environment via building leaks or through HVAC. Potential industrial injury to worker due to dropped drum.	Room HVAC; drum handling equipment design; waste package size limitations; drum design	Training; procedures; rad con program; industrial safety program; maintenance	F3	C	D	D	E0	IV	IV	
222S-222S-37	222-S Laboratory Operations	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to waste drum overpressurization during handling	Incompatible materials, gas expansion	Release of hazardous and radioactive material to the room environment and potential subsequent transport to the environment via building leaks or through HVAC. Potential serious industrial injury to worker due to drum overpressurization.	Room HVAC; drum handling equipment design; waste package size limitations; drum design	Training; procedures; industrial safety program	F3	A	D	D	E0	IV	IV	
222S-222S-38	222-S Laboratory Operations	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to a fire that involves a waste drum during filling or handling	Waste drum that contains incompatible chemicals or that contains combustibles which are ignited.	Release of hazardous and radioactive material to the room and potential subsequent transport to the environment via building leaks or through HVAC; potential industrial injury to worker due to dropped drum	Room HVAC; drum handling equipment design; waste package size limitations; drum design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-222S-39	222-S Laboratory Operations	Loose contamination in fume hoods/glove boxes (up to 1.04E-2 DE-Ci). High vapor pressure chemicals	Release of radioactive and/or hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	Release of particulate to operating area; potential transport to environment	HVAC system design; backup diesel exhaust fan	Training; procedures; maintenance	F3	C	D	D	E0	IV	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-219S-1	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to drop of cover block/roof panel on storage tanks	Operator error; equipment failure; structural failure	Release of radioactive and chemical materials; aerosol release; worker exposure; transport to environment; release to ground; industrial hazard to worker from dropped cover block	Handling equipment design	Training; procedures; maintenance	F2	B	C	D	E1	III	IV	Does not currently use cover blocks but fire protection may require use of cover blocks. Potential occupational industrial hazard.
222S-219S-2	219-S Tank System	OCC	Cover block/roof panel dropped	Operator error; equipment failure; structural failure	Injury or fatality to worker	Handling equipment design	Training; procedures; maintenance	F3	A	D	D	E0	IV	IV	Only addresses occupational industrial hazard.
222S-219S-3	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to spray release	Operator error; equipment failure; structural failure	Release of radioactive and chemical materials; aerosol release; worker exposure; transport to environment; release to ground	Transfer system design	Training; procedures; maintenance	F3	C	C	D	E1	III	IV	
222S-219S-4	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to tank failure/leak (101, 102, 104)	Operator error; equipment failure; structural failure	Release of radioactive and chemical materials; release to ground; release to air and environment.	Storage tank design; tank level monitoring	Training; procedures; maintenance	F3	C	D	D	E1	IV	IV	
222S-219S-5	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to fire in 219-S	Electrical failure; ignition of plastics/combusti-bles; vehicle impact causes fire	Building structure falls on tank; tank overpressurizes from fire; aerosol release to air; release to ground	Storage tank design	Training; procedures; fire protection program	F2	C	C	D	E1	III	IV	
222S-219S-6	219-S Tank System	700 gal NaOH	Release of hazardous material to environment due to failure/ leak of NaOH tank (201)	Tank structural failure; vehicle impacts building	Release of hazardous material to ground; release to air and environment	Storage tank design	Training; procedures	F3	C	D	D	E0	IV	IV	
222S-219S-7	219-S Tank System	700 gal NaOH	Release of hazardous material to environment due to release during filling NaOH tank during truck transfer operations	Human error; equipment failure	Release of hazardous material to ground; release to air and environment; potential spray release	Transfer system design; safety showers; temporary berm	Training; procedures; industrial safety program	F3	B	D	D	E1	IV	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-219S-8	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material due to leak or valving error during sampling in the sampling gallery.	Human error; equipment failure	Release of liquid spray in hood. Worker safety impact	Hood design	Training; procedures; industrial safety program	F3	B	D	D	E0	IV	IV	
222S-219S-9	219-S Tank System	Sample size bounded by 30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to environment due to drop/impact/crush/puncture of a sample	Human error; equipment failure	Release of liquid sample to ground; surface/pool formation; particulate release	Sample container design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	Bounded by 222-S Laboratory sample drop.
222S-219S-10	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to inadvertent mixing of chemicals and tank overpressurization	Operator error, valve failure, equipment failure	Release of haz chem, rad aerosols, potentially pressurize tank, uncontrolled chemical reaction, potential worker injury	Filters/vent system, transfer system design, tank design	Training; procedures	F3	C	C	D	E1	III	IV	Acid and caustic liquids are mixed during normal operations.
222S-219S-11	219-S Tank System	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to misrouting contents of 219-S tanks	Human error; equipment failure	Mixing of 219-S Tank contents with tanks at evaporator or tank farm. Potential for direct release to environment	Transfer system design	Training; procedures	F2	D	D	D	E2	IV	IV	May impact workers at other facilities.
222S-222FB-1	222-SB, SC, and SE Filter Buildings	Radioactive material on filter 5.41E-1 DE-Ci total	Release of radioactive material to environment due to failure of HEPA filters during replacement/maintenance	Human error; equipment failure	Release of radioactive material to environment	Filter handling equipment design	Training; procedures; rad con program	F3	C	D	D	E0	IV	IV	Filters in series. SC is first filter.
222S-222FB-2	222-SB, SC, and SE Filter Buildings	Radioactive material on filter 5.41E-1 DE-Ci total	Release of radioactive material to environment due to release from HEPA filters due to fire.	Vehicle impacts building and initiates fire; diesel spill during storage tank filling results in fire; flammable gas release (e.g., acetylene, propane) during delivery to 222S results in fire	Release of radioactive material to environment	Filter building design	Training; procedures; fire protection program; DOT shipping requirements	F2	C	C	D	E1	III	IV	
222S-222SD-1	222-SD Solid Waste Handling	4 drums per pallet. (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Release of radioactive and hazardous material to the ground; transport of particulates to the environment	Waste drum design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	SD has jib hoist, other areas do not; forklift handling.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222SD-2	222-SD Solid Waste Handling	4 drums per pallet. (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Release of radioactive and hazardous material to the environment	Waste drum design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-222SD-3	222-SD Solid Waste Handling	One drum at 8.3^{E}-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Release of radioactive and hazardous material to the environment; potential worker injury from overpressure	Waste drum design	Training; procedures	F3	B	C	D	E1	III	IV	
222S-222SD-4	222-SD Solid Waste Handling	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to drop/impact/crush/puncture	Human error; equipment failure	Release of radioactive and hazardous material to the ground; transport of particulates to the environment	Waste box design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	
222S-222SD-5	222-SD Solid Waste Handling	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to localized fire	Combustible materials ignite; forklift fuel ignites	Release of radioactive and hazardous material to the environment	Waste box design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-222SD-6	222-SD Solid Waste Handling	64 drums and 4 boxes (2.38 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to 222-SD area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Release of radioactive and hazardous material to the environment	Waste package design	Training; procedures; fire protection program	F2	C	C	D	E1	III	IV	
222S-HS008-1	HS-0082 HS-0083	4 drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Release of radioactive and hazardous material to the ground; transport of particulates to the environment	Waste drum design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	
222S-HS008-2	HS-0082 HS-0083	4 drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Release of radioactive and hazardous material to the environment	Waste drum design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-HS008-3	HS-0082 HS-0083	1 drum at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Release of radioactive and hazardous material to the environment; potential worker injury from overpressure	Waste drum design	Training; procedures	F3	B	C	D	E1	III	IV	
222S-HS008-4	HS-0082 HS-0083	176 drums (4.16 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Release of radioactive and hazardous material to the environment	Waste package design	Training; procedures; fire protection program	F2	C	C	D	E1	III	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-HS006-1	HS-0065 (A&B) Chemical Storage	Up to four 55-gal drums per pallet. 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture during filling or handling	Human error; equipment failure	Release of hazardous material to the ground; transport of particulates to the environment	Waste drum design; handling equipment design	Training; procedures	F3	B	C	D	E1	III	IV	
222S-HS006-2	HS-0065 (A&B) Chemical Storage	Up to four 55-gal drums per pallet. 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to localized fire during filling or handling	Combustible materials ignite; forklift fuel ignites	Release of hazardous material to the environment	Waste drum design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-HS006-3	HS-0065 (A&B) Chemical Storage	One 55-gal drum containing 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to failure of waste drum from overpressure during handling	Incompatible materials; gas expansion	Release of hazardous material to the environment; potential serious industrial worker injury from overpressure	Waste drum design	Training; procedures	F3	A	C	D	E1	III	IV	
222S-HS006-4	HS-0065 (A&B) Chemical Storage	Up to ten 55-gal drum of compatible chemicals per side, 20 total in storage unit	Release of hazardous material to the environment due to area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Release of hazardous material to the environment	Waste package design	Training; procedures; fire protection program	F2	C	C	D	E1	III	IV	
222S-BP-1	"Bull Pen" LLW Storage Area	Either one drum or box (8.3E-1 DE-Ci); four drums (1.32 DE-Ci); or total inventory (upper limit same as HS-0082 and HS-0083, 4.16 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Release of radioactive and hazardous material to the ground; transport of particulates to the environment	Waste drum design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	
222S-BP-2	"Bull Pen" LLW Storage Area	Four drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Release of radioactive and hazardous material to the environment	Waste drum design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-BP-3	"Bull Pen" LLW Storage Area	One drum at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Release of radioactive and hazardous material to the environment; potential worker injury from overpressure	Waste drum design	Training; procedures	F3	B	C	D	E1	III	IV	
222S-BP-4	"Bull Pen" LLW Storage Area	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to drop/impact/crush/puncture	Human error; equipment failure	Release of radioactive and hazardous material to the ground; transport of particulates to the environment	Waste box design; handling equipment design	Training; procedures	F3	C	C	D	E1	III	IV	
222S-BP-5	"Bull Pen" LLW Storage Area	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to localized fire	Combustible materials ignite; forklift fuel ignites	Release of radioactive and hazardous material to the environment	Waste box design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-BP-6	"Bull Pen" LLW Storage Area	Total equivalent to 176 drums/boxes (4.16 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to "Bull Pen" area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Release of radioactive and hazardous material to the environment	Waste package design	Training; procedures; fire protection program	F2	C	C	D	E1	III	IV	
222S-GD-1	212 Gas Storage Dock; Annex Combustible Gas Dock; 4M and 4TUV Gas Dock	222S inventory potentially impacted. Filter Building 222-SE. 5.41E-1 DE-Ci	Release of radioactive and/or hazardous material due to failure of pressurized gas cylinder resulting in missile	Human error; equipment failure	Release of radioactive and hazardous material to the environment	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	C	C	D	E1	III	IV	Missile impacting Filter Building is used for consequences.
222S-GD-2	212 Gas Storage Dock; Annex Combustible Gas Dock; 4M and 4TUV Gas Dock	OCC	Worker injury/fatality due to failure of pressurized gas cylinder	Operator error; cylinder valve failure; cylinder handling error	Injury or fatality to worker	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	A	D	D	E0	IV	IV	Only addresses occupational industrial hazard.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-GD-3	212 Gas Storage Dock; Annex Combustible Gas Dock; 4M and 4TUV Gas Dock	OCC	Failure of cryogenic dewar	Operator error; equipment failure	Injury to worker; freeze burns	Dewar design; support structure design	Training; procedures; industrial safety program	F3	B	D	D	E0	IV	IV	
222S-GD-4	212 Gas Storage Dock; Annex Combusti-ble Gas Dock; 4M and 4TUV Gas Dock	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to failure of flammable compressed gas cylinder or gas lines in storage dock. Fire propagates to building-wide fire	Operator error; equipment failure; release of gas; ignition; fire or explosion	Release of hazardous and radioactive material to the building and transport to the environment	Gas cylinder design; support structure design; fire protection system; Hanford fire department	Fire protection program; training; procedures; emergency response	F2	B	B	C	E2	II	III	
222S-207SL-1	207-SL Retention Basins	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to spill during transfer	Operator error; equipment failure	Release of hazardous and radioactive material to ground; release to air and environment; potential spray release	Transfer system design	Training; procedures	F3	D	D	D	E1	IV	IV	Included for complete-ness. Primarily an environ-mental issue.
222S-207SL-2	207-SL Retention Basins	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to failure of storage tanks.	Operator error; equipment failure; structural failure	Release of hazardous and radioactive material; release to ground; release to air and environment.	Storage tank design; tank level monitoring	Training; procedures; maintenance	F3	D	D	D	E1	IV	IV	Included for complete-ness. Primarily an environ-mental issue.
222S-207SL-3	207-SL Retention Basins	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to spill during sampling	Operator error; equipment failure	Release of hazardous and radioactive material to ground; release to air and environment; potential spray release	Sampling system design	Training; procedures	F3	D	D	D	E1	IV	IV	Included for complete-ness. Primarily an environ-mental issue.
222S-207SL-4	207-SL Retention Basins	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to environment due to drop of cover block on retention basin	Operator error; equipment failure; structural failure	Release of radioactive and chemical materials; aerosol release; worker exposure; transport to environment; release to ground; industrial hazard to worker from dropped cover block	Handling equipment design	Training; procedures; maintenance	F2	D	D	D	E1	IV	IV	Potential occupational industrial hazard.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-207SL-5	207-SL Retention Basins	OCC	Cover block dropped	Operator error; equipment failure; structural failure	Injury or fatality to worker	Handling equipment design	Training; procedures; maintenance	F3	A	D	D	E0	IV	IV	Only addresses occupational industrial hazard.
222S-222SA-1	222-SA Standards Lab	Four 1-gal containers packaged in a box (HNO3, NaOH, methy-lene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500 ml bottles/6 bottles per pkg.	Release of hazardous material to the environment due to drop/impact/crush/puncture handling accident during receiving/shipping	Operator error, equipment failure, improper packaging, truck accident	Release of hazardous material to the environment, potentail serious industrial injury to worker due to drop or impact	DOT packaging	Training, procedures, industrial hygiene program, emergency response, spill kits, safety shower	F3	A	C	D	E1	III	IV	
222S-222SA-2	222-SA Standards Lab	Four 1-gal containers packaged in a box (HNO_3, NaOH, methy-lene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500-ml bottles/6 bottles per pkg.	Release of hazardous material to the environment from the loading dock due to chemical container overpressurization during shipping/receiving activities	Incompatible materials; gas expansion	Release of hazardous material to the environment, potentail serious industrial injury to worker due to overpressure	Container design	Training; procedures; industrial hygiene	F3	A	C	D	E1	III	IV	Potential industrial injury from overpressure.
222S-222SA-3	222-SA Standards Lab	Four 1-gal containers packaged in a box (HNO3, NaOH, methy-lene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500-ml bottles/6 bottles per pkg.	Release of hazardous material to the environment from the loading dock due to fire during shipping/receiving activities	Incompatible materials, gas generation, ignition source; maintenance activity with combustibles present ignites and involves container; handling equipment as a fuel source	Release of hazardous material to the environment	Handling equipment design	Fire protection program; housekeeping; manual fire suppression; training; procedures	F3	C	C	D	E1	III	IV	
222S-222SA-4	222-SA Standards Lab	Four 1-gal containers of hazardous material	Release of hazardous material to the environment due to drop/impact/crush/puncture of chemical container in single lab	Operator error, equipment failure, defective container	Release of hazardous material to lab room; transport to environment by building leaks or ventilation system	Safety shower, eye wash, room ventilation	Training, procedures, industrial hygiene program, emergency response, spill kits, PPEs	F3	B	D	D	E0	IV	IV	Higher potential to injure employee due to enclosed area, handling individual containers outside DOT package.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222SA-5	222-SA Standards Lab	Two 8-liter containers of hazardous material (Erlenmeyer)	Release of hazardous material to the environment due to drop/impact/crush/puncture of chemical container in fume hood	Operator error, equipment failure, defective container	Release of hazardous material to fume hood; transport to environment by building leaks or ventilation system	Fume hood, safety shower, eye wash, room ventilation	Training, procedures, industrial hygiene program, emergency response, spill kits, PPEs	F3	B	D	D	E0	IV	IV	
222S-222SA-6	222-SA Standards Lab	Two 1-gal containers of flammable liquids	Release of hazardous material to the environment due to fire or explosion in fume hood	Flammable liquids ignited, electrical equipment/failure, pilot light instrument	Release of hazardous material to fume hood; transport to environment by building leaks or ventilation system	Fixed-head sprinkler system in each hood	Training; procedures; fire protection program	F3	B	D	D	E0	IV	IV	
222S-222SA-7	222-SA Standards Lab	Up to four flammable liquid (60 gal/cabinet) cabinets plus two 20-gal flammable refrigerators. Adjacent containers of haz chemicals (20 gal HNO3, 15 gal HCl, 10 gal H_2SO_4, NaOH, 30 lb miscellaneous oxidizers, small quantities of toxics)	Release of hazardous material to the environment due to fire in fume hood spreading to lab and 222-SA building	Flammable liquids ignited, electrical equipment/failure, pilot light instrument	Release of hazardous material to the building and transport to the environment	Fire protection system; Hanford Fire Dept.; portable fire extinguishers; flammable storage cabinets	Max flammable quantity limit; procedures; training	F3	B	C	D	E1	III	IV	Trailer is constructed of flammable material, room 1 has largest quantities of flammables, 20 gal propane tank in room 2.
222S-222SA-8	222-SA Standards Lab	60-gal cabinet assumed impacted	Release of hazardous material to the room and environment due to failure of compressed gas cylinder in lab resulting in a missile	Operator error; cylinder valve failure; cylinder handling error	Release of hazardous material to the room and potential subsequent transport to the environment via building leaks or through HVAC; potential serious injury to worker due to gas cylinder failure	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	A	C	D	E1	III	IV	
222S-222SA-9	222-SA Standards Lab	OCC	Missile generated from failure of compressed gas cylinder	Operator error; cylinder valve failure; cylinder handling error	Injury or fatality to worker	Gas cylinder design; support structure design	Training; procedures; industrial safety program	F3	A	D	D	E0	IV	IV	Only addresses occupational industrial hazard.

