



## Department of Energy

Washington, DC 20585

July 31, 1996

The Honorable John T. Conway  
 Chairman  
 Defense Nuclear Facilities Safety Board  
 625 Indiana Avenue, NW  
 Suite 700  
 Washington, D.C. 20004

RECEIVED  
 DEFENSE NUCLEAR FACILITIES SAFETY BOARD  
 JUL 31 1996

Dear Mr. Chairman:

Enclosed are the initial site-specific Corrective Action Plans for vulnerabilities and concerns identified through DOE's conduct of the Complex-Wide Review. Corrective action plans were required for each site where site-specific vulnerabilities or concerns were identified. These plans are a deliverable pursuant to the commitment in Task Initiative IV.B.6.b.2 identified in the Department of Energy's Implementation Plan, Revision I, for the Defense Nuclear Safety Board Recommendation 94-2. The site-specific vulnerabilities and concerns were identified in the *Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities*, of May 1996.

These Corrective Action Plans were prepared to identify and, as feasible, schedule actions necessary to address the sites' vulnerabilities and concerns. Closure of certain site-specific vulnerabilities depends on resolution of a related complex-wide vulnerability. Therefore, the stated site action may be only a interim measure pending the complex-wide response. The Corrective Action Plans summarize each vulnerability and concern and provide the planned actions pertinent to the described situation.

The Department has completed the actions identified under this commitment and proposes closure of the commitment.

Sincerely,

Alvin L. Alm  
 Assistant Secretary for  
 Environmental Management

Enclosure



**U.S. Department of Energy  
Office of Environmental  
Management**

**94-2 Complex-Wide Review**

**Corrective Action Plans  
Site Specific Vulnerabilities**

**July, 1996**

RECEIVED  
MAY 31 PM 5:18  
DNF SAFETY BOARD



**U. S. DEPARTMENT OF ENERGY**

**Low-Level Waste Management Task Group  
Deputy Assistant Secretary for Waste Management  
Office of Environmental Management**

## Title Page

Document Page: 94-2 Complex-Wide Review Corrective Action Plans  
Site Specific Vulnerabilities

Publication Date: July 1996

Prepared by: Martin Letourneau, Manager  
Low-Level Waste Management Task Group

Approval: Mark W. Frei  
Mark Frei  
DNFSB Recommendation 94-2  
Senior Management Officer

U.S. DEPARTMENT OF ENERGY  
Low-Level Waste Management Task Group  
Deputy Assistant Secretary for Waste Management  
Office of Environmental Management

RECEIVED  
JUL 21 1996  
DNFSB

**U.S. Department of Energy  
Office of Environmental  
Management**

**94-2 Complex-Wide Review**

**Corrective Action Plans  
Site Specific Vulnerabilities**

**July, 1996**



**U. S. DEPARTMENT OF ENERGY**

**Low-Level Waste Management Task Group  
Deputy Assistant Secretary for Waste Management  
Office of Environmental Management**

## TABLE OF CONTENTS

1.0	Executive Summary .....	1
2.0	Introduction .....	1
3.0	Organization and Management Structure to Implement the Corrective Action Plan .....	2
4.0	Summary Tables for Site Specific Action Plans .....	3

## TABS

FEMP	Fernald Environmental Management Project
HANF	Hanford Site
INEL	Idaho National Engineering Laboratory
LANL	Los Alamos National Laboratory
NTS	Nevada Test Site
ORR	Oak Ridge Reservation
RFETS	Rocky Flats Environmental Technology Site
SRS	Savannah River Site
SNL	Sandia National Laboratory
WVDP	West Valley Demonstration Project

# **ENVIRONMENTAL MANAGEMENT SITE CORRECTIVE ACTION PLANS FOR SITE-SPECIFIC VULNERABILITIES**

## **1.0 EXECUTIVE SUMMARY**

The Department of Energy (DOE), Office of Environmental Management (EM) completed an assessment of the low-level waste (LLW) management system for generation, treatment, storage, and disposal activities and programs at its sites which manage LLW. Forty-five site-specific vulnerabilities were identified across the 36 sites which were assessed. The primary purpose for and use of the site-specific vulnerabilities was to identify complex-wide vulnerabilities which were determined to be either inherent in or endemic across DOE's LLW management system and for which programmatic or complex-wide solutions would need to be developed. This analysis of the site-specific vulnerabilities was key to DOE's objective of establishing the dimensions of problems within DOE's LLW management system.

Corrective Action Plans (CAPs) for the complex-wide vulnerabilities are addressed in a separate document. Site-specific CAPs for each of the sites' vulnerabilities and concerns are provided herein. Each CAP identifies the finding, the site's response, and planned corrective actions with costs, schedules, and tracking mechanisms. These resolutions of the findings were developed by site management for those aspects of the LLW management system under a site's control. Since closure of certain of the site-specific vulnerabilities depend on resolution of a related complex-wide vulnerability, some site actions are interim measures pending implementation of the corresponding complex-wide response.

## **2.0 INTRODUCTION**

The complex-wide review involved an evaluation of LLW management activities at 38 DOE facilities at 36 sites that actively manage LLW and MLLW. The evaluations were conducted as follows:

- 1) Working Group Assessment Teams (WGATs) visited eight sites (10 facilities) which account for over 77 percent of all LLW currently managed and expected to be generated across the DOE complex over the next 20 years: Fernald Environmental Management Project, Hanford Site, Idaho National Engineering Laboratory, Los Alamos National Laboratory, Nevada Test Site, Oak Ridge Reservation (Oak Ridge National Laboratory, K-25 Site, Y-12 Plant), Rocky Flats Environmental Technology Site, and Savannah River Site. Other sites were evaluated through document reviews and interviews with cognizant DOE Headquarters, Field Office, and site personnel.
- 2) The site-specific vulnerabilities identified by the assessment teams were analyzed to identify complex-wide vulnerabilities.

- 3) Complex-wide vulnerabilities were analyzed to identify underlying causal factors, contributing causes, and inherent programmatic, technical, and institutional issues.

The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996.

The site-specific CAPs were prepared by each site to identify planned corrective actions and allow tracking of their implementation. The details provided for each action necessary to address a site-specific vulnerability/concern includes a time-line, the cost impact, and the system used to track resolution through to closure. The actions described in these site-specific CAPs are intended to resolve the findings described in Volume I and III of the Final Report. Sites and field management are responsible for tracking these actions until closure and advising EM regularly.

A site-specific CAP is required for each site where a site-specific vulnerability or concern was identified. These sites are:

- Fernald Environmental Management Project;
- Hanford Site;
- Idaho National Engineering Laboratory;
- Los Alamos National Laboratory;
- Nevada Test Site;
- Oak Ridge Reservation;
- Rocky Flats Environmental Technology Site;
- Savannah River Site;
- Sandia National Laboratory; and
- West Valley Demonstration Project.

The site-specific CAPs follow and are identified under the appropriate tabs. It should be noted that closure of certain of the site-specific vulnerabilities depends on resolution of a related complex-wide vulnerability. Therefore, the stated site action may be only an interim measure pending implementation of the complex-wide response.

This CAP is also a deliverable identified in Task Initiative IV.B.6.b.2, *Milestone: Prepare initial site-specific corrective action plans*, in the Implementation Plan responding to DNFSB Recommendation 94-2.

### **3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN**

The Office of Waste Management (EM-30) has the lead for ensuring that each site developed and implemented a site-specific CAP for the site's vulnerabilities and concerns. As noted, these CAPs have been prepared and are being implemented in accordance with DOE's Implementation

Plan for DNFSB Recommendation 94-2, Revision 1 (April 1996). The DOE Field Office Assistant Managers for Environmental Management will ensure that the vulnerability issues are effectively addressed under the planned corrective actions. For site-specific vulnerabilities that rely on closure of a complex-wide vulnerability, the appropriate complex-wide corrective actions and results which impact the sites will be incorporated into the site vulnerability resolution process.

The site personnel that are the points of contact are identified in each CAP. The HQ personnel with overall responsibility to ensure satisfactory resolution of the vulnerabilities are as follows:

<b>Role</b>	<b>Name</b>	<b>Org.</b>	<b>Responsibility</b>
Deputy Assistant Secretary for Waste Management	Steve Cowan (202) 586-0370	EM-30	Overall responsibility to ensure efforts described in the CAPs are completed. Ensures that funding is committed and the required priority is placed on the efforts.
94-2 Implementation Senior Management Officer	Mark Frei (301) 903-7201	EM-34	Provides senior management direction to implementation of the CAPs. Serves as the point of contact for raising issues to management attention including identification of needed resources.
Team Leader - Low-Level Waste Management Task Group	Martin Letourneau (301) 903-7656	EM-35	Manages and coordinates overall efforts on a day-to-day basis, including identification of resource issues. Resolves technical issues. Communicates with DNFSB staff on a regular basis.

#### 4.0 FINDINGS, RESPONSES, AND PLANNED CORRECTIVE ACTIONS

Provided below is a summary for each site-specific vulnerability/concern including the finding, the response, and the planned corrective actions for each of the site-specific vulnerabilities and concerns from Volumes I and III of the CWR Final Report. The tracking mechanism and references are provided as part of each CAP.



**FEMP CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Fernald Environmental Management Project

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
FEMP-Plant1-01	Lack of adequate covered drum storage	Inspect containers, repackage, and ship waste offsite are ongoing activities At current shipping rate of 25,750 cu ft per month, end in ten years	Ongoing	2004
FEMP-Silos-02	K-25 storage silos degradation	Construct pilot scale vitrification facility Vitrification equipment cold tests Demonstration radioactive tests Full scale process and vitrify wastes in storage	5/96 7/97 12/97	5/96 7/97 11/97 2004
FEMP-Bldg. 65-03	THORIUM OVERPACK PROJECT BUILDING DEGRADATION	approved plan for overpacking the wastes from Building 65 completion of the Operational Readiness Review (ORR) Complete Overpacking Activities	1/96 5/96 5/97	3/96 5/96 9/97
FEMP-Recycl-04	EXCESS SPECIAL NUCLEAR MATERIAL AND CONTAMINATED METALS STORED ON SITE	Memorandum of agreement Request for proposal Evaluate bids	7/94 5/96 6/96	2/96 5/96 8/96