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-222SA-10	222-SA Standards Lab	Up to four flammable liquid (60 gal/cabinet) cabinets plus two 20-gal flammable refrigerators. Adjacent containers of haz chemicals (20 gal HNO_3, 15 gal HCl, 10 gal H_2SO_4, NaOH, 30 lb miscellaneous oxidizers, small quantities of toxics)	Release of hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Fire or explosion in lab. Fire spreads to 222-SA building.	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Release of hazardous material to the lab room and transport to the environment via building leaks or through HVAC, potential serious industrial injury to worker due to explosion.	Gas cylinder design; support structure design; fire protection system; Hanford fire department	Training; procedures; industrial safety program; fire protection program	F3	A	C	D	E1	III	IV	
222S-222SA-11	222-SA Standards Lab	Two 8-liter containers of hazardous material (Erlenmeyer)	Release of hazardous material to the environment due to inadvertent mixing of incompatible chemicals	Operator error, equipment failure	Release of hazardous material to the building and transport to the environment	Room ventilation	Procedures; training	F3	B	D	D	E0	IV	IV	
222S-222SA-12	222-SA Standards Lab	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to drop/impact/crush/ puncture during filling or handling	Human error; equipment failure	Release of hazardous material to the ground; transport of particulates to the environment	Waste drum design; handling equipment design	Training; procedures	F3	B	C	D	E1	III	IV	
222S-222SA-13	222-SA Standards Lab	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to localized fire during filling or handling	Human error; combustible materials ignite	Release of hazardous material to the environment	Waste drum design; handling equipment design	Training; procedures; fire protection program	F3	C	C	D	E1	III	IV	
222S-222SA-14	222-SA Standards Lab	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to failure of waste drum from overpressure during handling	Human error; incompatible materials; gas generation	Release of hazardous material to the environment; potential serious worker injury from overpressure	Waste drum design	Training; procedures	F3	A	C	D	E1	III	IV	
222S-222SA-15	222-SA Standards Lab	High vapor pressure chemicals	Release of hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	Release of volatile chemicals to operating area; potential transport to environment	HVAC system design	Training; procedures; maintenance	F3	C	D	D	E0	IV	IV	

Event ID	Activity or Location	Material at Risk (MAR)	Hazardous Condition	Candidate Causes	Immediate Consequences	Candidate Controls		Freq Cat	Consequence Categories				Risk Bins		Remarks
						Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3	
222S-NP-1	Seismic Event	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to beyond design basis seismic event	Seismic event	Fail building structure; building-wide fire. Serious worker injury or fatality from falling structure.	Facility design; container design	Procedures; training; emergency response program	F1	A	B	C	E2	III	IV	Worker death from falling debris.
222S-NP-2	Extreme Winds	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to extreme winds	Extreme winds	Fail auxiliary buildings; 222-S Laboratory moderate damage. Serious worker injury or fatality from falling structure or missiles.	Facility design; container design	Procedures; training; emergency response program	F2	A	C	D	E1	III	IV	Worker death from falling debris.
222S-NP-3	Volcanic Ash Heavy Snowfall	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to volcanic ash/heavy snowfall	Volcanic ash or heavy snowfall	Fail roof structures; plug vent system, Serious worker injury or fatality from falling structure.	Facility design; container design	Procedures; training; emergency response program	F2	A	C	D	E1	III	IV	Worker death from falling debris.
222S-NP-4	Range Fire	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to range fire	Range fire	Building-wide fire	Facility design; container design	Procedures; training; emergency response program	F2	B	B	C	E2	II	III	Consequence s same as building-wide fire
222S-NP-5	Airplane Crash	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to air plane crash	Airplane crash	Release to the environment of due to fire and hazardous material that became “uncontained” during impact. Serious worker injury or fatality.	Facility design; container design	Procedures; training; emergency response program	F1	A	B	C	E2	III	IV	Worker death from falling debris.
222S-NP-6	Flood	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to flood	Flood				F0	D	D	D	E0	IV	IV	Buildings located above level of maximum flood.

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Appendix D

Candidate Representative Accident Worksheet

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Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1X	H1S	TP	222S-222S-29	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Interaction with flammable chemicals. Fire propagates to 222-S Laboratory building-wide fire.	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Gas cylinder design (OS); fire protection system (FP); building HVAC & ventilation (RP)	Fire protection program (FP); training (TNF); procedures (CO); emergency response (EPLAN); Hanford Fire Department (FP)	F2	A	B	C	E2	II	III
1	H1G	TP	222S-222SA-10	Up to four flammable liquid (60 gal/cabinet) cabinets plus two 20-gal flammable refrigerators. Adjacent containers of haz chemicals (20 gal HNO_3, 15 gal HCl, 10 gal H_2SO_4, NaOH, 30 lb miscellaneous oxidizers, small quantities of toxics)	Release of hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Fire or explosion in lab. Fire spreads to 222-SA building	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Gas cylinder design (OS); fire protection system (FP);	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP): Hanford fire department (FP): chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV
1	H1S	TP	222S-222S-12	39.11 DE-Ci	Release of radioactive and/or hazardous material to the hot cell and environment due to a fire inside the hot cell that involves the entire hot cell structure (multiple locations involved)	Ignition of combustible material from electrical services; combination of incompatible chemicals; leak of hydraulic fluid into hot cell from extruder	Hot cell structure (RP); HVAC & HEPAs (QA, RP, ALARA); extruder design (OS, ALARA); fire protection system (FP), hot cell design and segregation of hot cell locations (RP).	Training (TNF); procedures (CO); fire protection program (FP);	F2	B	B	C	E2	II	III
1	H1S	TP	222S-GD-4	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to failure of flammable compressed gas cylinder or gas lines in storage dock. Fire propagates to building-wide fire	Operator error; equipment failure; release of gas; ignition; fire or explosion	Gas cylinder design (OS); fire protection system (FP);	Fire protection program (FP); training (TNF); procedures (CO); emergency response (EPLAN); Hanford fire department (FP)	F2	B	B	C	E2	II	III
1	H1S	NPH	222S-NP-4	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to range fire	Range fire	Facility design (OS); container design (RP); fire protection system (FP)	Procedures (CO); training (TNF); emergency response program (EPLAN)	F2	B	B	C	E2	II	III

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1	H1S	TP	222S-222S-7	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to fire involving sample container (various) during shipping/receiving activities	Incompatible materials, gas generation, ignition source; maintenance activity with combustibles present ignites and involves container; handling equipment as a fuel source	Handling equipment design (OS, QA), fire extinguisher (FP)	Fire protection program (FP); housekeeping (CO); training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-222S-8	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to fire involving transportation vehicle	Equipment failure leads to release of fuel which ignites and involves container	Truck design (EPROTECT), fire extinguishers (FP)	Fire protection program (FP); housekeeping (CO); requirement for turning off vehicle when parked (CO); maintenance of vehicle (M); training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-222S-15	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to a fire that involves a waste drum outside of the hot cell during filling or handling	Waste drum that contains incompatible chemicals or that contains combustibles which are ignited	Room HVAC (RP); drum handling equipment design (RWP); waste package size limitations (RWP); drum design (RWP); fire protection system (FP)	Training (TNF); procedures (CO); fire protection program (FP)	F3	C	C	D	E1	III	IV
1	H1L	TP	222S-222S-28	Lab chemical and rad inventory; approximately 60 gal; 12 hoods (5.06 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to failure of flammable (propane) compressed gas cylinder or gas line in lab. Fire or explosion local to one lab.	Operator error; equipment failure; release of gas to lab room; ignition; fire or explosion	Gas cylinder design (OS); fire protection system (FP); building HVAC (RP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP); chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV
1	H1L	TP	222S-222S-38	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to a fire that involves a waste drum during filling or handling	Waste drum that contains incompatible chemicals or that contains combustibles which are ignited.	Room HVAC (RP); drum handling equipment design (RWP); waste package size limitations (RWP); drum design (RWP): building fire system (FP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP); chemical hygiene plan (IH)	F3	C	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1	H1S	TP	222S-222SD-2	Four drums per pallet. (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Waste drum design (RWP); handling equipment design (RP, ALARA, RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-222SD-5	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to localized fire	Combustible materials ignite; forklift fuel ignites	Waste box design (RWP); handling equipment design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-HS008-2	Four drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Waste drum design (RWP); handling equipment design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV
1	H1L	TP	222S-HS006-2	Up to four 55-gal drums per pallet. 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to localized fire during filling or handling	Combustible materials ignite; forklift fuel ignites	Waste drum design (RWM); handling equipment design (RP, OS)	Training (TNF); procedures (CO); fire protection program (FP)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-BP-2	Four drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to localized fire	Combustible materials ignite; forklift fuel ignites	Waste drum design (RWP); handling equipment design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV
1	H1S	TP	222S-BP-5	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to localized fire	Combustible materials ignite; forklift fuel ignites	Waste box design (RP, RWP); handling equipment design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1	H1L	TP	222S-222SA-3	Four 1-gal containers packaged in a box (HNO_3, NaOH, methylene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500-ml bottles/6 bottles per pkg.	Release of hazardous material to the environment from the loading dock due to fire during shipping/receiving activities	Incompatible materials, gas generation, ignition source; maintenance activity with combustibles present ignites and involves container; handling equipment as a fuel source	Handling equipment design (RP, OS): fire extinguishers (FP)	Fire protection program (FP); housekeeping (CO); training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	C	C	D	E1	III	IV
1	H1L	TP	222S-222SA-7	Up to four flammable liquid (60 gal/cabinet) cabinets plus two 20-gal flammable refrigerators. Adjacent containers of haz chemicals (20 gal HNO_3, 15 gal HCl, 10 gal H_2SO_4, NaOH, 30 lb miscellaneous oxidizers, small quantities of toxics)	Release of hazardous material to the environment due to fire in fume hood spreading to lab and 222-SA building	Flammable liquids ignited, electrical equipment/failure, pilot light instrument	Fire protection system (FP); portable fire extinguishers (FP); flammable storage cabinets (OS)	Max flammable quantity limit (OS); procedures (CO); training (TNF): Hanford Fire Department (FP); chemical hygiene plan (IH)	F3	B	C	D	E1	III	IV
1	H1L	TP	222S-222SA-13	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to localized fire during filling or handling	Human error; combustible materials ignite	Waste drum design (RWP); handling equipment design (RWP): fire protection system (FP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	C	D	E1	III	IV
1	H1L	TP	222S-219S-5	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to fire in 219-S	Electrical failure; ignition of plastics/ combustibles; vehicle impact causes fire	Storage tank design (RP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F2	C	C	D	E1	III	IV
1	H1S	TP	222S-222FB-2	Radioactive material on filter 5.41E-1 DE-Ci total	Release of radioactive material to environment due to release from HEPA filters due to fire	Vehicle impacts building and initiates fire; diesel spill during storage tank filling results in fire; flammable gas release (e.g., acetylene, propane) during delivery to 222S results in fire	Filter building design (RP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP); Hanford fire department (FP); DOT shipping requirements (RWP)	F2	C	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1	H1S	TP	222S-222SD-6	64 drums and 4 boxes (2.38 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to 222-SD area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Waste package design (RP, RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F2	C	C	D	E1	III	IV
1	H1S	TP	222S-HS008-4	176 drums (4.16 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Waste package design (RP, RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F2	C	C	D	E1	III	IV
1	H1G	TP	222S-HS006-4	Up to ten 55-gal drums of compatible chemicals per side, 20 total in storage unit	Release of hazardous material to the environment due to area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Waste drum design (RWP)	Training (TNF); procedures (CO); fire protection program (FP)	F2	C	C	D	E1	III	IV
1	H1S	TP	222S-BP-6	Total equivalent to 176 drums/boxes (4.16 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to "Bull Pen" area-wide fire	Forklift accident results in fire; vehicle accident; ignition of combustible materials	Waste package design (RP, RWP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F2	C	C	D	E1	III	IV
1	H1L	TP	222S-222S-25	30 g Pu (4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of hazardous and radioactive material to the fume hood, room, and environment due to fire inside fume hood.	Flammable liquids in hood; ignition source	Fume hood design and ventilation (RP)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	D	D	E0	IV	IV
1	H1S	TP	222S-222S-34	30 g of Pu (liquid or solid, 4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the glovebox and environment due to a fire in glovebox	Flammable liquids; ignition source	Glovebox design and ventilation (RP); glovebox fire protection system (FP, OS)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP)	F3	C	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
1	H1L	TP	222S-222SA-6	Two 1-gal containers of flammable liquids	Release of hazardous material to the environment due to fire or explosion in fume hood	Flammable liquids ignited, electrical equipment/failure, pilot light instrument	Fixed-head sprinkler system in each hood (FP, ALARA)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV
2X	M1L	PE	222S-219S-3	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to spray release	Operator error; equipment failure; structural failure	Transfer system design (RP)	Training (TNF); procedures (CO); maintenance (M)	F3	C	C	D	E1	III	IV
2	M1L	PE	222S-219S-7	700 gal NaOH	Release of hazardous material to environment due to release during filling NaOH tank during truck transfer operations	Human error; equipment failure	Transfer system design (RP); safety showers (RP, OS); temporary berm (EPROTECT); personnel protective equipment (OS)	Training (TNF); procedures (CO); industrial safety program (OS); fire protection program (FP), Hanford fire department (FP); chemical hygiene plan (IH)	F3	B	D	D	E1	IV	IV
2	M1L	PE	222S-219S-1	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to drop of cover block/roof panel on storage tanks	Operator error; equipment failure; structural failure	Handling equipment design (RP, OS)	Training (TNF); procedures (CO); maintenance (M); chemical hygiene plan (IH)	F2	B	C	D	E1	III	IV
2	L1L	PE	222S-219S-4	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to tank failure/leak (101, 102, 104)	Operator error; equipment failure; structural failure	Storage tank design (RP, EPROTECT); tank level monitors (RP, EPROTECT)	Training (TNF); procedures (CO); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E1	IV	IV
2	M1L	PE	222S-219S-6	700 gal NaOH	Release of hazardous material to environment due to failure/leak of NaOH tank (201)	Tank structural failure; vehicle impacts building	Storage tank design (RP, EPROTECT);	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV
2	L1L	PE	222S-219S-8	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material due to leak or valving error during sampling in the sampling gallery.	Human error; equipment failure	Hood design (RP)	Training (TNF); procedures (CO); industrial safety program (OS); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
2	L1L	PE	222S-207SL-1	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to spill during transfer	Operator error; equipment failure	Transfer system design (RP)	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	D	D	D	E1	IV	IV
2	L1L	PE	222S-207SL-2	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to failure of storage tanks	Operator error; equipment failure; structural failure	Storage tank design (ALARA, QA); tank level monitors (ALARA, EPROTECT)	Training (TNF); procedures (CO); maintenance (M)	F3	D	D	D	E1	IV	IV
2	L1L	PE	222S-207SL-3	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to the environment due to spill during sampling	Operator error; equipment failure	Sampling system design (RP, EPROTECT)	Training (TNF); procedures (CO)	F3	D	D	D	E1	IV	IV
2	L1L	PE	222S-219S-11	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to misrouting contents of 219-S tanks	Human error; equipment failure	Transfer system design (RP)	Training (TNF); procedures (CO)	F2	D	D	D	E2	IV	IV
3X	L1S	PE	222S-222S-5	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to sample container (various) drop/impact/crush/puncture during shipping/receiving activities	Operator error; equipment failure	Container design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP)	F3	C	C	D	E1	III	IV
3	M1L	PE	222S-222SA-1	Four 1-gal containers packaged in a box (HNO_3, NaOH, methylene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500-ml bottles/6 bottles per pkg.	Release of hazardous material to the environment due to drop/impact/crush/puncture handling accident during receiving/shipping	Operator error, equipment failure, improper packaging, truck accident	DOT packaging (RWP)	Training (TNF), procedures (CO); industrial hygiene program (IH); emergency response (EPLAN), spill kits (OS); EPROTECT), safety shower (OS); EPROTECT); chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV
3	L1S	PE	222S-222S-1	Tank Farm core sample (one segment or less per cask, 5.2E-3 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to container drop/impact/crush/puncture during shipping/receiving activities	Operator error; equipment failure	Shipping container design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP, ALARA)	F3	C	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
3	L1S	PE	222S-222S-2	PAS-1 Cask (~5.2E-2 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to PAS-1 Cask shipping container sample container (inner PAS-1 container) drop/impact/crush/puncture during shipping/receiving activities	Operator error; equipment failure	Crane/lifting equipment design (EPROTECT); shipping container design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP, ALARA)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-222S-3	Hardigg Case [Barney box] (~1.56E-2 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to Hardigg Case shipping container sample container drop/impact/crush/puncture during shipping/receiving activities	Operator error; equipment failure	Crane/lifting equipment design (EPROTECT); shipping container design (RWP)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP, ALARA)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-222S-4	Contents of a pig approximately 1.04E-2 DE-Ci	Release of radioactive and/or hazardous material to the environment from the loading dock due to pig drop/impact/crush/puncture during shipping/receiving activities	Operator error; equipment failure	Pig container design (RP, RWP)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP, ALARA)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-222S-10	Same as single containers in Shipping/ Receiving	Release of radioactive and/or hazardous material to the room and environment from the container due to container drop/impact/crush/puncture during hot cell loading activities	Operator error; equipment failure	Handling equipment design (RP, COO)	Training (TNF); procedures (CO); industrial safety program (OS); rad con program (RP, ALARA)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-222S-11	1.14 DE-Ci	Release of radioactive and/or hazardous material to the hot cell and environment from the container due to sample drop/impact/crush/puncture during hot cell activities (multiple samples involved)	Operator error; equipment failure	Hot cell structure (RP); HVAC & HEPAs (RP); negative dP (EPROTECT) handling equipment design (RP); sample bin design (RP, OS)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
3	L1L	PE	222S-219S-9	Sample size bounded by 30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to environment due to drop/impact/crush/puncture of a sample	Human error; equipment failure	Sample container design (RP, OS); handling equipment design (RP, OS)	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-222SD-1	Four drums per pallet. (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Waste drum design (RWP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
3	L1S	PE	222S-222SD-4	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to drop/impact/crush/puncture	Human error; equipment failure	Waste box design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-HS008-1	Four drums per pallet (1.32 DE-Ci)	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Waste drum design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
3	L1L	PE	222S-HS006-1	Up to four 55-gal drums per pallet. 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture during filling or handling	Human error; equipment failure	Waste drum design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	B	C	D	E1	III	IV
3	L1S	PE	222S-BP-1	Either one drum or box (8.3E-1 DE-Ci); four drums (1.32 DE-Ci); or total inventory (upper limit same as HS-0082 and HS-0083, 4.16 DE-Ci).	Release of radioactive and/or hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture	Human error; equipment failure	Waste drum design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
3	L1S	PE	222S-BP-4	One waste box at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to release from waste box due to drop/impact/crush/puncture	Human error; equipment failure	Waste drum design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
3	M1L	PE	222S-222SA-12	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to release from waste drum due to drop/impact/crush/puncture during filling or handling	Human error; equipment failure	Waste drum design (RWP, RP); handling equipment design (RP)	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	B	C	D	E1	III	IV
3	L1S	PE	222S-222S-13	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to a drop/impact/crush/puncture of a waste drum outside of the hot cell during filling or handling	Operator error; equipment failure	Room HVAC (RP); drum handling equipment design (RWP); waste package size limitations (RWP); drum design (RWP, RP, ALARA)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M)	F3	C	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
3	M1L	PE	222S-222S-16	Liter quantities of acids, bases, alcohol	Release of hazardous material to the room and environment due to a drop/impact/crush/puncture of a chemical container outside of the hot cell.	Operator error; handling equipment failure	Room HVAC(RP) ; handling equipment design (RWP) ; chemical package size limitations (OS)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV
3	M1L	PE	222S-222S-17	Liter quantities of acids, bases, alcohol	Release of hazardous material to the room and environment due to a drop/impact/crush/puncture of a chemical container inside of the hot cell.	Operator error; handling equipment failure	Hot cell design and ventilation (RP, OS); room HVAC (RP); handling equipment design ; (RWP); chemical package size limitations (OS)	Training (TNF); procedures (CO); tad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV
3	L1S	PE	222S-222S-21	30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to a sample drop/impact/crush/puncture in lab room.	Operator error; handling equipment failure	Equipment design (RWP, RWP); transport cart (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M)	F3	C	D	D	E0	IV	IV
3	L1S	PE	222S-222S-22	30 g Pu (4.95 DE-Ci)	Release of radioactive and/or hazardous material to the fume hood and environment due to a sample drop/impact/crush/puncture in fume hood	Operator error; handling equipment failure	Fume hood design and ventilation (RP, OS); equipment design (RWP) ; building structure and vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M)	F3	C	D	D	E0	IV	IV
3	M1L	PE	222S-222S-23	Gallon quantities of acids, bases, organics	Release of hazardous material to the room and environment due to drop/impact/crush/puncture of chemical container outside of fume hood	Operator error; handling equipment failure	Equipment design (RWP); transport cart (RPP); vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV
3	M1L	PE	222S-222S-24	Gallon quantities of acids, bases, organics	Release of hazardous material to the fume hood and environment due to drop/impact/crush/puncture of chemical container inside of fume hood	Operator error; handling equipment failure	Fume hood design and ventilation (OS); transport cart (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
3	L1S	PE	222S-222S-32	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the glovebox and environment due to a sample drop/impact/crush/puncture in glovebox	Operator error; equipment failure	Glovebox design and ventilation (RP); transport cart (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M)	F3	C	D	D	E0	IV	IV
3	L1L	PE	222S-222S-33	Gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the glovebox and environment due to a chemical container drop/impact/crush/ puncture in glovebox	Operator error; equipment failure	Glovebox design and ventilation (RP); transport cart (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV
3	L1L	PE	222S-222S-36	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to a drop/impact/ crush/puncture of a waste drum during filling or handling	Operator error; equipment failure	Room HVAC(RP) ; drum handling equipment design (OS); Waste package size limitations (RWP, RWP); drum design (RWP, RWP);	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV
3	M1L	PE	222S-222SA-4	Four 1-gal containers of hazardous material	Release of hazardous material to the environment due to drop/impact/crush/puncture of chemical container in single lab	Operator error, equipment failure, defective container	Safety shower (OS), eye wash (OS), room ventilation (RP); Personnel protective equipment (OS)	Training (TNF); procedures (CO); industrial safety program (OS); maintenance (M); emergency response (EPLAN); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV
3	M1L	PE	222S-222SA-5	Two 8-liter containers of hazardous material (Erlenmeyer)	Release of hazardous material to the environment due to drop/impact/crush/puncture of chemical container in fume hood	Operator error, equipment failure, defective container	Fume hood (RP), safety shower (OS), eye wash (OS), room ventilation (RP); personnel protective equipment (OS)	Training (TNF); procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M);emergency response (EPLAN); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
4X	M1S	PE	222S-222S-6	30 g of Pu (liquid or solid, 4.95 DE-Ci)	Release of radioactive and/or hazardous material to the environment from the loading dock due to sample container (various) overpressurization during shipping/receiving activities	Incompatible materials; gas generation	Container design (RP, ALARA, EPRTOTECT)	Training (TNF); Procedures (CO); rad con program (RP); industrial safety program (OS); maintenance (M)	F3	B	C	D	E1	III	IV
4	M1L	PE	222S-HS006-3	One 55-gal drum containing 15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three.	Release of hazardous material to the environment due to failure of waste drum from overpressure during handling	Incompatible materials; gas generation	Waste drum design (RWP); personnel protective equipment (OS)	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV
4	M1L	TE	222S-219S-10	10% of rad inventory per tank pH .5 then treat to pH 12.5 (3.91 DE-Ci). Acid (HNO_3 assumed bounding chemical)	Release of radioactive and/or hazardous material to environment due to inadvertent mixing of chemicals and tank overpressurization	Operator error, valve failure, equipment failure	Filters/vent system (RP, EPLAN), transfer system design, tank design (EPLAN)	Training (TNF); procedures (CO)	F3	C	C	D	E1	III	IV
4	M1S	PE	222S-222SD-3	One drum at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Waste drum design (RWP)	Training (TNF); procedures (CO)	F3	B	C	D	E1	III	IV
4	M1S	PE	222S-HS008-3	One drum at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Waste drum design (RWP)	Training (TNF); procedures (CO)	F3	B	C	D	E1	III	IV
4	M1S	PE	222S-BP-3	One drum at 8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the environment due to failure of waste drum from overpressure	Incompatible materials; gas generation	Waste drum design (RWP)	Training (TNF); procedures (CO)	F3	B	C	D	E1	III	IV
4	M1L	PE	222S-222SA-2	Four 1-gal containers packaged in a box (HNO_3, NaOH, methylene chloride, hexane) and adjacent containers; HF, HBr, H_2SO_4, fuming HNO_3 in 500-ml bottles/6 bottles per pkg	Release of hazardous material to the environment from the loading dock due to chemical container overpressurization during shipping/receiving activities	Incompatible materials; gas generation	Container design (RWP); protective equipment (OS)	Training (TNF); procedures (CO); industrial hygiene (IH); chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV
4	M1L	PE	222S-222SA-14	15-gal and 1-gal containers of compatible acids, bases, alcohol in 55-gal drum. A drum contains acids or bases or alcohols but only one of the three	Release of hazardous material to the environment due to failure of waste drum from overpressure during handling	Human error; incompatible materials; gas generation	Waste drum design (RWP, RWP); protective equipment (OS)	Training (TNF); procedures (CO); industrial hygiene (IH); chemical hygiene plan (IH)	F3	A	C	D	E1	III	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
4	M1S	PE	222S-222S-14	8.3E-1 DE-Ci	Release of radioactive and/or hazardous material to the room and environment due to waste drum overpressurization outside of the hot cell during handling	Incompatible materials, gas generation	Room HVAC (RP); drum handling equipment design (OS; waste package size limitations (RWP); drum design (RWP)	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	A	D	D	E0	IV	IV
4	M1L	PE	222S-222S-37	8.3E-1 DE-Ci; organic labpacks	Release of radioactive and/or hazardous material to the room and environment due to waste drum overpressurization during handling	Incompatible materials, gas generation	Room HVAC(RP); drum handling equipment design (OS; waste package size limitations (RWP); drum design (RWP)	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	A	D	D	E0	IV	IV
4	M1L	TE	222S-222SA-11	Two 8-liter containers of hazardous material (Erlenmeyer)	Release of hazardous material to the environment due to inadvertent mixing of incompatible chemicals	Operator error, equipment failure	Room ventilation (OS)	Training (TNF); procedures (CO); chemical hygiene plan (IH)	F3	B	D	D	E0	IV	IV
5X	M1L	PE	222S-222S-26	Multiple hood damage; (up to six hoods or 5.00 DE-Ci); 30 gal chemical inventory	Release of radioactive and/or hazardous material to the room and environment due to failure of compressed gas cylinder in lab resulting in a missile	Operator error; cylinder valve failure; cylinder handling error	Gas cylinder design (OS);	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	A	C	D	E1	III	IV
5X	M1S	PE	222S-GD-1	222S inventory potentially impacted. Filter Building 222-SE. 5.41E-1 DE-Ci	Release of radioactive and/or hazardous material due to failure of pressurized gas cylinder resulting in missile	Human error; equipment failure	Gas cylinder design (OS) ;	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	C	C	D	E1	III	III
5	M1L	PE	222S-222SA-8	60-gal cabinet assumed impacted	Release of hazardous material to the room and environment due to failure of compressed gas cylinder in lab resulting in a missile	Operator error; cylinder valve failure; cylinder handling error	Gas cylinder design (OS) ;	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	A	C	D	E1	III	IV
5	L1S	PE	222S-222S-18	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due errors or equipment failures during maintenance of manipulators	Operator error; handling equipment failure	Equipment design (OS) Transport cart (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con (RP); industrial hygiene (IH)	F3	B	D	D	E0	IV	IV
5	L1S	KE	222S-222S-19	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to failure of hot cell viewing window	Extruder failure; manipulator failure	Extruder design (OS) hot cell design (RP, RWP); vent system (RP)	Training (TNF); procedures (CO); rad con (RP); industrial hygiene (IH)	F3	C	D	D	E0	IV	IV
5	L1S	EE	222S-222S-20	Loose contamination in room (up to 1.04E-2 DE-Ci)	Release of radioactive and/or hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	HVAC system design (RP); backup diesel exhaust fan (RP)	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	C	D	D	E0	IV	IV