F O I    D O R    E T I    A C T    I P I  
SUMMARY TABLE

Site Name: Hanford

Vulnerability /Concern Number	Title	Corrective Action Activities/Status	Completion Date
HAN-CJB-1	No written procedures at PNNL to cover handling of waste packages with unknown contents	Train PNNL personnel and develop procedure to characterize unknown waste.	Completed 7/1/96
HAN-CJB-2	Packaging integrity for special case waste stored at Hanford	Project Management Plan	June 1999
HAN-MLM-1	Lack of leak detection for the 340 retention basin	No corrective action planned. Recent upgrades to the basins, diverters and process sewer lines have lowered the risk of contamination in the basins and of leaks.	N/A
HAN-TRS-2	No final closure plans for active East and West LLBGs	Complete closure plans for LLBGs.	9/30/98
HAN-TRS-3	Undetermined effect of interactive source terms for LLBGs	Complete composite analysis of interacting source terms and submit to HQ. HQ approve/act on composite analysis.	12/31/97 5/31/98
HAN-DAO-1	GW pathway from the 200 East PA not addressed in the WAC for the 200 East and West Burial Grounds	Complete 200 East LLBG PA and submit to HQ. HQ approve 200 East PA. Update the WAC to incorporate 200 East PA.	8/31/96 4/30/97 7/31/97
HAN-DAO-2	Lack of WAC for accepting waste for long-term storage at the PUREX tunnels	No further shipments to PUREX tunnels without WAC or equivalent.	Completed 7/15/96
HAN-JYB-1	Storage of LLW and potential LLW exposed to the elements during environmental cleanup	Complete regulatory process to allow disposal. The schedule is controlled by EPA. Waste shipment will begin within 60 days of regulatory approval.	7/31/97 (estimate)

FEMP-AWWT-05	LACK OF EMERGENCY POWER FOR KEY OPERATIONS ASSOCIATED WITH THE ADVANCED WASTE WATER TREATMENT FACILITY	Placed installatio of backup power in the FEMP multiyear plan for prioritized implementation.	4/96	9/96
FEMP-NTS DISP-06	DIFFICULTIES ASSOCIATED WITH DISPOSING WASTES OFFSITE	Continued discussions with DOE-NV to improve disposal methods, packaging and implement cost savings actions. Continued to seek alternative disposal location and methods of handling FEMP remediation waste.	6/90 9/93	FY 05 FY 05

Concern 1	No approved PA nor implementation of planned PA maintenance exists for active LLBGs.	PAs and composite analysis will be completed per the 94-2 IP.	See 94-2 IP
Concern 2	Packaged waste in 340 Area Storage Facility lacked proper container identification.	Characterization was completed and the waste was labeled per existing procedures.	Completed

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Idaho National Engineering Laboratory

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
INEL-001	Design of Surface Water Control Systems at the Subsurface Disposal Area (SDA)	Review and reconcile existing design documentation.	10/1/1996	6/30/1997
		Evaluate adequacy of the existing system and document any proposed modifications.	7/1/1997	9/30/1998
INEL-002	Lack of a Closure Plan	Complete Draft Preliminary Closure Plan.	ongoing	9/30/1996
		Perform tests, collect moisture migration data at Engineered Barrier Test Facility.	10/1/1996	9/30/2001
		Study for Soil Characterization and Effect on Waste Forms.	10/1/1996	9/30/1998
		Waste Stabilization Study	10/1/1996	9/30/1998
		Develop Post-Closure Environmental Monitoring Plan	10/1/1997	9/30/1999
		Develop Corrective Measures Plan	10/1/1999	9/30/2000
		Closure Cover Design	10/1/1999	9/30/2001
		Finalize Closure Plan	10/1/2000	9/30/2002
INEL-003	Groundwater Monitoring for Radiological Constituents at the SDA	Revise the INEL Groundwater Monitoring Plan	ongoing	9/30/1996

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE  
(Continued)**

Site Name: Idaho National Engineering Laboratory

INEL-004	Inadequate LLW Storage Conditions/Lack of Path Forward	Repackaging and shipment of ICPP LLW	ongoing	9/30/1996
		Evaluate SCW storage options	10/1/1996	9/30/1998
		Develop and implement procedure(s) for LLW storage and radiological surveillance.	10/1/1996	9/30/1998
INEL-005	Lack of Proceduralized Requirements for the Conduct of Waste Management Compliance Team (WMCT) Audits and Follow-up Corrective Actions to Audit Findings	Finalize and implement audit procedure	ongoing	9/30/1996
		Finalize and implement Memorandum of Understanding between RWMC and WERF.	ongoing	9/30/1996
		Revise RRWAC to clarify generator follow-up corrective actions.	ongoing	2/28/1997
INEL-006	Generators May Not Be Adequately Characterizing Their Wastes for Radiological Constituents	Develop and implement uniform radionuclide characterization procedures.	1/1/1997	9/30/1997
		Assess radiological characterization at ANL-W and recommend improvements and assist TRA in issuing revisions necessary for past shipment records.	10/1/1996	9/30/1997
		Conduct follow-up assessment of radiological characterization practices of ICPP, NRF, and TAN and improve practices.	10/1/1998	9/30/2003

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE  
(Continued)**

Site Name: Idaho National Engineering Laboratory

INEL-007	Impact to Groundwater from the Interactive Source Term at the RWMC	Source term/scenario development	ongoing	12/15/1996
		Performance Analysis	1/2/1997	4/30/1997
		Options Analysis	5/1/1997	7/10/1997
		Prepare and submit Composite Analysis Report to DOE-HQ.	5/1/1997	1/15/1998
INEL-008	The INEL Performance Assessment is Not Approved	Completion of review and approval of the PA.	ongoing	8/31/1996
Condition-001	There is no objective evidence of a formal information exchange between NRF and the RWMC	Evaluate adequacy of information exchange between NRF and RWMC.	10/1/1996	6/30/1997
Condition-002	LLW is not emplaced in a systematic manner at the bulk pit	Evaluate the waste forms being disposed in the bulk pit to assess the feasibility of reconfiguring waste.	ongoing	ongoing
Condition-003	Lack of National Environmental Policy Act (NEPA) documentation for Pits 18, 19, and 20	DOE-HQ completion of essential LLW management requirements document.	ongoing	2/28/1997

**CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Los Alamos National Laboratory

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
LANL-1	Management and oversight:	1. Perform review of stored LLW inventory.	3/11/96	6/15/96
	a. Management of stored waste inventory	2. Budget and prepare waste form review and approval procedures.	3/11/96	3/31/97
	b. Management and oversight of the LLW program has not been effective	3. Characterize stored H-3 waste	7/1/96	10/1/96
LANL-2	Waste characterization and packaging:	3. Develop Laboratory standard on treatment storage and disposal facility requirements and quality assurance requirements.	8/1/96	4/1/97
	a. Waste characterization			7/31/97
	b. Waste certification program	4. Perform QA measurements of received waste at the treatment storage and disposal facility.	8/1/96	
	c. Quality assurance/Quality control for waste management is inadequate	5. Submit final PA to DOE for approval.	3/11/96	1/31/97
	d. Training of waste management coordinators	6. Review WMC Laboratory standard to ensure training is adequate.		6/15/96
	e. Adequacy of the use of "acceptable knowledge" for determining waste characteristics	7. Refer to CWV2 and CWV6.		



LANL-3	<p>Performance assessment and site characterization:</p> <p>a. Performance Assessment not approved by Peer Review Panel and DOE Headquarters</p> <p>b. Waste Acceptance Criteria and Performance Assessment not integrated</p> <p>c. Collocated sources not included in existing TA-54 Area G Performance Assessment</p> <p>d. Performance Assessment All Source Term Analysis for TA-54 Area G</p>	<p>8. Final PA Submittal</p> <p>9. PA Composite Analysis</p> <p>10. Refer to CWV6.</p>	<p>1/1/94</p> <p>6/1/96</p>	<p>1/1/97</p> <p>12/31/97</p>
LANL-4	<p>Design and construction:</p> <p>a. Waste packages dropped into disposal shaft</p> <p>b. Fire Protection at TA-54</p> <p>c. Liquid LLW Treatment</p>	<p>11. Modify fire main for Area L yard fire suppression needs.</p> <p>12. Modify liquid waste facility to ensure material discharged is less than DCGs.</p> <p>13. Evaluate need for double walled piping.</p> <p>14. Review shaft disposal operations.</p>	<p>6/1/96</p> <p>3/11/96</p> <p>3/11/96</p> <p>3/11/96</p>	<p>1/1/97</p> <p>9/1/97</p> <p>9/15/97</p> <p>6/15/96</p>
LANL-5	<p>Operations and maintenance:</p> <p>a. Control of work activities and conduct of operations</p>	<p>15. Review work control practices.</p> <p>16. Modify Radiation Work Permit forms.</p>	<p>3/11/96</p> <p>5/15/96</p>	<p>6/17/96</p> <p>9/30/96</p>

LANL-6	<p>Environmental restoration and LLW volume projections:</p> <p>a. Projected LLW volumes exceed existing disposal capacity</p>	<p>17. Continue to monitor progress of SWEIS</p> <p>18. Obtain approval for off-site disposal if SWEIS appears to be delayed or a potential problem with continued construction at the facility is discovered.</p> <p>19. Continue to develop ER volume projections based on planning that reflects DOE/ER funding.</p> <p>20. Refer to CWV1 and CWV6.</p>	<p>Ongoing</p> <p>Based on #1</p> <p>Ongoing</p>	
Concern-LANL-1	Waste packaging integrity	21. Perform review of disposal practice for cardboard and unpackaged waste.	3/11/96	5/15/96
Concern-LANL-2	Closure plan	22. Prepare separate closure plan.	7/1/96	9/30/96
Concern-LANL-3	Voids in deep disposal shafts	23. Modify disposal procedure for shaft disposal to add fill material as indicated by shaft inspections.	7/1/96	9/1/96
Concern-LANL-4	Application of the ALARA program to public exposures and environmental releases	24. Review environmental activities to determine whether additional procedures, programs, project reviews or other activities would result in exposures being reduced	3/11/96	6/15/96

## SUMMARY TABLE

Nevada Test Site

Vulnerability/Concern	Title	CA Activities/Status	Start Date	Completion Date
Adequacy of Contractor SOPs	Contractor SOPs	(1) Distribute SOP for developing procedures	01/96	7/31/96
		(2) Complete company-level documents	7/31/96	9/1/96
		(3) Complete operating SOPs	7/31/96	12/31/96
Completion of the Area 3 PA	Area 3 PA	(1) Composite Analysis for the Area 3 RWMS	09/96	09/97
		(2) Composite Analysis for the Area 5 RWMS	09/97	03/99
Analysis of LLW disposed of prior to 1988 not included in PA for Area 5 RWMS	Area 5 PA	Composite Analysis for the Area 5 RWMS	09/97	03/99
Subsidence rate of pits, trenches, and craters containing LLW	Subsidence Rates	PRP review of a study of the subsidence situation at the Area 5 RWMS; finalization dependent upon PRP input (TBD)	06/96	TBD
Side-slope stability in pits, trenches, and craters	Side-slope Stability	Correct Trench 03 (Backfill)	05/96	05/96
		Correct side slope Pit 03	07/96	09/96
		Correct side slope Pit 06	07/96	12/96