Rep Acc	Rel Bin	Haz ID	Event ID	Material at Risk	Hazardous Condition	Candidate Causes	Defense in Depth		Freq Cat	Consequence Categories				Risk Bins	
							Engineered Features	Administrative Controls		S1	S2	S3	E	S2	S3
5	L1S	KE	222S-222S-35	30 g of Pu (liquid or solid, 4.95 DE-Ci); gallon quantities of acids, bases, organics	Release of radioactive and/or hazardous material to the room and environment due failure of glove or glovebox window in glovebox	Operator error; equipment failure	Glovebox design and ventilation (RP); transport cart (RP, Radioactive Waste Management, RWP); vent system (RP)	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	C	D	D	E0	IV	IV
5	L1S	EE	222S-222S-39	Loose contamination in fume hoods/glove boxes (up to 1.04E-2 DE-Ci). High vapor pressure chemicals.	Release of radioactive and/or hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	HVAC system design (RP); backup diesel exhaust fan (RP)	Training (TNF); procedures (CO); industrial hygiene (IH); maintenance (M)	F3	C	D	D	E0	IV	IV
5	L1S	PE	222S-222FB-1	Radioactive material on filter 5.41E-1 DE-Ci total	Release of radioactive material to environment due to failure of HEPA filters during replacement/maintenance	Human error; equipment failure	Filter handling equipment design (RP)	Training (TNF); procedures (CO); industrial hygiene (IH)	F3	C	D	D	E0	IV	IV
5	L1G	EE	222S-222SA-15	High vapor pressure chemicals	Release of hazardous material to the room and environment due to ventilation system failure	HVAC failure; loss of power	HVAC system design (RP)	Training (TNF); procedures (CO); industrial hygiene (IH); maintenance (M); chemical hygiene plan (IH)	F3	C	D	D	E0	IV	IV
5	M1L	PE	222S-207SL-4	Normally building waste water. Potential for low levels of radioactive or chemical contamination	Release of radioactive and/or hazardous material to environment due to drop of cover block on retention basin	Operator error; equipment failure; structural failure	Handling equipment design (RWP)	Training (TNF); procedures (CO); industrial hygiene (IH); maintenance (M)	F2	D	D	D	E1	IV	IV
6	L1S	NPH	222S-NP-6	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to flood	Flood			F0	D	D	D	E0	IV	IV
6	H1S	NPH	222S-NP-1	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to beyond design basis seismic event	Seismic event	Facility design (RP); container design (RWP, ALARA)	Procedures(TNF); training (CO); emergency response program (EPLAN)	F1	A	B	C	E2	III	IV
6	H1S	NPH	222S-NP-5	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to air plane crash	Airplane crash	Facility design (RP); container design (RWP, ALARA)	Procedures (TNF); training (CO); emergency response program (EPLAN)	F1	A	B	C	E2	III	IV
6	M1S	NPH	222S-NP-2	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to extreme winds	Extreme winds	Facility design (RP); container design (RWP, ALARA)	Procedures (TNF); training (CO); emergency response program (EPLAN)	F2	A	C	D	E1	III	IV
6	M1S	NPH	222S-NP-3	39.11 DE-Ci building inventory; building chemical inventory (bound by 5 times 222-SA)	Release of radioactive and/or hazardous material to the environment due to volcanic ash/heavy snowfall	Volcanic ash or heavy snowfall	Facility design (RP); container design (RWP, ALARA)	Procedures(TNF); training (CO); emergency response program (EPLAN)	F2	A	C	D	E1	III	IV

KEY

As Low As Reasonably Achievable (ALARA)
Configuration Management (CM)
Conduct of Operations (CO)
Emergency Planning (EPLAN)
Environmental Protection (EPROTECT)
Fire Protection (FP)
Industrial Hygiene (IH)
Maintenance (M)
Industrial Safety (OS)
Occupational Safety (OS)
Quality Assurance (QA)
Radiation Protection (RP)
Radioactive Waste Management (RWM)
Training for Nuclear Facilities (TNF)

ATTACHMENT J.7 - DOE Office of Environmental Management FY 14

Annual Performance Agreement

FY14 Annual Performance Agreement

U.S. Department of Energy

U.S. Department of Energy

Rev 3.2

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Office of Environmental Management
FY 2014 Performance Agreement

The Office of Environmental Management (EM) is working to complete the safe cleanup of the environmental legacy brought about by five decades of nuclear weapons development and government-sponsored nuclear energy research. For FY 2014, EM's commitments advance the program and management goals, priorities, and expectations of the Department of Energy (DOE). They will move us toward a more efficient and effective organization by using a business model that reflects the management philosophy of empowering the Field with the authorities and resources necessary to successfully execute the EM Program mission safely. The "lapse in appropriations" at the beginning of the fiscal year has disrupted work execution and may delay completion of proposed milestones.

This Performance Agreement articulates the link between DOE's Strategic Goals and those of EM. It is intended to communicate the metrics used to measure progress, and convey the commitment of EM's Senior Management to the mission of DOE. This Agreement is the commitment by the EM leadership team to turn ideas into reality and resources into results.

DOE Strategic Plan and EM's Mission

In May 2011, the Department released its Strategic Plan, a document that outlines the broad, cross-cutting and collaborative goals that stretch across our complex. The Strategic Plan is intended to serve as a blueprint for DOE to help address the Nation's energy, environmental, and nuclear challenges through transformative science and technology solutions. At the heart of that plan are the following Departmental goals:

DOE Goal 1: Transform Our Energy Systems. Catalyze the timely, material and efficient transformation of the Nation's energy system and secure U.S. leadership in clean energy technologies

DOE Goal 2: The Science and Engineering Enterprise. Maintain a vibrant U.S. effort in science and engineering as a cornerstone of our economic prosperity with clear leadership in strategic areas

DOE Goal 3: Secure Our Nation. Enhance nuclear security through defense, nonproliferation, and environmental efforts

DOE Goal 4: Management and Operational Excellence. Establish an operational and adaptable framework that combines the best wisdom of all Department stakeholders to maximize mission success

The plan expresses how the Department's missions and programs are designed to bring the best minds and capabilities to bear on important problems. DOE draws on the diverse talents of our federal workforce, scientists and engineers from national laboratories, academia, and the private sector in multidisciplinary teams, striving to find solutions to the most complex and pressing challenges. At the time of this writing, DOE has initiated efforts to develop a new Strategic Plan. Once completed, this Performance Agreement will be updated, as appropriate.

Measuring Progress

EM leadership has developed and assigned specific efforts targeted to further the overall mission of the organization. These management initiatives are each led by an assigned Deputy Assistant Secretary sponsor and will be implemented through a Plan of Action and Milestones (POAM). A review of the

status of these initiatives will be conducted on a bimonthly basis to ensure the organization is on-track to meet these high level commitments:

- Partner with NE to develop a strategy and alternatives for the utilization of WIPP for expanded material and waste forms. Resolve storage and disposition pathways of other waste forms
- Execute a National Academy of Science (NAS) study on Waste Classification in coordination with EM-10
- Complete first shipment of Hanford Tank Waste, considered and classified as TRU, to WIPP
- Complete construction of Low Activity Waste (LAW) facility at Hanford, along with direct feed capability and begin radioactive operations of the LAW facility no later than December 2019
- Complete construction by December 2016 and begin radioactive operations for the Salt Waste Processing Facility by December 2018
- Complete treatment of liquid sodium bearing waste at Idaho and close the four remaining liquid waste storage tanks. Achieve full operations, with high reliability, of IWTU
- Award of Paducah Site Surveillance & Maintenance contract
- Award the Expression of Interest/Request for Offerors for the future use of the Paducah gaseous diffusion plant and facilities and uranium tails
- Complete a site-by-site and contract-by-contract plan to consider and implement (as appropriate) the Deputy Secretary's principles for aligning contract management. Plan should include specific milestones and should include the participation of the relevant field office manager and the relevant DAS
- Review the regulatory framework for each site to determine flexibility in aligning expectations (to include potential new milestones and agreements under discussion) with current and out-year budget projections
- Implement process/procedures for scrap metal recycling to address: 1) clean materials in clean areas, 2) clean material in contaminated areas, and 3) contaminated materials in contaminated areas. Initial approach may focus on nickel recycling
- Prepare an EM analysis to assess the EM HQ and Field workforce/skills mix to justify increasing EM’s FTE personnel cap. Prepare a presentation to OMB
- Determine viability of processing graphite matrix coated used nuclear fuel (UNF) at SRS
- Continue Safety Conscious Work Environment (SCWE) training for all HQ EM staff. Develop and implement ongoing Safety Culture sustainment actions based on the information from the safety culture extent of condition review and benchmarking data
- Analyze Infrastructure and Min-Safe activities and costs across EM sites. Establish guidance if necessary
- Continue H-canyon operations in support of non-proliferation activities. Facilitate cost-effective use of the Nation’s only large-scale operating chemical and nuclear processing facility and comply with the public law by maximizing utilization of H-canyon facilities

Goals and Metrics

EM's primary responsibility is the safe cleanup of the environmental legacy of research and materials production by DOE and its predecessor agencies for which Congress established the EM Program. Programmatic success will be measured by *what* is accomplished, that is the number of sites restored, quantities of waste treated and disposed of, amounts of soil and groundwater remediated, etc. However, overall success will also be measured by *how* the program is managed, i.e., through critical management goals such as safety performance, project and contract management, and excellence in business management practices. To support this commitment to both improvement and programmatic success, EM has identified the following goals, strategies and metrics specifically for FY 2014. These goals evolve directly from DOE’s 2012 Amended Strategic Goals articulated by the Secretary of Energy.

Safety Culture

The safety of EM workers is a core value that is incorporated into every aspect of the EM program. To best protect our workers, EM has a goal of zero accidents or incidents in the work place and to date, has maintained a strong safety record. EM continues to utilize the Integrated Safety Management System to ensure that all work activities are appropriately scoped, analyzed for hazards, comprehensively planned to eliminate or mitigate those hazards, and effectively performed by trained employees. In addition, EM follows DOE Order 226.1B; *Implementation of Department of Energy Oversight Policy* that establishes the philosophy that line management is responsible for ensuring safety when work is performed. EM seeks to continue safety improvements by instituting corrective actions, promoting lessons learned, and developing new or improved processes.

Goal 1:	Improve safety, security and quality performance towards a goal of zero accidents, incidents, and defects and continue to improve the EM Complex-Wide Safety Culture

Strategies

- Use rigorous management oversight to help ensure EM sites and projects integrate safety, security and quality throughout their lifecycle, including planning, procurement, design, engineering, construction, commissioning, operation, deactivation/decommissioning, and environmental restoration
- Foster a safety culture that promotes quality work in a safe and secure manner by establishing strong leadership behaviors that reflect EM's expectations
- EM will further the implementation of Safety Conscious Work Environment (SCWE) training to all HQ EM staff. Develop and implement ongoing safety culture sustainment actions based on the information from the safety culture extent of condition review and benchmarking data in accordance with DOE's Safety Culture Improvement Implementation Plan
- Develop a transparent relationship with the Defense Nuclear Facilities Safety Board (DNFSB) to expeditiously resolve DNFSB concerns and issues
- For response to formal DNFSB correspondence requiring field input, the Field will submit final products at least 30 days prior to the established formal deliverable due date for Headquarters processing
- Collect key performance metrics that monitor the health of key security programs and equipment to prevent identified adverse outcomes or events, track data, and investigate and address emergent negative trends
- EM will continue to implement its Corporate Quality Program consistent with the quality requirements established in DOE O 414.1D, "Quality Assurance"

Metrics

- Metric 1.01: Maintain an average Total Recordable Case rate of <1.1 and a Days Away from Work, Restricted Work or Transfer case rate of <0.6
- Metric 1.02: Finalize implementation of EM-QA-001 Revision 1 by September 30, 2014, and verify through a HQ assessment of each EM field organization

- Metric 1.03: Ensure at least 80 percent of EM sites and contractors have documented performance metric processes and maintain key performance metrics that monitor the health of key security programs and equipment
- Metric 1.04: Maintain less than 20 percent overdue action items resulting from Defense Nuclear Facilities Safety Board (DNFSB) letters or recommendations
- Metric 1.05: Meet Federal Information Security Management Act (FISMA) requirements in accordance with planned EM activities
- Metric 1.06: Accomplish a web application penetration test of 50 public facing applications throughout the enterprise by September 30, 2014, such that vulnerabilities are discovered and mitigated

Reducing Lifecycle Cost

EM will continue to identify opportunities to make strategic investments that reduce the overall cost of the cleanup program while shortening project and program schedules. The current life-cycle cost estimate for EM is $274 to $309 billion. This includes $100 billion in actual costs from 1997 through 2011, and an additional estimate of $174 to $209 billion to complete EM's remaining mission in the timeframe of 2050 to 2062. EM will continue to identify opportunities, including technology development, to reduce the life-cycle cost of its program. In FY 2014, EM plans to continue investing in technologies that might/could reduce life-cycle costs, such as modeling to predict complex behaviors of radionuclides; developing in situ decommissioning sensor performance monitoring; investigating small column ion exchange technology to reduce cost of treating liquid waste; and evaluating the effects of placing heat-generating radioactive waste in a salt repository.

Goal 2:	Continue cleanup progress in a cost effective manner that is risk-informed, engages stakeholders, applies innovative solutions and provides value to the American taxpayer

Strategies

- Reduce risk, lower cost, and accelerate project completion by using the best scientific and technical resources available to ensure the technologies selected for development and deployment are appropriate
- Ensure projects have the tools necessary to succeed in the most efficient manner by working with the Federal staff, contractors, and union representatives to identify their needs
- Use Construction Project Reviews to identify and assist in resolution of key project issues regarding scope, cost, schedule, project risk management, security requirements, and technical approach
- Ensure Construction Project Review recommendations align with contract requirements. Partnership agreements may be considered but are informal
- Continue to implement the Operations Activity Protocol issued as Revision 0, March 15, 2012, conduct quarterly reviews of operations activities and revise as needed based on lessons from implementation
- Work to resolve storage and disposition pathways for HLW and spent nuclear fuel managed by the DOE
- Implement process/procedures for scrap metal recycling to address: 1) clean materials in clean areas, 2) clean material in contaminated areas, and 3) contaminated materials in contaminated areas. Initial approach may be to focus on nickel recycling

- Partner with NE to develop a strategy and alternatives for the utilization of WIPP for NNSA surplus material disposition and expansion of the WIPP mission
- Continue to safely transport and dispose of RH-TRU from Argonne National Laboratory in support of reducing laboratory facility from Category 2 to Category 3 as funding allows
- Reduce the life cycle cost by evaluating and implementing opportunities transferring leasing EM assets for reindustrialization and reutilization especially for renewable energy projects in support of DOE mission
- Work towards substantially completing the Low Activity Waste Vitrification Facility Construction by December 31, 2014
- Expand the use of authorized limits to support a cost effective approach to site remediation and D&D: specifically apply to Gaseous Diffusion Plants, in coordination with Portsmouth and/or Paducah
- Finalize and implement Operation Activity Manager certification program metrics

Metrics

- Metric 2.01: Working with stakeholders, industry and the sites create at least one business model for reindustrialization and reutilization for renewable energy projects on EM lands based on public-private partnership approach
- Metric 2.02: Review the regulatory framework for each site to determine flexibility in aligning expectations with current and out-year budget projections
- Metric 2.03: Complete final evaluation for procurement process to acquire services to deactivate the Paducah Gaseous Diffusion Plant upon turnover from the USEC
- Metric 2.04: Finalize agreement for sale of depleted and off-specification Uranium Hexafluoride Inventories at Paducah and Portsmouth
- Metric 2.05: Initiate an Environmental Assessment (EA) to evaluate the impacts of the receipt, storage and disposition of the German graphite spheres
- Metric 2.06: Conduct two workshops through the National Academy of Sciences on best practices for risk-informing decisions on remedies and closure and post-closure activities
- Metric 2.07: Implement requirement for certification of Operation Activity Managers by December 31, 2013

Achieving Excellence in Contract and Project Management

To ensure that EM delivers the best value for the American taxpayers, the FY 2014 budget request reflects continued improvement in acquisition, contract, and project management. EM will further improve acquisition processes by obtaining early involvement and approvals on various acquisition approaches from DOE senior management, including the Office of Acquisition and Project Management, the Office of the General Counsel, and the Office of Small and Disadvantaged Business Utilization.

EM's continued progress in contract and project management has resulted in EM meeting three of the five criteria needed in order to be removed from the Government Accountability Office's (GAO) High Risk List. One of GAO's remaining concerns is that EM must provide the capacity (people and resources) to address problems. EM's reorganization of February 2012 established project sponsor positions at Headquarters for all capital asset projects Field project and contract management resources will be evaluated to determine and address any gaps in staffing and skills for proper oversight so that any gaps can be addressed. GAO's second remaining concern is that EM must monitor and independently validate the corrective measures that it has taken to help ensure they are both effective and sustainable over the long term. EM's Annual Performance Agreement has been established as a vehicle for measuring,

tracking, and validating progress. EM has also developed a Continuous Improvement Program for Contract and Project Management to guide and monitor improvements.

Goal 3:	Improve management of contracts and projects/operations activities with the objective of delivering results on time and within cost

Strategies

- Annually assess contract and project management staffing and skills to build and sustain needed capacity for Federal oversight of EM mission. *(GAO High Risk Criteria)*
- Independently validate the effectiveness and sustainability of contract and project management improvement actions through project and contract management reviews. *(GAO High Risk Criteria)*
- Improve acquisition planning and contract management by adhering to principles described in Deputy Secretary's policy memorandum of December 13, 2012: 1) always seeking to align contractor interest with taxpayer interest; and 2) structuring contracts so that each party bears responsibility for its own actions
- Improve the timeliness of approvals for contract performance baselines, contract modifications, and project/operations activity changes to maintain contract, project/operations activity and budget alignment by ensuring change management requirements and guidance is understood and being followed
- Increase the use of prime contractor small businesses
- Become a stronger owner by ensuring requirements are clearly delineated in the contracts, by holding contractors accountable for delivering results, and by ensuring contractors' performance is fairly documented
- Execute world-class contract and project management, and administration of traditional contracts in accordance with OMB Circular A-123, Federal Acquisition Regulation, Department of Energy Acquisition Regulation, EM Head of Contracting Activity directives to ensure the activities listed below are executed in strict compliance: 1) separation of duties and functions; 2) performance evaluation and measurement; 3) fee determination; 4) timely approval, recording/documentation of changes; 5) resolution of audit findings and other deficiencies; 6) management of acquisition workforce; 7) proper review and certification of business systems; and 8) timely contract closeout
- Make progress in resolving the five oldest outstanding contract changes at each site

Metrics

- Metric 3.01: Achieve the overall prime contract small business goal of 6% for each site with a stretch goal of meeting the current DOE goal
- Metric 3.02: Approve contract performance baselines with work aligned with the contract for the following contracts: 1) DUF6 Conversion Plants; 2) ORP Tank Operations; 3) Waste Treatment and Immobilization Plant project; 4) Salt Waste Processing Facility project; and for all new contracts within 180 days after transition
- Metric 3.03: Implement partnering agreements for the following two contracts: 1) Savannah River Nuclear Solutions; and 2) Idaho Treatment Group
- Metric 3.04: Ensure 90% of capital projects have Federal Project Directors that are certified at the appropriate level assigned to projects not later than CD-3

- Metric 3.05: Complete 16 project peer reviews for active post CD-0 capital projects with TPCs greater than $10M
- Metric 3.06: Complete a site-by-site and contract-by-contract plan to consider and implement (as appropriate) the Deputy Secretary's principles for aligning contract management
- Metric 3.07: Ensure 95% of contractors maintain their Earned Value Management System certification, when EVMS is required by the contract

Management Excellence

As described in DOE's Strategic Plan, EM's success will require a sustained commitment to management excellence from Headquarters to every site office, service center, laboratory, and production facility. Management principles will be translated into action by focusing on operational and technical excellence. That excellence requires developing the most highly qualified, capable, and flexible federal workforce. Additionally, our management principles require implementation of a performance-based culture that clearly links work to agency goals, hold employees accountable for meeting our mission, and appropriately rewards employees for their efforts. These concepts are represented in EM's fourth goal.

Goal 4:	Achieve excellence in leadership and resource management by championing financial stewardship, integrating business processes, optimizing EM culture change, and improving communications with the objective of enhancing accountability and achieving performance results

Strategies

- Use surveys to identify where EM can enhance its customer and stakeholder relationships and implement improvements
- Utilize the results of the Employee Viewpoint Survey to implement actions that will improve all aspects of the EM Workplace and enhance mission execution

Metrics

- Metric 4.01: Analyze Infrastructure and Min-Safe activities and costs across EM sites. Complete Report on the Analysis of Infrastructure And Min-Safe Activities
- Metric 4.02: Prepare an analysis to assess the EM HQ and Field workforce/skills mix and prepare a presentation to OMB by December 2013.
- Metric 4.03: Ensure at least 90% of employees are either on current IDPs or EEPs that align to EM goals and objectives. Review employee Learning and Development progress on a quarterly basis
- Metric 4.04: Develop a strategic framework that integrates leadership culture, employee engagement, safety conscious work environment and diversity and inclusion to implement improvements in organizational culture
- Metric 4.05: Develop an EM complex-wide Human Capital Management Plan to include strategies for Knowledge Transfer
- Metric 4.06: Develop an EM career intern program based on the DOE new Pathways program

Sustainability

As stated in the DOE Strategic Plan, "*The Department is uniquely positioned to lead by example in transforming domestic energy use. Integrating sustainability throughout the Department is an essential aspect of implementing Executive Order 13514, Federal Leadership in Environmental Energy, and Economic Performance, and Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management, as well as related statutes, and meeting or exceeding all required energy management and environmental goals. As stated in the U.S. Department of Energy Strategic Sustainability Performance Plan (SSPP), the Department will reduce greenhouse gas emissions from onsite combustion of fossil fuel, fugitive emissions, and purchased power by 28% and reduce emissions from outside sources—such as business travel and employee commuting—by 13% by 2020. We will strive to exceed these goals at our own facilities by incorporating sustainability into all corporate management decisions,*
continually improving our operations and existing infrastructure to maximize efficient use of energy and natural resources, and ensuring, whenever built, new facilities are highly energy efficient. We will also meet the new goal on Climate Change Adaptation which has been elevated by the President's Climate Action Plan in June, 2013". The strategies and metrics of EM's Goal 5 are our responses to the Sustainability challenge.

Goal 5:	Execute the EM Mission in a Sustainable Manner

Strategies

- Meet Executive Order 13514 - reduce energy intensity in agency buildings, by soliciting suggestions from the staff and contractors
- Identify means for reducing the overall EM carbon footprint
- Utilize the Department's Energy Saving Performance Contract (if viable) or alternative data center optimization practices to reduce the IT data center's infrastructure footprint while providing state of the art services
- Identify activities that promote climate change adaptation and mitigation
- Work with local jurisdictions, as appropriate, to develop regional partnerships for climate change information sharing and collaboration

Metrics

- Metric 5.01: Promote effective IT energy conservation practices across EM, with at least 3 sites joining, or continuing to participate in, EPA's "Federal Green Challenge" (FGC) or winning a DOE Sustainability (Green IT) award by September 30, 2014
- Metric 5.02: Utilize DOEGRIT or DC Pro energy efficiency assessment tools at 2 EM data centers to document baseline configurations by September 30, 2014
- Metric 5.03: Reduce EM's IT data center footprint by 20% by September 30, 2014
- Metric 5.04: Conduct detailed risk or vulnerability assessments, as appropriate, for selected EM site(s)
- Metric 5.05: Update site sustainability plans to address climate change resiliency

Process and Procedure

The Office of Program Planning and Budget will track/monitor the progress on strategies and metrics identified in this agreement and provide periodic reports to EM Management. EM DASs, Field

Managers and Office Directors will update the status of all items on a quarterly basis through the predetermined tracking or reporting systems involving the appropriate field sites as needed. All changes to goals and/or metrics will be fully vetted, documented and used as lessons learned when appropriate. All the results will be evaluated and assessed to ensure success meeting of goals as well as their effectiveness and appropriateness. The results of these assessments will be considered for lessons learned and possible impact on FY 2014 goals.

EM Senior Advisor Support

In order to accomplish the goals herein described, it is the EM Senior Advisor's objective to *provide visible, high profile support to:*

- Ensure that the necessary resources are in place to promote the success of these goals
- Communicate goal achievement and progress periodically through EM Updates, Reports and other media
- Formally recognize superior efforts in achieving goals through incentive awards
- Communicate, negotiate and mitigate responses and issues with senior Department and private sector officials

Office of Environmental Management

Terms of Agreement

This agreement is intended to improve the internal management of the U.S. Department of Energy's Office of Environmental Management and is not intended to and does not create any right, benefit, trust or responsibility, substantive or procedural, enforceable by law or equity by any party against the U.S. Department of Energy, its agencies, its officers, or any person. This agreement will remain in effect until modified. It is expected that it will be updated as needed to reflect significant changes in budget, policy, personnel or other factors that may affect the accomplishment of objectives. This agreement represents our joint commitment to an EM that works better, costs less, and fulfills our sacred trust to the American People.