Adequacy of 5-01 road from the Mercury Highway to the Area 5 RWMS	Adequacy of 5-01 Road	Manufacturing aggregate Road construction Bridge construction	07/96 08/96 10/96	08/96 09/96 (90%) 12/96 (job complete)
Adequacy of TPCB Fire Protection	TPCB Fire Protection	Detection system procurement Detection system installation	07/96 08/96	08/96 09/96
Cleaning up and managing the ER Program's Pu-contaminated soil may create unnecessary risk to workers	Pu-contaminated soil management	ER cleanup schedule at TTR: Double Tracks Clean Slate 1 Clean Slate 2 Clean Slate 3	10/95 10/96 10/97 10/98	09/96 09/97 09/98 09/99
Evaluation of Inactive Disposal Sites which may interact with Areas 3 and 5 RWMSs	Inactive Disposal Sites	(1) Composite Analysis for Area 3 RWMS (2) Composite Analysis for Area 5 RWMS	09/96 09/97	09/97 03/99

**OAK RIDGE RESERVATION CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Oak Ridge Reservation

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
ORR-ORNL-MO-DS1	Special case waste with no disposal path forward	(1) Update SCW Inventory (2) Improve SCW Forecast (3) Identify Path Forward for Disposal (4) Identify SCW Needing Repository (5) Develop Life-Cycle Cost (6) Out-Year Disposal Goals	July, 1996 July 1996 July 1996 July 1996 July 1996 July 1996	September 1996 July 1997 September 1996 September 1996 October 1996 September 1999
ORR-OM-WT1	Emergency management planning for natural phenomenon impacting ORR LLW management facilities	(1) Complete Auditable Safety Analysis for the K-1066-H outdoor storage pad (2) Complete safety documentation for the Y-12 LLW compactor and Above Grade Storage Facility	October 1996  October 1996	August 1997  September 1997
ORR-WC-DT1	Uncharacterized legacy waste managed at the ORR	(1) Characterize K-25 Legacy Inventory (2) Develop a Project Plan to disposition the DP "in-process" wastes	October 1995 October 1996	September 1996 June 1997
ORR-MO-JA1	Lack of disposal options for LLW	(1) Implement Certification Improvements at K-25 & Y-12 Implement ORNL program (2) Establish Off-Site Disposal Options (3) Dispose PWTP Inventory	September 1994  October 1994 October 1995	Complete  June 1998 Continuing September 1997
ORR-SWSA-6-PA-ML1	Performance assessment indicators for SWSA-6 disposal facilities do not include impacts from waste disposed on-site before 1988	Develop a Composite Analysis for the IWMF	October 1996	September 1997
ORR-ER-DL1	Waste storage pads continuing release	LLW Storage Plan Development	July 1996	December 1996

Vulnerability/ ConcernNumber	Title	Corrective Action Activities/Status	Start Date	Completion Date
ORR-ORNL-MD-DS2	Process tracking and trending at ORR	(1) Implementation of Verification Procedures at K-25 and Y-12 (2) Expansion of NCR Tracking/Trending Program at ORNL	September 1995  September 1995	Complete  December 1996
ORR-IWMF-WC-CC1	Disposal curie inventory at the X-10 IWMF (Bldg 7886)	Revise WAC Reporting Requirements	July 1996	September 1996

**RFETS CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Rocky Flats Environmental Technology Site

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
RFETS-HLP-01	RFETS Path Forward Issues	1)Develop path forward for LLW/MLLW treatment/storage/disposal 2)Ship two mega-loads of saltcrete to Envirocare in FY96 (see JMC-01) 3)Ship saltcrete to Envirocare in FY97 (see JMC-01)	Fall 1995	July 1996 (10-Year Plan) Sept. 30, 1996  Sept. 30, 1997
RFETS-JMC-01	Less Waste Shipped Off-site Than Being Generated	1)Investigation of new waste disposal options 2)Ship two mega-loads of saltcrete to Envirocare in FY96 3)Ship saltcrete to Envirocare in FY97	FY96	on-going  Sept. 30, 1996  Sept. 30, 1997
RFETS-AAF/HLP/DPH/WHR-01	Large Amounts of LLW and MLLW Improperly Characterized	1) Continue safe, compliant storage of legacy waste & continue to seek disposal options 2)Characterize backlog waste with available disposal option by implementing Backlog LLW Work-off Plan 3)Complete Excess/Reactive Chemicals Management	FY95	on-going  on-going  Oct. 1996

		Plan 4)Treat 37 reactive chemicals		August 1996
RFETS-WHR-01	Projections of D&D Waste Amounts Unknown	Complete LLW and MLLW projections	Fall 1995	July 1996 (10-Year Plan)
RF-01	RCRA Permit Revisions	Incorporate suggested changes in the new RCRA Permit application		Sept. 3, 1996
RF-02	Building 964 Leaking Roof	Complete an engineering review and analysis		July 25, 1996
RF-03	Vacuum Filter Sludge Concern	1)Continue safe, compliant storage 2)Continue STP negociations with the state		on-going on-going
RF-04	Building 906 Storage Concern	Permit modifications will be sought if liquid storage is allowed in the future. No action required at this time.		N/A
RF-05	904 Pad Storage Concern	Replace tent panels as necessary.		on-going
RF-06	TRU Waste ALARA Concern	No action taken under LL/MLLW program.		N/A
RF-07	Drum Stacking Concern in Building 906	Stacking concern was resolved through the USQD process. No further action necessary.		N/A



RF-08	Storage Capacity Concern	1) Continue to evaluate conversion of existing building to storage facilities. 2) Complete Bldg. 440 conversion to LLW storage. 3) Continue waste shipments to alleviate storage capacity problems.(see JMC-01)		on-going  Nov. 1996  on-going
-------	--------------------------	---	--	---

## SUMMARY TABLE

This table lists the corrective actions planned for SRS, as well as the schedules for each.

Finding #	Title	Corrective Action/Status	Completion Date
SRS-V-96-01	Inadequate Program to Maintain and Validate PAs	<ol style="list-style-type: none"> <li>1. Publish PA maintenance guidance document.</li> <li>2. Publish PA format and content, and standard review plan documents.</li> <li>3. Implement DOE-HQ Final PA Maintenance Guidance Document.</li> <li>4. Develop a program to validate PA assumptions and results.</li> </ol>	<p>9/30/96</p> <p>1/31/97</p> <p>8 months after final guidance is issued</p> <p>7/31/97</p>
SRS-V-96 02	Undetermined Effect of Interactive Source Terms on active LLW Disposal Facility	<ol style="list-style-type: none"> <li>1. Issue guidance for conducting composite analysis.</li> <li>2. Issue a description of the process and criteria for DOE review of composite analyses.</li> <li>3. Submit composite analyses to DOE-HQ for review.</li> <li>4. Issue disposal authorization statement or direction to resolve issues or concerns.</li> </ol>	<p>Complete</p> <p>10/31/96</p> <p>9/30/97</p> <p>3/31/98</p>

SRS-V-96-03	Inadequate Program to address stored materials with no Disposal Path Forward	<ol style="list-style-type: none"> <li>1. Implement the SR-Site Treatment Plan.</li> <li>2a. Complete DOE LLW Projection Program.</li> <li>2b. Prepare privatization guidelines.</li> <li>3. Develop a plan to evaluate treatment/disposal options for currently stored LLW.</li> </ol>	<p>per STP</p> <p>12/31/96</p> <p>9/30/96</p> <p>8/30/97</p>
SRS-C-96-01	The Lack of Detailed Closure Plans for EAV	NA	NA
SRS-C-96-02	The WCB responsibilities and interfaces have not been incorporated into the WAC	1. Incorporate WCB responsibilities into the SRS IS Manual	Complete
SRS-C-96-03	No Verification is conducted for Waste Received by SWMD	1. Implement generator "	

**SNL-NM CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Sandia National Laboratories-New Mexico

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
SNL-M01	Disposal options for high-activity MLLW, and classified MLLW	<p><b>Activities:</b> This vulnerability is addressed in part by the Complex-Wide Vulnerability #5 CAP.</p> <p><b>Status:</b> There is no Site-Specific Corrective Action Plan. SNL/NM will store high activity MLLW and classified MLLW (in an LDR-treated state when possible) until disposal options become available.</p>	N/A	N/A

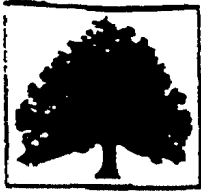
SUMMARY TABLE

SITE-SPECIFIC CORRECTIVE ACTION PLAN  
SUMMARY TABLE

SITE NAME: West Valley Demonstration Project

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
WVDP-LSA-1	Storage of low-level radioactive waste (LLW) and mixed low-level (MLLW) in tent facilities.	Construct a metal LSA-3 replacement structure	9/5/96	12/31/96

***TAB***



**Department of Energy**

**Ohio Field Office  
Fernald Area Office  
P. O. Box 538705  
Cincinnati, Ohio 45253-8705  
(513) 648-3155**



JUL 29 1996

DOE-1168-96

Mr. Martin Letourneau  
C/O Argonne National Laboratory  
1 Bank Street, Suite 250  
Gaithersburg, Maryland 20878

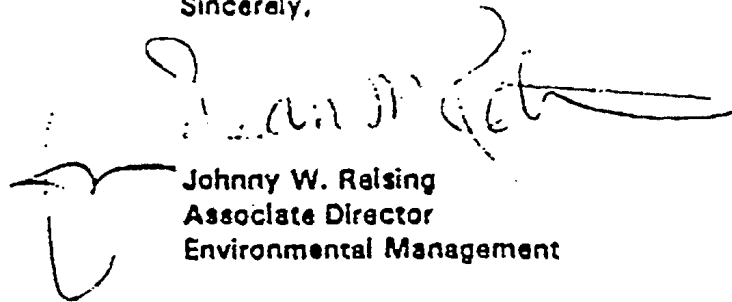
Dear Martin Letourneau:

**CORRECTIVE ACTION PLAN**

Enclosed is the Corrective Action Plan for the Department of Energy, Fernald Environmental Management Project (DOE-FEMP). Please incorporate this information into the report to be submitted to the Defense Nuclear Facilities Safety Board for Finding 94-2.

If any questions, please contact Dave Rast at (513) 648-3138.

Sincerely,



Johnny W. Raising  
Associate Director  
Environmental Management

FN:Rast

Enclosure: As Stated

cc w/enc:

R. Nace, EM-425, GTN  
L. Suttora, EM-425, GTN

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
CORRECTIVE ACTION PLAN  
FOR THE LLW COMPLEX-WIDE REVIEW**

**1.0 EXECUTIVE SUMMARY**

The Fernald site was transferred from Defense Programs to Environmental Management (EM) in 1990 and has since come entirely under the management of the Office of Environmental Restoration (EM-40). The major activities since that time have focused on managing the waste to reduce opportunities for worker and environmental exposure, decreasing reliance on storage in decrepit buildings, preparing the site for remediation, overpacking deteriorating waste containers, and shipping waste for off-site disposal. A plan has been developed to tear down all process buildings, clean up the site and release most of the land for public use in the next ten years.

The Fernald WGAT completed a LLW management system assessment by (1) inspecting facilities and operations of the existing treatment, storage, and former disposal facilities and (2) interviewing site personnel of the existing treatment, storage, and former disposal facilities. The team was provided briefings on planned treatment facilities and a planned disposal facility. Fernald site personnel estimated that the WGAT reviewed approximately 90 percent of the site's total LLW inventory. The current inventory of LLW on-site is 798,100 cubic feet (22,600 cubic meters) while the untreated projected volume of LLW is approximately 88,282,000 cubic feet (2,500,000 cubic meters).