EM Senior Advisor — Date

Principal Deputy Assistant Secretary — Date 11/7/13

Chief of Staff — Date 11/7/13

Office of External Affairs — Date 11/7/13

Deputy Assistant Secretary, Site Restoration — Date 11/25/13

Deputy Assistant Secretary, Tank Waste & Nuclear Material — Date 11/6/13

Deputy Assistant Secretary, Waste Management — Date 11/25/13

Deputy Assistant Secretary, Safety, Security & Quality Programs — Date 11/25/13

Deputy Assistant Secretary, Acquisition & Project Management — Date Nov 6, 2013

Deputy Assistant Secretary, Program Planning & Budget — Date 11/22/13

Deputy Assistant Secretary, Human Capital & Corporate Services — Date 11/25/13

Associate Principal Deputy Assistant Secretary — Date 11/20/13

Manager, Carlsbad Field Office — Date 11/6/13

Manager, Consolidated Business Center — Date 11/6/13

Manager, Idaho Operations Office — Date 11/25/2013

Manager, Oak Ridge Operations Office — Date 11/22/13

Manager, Office of River Protection — Date 11/22/13

Manager, Portsmouth/Paducah Project Office — Date 11/12/13

Manager, Richland Operations Office — Date 11/25/13

Manager, Savannah River Site — Date 11/6/13

ETEC

Metrics

- ETEC-01: Complete chemical and radiological soil characterization that defines the nature and extent at the ETEC site by June 30, 2014
- ETEC-02: Complete the Notice of Intent (NOI) and re-Scoping of the NEPA process by April 30, 2014
- ETEC-03: Complete the groundwater characterization for the Area IV responsibilities by September 30, 2014

Idaho

Strategy

- Maintain shipments of TRU waste to WIPP in accordance with WIPP's integrated schedule

Metrics

- INL-01: Begin hot operations of the Idaho Integrated Waste Treatment Unit (IWTU) by June 30, 2014
- INL-02: Initiate treatment of liquid sodium bearing waste by May 30, 2014
- INL-03: Complete exhumation work at the Accelerated Retrieval Project (ARP) II and III facilities by March 30, 2014

LANL

Strategies

- Submit approval of interim work plan on chromium in groundwater
- Resolve litigation on 2010 RCRA Permit

Metrics

- LANL-01: Complete Framework Agreement Legacy TRU Waste Disposal Component: Dispose of 1,106 m3 legacy TRU waste under 3706 TRU Campaign by June 30, 2014
- LANL-02: Submit supplemental interim work plan on chromium in groundwater
- LANL-03: Submit integrated Lifecycle Baseline to Headquarters for approval by July 30, 2014

Moab

Strategy

- Continue efforts to reduce project life cycle costs and reduce the overall project completion schedule

Metrics

- Moab-01: Safely transport and dispose of 650K tons of Uranium Mill Tailings by September 30, 2014
- Moab-02: Continue groundwater cleanup with the extraction of 15,000,000 gallons of water and removal of 250 lbs of uranium by September 30, 2014

Nevada

Strategies

- Continue progress toward closure of approximately 900 subsurface contaminated groundwater sites
- Continue audits and waste certification reviews in support of generator programs to ensure compliance with the Nevada National Security Site Waste Acceptance Criteria

Metric

- NNSS-01: Complete characterization activities for 19 contaminated soil sites and closure of 16 contaminated soil sites

Oak Ridge

Strategy

- Establish a TRU Central Characterization Program through CBFO

Metrics

- ORO-01: Submit integrated lifecycle baseline updates to Headquarters for approval by December 31, 2013
- ORO-02: Obtain agreement from regulators for the siting of the Environmental Management Disposal Facility by September 30, 2014
- ORO-03: Submit CD-1 package for the Outfall 200 project in sufficient time for approval by September 30, 2014
- ORO-04: Complete demolition and waste disposal for four of the remaining six units of the K-25 Building at Oak Ridge's East Tennessee Technology Park by September 30, 2014
- ORO-05: Renegotiate the current STP milestone for construction start of the sludge build out project by September 30, 2014

Office of River Protection

Strategies

- Resolve issues with respect to the High Level Waste Facility sufficiently that plans can be completed and construction ramped up to planned level in FY14
- Continue construction on Analytical Laboratory, Low Activity Waste Facility, and Balance of Facilities
- Define the path forward for the tanks that potentially contain contact-handled TRU waste

Metrics

- ORP-01: Complete the High-Level Waste (HLW) Facility Technical Issue Resolution Plan so that decision can be made on resumption of HLW production engineering and appropriate construction by June 30. 2014
- ORP-02: Complete an initial version of the Interface Control Document (ICD) 19 that provides the waste characterization feed parameters necessary to optimize Full Scale Vessel Testing by September 30, 2014
- ORP-03: Complete hard-heel waste removal from 4 single shell tanks in C Farm by September 30, 2014
- ORP-04: Restart the 242-A Evaporator and conduct 3 evaporator campaigns by July 30, 2014

Portsmouth/Paducah

Metrics

- PPPO-01: Complete process to support issuance of ROD on CERCLA cell at Paducah
- PPPO-02: Submit to Ohio Environmental Protection Agency (Ohio EPA) the Proposed Plan for the Site-Wide Waste Disposition Evaluation Project by September 30, 2014
- PPPO-03: Establish long term operational parameters and align operational baseline for DUF6 by September 30, 2014
- PPPO-04: Submit to Ohio EPA the Proposed Plan for the Process Buildings and Complex Facilities D&D Evaluation Project by September 30, 2014
- PPPO-05: Disposition Legacy and newly generated LLW & MLLW of 10,000 cubic meters
- PPPO-06: Remove 50 complete cells of process gas equipment from X-326 process building at the Portsmouth Gaseous Diffusion Plant
- PPPO-07: Complete shipment of a combination of 500 converters and compressors from the X-326 process building

Richland

Strategies

- Initiate implementation of beryllium corrective action plan products into the site's Chronic Beryllium Disease Prevention Program (CBDPP)
- Issue the draft natural gas pipeline Environmental Impact Statement for public comment

Metrics

- RL-01: Complete removal of the 174 glove boxes associated with Plutonium Finishing Plant capital asset project
- RL-02: Complete cleanup of 80 waste sites in the Columbia River Corridor
- RL-03: Complete decontamination and demolition of all (11) surplus facilities in the Columbia River Corridor (except 324 Building and 100K)
- RL-04: Remediate 1.8 Billion gallons of contaminated groundwater
- RL-05: Complete a Pretreatment Facility Technical Issue Resolution Plan for the Waste Treatment Plant project that outlines scope and schedule to resume Pre-Treat Facility engineering and return the HLW Facility to construction status by September 30, 2014

Savannah River

Strategies

- Continue processing Used Nuclear Fuel (e.g., Sodium Reactor Experiment (SRE); Material Testing Reactor (MTR); and High Flux Isotope Reactor (HFIR) at H Canyon)
- Dissolve plutonium feedstock in H Canyon to feed HB line for conversion to oxide (for MOX), meeting HB-Line throughput requirements
- Perform activities to reduce the risk to personnel and the environment by reducing the residual plutonium-238 contamination in the F-Area Materials Storage Facility (235-F) as committed in DNFSB Recommendation 2012-1

Metrics

- SRS-01: Dissolve plutonium feedstock in H Canyon at the Savannah River Site to feed HB line for conversion to oxide (for MOX), meeting HB-Line throughput requirements

- SRS-02: Perform activities to reduce the risk to personnel and the environment by reducing the residual plutonium-238 contamination in the F-Area Materials Storage Facility (235-F) as committed in DNFSB Recommendation 2012-1
- SRS-03: Produce 100 canisters of highly radioactive waste with 2 million curies at the Defense Waste Processing Facility at Savannah River by September 30, 2014
- SRS-04: Perform activities to support 46 TRUPACT3 shipments of Legacy CH-TRU Waste out of SRS to the WIPP by September 30, 2014.
- SRS-05: Close Tanks 5 and 6 at the Savannah River Site by September 30, 2014
- SRS-06: Tank waste processed for disposition (mass of sodium): 400 metric tons by September 30, 2014
- SRS-07: Accept FRR and DRR receipts as agreed to with NNSA
- SRS-08: Complete processing Sodium Reactor Experiment (SRE) Fuel and begin treatment of aluminum-clad spent nuclear fuel
- SRS-09: Determine viability of processing graphite matrix coated used nuclear fuel (UNF)
- SRS-10: Complete CPA 100 foot elevation north labyrinths piping installation.
- SRS-11: Implement Savannah River National Laboratory Infrastructure Plan to reduce operational cost by facility and scientific instrument renewal as well as an improved Asset Condition Index

West Valley

Strategy

- Build a dry cask storage system for HLW canisters to permit timely D&D of the site.

Metrics

- WVDP-01: Complete demolition of the Environmental Lab by June 30, 2014
- WVDP-02: Complete fabrication of eight Vertical Storage Casks and eight Multi Purpose Canisters for the High-Level Waste Canister Relocation Project by September 30, 2014
- WVDP-03: Complete Vitrification Cell decontamination and final survey by September 30, 2014

ATTACHMENT J.8 - GOVERNMENT FURNISHED PROPERTY LIST

Identifier	Official Name	Manufacturer	Model	Quantity	Asset Value	Acquisition Date	Site	Building	Room
WC77414	COMPUTER	DELL COMPUTER	GX150MT	1	$768.00	4/9/2002	200W	222S	4C
WC90968	COMPUTER	DELL COMPUTER	GX620MT	1	$704.52	9/18/2006	200W	222S	B1F
WC90969	COMPUTER	DELL COMPUTER	GX620MT	1	$704.52	9/18/2006	200W	2713S	146E
WC90974	COMPUTER	DELL COMPUTER	GX620MT	1	$704.52	9/18/2006	200W	222S	B1F
WC90976	COMPUTER	DELL COMPUTER	GX620MT	1	$704.52	9/18/2006	200W	222S	4M
WC92213	PROJECTOR	DELL COMPUTER	2400MP	1	$1,227.46	7/11/2007	200W	2704S	25
WC94561	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$799.55	5/6/2008	200W	2713S	146L
WC94564	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$799.55	5/6/2008	200W	222S	5-A/B
WC94626	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$799.55	5/20/2008	200W	2713S	146F
WC94669	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$799.55	6/6/2008	200W	2713S	129
WC94672	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	6/11/2008	RCHN	1979SNYDER	STE 130 C17
WC94675	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	6/11/2008	200W	2704S	29
WC94708	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	6/25/2008	RCHN	1979SNYDER	STE 130 C-14
WC94728	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	7/1/2008	200W	2713S	146E
WC94732	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	7/8/2008	200W	2713S	139
WC94780	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	7/17/2008	200W	2713S	143
WC94794	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	7/17/2008	200W	2704S	27-B
WC94846	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$942.00	7/23/2008	200W	2713S	147L
WC94873	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	8/6/2008	200W	2704S	5
WC94903	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	8/21/2008	200W	222S	4D
WC94904	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	8/21/2008	200W	2713S	146A
WC94934	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/3/2008	RCHN	1979SNYDER	STE 130 ROOM 1
WC95063	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	RCHN	1979SNYDER	STE 130 C18
WC95066	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	200W	2713S	147U
WC95073	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	200W	2704S	14
WC95082	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	RCHN	1979SNYDER	130/7
WC95089	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	200W	2713S	146J
WC95100	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$839.85	9/11/2008	200W	2713S	129
WC95229	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	200W	2713S	139

WC95250	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	200W	2704S	27-B
WC95253	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	RCHN	1979SNYDER	SUITE 130 RM 5
WC95255	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,972.05	10/3/2008	RCHN	1979SNYDER	SUITE 130 RM 4
WC95258	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	200W	2713S	148N
WC95262	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	RCHN	1979SNYDER	STE 130 C13
WC95265	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	200W	2713S	140
WC95291	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/16/2008	200W	2713S	147M
WC95337	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	141
WC95349	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	222S	B1F
WC95361	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	148G
WC95364	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	148P
WC95366	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	147F
WC95371	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	146E
WC95375	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	2713S	146P
WC95376	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/15/2008	200W	222S	4M
WC95403	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$1,076.60	10/3/2008	200W	2713S	147X
WC95528	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/29/2008	200W	2713S	146B
WC95534	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/29/2008	200W	2713S	135
WC95553	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/29/2008	200W	2713S	147H
WC95556	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	10/29/2008	RCHN	1979SNYDER	SUITE 130 RM 11
WC95572	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	11/10/2008	200W	2713S	146G
WC95579	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	11/10/2008	200W	2713S	146D
WC95619	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$814.47	11/13/2008	200W	2713S	130B
WC95799	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2704S	27A
WC95802	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	147N
WC95804	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2704S	25
WC95816	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	222S	B1F
WC95820	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	146O
WC95821	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	146R
WC95830	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	146C
WC95851	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	147S
WC95854	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	RCHN	1979SNYDER	SUITE 130 C15
WC95862	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	200W	2713S	133
WC95880	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	1/16/2009	RCHN	1979SNYDER	SUITE 130 CUB C16

WC95937	COMPUTER	DELL COMPUTER	OPTIPLEX 755MT	1	$768.79	2/4/2009	RCHN	1979SNYDER	STE 130 RM 3
WC96174	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	3/11/2009	200W	2704S	26
WC96175	EXTERNAL HARD DRIVE	WESTERN DIGITAL	WDH1U3200N	1	$92.02	3/9/2009	200W	2704S	28
WC96197	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,528.78	3/13/2009	200W	222S	5A/B
WC96198	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,799.48	3/13/2009	RCHN	1979SNYDER	9
WC96978	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	4/15/2009	RCHN	1979SNYDER	SUITE 130 CUBE 19
WF11308	CAMCORDER	SONY	DCR-SR85	1	$599.00	5/7/2008	200W	2713S	146K
WF11449	PDA PHONE	BLACKBERRY	8310	1	$300.00	9/25/2008	1100	2355STEVENS	WHSE
WF13102	HARD DRIVE	WESTERN DIGITAL	MY BOOK	1	$114.00	8/3/2009	RCHN	1979SNYDER	SUITE 130 RM 7
WF13103	HARD DRIVE	WESTERN DIGITAL	MY BOOK	1	$114.00	8/3/2009	RCHN	1979SNYDER	STE 130 RM 4
WF16092	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	5/14/2009	200W	2704S	16
WF16291	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,765.64	5/18/2009	200W	2704S	28
WF16294	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,765.64	5/18/2009	200W	2713S	146L
WF16589	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	5/20/2009	200W	2713S	146I
WF16598	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	5/28/2009	200W	2713S	148M
WF18949	PDA PHONE	BLACKBERRY	9800 TORCH	1	$108.00	1/10/2011	200W	2704S	5
WF19030	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	6/20/2009	200W	2704S	8
WF19173	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,771.53	6/24/2009	200W	2704S	15
WF19971	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	7/29/2009	200W	2704S	26
WF19999	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	8/3/2009	200W	2713S	134
WF20132	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,771.53	9/17/2009	RCHN	1979SNYDER	9
WF20303	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	9/14/2009	200W	2713S	147J
WF20304	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	9/14/2009	200W	2713S	147I
WF20306	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	9/14/2009	200W	2713S	142
WF20307	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	9/14/2009	200W	2704S	7
WF20308	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$861.85	9/14/2009	200W	2713S	139
WF21219	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147D
WF21220	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147E
WF21221	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	146F
WF21222	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147B
WF21223	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147A

WF21224	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147C
WF21230	COMPUTER	DELL COMPUTER	OPTIPLEX 760MT	1	$900.76	1/20/2010	200W	2713S	147G
WF21542	LAPTOP	DELL COMPUTER	LATITUDE E6400	1	$1,832.44	3/10/2010	200W	2713S	136
WF21559	COMPUTER	DELL COMPUTER	OPTIPLEX 780MT	1	$904.99	3/15/2010	200W	2704S	28
WF21676	COMPUTER	DELL COMPUTER	OPTIPLEX 780MT	1	$904.99	4/10/2010	200W	2713S	147K
WF21677	COMPUTER	DELL COMPUTER	OPTIPLEX 780MT	1	$904.99	4/10/2010	200W	2713S	147H
WF23501	COMPUTER	DELL COMPUTER	OPTIPLEX 780MT	1	$935.20	10/22/2010	RCHN	1979SNYDER	SUITE 130 RM 2
WF25107	PDA PHONE	BLACKBERRY	9800 TORCH	1	$649.99	3/1/2011	200W	2713S	136
WF25108	PDA PHONE	BLACKBERRY	9800 TORCH	1	$649.99	3/1/2011	RCHN	1979SNYDER	STE 130 RM 4
WF25109	PDA PHONE	BLACKBERRY	9800 TORCH	1	$649.99	3/1/2011	RCHN	1979SNYDER	STE 130 ROOM 6
WF25623	SCANNER	FUJITSU	FI6770	1	$5,098.00	10/4/2010	200W	2713S	139
WF27349	PDA	BLACKBERRY	TORCH 9810	1	$55.00	2/21/2012	200W	2713S	140
WF28102	SMART PHONE	APPLE	IPHONE 5	1	$199.99	2/25/2013	200W	2704S	14
WF28310	SMART PHONE	APPLE	IPHONE 5	1	$649.99	7/1/2013	200W	2713S	134

ATTACHMENT J.9 - PERFORMANCE EVALUATION AND MEASUREMENT PLAN

A. INTRODUCTION

This Performance Evaluation and Measurement Plan (PEMP) is the basis for the Laboratory Analysis and Testing Services Contract evaluation of the Contractor's performance on the Award Fee incentives and for presenting an assessment of that performance to the Fee Determining Official (FDO). It describes specific criteria and procedures used to assess the Contractor's performance and to determine the amount of fee earned. Actual performance fee determinations and the methodology for determining fee are unilateral decisions made solely at the discretion of the Government.

The intent of this Plan is to incentivize the highest levels of excellence in specific focus areas -- but not at the expense of basic schedule, safety, or technical performance. Accordingly, no fee will be paid if the Contractor's basic schedule, safety, or technical performance (contract requirements) is less than Very Good. DOE's documented basis for all award-fee determinations will include, at a minimum, a determination whether basic schedule, safety, or technical performance is at a Very Good level. This determination and the methodology for determining the award fee are unilateral decisions made solely at the discretion of the Government.

No Award Fee is available for performance at the Satisfactory level since the contractor is already earning normal profit in its fixed-price amount for such performance.

If the contractor's performance is considered unacceptable in *any* area of contract performance, the FDO may, at his or her discretion, determine the contractor's overall performance to be unacceptable and withhold the entire performance fee for the evaluation period.

B. ORGANIZATION

The award fee organization consists of: the Fee Determining Official (FDO); an Award Fee Board (AFB) that consists of the COR as chairperson; the Contracting Officer; other functional area participants; and advisor members.

C. RESPONSIBILITIES

1. Fee Determining Official. The FDO approves the award fee plan and any significant changes. The FDO reviews the recommendation(s) of the AFB, considers all pertinent data, and determines the earned award fee amount for each evaluation period.

2. Award Fee Board: Under the leadership of the AFB Chair, AFB members review performance reports and COR evaluation(s), consider all information from pertinent sources, prepare interim performance reports, and prepare the Fee Recommendation Report to be presented to the FDO. The AFB may also recommend changes to this plan.

3. AFB Recorder. The AFB recorder is responsible for coordinating the administrative actions required by the COR, the AFB and the FDO, including:
    a. receipt, processing and distribution of reports and evaluations from all required sources;
    b. scheduling and assisting with internal evaluation milestones, such as briefings; and
    c. accomplishing other actions required to ensure the smooth operation of the award fee process.

4. CO. The CO is the liaison between Contractor and Government personnel and shall ensure the incentive process is properly administered in accordance with agency regulations. The CO shall also modify the contract in regards to any contractual issues that may arise during the term of the contract.

5. COR. The COR maintains written records of the contractor's performance in their assigned evaluation area(s) so that a fair and accurate evaluation is obtained. The COR prepares interim and end-of-period evaluation reports as directed by the AFB.

D. FEE ALLOCATION

The available fee for each evaluation period is shown in Attachment 1. The fee earned will be paid based on the Contractor's performance during each evaluation period for the following incentives:

- Incentives 1 through 3: This part is based on consideration of quantitative performance measures as compared to targets specified in this PEMP. The amount of fee allocated to this part is 60% of the total.

- Incentives 4 through 7: This part is based on consideration of Contractor performance in areas that cannot be measured quantitatively, taking into account external factors and conditions. The amount of fee allocated to this part is 40% of the total.

Details are provided in Attachment 1 to the PEMP.

E. FEE EVALUATION PROCESS

The first evaluation period shall commence on the day the Contractor assumes full responsibility for performing work at the 222-S Laboratory as specified in Section C.2.1.9. The Contractor will be evaluated annually to determine eligibility for award fee.

a. No later than ten (10) calendar days after the end of an evaluation period, the Contractor shall provide the CO with an electronic copy of the Contractor's self-assessment showing an assessment of performance against the evaluation criteria set forth in this PEMP. Where applicable, the self-assessment shall include, as an attachment, calculations showing the quantitative basis for claimed achievements.

b. No later than twenty (20) calendar days after the end of an evaluation period, COR(S) will prepare and submit an independent assessment of Contractor performance against the evaluation criteria set forth in this PEMP. The assessment will include a validation of any supporting materials the Contractor has provided.

c. Within approximately sixty (60) calendar days after the end of an evaluation period, the AFB will consolidate COR assessments, validations, and supporting information, and the AFB Recorder will submit an evaluation report and fee recommendation to the FDO. Because this report is pre-decisional, its contents will not be formally shared with the Contractor. If the Contractor and DOE assessments are at significant variance, then the AFB will take whatsoever actions it deems appropriate to gather additional

information from the Contractor and resolve differences.

d. Within seventy (70) calendar days after the end of an evaluation period or sixty calendar days (60) after receipt of the Contractor's self-assessment, whichever is later, the FDO will make a determination of fee earned and notify the Contractor in writing.

e. Within thirty (30) calendar days after the FDO determination of fee earned for the evaluation period, the CO will issue a contract modification authorizing payment of the earned fee amount.

F. DOCUMENTATION

The rationale for fee payments will be documented by the AFB and the FDO. When discussions are held by the people listed in Section C above that significantly impact DOE evaluation of Contractor performance, the major conclusions of the discussion and the rationale behind them will be documented in the form of signed and dated notes, minutes, or correspondence. This documentation will be kept by the AFB Recorder until the fee payment is finalized, at which time it will be placed in the contract file of the ORP Contracts and Property Management Division along with the AFB Fee Recommendation and the FDO's Fee Determination Report.

G. COMMUNICATION

The Contractor may request informal feedback on any aspect of its performance during any interface meeting with the CO. In the spirit of open communication and shared goals, DOE will make a good faith effort to respond in a timely manner with complete and actionable advice based on currently known information.

H. FEE PLAN CHANGE PROCEDURE

The PEMP will be unilaterally established by the Government. The initial PEMP and any subsequent revisions shall be provided to the Contractor not later than thirty (30) calendar days prior to the start of the evaluation period to which the revisions apply. The PEMP may be revised unilaterally by the Government at any time during the period of performance. The Contractor may recommend changes to the CO no later than 60 days prior to the beginning of the new evaluation period.

All significant changes are approved by the FDO; however, the AFB Chairperson may approve other changes. Examples of significant changes include changing evaluation criteria, adjusting weights to redirect the contractor's emphasis to areas needing improvement, and revising the distribution of fee dollars.

I. CONTRACT TERMINATION

If the contract is terminated for the convenience of the Government after the start of a fee evaluation period, the available fee for that period shall be prorated and the amount of fee earned by the Contractor shall be determined by the FDO using the fee evaluation process described in this PEMP.

ATTACHMENT J.9.1 - DETAILED FEE PLAN

Total Award Fee Available – Base Period – Months 3 through 12

Total Award Fee Available	100%	2.5% of contract price for applicable period

Incentives Award Fee Allocation Table

Incentive	VALUE (%)	VALUE ($)
1 - Delivery	20%	$28,554.19
2 - Evaluations/Proficiency Tests	20%	$28,554.18
3 - Maintain Holding Times	20%	$28,554.18
4 - Business Interfaces and Efficiency	10%	$14,277.10
5 - Analytical Reporting and Data Quality	10%	$14,277.10
6 - Environmental Stewardship and Compliance	10%	$14,277.10
7 - Worker Safety, Health, and Safety Culture	10%	$14,277.10
Total Award Fee Available	100%	$142,770.95

Descriptions and Evaluation Criteria for Incentives 1 through 3

Incentive 1 (See Section C.1.2.5)	Delivery	Due Date: 5/27/2016
		Value (%): 20%
		Value ($): $28,554.19
Performance Objective	The Contractor will provide at a minimum 95% on-time delivery of analytical deliverables due to customers during this evaluation period.	
Performance Measures/Surveillance Method	This incentive will be measured by dividing the number of on-time analytical deliverables by the total number of analytical deliverables due to customers during this evaluation period.	
Performance Target	Available award fee will be:	

	Score % less than or equal to 95%, is not eligible for Fee Score % greater than 95% and less than 97%, is eligible for 50% of Fee Score % greater than or equal to 97%, is eligible for 100% of Fee

Incentive 2 (See Section C.2.1.4)	Evaluations/Proficiency Tests	Due Date: 5/27/2016
		Value (%): 20%
		Value ($):$28,554.18
Performance Objective	The Contractor shall maintain an overall average score of at least 95% for proficiency tests performed during the evaluation period.	
Performance Measure/Surveillance Method	This incentive will be measured by the percent of acceptable performance evaluation results of the total number of performance evaluation analyses performed.	
Performance Target	Available award fee will be: Score % less than or equal to 95%, is not eligible for Fee Score % greater than 95% and less than 97%, is eligible for 50% of Fee Score % greater than or equal to 97%, is eligible for 100% of Fee	

Incentive 3 (See Section C.1.2.1)	Maintain Holding Times	Due Date: 5/27/2016
		Value (%): 20%
		Value ($):$28,554.18
Performance Objective	The Contractor will maintain holding time performance at greater than or equal to 95% of all samples received during this evaluation period.	
Performance Measure/Surveillance Method	This incentive will be measured by dividing the number of holding times met by the total number of samples received by the laboratory during this evaluation period.	

Performance Target	Available award fee will be: Score % less than or equal to 95%, is not eligible for Fee Score % greater than 95% and less than 97%, is eligible for 50% of Fee Score % greater than or equal to 97%, is eligible for 100% of Fee

Evaluation Methodology for Incentives 4 through 7

DOE will evaluate performance for Incentives 4 through 7 against the desired outcomes specified below. The evaluation will assign a Numerical Rating of 0 to 100 and associated adjectival rating. The numerical ratings shall correspond to the Percent of Available Fee Earned awarded to each of these incentives as shown in the Ratings and Description Chart below. Ratings shall take into account whether Contractor performance (as opposed to other factors and conditions) directly contributed to the desired outcome.

While Incentives 4 through 7 each have associated evaluation criteria and surveillance methods, DOE may consider other pertinent information in determining performance. DOE may not use all of the listed surveillance methods during any one evaluation period, but rather will select a subset of the listed surveillance methods appropriate to current priorities and concerns.

For Incentives 4 through 7, an adjectival rating below Good for total performance is a matter of concern to DOE-ORP. Although this rating represents satisfactory performance, it indicates significant room exists for improvement in quality of services delivered.

Descriptions and Evaluation Criteria for Incentives 4 through 7

Incentive 4	Business Interfaces and Efficiency	Due Date: 5/27/2016
		Value (%): 10%
		Value ($): $14,277.10
Performance Objective	The Contractor will maintain positive and effective relationships with DOE and interface partners	
Award fee evaluation criteria	• Service Level Agreements are implemented and updated in a timely manner to reflect changing customer baselines. • Customer (Non-TOC) costs associated with analytical work are calculated according to a clear and consistent documented basis. • Negotiations with interface partners are carried out in a spirit of cooperation and transparency, including timely submission of requests for additional data, timely counteroffers, conveying a positive and professional attitude. • Dispute resolution processes are robust, effective, and used appropriately. • The Contractor demonstrates sustainable reductions in use of	

	government-furnished property, materials, and services. • Key personnel remain in their posts for the contractually required period.
Surveillance Method	• Check alignment between the sample receipt schedules shown in SLAs and the corresponding actuals. • Verify Contractor cost estimating procedures for reasonableness for Non-TOC customers. • Verify whether the Contractor's cost estimating procedures were correctly used for Non-TOC customers. • Note the frequency with which inter-contractor disputes are elevated to DOE for resolution. • Check invoices submitted by TOC and MSC to see whether Contractor usage of their DOE direct funded services and materials is reasonable. • Validate Contractor claims of sustainable reductions in use of government-furnished property, materials, and services. • Consider any changes in key personnel.

Incentive 5	Analytical Reporting and Data Quality	Due Date: 5/27/2016
		Value (%): 10%
		Value ($): $14,277.10
Performance Objective	The Contractor will deliver a high-quality product that meets Customer needs and provides maximum value to the Hanford site cleanup mission.	
Award fee evaluation criteria	• Quality of reporting measured by issues identified through customer feedback which includes: review comment records, complaints, and requests for revised or corrected reports. • The number and seriousness of quality issues associated with analytical data and the effectiveness and speed with which they are resolved. • Appropriateness of sample archival and sample preservation activities to meet customer and site needs. • Effective implementation of compliant QA processes including a proactive QA assessment and evaluation program.	
Surveillance Method	• Solicit input from customers on the quality of Contractor analytical services. • Consider review comment records, complaints, and requests for revised and corrected reports. • Check sample archiving to determine whether appropriate protocols are being observed for sample preservation. • Observe Laboratory activities and note any procedural non-	

	compliances. • Audit the Contractor's QA program.

Incentive 6	Environmental Stewardship and Compliance	Due Date: 5/27/2016
		Value (%): 10%
		Value ($): $14,277.10
Performance Objective	The Contractor will demonstrate sound Environmental Stewardship and Compliance	
Award fee evaluation criteria	• Contractor actions fully support the TOC and MSC in maintaining applicable environmental permits and implementing waste minimization and pollution prevention practices • Early identification of issues and concerns through a proactive assessment and evaluation program • Number and seriousness of any non-compliances, infractions, or violations and the timeliness and quality of related reporting and responses. • Compliance with requirements for management of chemicals.	
Surveillance Method	• Solicit TOC input on the effectiveness of Contractor support in environmental stewardship and compliance. • Review Contractor self-assessments of environmental compliance and waste management activities. • Observe waste management practices and note any non-compliances with procedures and environmental regulations. • Note the number and seriousness of any non-compliances, infractions, or violations and the timeliness and quality of related reporting and responses. • Observe whether the Contractor's chemical management practices are in compliance with procedures and environmental regulations.	

Incentive 7	Worker Safety, Health, and Safety Culture	Due Date: 5/27/2016
		Value (%): 10%
		Value ($): $14,277.10
Performance Objective	Workers at the 222-S Laboratory are protected from health and safety hazards, and are encouraged to raise health and safety concerns without fear of retaliation.	
Award fee evaluation	• Issue identification and resolution before negative impact to personnel safety.	

criteria	• Clear and effective communication to workers about avenues available for raising safety and health concerns. • Visible and sustained engagement by Contractor management in worker safety, health, and safety culture. • Prompt and accurate reporting on work-related injuries, illnesses, and exposures among Contractor employees. • Effectiveness of processes defined in the Contractor's Integrated Safety Management System.
Surveillance Method	• Monitor the Contractor's activities to identify and correct health and safety concerns. • Monitor Management handling of and response to worker injuries, illnesses, and exposures, including any corrective actions. • Monitor Contractor compliance with Hanford health and safety programs. • Solicit input from the TOC on whether the Contractor is an effective partner in ensuring safe operations at the 222-S Laboratory complex. • Consider the results of any safety culture surveys of Contractor staff performed during the evaluation period. • Observe posters, emails, and other channels used by Contractor management to communicate with workers to see whether safety messages are consistent and effective. • Consider the safety and health issues, if any, raised by Contractor staff through the Employee Concerns Program or other issue management process.

Ratings and Definitions Chart

Assigned Numerical Rating	Adjectival Rating *(corresponding to Numerical Rating)*	Definition	Percentage of Award Fee Earned
91 to 100	Excellent	Contractor has exceeded almost all of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period. Contractor's work is highly professional. Contractor solves problems with very little, if any, Government involvement. Contractor is proactive and takes an aggressive approach in identifying problems and their resolution, including those identified in the risk management process, with a substantial emphasis on performing quality work in a safe manner within cost/schedule requirements. No significant re-work.	91% to 100%
76 to 90	Very Good	Contractor has exceeded many of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the criteria in the award-fee plan for the award-fee evaluation period. Contractor solves problems with minimal Government involvement. Contractor is usually proactive and demonstrates an aggressive approach in identifying problems and their resolution, including those identified in the risk management process, with an emphasis on performing quality work in a safe manner within cost/schedule requirements. Problems are usually self-identified and resolution is self-initiated. Some limited, low-impact rework within normal expectations.	25% to 50%
51 to 75	Good	Contractor has exceeded some of the significant award-fee criteria and has met overall cost, schedule, and technical performance requirements of the contract in the aggregate as defined and measured against the award-fee plan for the award-fee evaluation period. Contractor is able to solve	0%

		basic problems with adequate emphasis on performing quality work in a safe manner within cost/schedule objectives. The rating within this range will be determined by level of necessary Government involvement in problem resolution, including those problems identified in the risk management process, and extent to which the performance problem is self-identified vs. Government-identified. Some re-work required that unfavorably impacted cost and/or schedule.	

CONTRACTOR PERFORMANCE EVALUATION REPORT

Calculations: For Incentives 1 through 3, percent of fee earned is calculated according to the instructions provided in each incentive's description and applied to the corresponding value in the Incentives Award Fee Allocation table. For Incentives 4 through 7, the assigned rating is converted to a percent according to the Ratings and Definitions Chart and then multiplied by the value provided in the Incentives Award Fee Allocation Table. Fees for the seven incentives are summed to produce the total fee earned.
A sample evaluation form is shown on the next page.