In general, the vulnerabilities identified by the WGAT were related to off-site disposal issues or container storage issues. The site was aware and currently working on all of these issues. In some cases, the corrective actions have been delayed or extended due to funding cuts, however, these actions are still expected to continue. Only the back-up generator at the wastewater treatment facility is not expected to be funded in the near-term.

While many of the vulnerabilities address management of containerized waste and overpacking the waste, the site has worked hard to control the huge containerized waste volumes at FEMP. In five years since the site was turned over to the control of EM-40, they have managed to consolidate the majority of the waste into a few areas on site, have slowed a huge problem of leaking and deteriorating drums, and managed the waste in a manner that allows greater opportunity for inspection. Although, as noted above, the WGAT identified a number of vulnerabilities, the overall state of the LLW management at this site is considered to pose a low risk overall. Only one vulnerability, degradation of the K-65 storage silos, was found to constitute a medium risk to the public, workers, or environment.

**2.0 INTRODUCTION**

The assessment of Fernald Environmental Management Project (FEMP) was performed during the period February 26, 1996, through March 2, 1996. The assessment has been documented and



the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included treatment, storage, and disposal facilities and resulted in the review of 90 percent of the site's LLW inventory.

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan responding to DNFSB Recommended 94-2. The actions described in this CAP are intended to resolve the findings described in the FEMP Site-Specific Assessment Report in Volume III of the Final Report.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The FEMP is operated by the Fernald Environmental Restoration Management Corporation (FERMCO) under direction of the Department of Energy (DOE) through the DOE-Fernald Area Office (DOE-FN). This DOE Area Office reports to the Office of Environmental Restoration (EM-40). DOE-FN, as the site DOE representative, has the lead for ensuring that the CAP is implemented by FERMCO. EM-40 is responsible for overseeing the effectiveness of implementation of the CAP.

The following personnel are the points of contact for their respective organization:

<u>Organization</u>	<u>Name</u>	<u>Phone Number</u>
FERMCO	Mike West	(513) 648-5647
FN	Dave Rast	(513) 648-3138
EM-42	Rick Nace/Sharon Fauver	(301) 903-7219/7667

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses to and planned actions for each of the six FEMP findings from Volume III of the CWR Final Report.

---

<b>Finding No.:</b>	FEMP-Plant 1-01
<b>Finding Description:</b>	<u>Lack of adequate covered drum storage.</u> Steel drums and other containers (primarily steel waste boxes) are stored on uncovered areas and in unheated enclosures of the Plant Number 1 Waste Storage Pad. Many of the drums exhibit deterioration. Continued storage of drums under these conditions will result in additional breaches and release of LLW.

**Risk Ranking:** The risks associated with this vulnerability are low for both the worker and the environment.

**Response:** Waste management programs have been substantially upgraded for storage facilities and monitoring is continuing. Overpacking has been underway and the repacking rate and degraded container discovery rate has steadily declined.

**Planned Corrective Action:** Inspection and repacking of containers continues in order to minimize the potential for releases. FEMP will continue to ship wastes off-site. Current planning is to remove legacy waste inventories by the end of Fiscal Year 1997.

**Schedule and Costs:** With a backlog of 40,000 containers of legacy waste, and future wastes expected from remediation activities, packaging and shipment of wastes is expected for the next ten years. The offsite shipment and disposal work is being conducted under ADS 16-C3 and is now considered a routine part of site operations. The shipping rate is approximately 25,750 cubic feet per month. The FY96 estimate is that off-site shipments will involve about 40 FTEs (one DOE-FN and the balance FERMCO) now through September 30, 1996. The annual cost is estimated to be \$15,500K for FY96 and future budget cycles. Current planning is to remove legacy waste inventories by the end of Fiscal Year 1997.

**Tracking Mechanism:** This action is being tracked by the above referenced ADS as part of the site budget and management systems. In addition, DOE-FN monitors due dates through the use of the DOE-FN Action Tracking System. J. Sattler is the DOE-FN Project Manager responsible for waste packaging and shipping.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No:** FEMP-Silos-02

**Finding Description:** K-65 Storage Silos degradation A potential for collapse of the K-65 Silos exists due to severe degradation of the structure of the storage silos. The silos contain high concentrations of radium and small concentrations of thorium.

**Risk Ranking:** If the silos were to collapse, there would be a potential exposure to workers and the public and release to the environment. The risk level is considered medium for the public, workers, and environment receptors.

**Response:** The FEMP has recognized the potential risk associated with the storage silos and has been actively addressing cleanup since the site mission changed. Actions completed to date include environmental remedial action documentation under CERCLA resulting in a Record of Decision.

**Planned Corrective Action:** The current plan is to vitrify the waste and dispose of the glassified waste at the NTS. A pilot scale vitrification facility is being constructed. If the vitrification demonstration is successful, the wastes would be removed from storage in the silos thereby eliminating the hazard and resulting in a waste form suitable for offsite disposal.

**Schedule and Costs:** The pilot scale vitrification facility was completed on May 2, 1996. The current schedule is to complete the equipment tests and cold runs by July 1997. The demonstration of the vitrification process with radioactive materials is scheduled for November 1997. Development of the full scale process and vitrification of the wastes in storage is scheduled to be completed in 2004.

The total project cost is estimated to be \$257M and is being performed under ADS 49B2.

**Tracking Mechanism:** The Compliance Agreement is the primary driver to ensure the Corrective Action Plan for the silo wastes will be carried out as planned, or if vitrification would be unsuccessful, for developing a second option. J. Riesling is the DOE-FN Project Manager for the K-65 Silos responsible for ensuring the silo waste removal.

**References:**

Project Execution Plan for K-65 Silos  
Record of Decision (ROD) for Operable Unit 4, K-65 Silos  
Remedial Design/Remedial Action Plan for OU-4, K-65 Silos  
Safety Analysis Report for the Pilot Scale Vitrification Plant

---

**Finding No.:** FEMP-Bldg. 65-03

**Finding Description:** THORIUM OVERPACK PROJECT BUILDING DEGRADATION There are deteriorating containers in Building 65 which contain 30 percent thorium products such as thorium hydroxide and thorium oxalate. Some containers have been breached, and the failure of others is imminent. Waste handling is especially difficult since the drums are degraded. The drums on the bottom of the triple stacked pallets could fail, and the waste could fall through the walls of the building, resulting in an on-site release.

**Risk Ranking:** If the building wall were breached by falling drums, the receptors of a release would be workers and potentially the environment. Any environmental release would remain onsite and therefore would constitute a low risk since the entire site contains contamination and will be cleaned up shortly. Workers would only be exposed during cleanup of the drums that rupture. Since workers would be wearing protective clothing, worker risk is low.

**Response:** The FEMP has recognized the potential risk associated with the storage of thorium residues and has been actively addressing cleanup since the site mission changed. Actions completed to date building preparation and completion of the Operational Readiness Review (ORR).

**Planned Corrective Action:** The site already has an approved plan for repackaging/overpacking the wastes from Building 65, and activities began in May of 1996 after the scheduled ORR. The overpacking will be performed via robotics in order to decrease the potential for worker exposure. Due to decreased funding, this project was originally scheduled to take one year but is now scheduled to take two years.

**Schedule and Costs:** Completion of overpacking activities is scheduled for September 1998, budget in ADS 16-C3 is \$7,000K

**Tracking Mechanism:** This action is being tracked by the above referenced ADS as part of the site budget and management systems. In addition, DOE-FN monitors due dates through the use of the DOE-FN Action Tracking System. J. Trygier is the DOE-FN Project Manager responsible for thorium overpacking.

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** FEMP-Recycl-04

**Finding Description:** EXCESS SPECIAL NUCLEAR MATERIAL AND CONTAMINATED METALS STORED ON SITE Continued worker exposure is caused by excess Special Nuclear Material, and contaminated metals which are stored onsite and may not be moved offsite in the near term.

**Risk Ranking:** There is a low risk to workers from inspections, monitoring, and handling of containers. Radiological controls exist to ensure each worker's allowable exposure is not exceeded. There is a low risk to the environment from minor releases.

**Response:** Request for proposals have been issued and bid packages were received June 28, 1996 and are in evaluation. Issue has been elevated to headquarters to evaluate the storage of nuclear materials at Department Environmental Restoration sites.

**Planned Corrective Action:** There are plans to sell the Special Nuclear Material to private concerns; however, FEMP is dependent upon final negotiations between DOE and United States Enrichment Corporation. A memorandum of agreement was signed between DOE and United States Enrichment Corporation on February 23, 1996, however, the document does not identify when and how the material will be removed.

As an interim measure, FEMP will continue to store the material in safe configuration in monitored facilities. Efforts have been made to consolidate storage areas to reduce overall storage cost and impact to site decontamination and decommissioning activities.

The contaminated metals do not yet have a path forward because final cost analyses have not been completed to determine whether it is more effective to recycle the metals or declare them waste. A cost analysis methodology for metals has been reviewed by stakeholders and comments are expected to be incorporated to allow start of analyses by August 31, 1996.

**Schedule and Costs:** With no identified customers or declaration of waste or funding for disposition of nuclear material, no schedule can accurately be determined or cost of material disposition accurately estimated. Cost to waste the material could exceed \$25,000K. Annual storage cost for the nuclear material are expected to remain constant at \$2,000K.

**Tracking Mechanism:**

This action is being tracked by as part of the site budget and management systems and is funded by non Major System Acquisition funds. In addition, DOE-FN monitors due dates through the use of the DOE-FN Action Tracking System. W. Pasko is the DOE-FN Project Manager responsible for disposition of nuclear material.

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996

---



**Finding No.:** FEMP-AWWT-05

**Finding Description:** LACK OF EMERGENCY POWER FOR KEY OPERATIONS ASSOCIATED WITH THE ADVANCED WASTE WATER TREATMENT FACILITY The Advanced Waste Water Treatment Facility (AWWT) does not have an emergency generating system. Because the Plant cannot be operated manually, it must be shut down when a power outage occurs. During these shutdowns, it is likely that untreated waste water must be discharged into the Miami River, and the uranium discharge limit will be exceeded. When storm water retention ponds are near capacity, a power outage could allow untreated water to be released to the river or could cause the groundwater extraction system to be shut down.

FEMP has recognized the vulnerability and requested funding to procure emergency generating system and auxiliary compressed air, but funding was not provide because of other priorities. The emergency generators were in the original design of the facility but were not installed in an effort to reduce costs.

**Risk Ranking:** Little or no damage would be incurred by the environment in case of an exceedence of the permitted discharge limit due to dilution and because it would be a transitory occurrence. Therefore, the risk to the environment is low.

**Response:** The FEMP is on a multiple input electrical feed loop therefore the loss of all electrical power when storm water retention basins are at capacity is an unlikely scenario. Since discharge is monitored for compliance via a monthly average against the discharge limit, a discharge exceeding this limit for a short period of time would not affect compliance.