PEMP EVALUATION SCORE CARD EXAMPLE

PERIOD FROM _____ TO_____ CONTRACT NO. _____
CONTRACTOR _____ DATE OF REPORT _____
BOARD MEMBERS
_____
_____

INCENTIVES 1 THROUGH 4

	Score	Percent of fee	Amount of fee
INCENTIVE 1 - DELIVERY	_____%	_____% x (TBD) =	$_____
INCENTIVE 2 - EVALUATIONS/PROFICIENCY TESTS	_____%	_____% x (TBD) =	$_____
INCENTIVE 3 - MAINTAIN HOLDING TIME	_____%	_____% x (TBD) =	$_____
INCENTIVES 1 THROUGH 3 SUBTOTAL			$_____

INCENTIVES 4 THROUGH 7

	Assigned Numerical Rating	Percent of fee	Amount of fee
INCENTIVE 4 - BUSINESS INTERFACE AND EFFICIENCY	_____	_____% x (TBD) =	$_____
INCENTIVE 5 - ANALYTICAL REPORTING AND DATA QUALITY	_____	_____% x (TBD) =	$_____
INCENTIVE 6 - ENVIRONMENTAL STEWARDSHIP AND COMPLIANCE	_____	_____% x (TBD) =	$_____

INCENTIVE 7 - WORKER SAFETY, HEALTH, AND SAFETY CULTURE	_____	_____% x (TBD) =	$_____
INCENTIVES 4 THROUGH 7 SUBTOTAL			$_____
		TOTAL FEE EARNED	**$_____**

Chairperson Signature _____Date signed_____

ATTACHMENT J.10 - EXECUTED PERFORMANCE GUARANTEE AGREEMENT

[Not Applicable]

ATTACHMENT J.11 - ACRONYM LIST

Acronym	Description
ABCASH	Automated Bar Coding of All Samples at Hanford
ADR	Alternative Dispute Resolution
AEA	Alpha Energy Analyzers
AFB	Award Fee Board
ASME	American Society of Mechanical Engineers
ASTC	Analytical Services Testing Contractor (Same as Laboratory Analytical Services and Testing Contractor (LAS&T)
BMS-OTM	Overtime Management System
CAIRS	Computerized Accident/Incident Reporting System
CCR	Central Contractor Registration
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CLIN	Contract Line Item Number
CIAC	Cyber Incident Advisory Capability
CITS	Chemical Inventory Tracking System
CO	Contracting Officer
COR	Contracting Officer Representative
CPARS	Contractor Performance Assessment Reporting System
CRD	Contractor Requirements Document
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
DOL	Department of Labor
DPLH	Direct Productive Labor Hours
DSA	Documented Safety Analysis
DSC	Differential Scanning Calorimeters
EEO	Equal Employment Opportunity
EEOICPA	Energy Employees Occupational Illness Compensation Program Act
ECP	Employee Concerns Program
EFT	Electronic Funds Transfer
EMS	Environmental Management System
EMCBC	Environmental Management Consolidated

	Business Center
EJTA	Employee Job Task Analysis
EPA	Environmental Protection Agency
ERISA	Employee Retirement income Security Act
FAPIIS	Federal Awardee Performance and Integrity Information System
FAR	Federal Acquisition Regulation
FDO	Fee Determining Official
FP	Fixed Price
FOCI	Foreign Ownership, Control, or Influence
FNVA	Foreign National Visits and Assignments
GAO	Government Accountability Office
GC/MS	Gas Chromatograph/Mass Spectrometers
GEA	Gamma Energy Analyzers
GFE	Government Furnished Equipment
GFP	Government Furnished Property
GSA	General Services Administration
GSP	Graded Security Protection
HAZQARD	Hanford Analytical Services Quality Assurance Requirements Document
HEIS	Hanford Environmental Information System
HEWT	Hanford Employee Welfare Trust
HGET	Hanford General Employee Training
HISI	Hanford Information Systems Inventory
HLAN	Hanford Large Area Network
HSPP	Hanford Site Pension Plan
HSSP	Hanford Site Savings Plans
HTML	Hyper Text Markup Language
IC	Ion Chromatographs
IDMS	Integrated Document Management System
ICD	Interface Control Documents
IG	Inspector General
IH	Industrial Hygiene
ICP/MS	Inductively Coupled Plasma/Mass Spectrometer systems
Inc.	Incorporated
ISAP	Infrastructure and Services Alignment Plan
ISO	International Organization for Standardization
ITEM	Integrated Training Electronic Matrix

JV	Joint Venture
LA&TS	Laboratory Analysis and Testing Services
LAS&T	Laboratory Analytical Services and Testing Contractor
LIMS	Laboratory Information Management System
LLC	Limited Liability Corporation
LTS2	Laboratory Training System 2
MC&A	Material Control and Accountability
MBA	Material Balance Area
MOA	Memoranda of Agreement
MOU	Memoranda of Understanding
MSC	Mission Support Contractor
MSDS	Material Safety Data Sheets
NAICS	North American Industrial Classification System
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
NQA	Nuclear Quality Assurance
NTP	Notice to Proceed
OCI	Organizational Conflict of Interest
OpEx	Operating Experience
OPEXShare	OPerating EXperience Sharing
OPSEC	Operations Security
ORFSC	Oak Ridge Financial Service Center
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration
OUO	Official Use Only
PE	Performance Evaluation
PEMP	Performance Evaluation Measurement Plan
PDF	Portable Document Format
PIDS	Property Information Data System
PIV	Personal Identity Verification
PMP	Pension Management Plan
PNNL	Pacific Northwest National Laboratory
POMS	Performance Objectives, Measurements, and Commitments

PPA	Pension Protection Act
PPIRS	Past Performance Information Retrieval System
PRC	Plateau Remediation Contractor
PROTRAX-ATL	Procedure Status Tracking
Pu	Plutonium
PWS	Performance Work Statement
RCW	Washington Revised Code
RFP	Request for Proposal
QA	Quality Assurance
QAP	Quality Assurance Program
QC	Quality Control
RCCC	River Corridor Closure Contract(or)
RCRA	Resource Conservation and Recovery Act
RL	Richland Operations Office
SAA	Satellite Accumulation Areas
SAM	System for Award Management
SAMS	Sunflower Asset Management System
SAS	Safety and Security
SBA	Small Business Administration
SCR	System Change Request
SEB	Source Evaluation Board
SECON	Security Conditions
SEM	Scanning Electron Microscopes
SES	Security and Emergency Services
SF	Standard Form
SLA	Service Level Agreement
SSO	Source Selection Official
Sr	Strontium
TFMSS	Tank Farms Material Service System
TGA	Thermal Gravimetric Analyzers
T&M	Time-and-Materials
TOC	Tank Operations Contractor
TPA	Third Party Administrator or Tri-Party Agreement
TRAINTRAX-222-S	Training Tracking System
TSR	Technical Safety Requirements
U.S.C	United States Code

VIPERS	Vendor Inquiry Payment Electronic Reporting System
WRPS	Washington River Protection Solutions
WASP	Workplace Substance Abuse Programs
WSCF	Waste Sampling and Characterization Facility
WSHP	Worker Safety and Health Plan
WTP	Waste Treatment Plant
90DAAs	90-Day Accumulation Areas

ATTACHMENT J.12 STAFFING PLAN

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Appendix A: Staffing Plan

The Wastren Advantage, Inc. (WAI) Staffing Plan defines our approach to meet all management and technical personnel requirements to successfully execute the Hanford 222-S Laboratory Analysis and Testing Services (LA&TS) contract, while delivering enhanced performance and real cost savings. We will present our plan to obtain, retain, and maintain the depth and breadth of qualified staff; our approach to pension and benefits; and a detailed staffing plan along with our proposed staffing level and labor skill mix. We will also present our Key Personnel and explain their roles relative to the management and execution of work.

A main component of our strategy for successful project execution is retention of high-performing incumbent staff while enhancing overall capabilities by providing key management and technical staff with a track record of successful nuclear facility operations, analytical laboratory management, and labor union management. WAI's proven track record of successful contract transitions on large, complex DOE projects demonstrates our ability to obtain, retain, and maintain the depth and breadth of qualified staff required to ensure performance at 222-S. Three recent examples of our ability to deliver and retain staff are the Environmental Restoration Disposal Facility (ERDF) contract transition at Hanford, and the transition of two DOE-direct contracts: Portsmouth Facility Support Services (FSS) and the TRU Waste Processing Center (TWPC). At ERDF, Portsmouth, and TWPC, WAI delivered all key personnel as promised in our proposal to drive performance enhancements and deliver real cost savings. At ERDF, WAI recruited, trained, and retained approximately 135 project personnel. On the Portsmouth contract, WAI recruited, trained, and retained approximately 170 project personnel, and at TWPC, over 300 project personnel.

For the 222-S project, WAI proposes similar approaches and programs to those used successfully on our recent DOE contract transitions. These proven approaches, described below, will ensure performance at 222-S.

A.1 Our Approach to Obtain the Depth and Breadth of Qualified Staff

WAI has taken considerable effort to identify the right Key Personnel for the 222-S LA&TS contract. Our mix of highly competent management and technical staff demonstrates WAI's ability to attract qualified staff.

Our plan assumes that a majority of staff at contract start will be the personnel performing the work functions on the contract today. They bring program knowledge and experience as well as strong relationships with the key customers and stakeholders. They understand the project goals and objectives and are experienced in working in alignment with DOE and the tank operations contractor (TOC). We are confident that these resources provide an excellent foundation to fulfill the requirements of the 222-S LA&TS contract, and retention of this staff will result in continuity and efficiency of services delivered.

The WAI team routinely recruits nationwide for the best possible talent for our clients. Past experience causes us to anticipate little difficulty recruiting and retaining both key and non-key staff as the demonstrated success of our competitive benefits packages significantly enhance our attractiveness to potential recruits. WAI is one of the most successful small businesses in the DOE complex. Its small business culture is appealing to its employees and includes flexible schedules and a family-friendly atmosphere. WAI also has an outstanding safety culture, as

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demonstrated by our achievement of operating two DOE facilities that have received Voluntary Protection Program (VPP) Star status, the Star of Excellence Award, and the Legacy of Stars Award. WAI employees know that as they gain experience and knowledge they have the option to cross into new areas of interest and take on additional responsibilities. WAI also routinely surveys its employees to gauge their satisfaction and morale and acts upon their feedback for continuous improvement in our recruiting and retention. In the past five years, WAI conducted two significant DOE contract transitions (TWPC and Portsmouth FSS) and one contract transition at Hanford (ERDF) that were successful in retaining 95 percent to 99 percent of the existing staffs.

During the transition of this contract, we will implement a systematic staffing process (***Figure A-1***) that provides direction on interviewing and selecting qualified candidates. This includes guidance on contract requirements regarding the hiring of incumbent staff and union staff or labor agreement employees. The guidance also ensures that we obtain and maintain appropriate documentation to substantiate employment decisions.

This process utilizes well-established recruiting tools, including specialized recruiters, customer and other professional referrals, past and current employee referrals, local and national advertising, and internet job websites, including our companies' home pages. Last year, WAI used this process to recruit more than 100 new personnel and, at TWPC the previous year, rapidly recruited and mobilized approximately 150 new personnel in response to American Recovery and Reinvestment Act (ARRA) funding.

But recruiting is only part of the equation. It is imperative for operational efficiency and continuity of approach to retain personnel and provide a work environment that allows them to work productively. Our broader approach to retention is outlined in the following paragraphs.

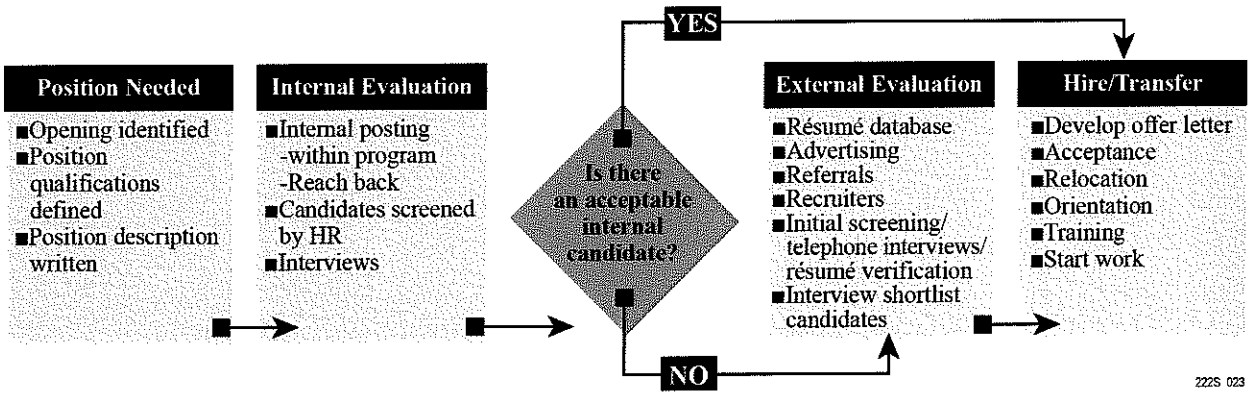

Figure A-1: ***WAI Team Recruiting Process.*** The WAI team will first draw from our considerable internal technical resources to fill positions at 222-S, and utilize our corporate recruiting resources to attract and obtain qualified external candidates.

A.2 Our Approach to Retain the Depth and Breadth of Qualified Staff

As one element of retention of our 222-S personnel, the WAI team offers competitive benefits packages that enable us to easily recruit and retain professional talent. Our total compensation approach exceeds industry averages and contains a mixture of competitive salary; salary increases based on merit and excellent performance; bonuses for exemplary contributions; comprehensive health, benefit, and holiday/vacation/sick-leave packages; and a company-matching 401(k) savings plan.

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Our Staffing Plan goes beyond compensation in terms of our retention approaches. Our management approach emphasizes providing the workforce with the tools needed to do the job, with a culture that allows them to thrive and advance in their careers. As the callout box on this page summarizes, our retention approach addresses a variety of cultural and workforce support elements.

WAI Retention Techniques

- Total compensation (pay, benefits, incentives) exceeding industry average
- Empowerment of the workforce through vehicles such as the Junior Leadership Council
- Defined succession planning, supported by technical and management mentoring, to ensure clear career paths
- Encouragement of continuing education opportunities
- Corporate culture that values all employees and promotes their professional and personal well-being
- Provide employess with challenging and satisfying work

222S_024

The WAI team will provide a strong culture of workforce empowerment, recognizing that employees on the front line of work execution often have the best perspective on improvement opportunities for technical execution, safety, quality, and cost effectiveness. We encourage and reward behavior that supports continuous improvement, and we value the input of all employees. Our Laboratory Manager, Kristine Kuhl-Klinger, will facilitate open communication with all employees to ensure they have an opportunity to participate in the continuous improvement process, supporting retention by empowering them to make meaningful contributions.

Another critical element of our retention strategy is a formalized succession planning process, supported by a technical and management-mentoring program. All managers are expected to identify succession plans and to identify high-potential employees within their respective organizations who are mentored in technical and management techniques to ensure their readiness for advancement within the organization. We have established a commitment in this proposal to have the formal mentoring program in place by the end of the first year of the contract and to have 50 percent of all staff engaged in the formal mentoring program by the end of the LA&TS contract. In addition to the internal mentoring, we also encourage continuing education opportunities to help our workforce expand their capabilities. Through these efforts, we define specific career paths that give our workforce a vision of their future and that promote retention. As part of our LA&TS technical and management approach, we also propose Communities of Practice that will link our LA&TS staff with experts in nuclear facility operation, laboratory analyses, and laboratory method development throughout our corporate organizations. We want our 222-S staff to recognize that they are part of a larger organization and to both benefit and contribute to our overall cultures.

Once our staff has been identified and hired, it is management's responsibility to provide programs that keep qualified staff motivated and performing at a high level. It is management's responsibility to demonstrate to employees that they are recognized and appreciated by the employer. Our objective is to minimize employee turnover and increase employee satisfaction and performance. Programs that will be implemented to achieve these objectives include:

- Management commitment to programs that provide employee security such as safety and health initiatives, wellness programs, employee suggestions and concerns programs, etc. and engaging employees so they actively participate in program committees, provide timely and meaningful feedback, and view programs as a positive part of their employment experience
- Establish training and development opportunities to strengthen employee skills and capabilities
- Provide employees timely and meaningful performance feedback

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- Provide comprehensive market-based compensation programs (merit increases, promotional opportunities, and incentive compensation) that recognize and reward high performance
- Provide market-based benefit programs (retirement, health and welfare, employee support, etc.) that provide employee and dependents a sense of security
- Inclusion of 222-S personnel in a larger corporate culture that includes a community of nuclear facility operations and analytical services professionals

WAI has two projects that are DOE-recognized VPP sites and we have operated over 3.7 million labor hours since 2010 without a lost-time accident. Employees on the 222-S project will participate in our company employee involvement programs that are used at these, and other, project sites.

A.3 Our Approach to Maintain the Depth and Breadth of Qualified Staff

During project performance it is inevitable for some employee turnover to occur. We will utilize programs that minimize the impact of turnover and create opportunities to improve project performance. These include the following:

- Robust recruiting capabilities will identify and attract skilled and qualified outside candidates, as needed.
- Training and development programs will increase existing staff capabilities and prepare them to fill open positions.
- Mentoring and succession programs will identify high potential individuals and prepare them for increased roles and responsibilities.
- Internal job posting process will communicate opportunities to existing personnel.

As detailed in ***Section A.2*** above, WAI will initiate a formal mentoring program and succession planning to ensure that turnover creates opportunity rather than potential performance issues. Based on our extensive experience with unions and labor agreements, WAI understands the issues associated with "bump and roll" and the potential need for retraining of union staff. WAI is prepared to anticipate this requirement, utilizing both onsite training resources as well as our considerable corporate training and program personnel to aggressively track and deliver the necessary training.

WAI has internal recruiting capabilities that allow us to quickly post open positions locally or nationwide depending on where best to find qualified candidates. We use nationally recognized internet-based job sites such as Monster, LinkedIn, etc. as well as recruit through local job sites, job fairs, etc.

A.4 Approach to Pension and Benefits

Meeting the Section H requirements regarding pension and benefits will not be an issue for WAI given that we already successfully manage complex pension and benefit programs at existing DOE sites. We currently operate under multiple DOE contracts with specific pension and benefit requirements in Hanford, Portsmouth, Oak Ridge, and Paducah. Our corporate business management and human resources staff are well versed in benefit administration and manage activities that support Defined Benefit and Defined Contribution Pension and Retirement programs for our employees as well as managing various types of health and welfare programs covering 650 employees across the country.

Our experience in managing special contractual benefit and program requirements for incumbent personnel are outlined in ***Figure A-2*** below.

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Location	Special Pension and Benefit Requirements	Approximate # of Employees Involved	Types of Personnel Involved
Portsmouth, Ohio	Multi-Employer Pension Plan (MEPP) Multiple Employer Welfare Arrangement (MEWA)	280	Salaried Hourly Union Represented
Hanford, Washington	Hanford Site Stabilization Agreement	60	Union Represented
Paducah	Multi-Employer Pension Plan (MEPP) Multiple Employer Welfare Arrangement (MEWA)	10	Salaried

Figure A-2: ***WAI Incumbent Employee Pension and Benefit Experience Matrix***. WAI's experience with union labor and grandfathered employee Pension and Benefit Programs at numerous DOE Sites ensures professional and compliant management of the 222-S programs.

Our DOE prime contract in Portsmouth (WEMS) requires WAI to be an active participant in the administration and management of the MEPP, and we participate as a voting member of the MEPP.

In addition to managing these programs for incumbent personnel, WAI also manages market-based retirement and benefit programs for non-incumbent personnel at similar locations as well as for our commercial operations. Given this diverse background in benefit program management, we are well versed in qualified plan testing requirements (410(b) and other non-discrimination testing for qualified benefit plans) and integrating that testing into the plans in which WAI participates.

WAI's Business Manager, Rick Penpek, has more than 20 years of experience implementing and managing benefit and pension programs covering from 50 to more than 20,000 employees. Our approach to pension and benefits starts with his comprehensive understanding of specific contract requirements such as those outlined in Section H. Once the contract requirements are identified, we develop implementation plans, identify potential issues, and formalize mitigation strategies that ensure programs are compliant not only with contractual requirements but also with federal and state regulations (ERISA, PBGC, etc.). We work with subject matter experts (ERISA attorneys, actuaries, insurers, and qualified third-party administrators) to develop our programs and understand our obligations.

Once programs are "stood up" we develop an activity matrix that identifies specific contract and/or benefit program filing or other compliance requirements. This matrix helps outline the various filing deadline requirements and allows WAI to properly plan and execute activities to ensure continued compliance. In addition, we evaluate our programs annually for effectiveness and make adjustments as required. Tools such as Benefit Valuations as required under Section H are already being used by WAI.

A.5 Staffing Plan for all Personnel

WAI's organizational structure reflects our deep understanding of HazCat-III nuclear facility operations, analytical laboratory management, and labor union management. It also reflects the importance of customer interface, relationship management, ISMS, quality and process improvement.

The following sections describe our approach for staffing all personnel at the 222-S laboratory.

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A.5.1 Key Personnel

WAI has designated four Key Personnel positions. In selecting the four Key Personnel positions, WAI endeavored to identify the key areas that are critical to the successful execution of the LA&TS contract. Therefore, we have identified the following Key Personnel positions:

- Laboratory Manager
- Environmental, Safety, Health and Security Manager
- Analytical Services Manager
- Operations Manager

Our Key Personnel will provide the overall leadership, oversight, and direction for the daily operation of the 222-S Laboratory, have signed commitment letters, and are prepared to mobilize upon contract start. In selecting our Key Personnel, WAI was careful to ensure that each key staff member is widely recognized for excellence in his or her respective field. Our Key Personnel bring significant knowledge and experience in HazCat-III nuclear facility management, laboratory operations, analytical services, quality, health and safety, environmental protection, and union labor management.

Leading the WAI 222-S organization is the RFP-required Laboratory Manager. The Laboratory Manager provides overall leadership and direction for all management and execution activities.

WAI proposes Ms. Kristine Kuhl-Klinger as our 222-S Laboratory Manager. Kris Kuhl-Klinger has managed and led analytical operations at both HazCat II and III facilities as well as a radiological facility in organizations spanning routine analytical production through applied research and development. Responsibilities included managing organizations and/or programs with annual budgets in excess of $10 M. She has built contractor/performance assurance, performance measurement, QA and worker safety and health programs and led the accomplishment of VPP recognition. She has built relationships across the Hanford Site including DOE, site clients, and regulators. In addition, she has led emergency response, fact-findings, and event investigations that involved multiple stakeholders.

She is well versed in contract requirements management, interface management, radiation protection, ES&H, safeguards and security, and QA policies and practices; particularly as they relate to analytical laboratory management. She also has participated in contract negotiations, collaborative development of client agreements, and strategic as well as tactical planning.

She has demonstrated a disciplined approach to management balanced by care and concern for the health and well-being of staff, which has garnered her trust and respect from the organizations she managed. Kris will add continuity to operations, will implement performance management approaches designed to support effective decisionmaking in support of DOE requirements and expectations, and will engage and provide a stabilizing resource to the existing workforce.

WAI has designated the Environmental Safety, Health, Safeguards & Security (ESH&S) as a key position because of the importance of these scope elements to overall program management and execution. Environmental, safety, health, and safeguards and security activities are fundamental to the ability to deliver services that are safe, cost-effective, high quality, and environmentally responsible. WAI proposes Mr. Matthew Miller as our 222-S ESH&S Manager.

Mr. Miller is a Certified Safety Professional (CSP) and industrial hygienist with a varied technical background. In addition to developing and implementing successful ES&H programs (including VPP, ISMS, Worker Safety and Health, Beryllium) at DOE sites, Mr. Miller has

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experience providing daily direction to quality assurance, radiological control, regulatory compliance, and safeguards and security. Mr. Miller is also currently responsible for ES&H Industrial and Chemical Hygiene in a DOE Analytical Laboratory (X-710 at the Portsmouth Gaseous Diffusion Plant), which has performed research and development projects.

WAI has also designated the Analytical Services Manager (ASM) as a key position because of the critical technical and management role the ASM plays in the overall organization. The ASM will manage all technology deployed for both conventional and radiochemistry analytics, will be the key architect of the analytical techniques, and will implement and deliver the Laboratory Manager's vision in terms of efficiencies, technical expertise, training, quality, and methods from the bench-level up. WAI proposes Mr. Terence Romanko as our 222-S ASM.

Terry has more than two decades of experience in all aspects of laboratory environments that have been constantly stressed to deliver more impact for less dollars invested; similar to 222-S. His duties have included everything from bench work, regulatory compliance, operations management and scheduling, to client assistance with data reporting and technical issues. His career involvement in radiochemistry spans a diverse range from startup of a new environmental laboratory near the Nevada National Security Site to managing just-in-time production of short half-life raw materials for radiopharmaceuticals. Currently as technical director for the TA's St. Louis laboratory, Terry oversees the technical and scientific aspects of analytical services. He is considered the key expert in radiochemistry in the company. With hands-on knowledge of hot cell operations, counting rooms and benchtops, Terry's experiences dovetail with the knowledge needed to operate 222-S laboratory.

Finally, WAI has designated the Operations Manager (OM) as a key position because of the critical interface with union personnel and operational integration with the ASM. WAI proposes Mr. Anthony Scott as our 222-S Operations Manager.

Tony has more than 21 years of experience in technical functions at operating nuclear facilities and 26 years of nuclear facilities management, operations, training, maintenance, radiation protection, and compliance assurance within DOE and nuclear Navy facilities. As a part of senior management, he supports improvements in facility operations by exhibiting, promoting and implementing sound CONOPs principles. Tony has proven experience in the oversight of nuclear operations activities and the development of procedures/programs ensuring compliance with site-specific and DOE requirements to improve efficiency of facility operations. In addition to senior management responsibilities, Tony has developed and implemented on-the-job training for new and incumbent operators for work in hot cell and glove box environments, ensuring safety is the top priority at all times.

A.5.2 Incumbent Staff

WAI recognizes the breadth and depth of relevant experience held by incumbent staff at the 222-S Laboratory. We know that retaining many of the staff in order to reduce transition risks and challenges can add significant advantage, leverage the investment made by DOE in the training and development of these staff, and provide excellent service to our onsite clients going forward. Our strategy for retention of incumbent staff is detailed in ***Section A.2***.

A.5.3 Staffing Levels

Our Laboratory Manager will have immediate access to all staff members and reach back to the full complement of analytical capabilities, ES&H, maintenance, temporary equipment access, and planning and corporate administrative support functions at both WAI and TA.

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The WAI team has based our staffing levels on the workload estimates for 2014, the 2014 and 2013 historical actual sample numbers, and the 222-S laboratory budget projections from the various contractors on-site. A thorough review of the current staffing revealed a management-heavy organization with overstaffed task-level labor. For instance, Attachment L-6 of the RFP includes staffing for the following 25 management and supervisory positions in addition to the Laboratory Manager:

- One deputy project manager
- Five supervisors
- Three other managers
- Five program leads
- One senior program administrator
- Six program administrators
- One project director
- One senior project coordinator
- Two project coordinators

All of this management is in addition to 14 senior scientists, eight scientists and 30 bargaining unit employees.

Our review also revealed direct contract support that can be more cost effectively managed and provided via back office or corporate support, such as extensive support for project management and finance management.

Our proposed staffing level will right-size the management team and structure it for the single-purpose of leading and managing the Hanford 222-S LA&TS contract. We will utilize disciplined work control procedures that we have successfully implemented at other DOE sites to gain workforce efficiencies and effect a staff reduction at contract transition. Throughout contract execution, the WAI team will continue to look for opportunities to apply proven management tools and practices to do more with less with the 222-S workforce.

Finally, the WAI team will revise the incumbent's current practice of burdening the 222-S LA&TS contract with excessive business management resources. We will provide the appropriate level of onsite resources to ensure that regular reporting requirements are met, and DOE and 222-S customer interface management is effectively managed. All additional business management support will be provided by WAI team corporate resources in order to deliver real cost savings immediately upon contract transition while ensuring that professional, senior-level business management resources are available to the 222-S staff.

Based on the considerations above, the WAI team proposes the staffing levels presented in ***Figure A-3.*** Our organizational chart is in ***Figure A-4.***

A.6 Proposed Skill Mix and Labor Hours

The 222-S Laboratory staff requires technical analytical and management skill sets specific to their function and specialty. An active and well-conceived training program is essential to ensure that the staff is fully aware of their responsibilities with respect to all facets of ISMS, Quality, the technical analytical tasks, and the programmatic and administration tasks.

During transition, WAI will assess the current training program and identify any modified or additional training needed for each job category. From within our team we can provide extensive resources, personnel, programs, and training modules applicable for laboratory personnel.

WAI and TA bring their training capabilities as needed in the current laboratory organization for the annual training in QA, ethics, technical, ISMS, and process components. Ongoing

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technical training must be conducted to maintain the staff's proficiency to accurately produce the analytical data required.

Technical cross-training is critical. Redundancy in staff capabilities across analytical disciplines and methods to ensure that hold times will be achieved and client expectations for turnaround times are met. The need for cross training in other areas will be evaluated during transition activities.

Each position listed in ***Figures A-3*** and ***A-4*** represents one full-time equivalent (FTE) for the staffing category. Each FTE represents 2,080 hours per year, including planned time-off (holidays, vacation, sick time, etc.). The total number of hours above the baseline of work, or the "surge hours", is estimated to be 2,200, per the RFP. These projected hours are spread over a variety of staffing categories. Surges will be carefully managed to minimize overtime and continue to provide on-time delivery of analytical results.

222-S Position Title	Labor Category	Number of Personnel
Laboratory Manager	Laboratory Manager	1
ESH&S Manager	ESH&S Manager	1
QA Manager	QA Manager	1
Analytical Services Manager	Analytical Services Manager	1
Client Services Manager	Client Services Manager	1
Operations Manager	Operations Manager	1
Business Manager	Business Manager	1
Hot Cell Supervisor	Hot Cell Supervisor	1
ESH Specialist	Program Administrator	2
QA Specialist	Program Administrator	3
Analytical Services Leads	Sr. Scientists	2
Analytical Services Support	Scientists	10
Client Services Leads	Senior Project Coordinator	1
Client Services Support	Project Coordinator	3
HAMTC	Sr. Chemical Technologist	1
HAMTC	Chemical Technologist	20
Project Controls Specialist	Project Controls Specialist	1
HR Specialist	Human Resources Generalist	1
Computer Specialist	Computer Systems Analyst	1
Administrative Assistant	Administrative Assistant	2

Figure A-3: ***WAI Team Staffing Level and Labor Mix***. Our staffing levels include fewer management and support staff to more cost-effectively deliver PWS requirements

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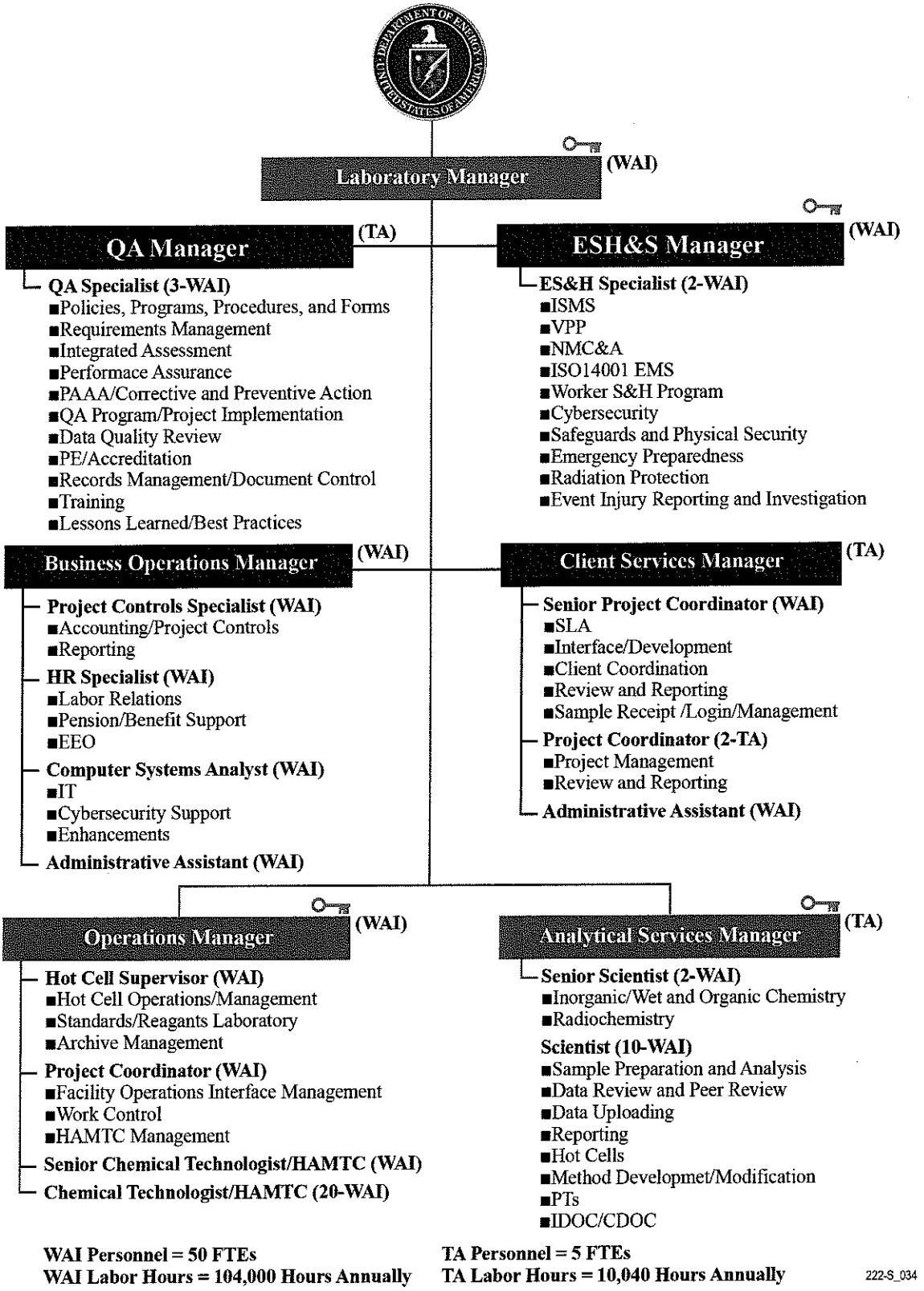

Figure A-4. ***Our Staff Organizational Chart.*** Our staff are aligned to focus on Mission Delivery.

ATTACHMENT J.13 - HANFORD SITE DATA SYSTEMS

- Automated Bar Coding of All Samples at Hanford (ABCASH) system: Site wide application used to track sample data for air filters, soil samples and vegetation samples.

- Laboratory Training System 2 (LTS2): A training record database management tool for laboratory managers.

- Tank Farms Material Service System (TFMSS): Provides automated collection, statusing and reporting of materials utilized for projects by the TOC on the Hanford Site.

- Procedure Status Tracking (PROTRAX-ATL): Tracks the status of procedures, operator aids and standing orders for the 222-S Laboratory analytical services provider.

- Training Tracking System (TRAINTRAX-222-S): A training tracking system used by the 222-S Laboratory to interface with the ITEM database and track qualification cards.

- Overtime Management System (BMS-OTM): A business management system which tracks overtime hours for the Contractor's bargaining union personnel.

- Hanford Environmental Information System (HEIS): A site wide repository of environmental data and information collected during environmental monitoring.

- Chemical Inventory Tracking System (CITS): Site wide database that keeps track of all hazardous chemicals, their locations and quantities.

- OmniLIMS™: A laboratory information management system that accumulates analytical data directly from instruments and from manual input. It also includes tools for data reduction, conversion to proper electronic formats and report generation.

- OPEXShare (OPerating EXperience Sharing): This Web site contains Hanford related operating experience articles including Lessons Learned, Safety Bulletins, Recalls, and other types of information that can be used for preventing recurrence of events, and sharing of good work practices.

- Hanford Information Systems Inventory (HISI): Site wide database tracking controlled software that is safety significant.

- Integrated Document Management System (IDMS): Hanford Site approved electronic records management tool.

- Integrated Training Electronic Matrix (ITEM): Site-wide system used to track training.

- Material Safety Data Sheets (MSDS) System: Site wide database used for retrieving Material safety data sheets for chemicals used by Hanford contracts.

- System Change Request (SCR): The SCR system maintains and stores work records for system development efforts.

- Sunflower Asset Management System (SAMS) Property Management Database.

- Computerized Accident/Incident Reporting System (CAIRS): a database for recording incidents involving injuries or requiring first aid.