**Planned Corrective Action:** Addition of the power backup has been placed in the FEMP multiyear plan for prioritized implementation. The revised multiyear plan is currently undergoing review and Level 1 approval is expected on or before September 1, 1996.

**Schedule and Costs:** Implementation of a emergency power system is costed at 2,000K in 1996 dollars. Water treatment is part of the Operable Unit 5 area of responsibility and is funded through ADS 50-B2.

**Tracking Mechanism:** This action is being tracked by the above referenced ADS as part of the site budget and management systems. In addition, DOE-FN monitors due dates through the use of the DOE-FN Action Tracking System. R. Janke is the DOE-FN Project Manager responsible for Groundwater Remediation.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** FEMP-NTS DISP-06

**Finding Description:** DIFFICULTIES ASSOCIATED WITH DISPOSING WASTES OFFSITE DOE Order 5820.2A authorizes disposal of LLW at only DOE facilities. This Order requires FEMP to dispose of LLW at NTS. FEMP has received an exemption from this Order to dispose of certain wastes at commercial disposal facilities; however, the exemption is very specific for only certain wastes. If waste does not meet the WAC for either NTS or for commercial disposal or if NTS stops accepting all off-site wastes, then FEMP will accumulate a large backlog of waste.

**Risk Ranking:** The receptors to exposure are the workers and the environment. These are for the same reasons as the Plant 1 Pad vulnerability (FEMP-Plant 1-01). The workers are potentially exposed during constant repackaging and rehandling of wastes during demolition until a disposal facility is located. Administrative controls assure that workers do not exceed exposure limits; therefore, the risk of contamination is low. The risk to the environment is also low since the storage pads are sealed and the stormwater is treated. Airborne contamination could occur; however, it is unlikely to occur due to the daily inspections of drums and cleanup of leaks.

**Response:** FEMP representatives continue to work with Headquarters and DOE-NV to improve the waste acceptance process and reduce the cost of the waste disposal program.

**Planned Corrective Action:** FEMP to this end has continued discussions with DOE-NV to improve disposal methods, packaging and implement cost savings actions. FEMP has also continued to seek alternative disposal location and methods of handling FEMP remediation waste.

**Schedule and Costs:** Approximately 600,000 cubic feet in FY 97 cost \$22,000K funded under ADS 16-C3. Current planning is to remove legacy waste inventories by the end of Fiscal Year 1997.

**Tracking Mechanism:** This action is being tracked by the above referenced ADS as part of the site budget and management systems. In addition, DOE-FN monitors due dates through the use of the DOE-FN Action Tracking System. J. Sattler is the DOE-FN Project Manager responsible for waste packaging and shipping.

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996

---

**FEMP CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Fernald Environmental Management Project

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
FEMP-Plant1-01	Lack of adequate covered drum storage	Inspect containers, repackage, and ship waste offsite are ongoing activities At current shipping rate of 25,750 cu ft per month, end in ten years	Ongoing	2004
FEMP-Silos-02	K-25 storage silos degradation	Construct pilot scale vitrification facility Vitrification equipment cold tests Demonstration radioactive tests Full scale process and vitrify wastes in storage	5/96 7/97 12/97	5/96 7/97 11/97 2004
FEMP-Bldg. 65-03	THORIUM OVERPACK PROJECT BUILDING DEGRADATION	approved plan for overpacking the wastes from Building 65 completion of the Operational Readiness Review (ORR) Complete Overpacking Activities	1/96 5/96 5/97	3/96 5/96 9/97
FEMP-Recycl-04	EXCESS SPECIAL NUCLEAR MATERIAL AND CONTAMINATED METALS STORED ON SITE	Memorandum of agreement Request for proposal Evaluate bids	7/94 5/96 6/96	2/96 5/96 8/96

FEMP-AWWT-05	LACK OF EMERGENCY POWER FOR KEY OPERATIONS ASSOCIATED WITH THE ADVANCED WASTE WATER TREATMENT FACILITY	Placed installatio of backup power in the FEMP multiyear plan for prioritized implementation.	4/96	9/96
FEMP-NTS DISP-06	DIFFICULTIES ASSOCIATED WITH DISPOSING WASTES OFFSITE	Continued discussions with DOE-NV to improve disposal methods, packaging and implement cost savings actions. Continued to seek alternative disposal location and methods of handling FEMP remediation waste.	6/90 9/93	FY 05 FY 05

***TAB***

United States Government

Department of Energy

# memorandum

Richland Operations Office

DATE: JUL 22 1996  
REPLY TO:  
ATTN OF: AMW:PMK/96-AMW-032  
SUBJECT: HANFORD CORRECTIVE ACTION PLANS FOR DEFENSE NUCLEAR FACILITIES SAFETY BOARD (DNFSB) RECOMMENDATION 94-2 COMPLEX-WIDE REVIEW (CWR) VULNERABILITIES AND CONCERNS  
TO: Stephen P. Cowan, Deputy Assistant Secretary  
for Waste Management, EM-30, HQ

Enclosed please find the U.S. Department of Energy, Richland Operations Office (RL) Corrective Action Plans for the DNFSB 94-2 CWR vulnerabilities and concerns.

In addition to the tracking mechanism within the responsible divisions for these vulnerabilities, RL tracks all DNFSB commitments through our DNFSB Liaison in the Quality, Safety and Health Division. RL is committed to correcting these vulnerabilities and concerns to ensure all low level waste and low level mixed waste is safety stored, treated and disposed. RL has assigned a senior manager (Deputy Assistant Manager for Waste Management) to coordinate our efforts and ensure we meet our DNFSB 94-2 commitments. An electronic copy of this plan has been transmitted to Marty Letourneau to facilitate your collation of the Department's response.

If you have any questions or comments, please contact me on (509) 376-7395 or your staff may contact Pete Knollmeyer, RL's DNFSB 94-2 Coordinator, on (509) 376-7434.



John D. Wagoner  
Manager

Enclosure

cc w/encl:  
M. Frei, EM-34  
M. Harmon, EM-442  
M. Hunemuller, EM-38  
M. Letourneau, EM-35  
R. Martinez, EM-65



DNFSB 94-2

HANFORD SITE

CORRECTIVE ACTION PLAN

FOR THE LOW-LEVEL WASTE COMPLEX-WIDE REVIEW

Approved: John D. Wagoner 1/22/96  
John D. Wagoner Date  
RL Manager

**HANFORD SITE  
CORRECTIVE ACTION PLAN  
FOR THE LOW-LEVEL WASTE COMPLEX-WIDE REVIEW**

**1.0 EXECUTIVE SUMMARY**

The Hanford Site is primarily engaged in a variety of Low-Level Waste (LLW) generation, storage, treatment, and disposal activities. The bulk of the LLW currently being generated results from deactivation of facilities, decontamination of equipment, and incidental waste, such as personnel protective equipment. There is short-term LLW storage at a variety of generator sites across the Hanford Site. In addition, there is long-term LLW and Low-Level Mixed Waste (LLMW) storage at several sites [e.g., the PUREX tunnels and the Central Waste Complex (CWC)]. Treatment activities include decontamination of equipment and liquid effluent treatment. Disposal of site-generated and off-site LLW is ongoing or planned at a number of LLW and LLMW disposal facilities, such as the burial trenches and the Environmental Restoration Disposal Facility (ERDF). Environmental restoration activities are beginning to generate substantial quantities of LLW that will be disposed of at ERDF.

During 1995, Hanford managed the following volumes of waste: 8.7 million gallons of liquid LLMW were in storage at the Liquid Effluent Retention Facility (LERF), and 292,600 cubic feet (8,286 cubic meters) of LLMW and 30 cubic feet (0.83 cubic meters) of Greater than Category III LLW were in storage at the CWC. A total of 2.4 million gallons of LLMW was treated at the Effluent Treatment Facility (ETF), and the effluent containing 55 curies of tritium was disposed in a state-approved land disposal site (SALDS). A total of 491,600 cubic feet (13,922 cubic meters) of waste were disposed of in the low-level waste burial grounds (LLBG). Also, 16,000 cubic feet (450 cubic meters) of material were decontaminated at the T-Plant.

The Working Group Assessment Team (WGAT) conducted an assessment of the Hanford Site LLW management system that included inspection of operating facilities of waste generators as well as treatment, storage and disposal facilities. Additionally, the assessment included interviews with site generators and waste management personnel. The WGAT identified the following eight vulnerabilities and two concerns at the Hanford Site.

**Vulnerabilities:**

HAN-CJB-1	No written procedures at Pacific Northwest National Laboratory (PNNL) to cover the handling of waste packages with unknown contents.	Worker-low
HAN-CJB-2	Packaging integrity for special case waste stored at Hanford.	Worker-low Environment-low

HAN-MLM-1	Lack of leak detection for the 307 retention basin.	Worker-low Environment-low
HAN-TRS-2	No final closure plans for active East and West LLBG.	Public-low Environment-low Disposal facility performance-low
HAN-TRS-3	Undetermined effect of interactive source terms for LLBG.	Public-low Environment-low Disposal facility performance-medium
HAN-DAO-1	Groundwater pathway from the 200 East Performance Assessment (PA) not addressed in the Waste Acceptance Criteria (WAC) the for the 200 East and 200 West Burial Grounds.	Public-low Environment-low Disposal facility-low
HAN-DAO-2	Lack of waste acceptance criteria for accepting waste for long-term storage at the PUREX tunnels.	Worker-low Environment-low
HAN-JYB-1	Storage of LLW and Potential LLW [e.g., Investigative Derived Waste (IDW)] exposed to the elements during environmental cleanup.	Worker-low Environment-low

**Concerns:**

- (1) No approved performance assessments nor implementation of planned PA maintenance exists for the active LLBG in Hanford 200 Area East and West.
- (2) Packaged waste in the 340 Area Storage Facility lacked proper container identification.

Although a number of vulnerabilities were identified, the WGAT specified the overall state of LLW management at Richland is considered to be acceptable. None of the vulnerabilities constitutes a major or imminent threat to the public, workers, or the environment.

**2.0 INTRODUCTION**

The assessment of the Hanford Site was performed from March 4 to March 15, 1996. The assessment has been documented and results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management Environmental Safety & Health Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included treatment, storage and disposal facilities (T-Plant, CWC, LLBG, 200 ETF, PUREX tunnels), as well as generator facilities (300 Area, PUREX, Environmental Restoration).

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan responding to Defense Nuclear Facility Safety Board Recommended 94-2. The actions described in this CAP are intended to resolve the findings described in the Hanford Site-Specific Assessment Report in Volume III of the Final Report.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The DOE-RL, Deputy Assistant Manager for Waste Management (AMW) has the overall responsibility for DNFSB 94-2 actions, including coordination with other organizations within RL to ensure that the corrective actions detailed in this plan are completed per the schedule provided herein.

The following personnel are points of contacts:

<u>ROLE</u>	<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>
Hanford Site 94-2 Coordinator	Pete Knollmeyer	DOE-RL/AMW	(509) 376-7434
HAN-CJB-2	Rudy Guercia	DOE-RL/WPD	(509) 376-5494
HAN-TRS-2 HAN-TRS-3 HAN-DAO-1 Concern (1)	Allison Crowell	DOE-RL/WPD	(509) 372-2346
HAN-MLM-1 Concern (2)	Liz Bowers	DOE-RL/WPD	(509) 373-9276
HAN-CJB-1	Annette Barnard	DOE-RL/STP	(509) 372-4931
HAN-DAO-2	Rick Gonzalez	DOE-RL/TPD	(509) 373-9922
HAN-JYB-1	Mike Thompson	DOE-RL/RSR	(509) 373-0750

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses to and planned actions for each of the Hanford Site specific findings from Volume III of the Complex-Wide Review Final Report.

**Finding No.:** HAN-CJB-1

**Finding Description:** No written procedures at PNNL to cover the handling of waste packages with unknown contents

There are no written procedures implemented at the 300 Laboratories and other facilities, where appropriate, to address the necessary precautions when opening and handling containers with unknown waste contents. Lids have blown off drums during opening of drums. Radiological and hazardous constituents released from such an incident pose the potential to contaminate individuals and cause the material to become airborne and be inhaled by workers.

**Risk Ranking:** The risk associated with this vulnerability is low for the worker.

**Response:** Staff from PNNL's Waste Management Services Department have developed a written procedure that allows for the effective management of waste containers that originate from an unknown source.

**Planned Corrective Action:** PNNL waste management staff have received training in HAZCAT technology which allows for additional field screening tests to be performed on unknown contents. Procedures have been developed which allow waste management personnel to complete an initial characterization plan for those items being evaluated.

**Schedule and Costs:** Training and procedure approval were completed July 1, 1996. Cost, approximately \$7.5K

**Tracking Mechanism:** N/A

**Reference:** PNNL Operation Procedure #WMS-RWO-001, titled "Identifying Unknowns" dated and approved for use on July 1, 1996.

**Finding No.:** HAN-CJB-2

**Finding Description:** Packaging integrity for Special Case Waste stored at Hanford.

The Hanford Site has in storage at the Central Waste Complex (CWC), Purex Tunnels and generator facilities, Special Case Waste that cannot be disposed of via shallow land burial at Hanford due to its high specific activity. The concern for this waste is packaging integrity for long-term storage.

**Risk Ranking:** The risk associated with this vulnerability is low for the worker and the environment.

**Response:** RL does not manage a waste stream called "special case waste". LLW not deemed eligible for shallow land disposal is managed as Greater than Category 3 (GTC3) waste. Disposal plans for GTC3 waste, as well as Greater than Class C (GTCC) waste have not been formulated at the DOE Complex level. Continued storage of this waste represents the only available option at this time. Future storage needs will be addressed by Tri-Party Agreement (TPA) Milestone M-91-10.

**Planned Corrective Action:** Hanford's regulators are concerned that not enough storage is available to allow compliant storage of low level mixed waste prior to treatment. GTC3 waste occupies the same storage units in the CWC. RL has committed to the State of Washington, Department of Ecology that enough storage will be available to meet Hanford needs. The M-91-10 Milestone requires a Project Management Plan (PMP) be submitted to the regulators to address future storage needs required to allow for safe storage of the GTC3 waste. Disposal of the waste will await suitable repository activities, spearheaded by the LLW Program at INEL.

Until that disposal becomes available, waste stored at the CWC is inspected visually on a regular basis as required by the interim status requirements of the CWC (RCRA Part A Permit). Past experience has shown that pinhole breaches of the storage containers are infrequent. When discovered, prompt corrective action (overpacking) is performed to eliminate the integrity concern. Waste stored at Purex is described and controlled by the Purex Part B Permit. Surveillance of the wastes to monitor for conditions hazardous to workers or the environment are performed as a requirement under the Part B Permit. Wastes at generator facilities will be transferred to the Solid Waste Program which requires containers in good condition before acceptance.

**Schedule and Costs:** To be developed as part of the PMP in the M-91-10 Milestone which is due June 1999. Overpacking costs cannot be estimated due to the infrequent nature of this corrective action.

**Tracking Mechanism:**

This item will be tracked on Hanford Site "Soft Reporting" with all other Tri-Party Agreement milestones. Drum storage problems are documented as part of the operating record of the CWC.

**Reference:**

Tri-Party Agreement.

<b>Finding No.:</b>	HAN-MLM-1
<b>Finding Description:</b>	Lack of leak detection for the 340 Facility Retention Basins. There are four retention basins that hold potentially contaminated liquid prior to verification and release. The basins have no leak detection system. Without a leak detection system, a leak could go unnoticed for some period of time. (Note: The 307 facility is mistakenly called the 340 facility in the Complex Wide Review Final Report. These are two distinct facilities).
<b>Risk Ranking:</b>	The risk associated with this vulnerability is low for both the worker and the environment.
<b>Response:</b>	<p>The ES&amp;H Vulnerability Assessment Form states that, due to the age of the basins and two recent occurrence reports (RL-PNNL-PNNLNUCL-1996-0011 and RL--WHC-300LEF-1996-002) the absence of a leak detection system was identified as a weakness. These occurrence reports are for the ignitable waste PNNL accidentally discharged to the 340 Facility, Radioactive Liquid Waste System, which has a separate pipeline and is a separate system from the 307 Facility. It is clear that vulnerability applies to the 307 basins since there are four basins and they do receive potentially radioactive liquid.</p> <p>The cited Occurrence Reports are unrelated to the 307 Basins. In February 1995, the 307 Basins were upgraded to include a new lining in the basins, installed new pumps and control equipment, and improved sampling and monitoring equipment. Currently, the diverter stations at the five laboratory facilities are being upgraded to enhance contamination detection capability for waste water diverters upstream of the 307 Basins. The purpose of these diverters is to prevent radioactive waste from accidentally reaching the 307 Basins. This diverter improvement project has added a ten-fold increase in the detection capability and improved piping configuration. In June 1996, under the process sewer piping upgrade project, the retention process sewer pipeline was cleaned and relined in the 300 Area, including the pipeline upstream of the 307 Basins. This has eliminated the potential for release of contamination from the process sewer piping to the 307 basins. The improved sampling system, installed in 1995, draws a sample every few minutes from the waste water entering the basins. This sample is analyzed and verified to be free of contamination prior to pumping the basins to the 310 Effluent Treatment Facility. If contamination were discovered in the sample, corrective action is taken to remove the water from the basin to a radioactive storage container.</p>
<b>Planned Corrective Action:</b>	Plans are to continue to operate the 307 Retention Basins in accordance with DOE Order, federal, and state regulations. Non-compliances have not been identified, therefore corrective actions are not warranted at this time.



The 307 basins are not impacted by the planned shutdown of the 340 facility.

**Schedule and Costs:**

Project W-345, "307 Basin Maintenance Upgrades" completed February 1995, cost \$1.1M. Project W-353, "300 Area Diverter Station Upgrade", completion August 1996, cost \$610K. Project L-070, "300 Area Process Sewer Piping Upgrade," completed June 1996, cost \$8.9M.

**Tracking Mechanism:**

N/A

**Reference:**

N/A

**Finding No.:** HAN-TRS-2

**Finding Description:** No final closure plans for active east and west LLBG.

The active disposal burial grounds do not have at this time final closure plans. Such planning is needed to assure proper burial ground operation, management, and design of the closure system. To reduce and/or eliminate potential radiological exposure or release.

**Risk Ranking:** The risk associated with this vulnerability is low for both the public, the environment and the disposal facility performance.

**Response:** The burial ground operation plans are contained in WHC-SD-WM-ES-355, "Low-Level Burial Grounds Disposal Plans," and describe the long-term management of the various burial grounds and trenches. Implementation of trigger values from the performance assessment analyses also serve to assure continued proper management of the LLW disposal system.

**Planned Corrective Action:** Development of a LLW burial ground closure plan will be undertaken. Included in the plan will be strategy to integrate operation, management, and closure design. The Life Cycle waste volume forecast WHC-EP-0900, "FY 1996 Solid Waste Integrated Life Cycle Forecast Volume Summary, February 1996" will be utilized for both volumes and waste characteristics.

**Schedule and Costs:** The closure plan will be completed by September 30, 1998. Costs will be determined during the FY 1997 Multi-Year Work Plan (MYWP) preparations.

**Tracking Mechanism:** This item will be tracked on the "Waste Reporting and Tracking System."

**Reference:** WHC-SD-WM-ES-355, "Low-Level Burial Grounds Disposal Plan."

**Finding No.:** HAN-TRS-3

**Finding Description:** Undetermined effect of interactive source terms for LLBG. During the PA and site characterization review of the Hanford Site active disposal facilities, groundwater contamination from other sources adjacent to the active LLBG in the 200 East and West was indicated. The PA for the West Area Burial Grounds needs to consider interacting source terms. It was also indicated that potential interactive sources were not thoroughly addressed in the draft PA for the 200 East Area Burial Grounds.

**Risk Ranking:** The risk associated with this vulnerability is low for both the public and the environment. Risk to disposal facility performance would be medium.

**Response:** Under the current direction, interacting source terms are addressed in the composite analysis, not the PA.

**Planned Corrective Action:** An integrated site effort is already underway at Hanford. Hanford will complete the composite analysis by December 31, 1997. Environmental Restoration has the lead for conducting the composite analysis at Hanford.

**Schedule and Costs:** The schedule for completing the composite analysis is December 31, 1997. Costs for the LLBG portion are being developed through preparation of the MYWP. The MYWP will be signed in mid-September 1997. FY 1996 contractor costs for the burial ground portion are approximately \$80,000 (ADS 2200-0, Cost Account 1601).

**Reference:** Implementation Plan for DNFSB Recommendation 94-2 Conformance with Safety Standards at DOE Low-Level Nuclear Waste and Disposal Sites, Rev. 1, April 1996.

**Finding No.:**

HAN-DAO-1

**Finding Description:**

The WAC for the 200 East and West Burial Grounds does not address the groundwater pathway from the 200 East PA.

The WAC for the active LLBG, WHC-EP-0063-4 specifies the criteria for accepting waste for disposal for the 200 East and 200 West Burial Grounds. The WAC is primarily based on the PA for the 200 West Burial Grounds. Because the WAC is based on the 200 West PA, the groundwater pathway for exposure for the 200 East Burial Ground is not considered. This potential for exposure may lead to more stringent limits for mobile radionuclides in the WAC to ensure meeting the Performance Objectives (PO) of DOE Order 5820.2A, Radioactive Waste Management, for the 200 East LLBG.

The likelihood of exceeding the PO would be greater than 100 years. Potential for exceeding the PO would be consistent with the time frame associated with the peak dose from the radionuclides of concern for this weakness. Potential excessive releases of radionuclides from the 200 East Area Burial Grounds could result in minimal additional exposure to the members of the public, but is not anticipated at levels greater than the acceptable limits. Thus, the impact to the public would be moderate to low. The potential for increased radionuclides in the environment would be expected to be minor if the radionuclide inventories were not properly limited to meet the POs. The existing limits are based on a similar PA; therefore, the POs are not anticipated to be exceeded by much, if at all. Impact on disposal facility performance would be minimal.

The 200 East Area PA is to be reviewed by the Peer Review Panel (PRP) in the very near future. Once deemed technically adequate, the site has indicated that the WAC will be revised if necessary. Other mitigating actions by the site include minimizing waste disposal in the 200 East Area.

**Risk Ranking:**

The risk associated with this vulnerability is low for the public, the environment and the disposal facility performance.

**Response:**

The need to include the effects of the 200 East PA groundwater pathway for the 200 East Burial Grounds had been previously identified. The WAC for both the 200 East and 200 West Burial Grounds was modified following the incorporation of PRP comments into the 200 West PA. This interim measure was adopted to provide for incorporation of identified criteria. The WAC will be adjusted, as necessary when the 200 East PA results are validated.

**Planned  
Corrective Action:**

The 200 East Burial Ground PA will be submitted to HQ (and the PRP) by August 31, 1996. Although the preliminary review of the 200 East analysis shows that the current WAC are sufficient, it is premature to formally incorporate them.

Any changes to the WAC from the 200 East Burial Ground PA will be added following being considered technically adequate by the PRP.

Tracking of mobile radionuclides in each of the 200 East Burial Grounds using existing trigger concentrations will be initiated by December 1, 1996.

These actions will satisfy the vulnerability by incorporating requirements from both the 200 East and 200 West Burial Ground PA into the Hanford Site Solid Waste Acceptance Criteria (WHC-EP-0063-4).

**Schedule and Costs:**

To be completed by July 31, 1997. Cost approximately \$15,000.

**Tracking Mechanism:**

Progress towards completion of this Corrective Action will be tracked by the LLBG Program Manager and through the Fiscal Year (FY) 1997 Cost Account Plan for the LLBGs in Activity Data Sheet (ADS) 2200-0. Included in the Cost Account Plan is a schedule that is updated monthly; milestones are included.

**Reference:**

WHC-EP-0645, "Performance Assessment for the Disposal of Low-Level Waste in the 200 West Area Burial Grounds," 1995.

WHC-SD-WM-TI-730, "Performance Assessment for the Disposal of Low-Level Waste in the 200 East Area Burial Grounds (draft)," 1996.

WHC-EP-0063-4, "Hanford Site Solid Waste Acceptance Criteria," 1993.

**Finding No.:**

HAN-DAO-2

**Finding Description:**

Lack of waste acceptance criteria for accepting waste for long-term storage at the PUREX tunnels.

No WAC has been established for the storage of waste in the PUREX tunnels. These tunnels are being used for long-term storage for high-activity low-level and mixed low-level waste that has no path forward for disposal. The concern for not having a WAC in accordance with DOE Order 5820.2A is that all requirements for protection of the worker and environment are not necessarily met.

**Risk Ranking:**

The risk associated with this vulnerability is low for both the public and the environment.

**Response:**

Waste shipments to the PUREX Tunnels have recently been stopped. For wastes presently in storage, the requirements to maintain safe storage conditions that are contained in the RCRA Part B Permit apply to tunnel operations. Since these EPA requirements exceed those in DOE 5820.2A for a WAC for storage, they are considered to fulfill the Order's requirement for a WAC to adequately protect human health and the environment.

The "Hanford Facility Dangerous Waste Permit Application, PUREX Storage Tunnels" (DOE/RL-90-24) established "Waste Analysis Parameters" as part of the Waste Analysis Plan (WAP). These parameters assured that waste in storage was safe for workers and the environment and that new waste placed in the tunnels was within the scope of the facility's permit. The function of the PUREX tunnels will be to store the present inventory until the waste can be processed for final disposal. This WAP includes the following requirements:

- 1) For wastes generated at PUREX, characteristics important to safe storage such as waste form, radionuclide and chemical content, and criticality safety requirements were based on process knowledge of the characteristics.
- 2) For acceptance for storage of mixed wastes generated at facilities other than PUREX, each container was reviewed on a case-by-case basis. Sampling, chemical analysis, and/or process knowledge were required to establish the characteristics to ensure safe storage.
- 3) Liquid wastes were not generally accepted for storage in the tunnels, although small amounts of liquid mercury were permitted to be contained in thick walled thermowells within discarded dissolvers.

- 4) Discarded chemical products and wastes listed on one of the "Dangerous Waste Sources List" (Washington Administrative Code 173-303-9904) were not accepted for storage in the tunnels.
- 5) Operation of the tunnels does not involve land disposal or treatment of mixed waste.
- 6) Surveillances have been and are being performed to monitor for conditions that may pose a hazard to workers or the environment as part of the Part B Permit (DOE/RL 90-24).

Although there are high-activity and mixed wastes in the tunnels, the PUREX tunnels were designed and constructed to be thick-walled, weather-tight structures that provide the shielding and confinement necessary to protect employees and minimize potential releases to the environment. The tunnels' design provides an adequate degree of protection for the current waste inventory to allow safe operation of the tunnels and prevent significant impacts on human health and the environment.

**Planned Corrective Action:**

The acceptance of waste at the PUREX Tunnels has been stopped. In the event wastes would be considered in the future for acceptance for storage at the Tunnels, a DOE 5820.2A compliant WAC would be prepared prior to acceptance. PUREX Tunnels operations will continue to implement the requirements of DOE/RL 90-24 and perform the current facility surveillance plan to provide for minimization of the potential for exposures to workers or releases to the environment. When treatment and disposal options become available, the wastes will be dispositioned.

**Schedule and Cost:**

There are no additional costs to date that resulted from this planned corrective action. Costs for a compliant WAC would be included in the costs for acceptance of wastes at the Tunnels in the future.

**Tracking Mechanism:**

N/A

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996

**Finding No:** HAN-JYB-1

**Finding Description:** Storage of low-level and potential low-level waste [e.g., Investigative Derived Waste (IDW)] exposed to the elements during environmental cleanup.

There are no requirements for low-level or potential low-level waste (e.g., IDW) to be stored protected from the elements. Deteriorating drums and bulk uncovered waste at environmental restoration generator sites pose the potential for release of radionuclides and spread of contamination to the environment and the worker.

**Risk Ranking:** The risk associated with this vulnerability is low for both the worker and the environment.

**Response:** RL is acutely aware of the IDW which is presently stored in a condition where drums are exposed to the environment and do not have secondary containment. Aggressive actions are underway to permanently dispose of these wastes.

The IDW generally consists of drillings, cuttings, and groundwater resulting from characterization activities under the Tri-Party Agreement. These wastes were generated under Work Plan, either a RI/FS or RFI/CMS approved by the Environmental Protection Agency (EPA) or the State of Washington, Department of Ecology (Ecology), respectively. The IDW are stored under an EPA or Ecology approved Waste Control Plan; approved by the lead regulator as defined under the Tri-Party Agreement. Although the drums of the IDW are not stored with secondary containment, they are stored in a regulatory compliant manner. Such storage is temporary, pending regulatory actions required to dispose of these wastes in the recently completed ERDF. Because these IDW drums pose minimal threat to human health and the environment, it is not necessary or cost effective to move the IDW to another storage location prior to disposal. Failure of the drums is not expected in the foreseeable future.

**Planned Corrective** RL is actively working with EPA and Ecology to assure that **Action:** the required Explanation of Significant Difference (ESD) is completed by EPA for the ERDF in a timely manner. This regulatory action will allow the majority of the IDW to be disposed of in the ERDF. Regulatory actions are also required for some of the operable units that generated the wastes to allow disposal. For instance, an amendment is needed to the Ecology-issued Action Memorandum for the 100-N Pilot Project. These actions were brought before the Hanford Advisory Board on July 10, 1996. The drums will be inspected per the applicable regulatory requirements until disposal is accomplished.

**Schedule and Costs:** The Environmental Restoration Contractor (ERC) will transport and dispose of this IDW within 60 days of the approval of the regulatory



actions required for disposal. RL has established a performance fee for the ERC to assure timely permanent disposal of these wastes. Regulatory decisions and disposal are expected to be complete by July 31, 1997.

Disposal of wastes to ERDF costs approximately \$60/yd<sup>3</sup>. Some waste treatment to meet ERDF waste acceptance criteria, such as solidification of wet wastes, may be required and will be determined in the regulatory approval process. Costs for the disposal of IDW wastes are included in the existing ER baseline in the applicable 3100 and 3200 ADS.

**Tracking Mechanism:**

RL is tracking the issue in the monthly Environmental Restoration Project Review.

**References:**

Explanation of Significant Differences, ERDF ROD  
Action Memorandum for 100-N Pilot Project  
Records of Decision  
100 HR3-100KR4  
200-UP-01  
200-2P-01  
200-2P-02  
Operable Unit Waste Control Plans

**Concern (1):** Volume III, Section 3.1, Hanford Executive Summary Page 3-2

**Concern Description:** No approved PA nor implementation of planned PA maintenance exists for the active LLBG in Hanford 200 East and West Areas.

**Risk Ranking:** N/A

**Response:** The 200 West Area PA was submitted to DOE-HQ in November 1994. On June 27, 1996, conditional acceptance of the Hanford 200 West Area Burial Ground PA was obtained. In accordance with the latest policy, approval of PAs is provided through a disposal authorization statement after both the PAs and composite analysis have been completed.

The 200 East Area PA will be submitted, reviewed, and approved in accordance with the schedule in the Implementation Plan (IP) for DNFSB Recommendation 94-2.

A PA maintenance program will be implemented following issuance of the PA maintenance guidance required by Task VII. Radiological Assessments 4.b.1. of the IP for 94-2.

**Planned Corrective Action:** Submit 200 East PA and composite analysis to DOE-HQ in accordance with schedules in IP for DNFSB Recommendation 94-2, Rev. 1.

**Short-term Planned Activity:** PA maintenance activities will be established through the 1997 MYWP preparation process. Agreed upon activities will be submitted to HQ for incorporation into this CAP in September 1997.

Currently, uranium solubility studies are underway to quantify solubility values in the Hanford soil column. This study will be completed by the end of FY 1997.

Software for tracking inventory in active trenches or burial grounds has been developed. Implementation will be completed by December 1, 1996.

**Schedule and Costs:** The 200 East Area Burial Ground PA submittal to DOE-HQ is August 31, 1996. The composite analysis for Hanford is due on December 31, 1997. The costs for burial ground portion of the composite analysis are currently being developed.

The costs and schedule for PA maintenance activities are currently being developed and will be incorporated into the 1997 MYWP.

**Tracking Mechanism:** This item will be tracked on the "Waste Reporting and Tracking System."

**Reference:**

**Implementation Plan for DNFSB Recommendation 94-2  
Conformance with Safety Standards at DOE Low-Level Nuclear  
Waste and Disposal Sites, Rev. 1, April 1996.**

**Memorandum, Steven P. Cowan, EM-30, to Charles Hansen,  
RL/AMW, "Conditional Acceptance of the Hanford 200 West Area  
Burial Ground Performance Assessment," dated June 27, 1996.**

**Concern (2):** Volume III, Section 3.1, Hanford Executive Summary Page 3-2

**Concern Description:** Packaged waste in the 340 Facility lacked proper identification.

**Risk Ranking:** N/A

**Response:** The waste containers in the 340 Facility were containers of sludge removed from the process sewer during Project L-070. These containers were inside a radiation area and were in the process of being packaged, characterized, and prepared for shipment to the disposal facility per the referenced procedure. The markings on these containers consisted of bar-code labels and radioactive material tags which are required by the Hanford Site RadCon Manual, with container-specific information on each tag. These containers were labeled and stored in accordance with the referenced procedure and the Hanford Site RadCon Manual while awaiting characterization results. The characterization results showed that the radioactive levels were less than the 2 nCi/g DOT limit for radioactive material.

**Planned Corrective Action:** Upon completion of characterization, the containers were labeled according to the characterization results and shipped for storage/disposal. No additional action is required.

**Schedule and Costs:** N/A

**Tracking Mechanism:** N/A

**Reference:** WHC Procedure 340-OP-009, "Package and Load Radioactive and Mixed Solid Waste"

**HANFORD CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Hanford

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Completion Date
HAN-CJB-1	No written procedures at PNNL to cover handling of waste packages with unknown contents	Train PNNL personnel and develop procedure to characterize unknown waste.	Completed 7/1/96
HAN-CJB-2	Packaging integrity for special case waste stored at Hanford	Project Management Plan	June 1999
HAN-MLM-1	Lack of leak detection for the 340 retention basin	No corrective action planned. Recent upgrades to the basins, diverters and process sewer lines have lowered the risk of contamination in the basins and of leaks.	N/A
HAN-TRS-2	No final closure plans for active East and West LLBGs	Complete closure plans for LLBGs.	9/30/98
HAN-TRS-3	Undetermined effect of interactive source terms for LLBGs	Complete composite analysis of interacting source terms and submit to HQ. HQ approve/act on composite analysis.	12/31/97 5/31/98
HAN-DAO-1	GW pathway from the 200 East PA not addressed in the WAC for the 200 East and West Burial Grounds	Complete 200 East LLBG PA and submit to HQ. HQ approve 200 East PA. Update the WAC to incorporate 200 East PA.	8/31/96 4/30/97 7/31/97
HAN-DAO-2	Lack of WAC for accepting waste for long-term storage at the PUREX tunnels	No further shipments to PUREX tunnels without WAC or equivalent.	Completed 7/15/96
HAN-JYB-1	Storage of LLW and potential LLW exposed to the elements during environmental cleanup	Complete regulatory process to allow disposal. The schedule is controlled by EPA. Waste shipment will begin within 60 days of regulatory approval.	7/31/97 (estimate)
Concern 1	No approved PA nor implementation of planned PA maintenance exists for active LLBGs.	PAs and composite analysis will be completed per the 94-2 IP.	See 94-2 IP
Concern 2	Packaged waste in 340 Area Storage Facility lacked proper container identification.	Characterization was completed and the waste was labeled per existing procedures.	Completed

***TAB***

# memorandum

Idaho Operations Office

DATE: July 10, 1996

SUBJECT: Corrective Action Plan for ES&HLLW Vulnerabilities (OPE/WM 96-011)

TO: Martin J Letourneau, EM-33  
300/TREV

As Requested in the memorandum from Mr. Stephen P. Cowan dated June 24, 1996, regarding the subject corrective action plan, attached is the INEL draft Corrective Action Plan for the LLW Vulnerabilities Assessment for your review and comment. Please be informed that this draft is not written in the format that was attached with the June 24, 1996, memorandum. DOE-ID will correct the format of the draft by the July 19, 1996, re-submittal. Should you have any questions please contact Mr. Karl Hugo at (208) 526-5375 or myself at (208) 526-6795.



Joel T. Case, Manager  
Waste Management Program Office

cc:Mark Frei, EM-34 322/Trev

DNFSE 94-2

IDAHO NATIONAL ENGINEERING LABORATORY

CORRECTIVE ACTION PLAN

FOR THE LOW-LEVEL WASTE COMPLEX-WIDE REVIEW

Approved:

Karl Hugo  
Karl Hugo

7/30/96  
Date



**Corrective Action Plan for INEL  
Low-Level Waste Management ES&H Vulnerabilities**

Published July 1996

**Idaho National Engineering Laboratory  
Lockheed Martin Idaho Technologies Company  
Idaho Falls, Idaho 83415**

Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environmental Management  
Under DOE Idaho Operations Office  
Contract DE-AC07-94ID13223

## ACRONYMS

ALARA	As Low As Reasonably Achievable
ATR	Advanced Test Reactor
ANL-W	Argonne National Laboratory-West
CAP	Corrective Action Plan
DNFSB	Defense Nuclear Facilities Safety Board
DOE-HQ	Department of Energy Headquarters
DOE-ID	Department of Energy Idaho Operations Office
EDF	Engineering Design File
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
GWMP	Groundwater Monitoring Plan
ICPP	Idaho Chemical Processing Plant
INEL	Idaho National Engineering Laboratory
LMITCO	Lockheed Martin Idaho Technologies Company
LLW	Low-level waste
MOU	Memorandum of Understanding
MLLW	mixed low-level waste
NEPA	National Environmental Policy Act
NRC	Nuclear Regulatory Commission
NRF	Naval Reactors Facility
NR-IBO	Naval Reactors Idaho Branch Office
PRP	Peer Review Panel
PATT	Performance Assessment Task Team
PA	performance assessment
RWMC	Radioactive Waste Management Complex

## ACRONYMS

RWMIS	Radioactive Waste Management Information System
RRWAC	Reusable Property, Recyclable Materials, and Waste Acceptance Criteria
SCW	Special Case Waste
SDA	Subsurface Disposal Area
TAN	Test Area North
TRA	Test Reactor Area
USGS	United States Geological Survey
WCP	Waste Certification Program
WERF	Waste Experimental Reduction Facility
WMCT	Waste Management Compliance Team
WGAT	Working Group Assessment Team

# **Corrective Action Plan for INEL Low-Level Waste Management ES&H Vulnerabilities**

## **1.0 EXECUTIVE SUMMARY**

Idaho National Engineering Laboratory (INEL) is a multi-program laboratory whose primary mission is to provide the nation with innovative nuclear technologies and with unique scientific and engineering capabilities in non-nuclear programs that provide commercialization potential or enhance the quality of the environment. Areas of primary emphasis include nuclear reactor technology research and development, waste management and environmental restoration, advanced energy production, defense-related support, safety and health, technology transfer, education, and non-nuclear research and development projects. Low-level waste (LLW) activities at the INEL include numerous waste generators, storage facilities, three treatment facilities, and one disposal facility.

The Working Group Assessment Team (WGAT) conducted an assessment of the LLW management program in response to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-2 "Conformance with Safety Standards at Department of Energy Low-Level Nuclear Waste and Disposal Facilities". The assessment included a review of waste generators, liquid effluent treatment, storage facilities and practices, and a disposal facility with vaults and a shallow subsurface burial site. The WGAT reviewed relevant documents and conducted tours concerning these LLW operations. The vulnerabilities that the WGAT had identified were similar in nature to those self-identified by INEL and in most cases the vulnerabilities identified did not raise any issues that had not been previously brought to the attention of INEL. The vulnerabilities that INEL had identified are concerned with storage and disposal of LLW. INEL has concentrated on these vulnerabilities due to their impacts on facilities operations and environmental restoration activities.

This assessment resulted in the documentation of eight vulnerabilities and three conditions. The WGAT assessed the overall LLW/mixed low-level waste (MLLW) management program at INEL as being generally effective. As recommended by the DNFSB, a site-specific Corrective Action Plan (CAP) has been prepared and constitutes the initial site improvement activities.

## 2.0 INTRODUCTION

The WGAT conducted an assessment of the LLW management program in response to the DNFSB Recommendation 94-2 "Conformance with Safety Standards at Department of Energy Low-Level Nuclear Waste and Disposal Facilities". The assessment included a review of waste generators, liquid effluent treatment, storage facilities and practices, and a disposal facility with vaults and a shallow subsurface burial site.

The assessment of INEL was performed during the period February 26, 1996 through March 8, 1996. The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included liquid effluent treatment, storage facilities, and a disposal facility with vaults and a shallow subsurface burial site.

This CAP was prepared to meet the commitment in DOE's Implementation Plan responding to the DNFSB Recommendation 94-2 "Conformance with Safety Standards at Department of Energy Low-Level Nuclear Waste and Disposal Facilities". The actions described in this CAP are intended to resolve the eight site-specific vulnerabilities and the three conditions identified for the INEL:

### INEL Vulnerabilities

- INEL-001 Design of Surface Water Control Systems at the Subsurface Disposal Area (SDA)
- INEL-002 Lack of a Closure Plan
- INEL-003 Groundwater Monitoring for Radiological Constituents at the SDA
- INEL-004 Inadequate LLW Storage Conditions/Lack of Path Forward
- INEL-005 Lack of Proceduralized Requirements for the Conduct of Waste Management Compliance Team (WMCT) Audits and Follow-up Corrective Actions to Audit Findings
- INEL-006 Generators May Not Be Adequately Characterizing Their Wastes for Radiological Constituents
- INEL-007 Impact to Groundwater from the Interactive Source Term at the Radioactive Waste Management Complex (RWMC)
- INEL-008 The INEL Performance Assessment is Not Approved

## INEL Conditions

- Condition 001 There is no objective evidence of a formal information exchange between Naval Reactors Facility (NRF) and the RWMC
- Condition 002 LLW is not emplaced in a systematic manner at the bulk pit to minimize void space and this practice may lead to subsidence of either the operational or final cover
- Condition 003 There is a lack of National Environmental Policy Act (NEPA) documentation for Pits 18, 19, and 20

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The INEL is operated by Lockheed Martin Idaho Technologies Company (LMITCO) under direction of the Department of Energy (DOE) through the Idaho Operations Office (DOE-ID). DOE-ID as the site representative, has the lead responsibility for ensuring that the CAP is implemented by LMITCO.

The following personnel are the points of contact for their respective organization:

<u>Organization</u>	<u>Name</u>	<u>Phone Number</u>
DOE-ID	Karl J. Hugo	(208) 526-5375
DOE-ID	Jeffery N. Perry	(208) 526-7025
LMITCO	Thomas L. Clements, Jr.	(208) 526-0664

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses and planned corrective actions for each of the eight site-specific LLW management ES&H vulnerabilities identified for the INEL.

---

**Finding No.:** INEL-001

**Finding Description:** Design of Surface Water Control Systems at the Subsurface Disposal Area (SDA) Documentation is inadequate for the design of engineered structures and systems intended to prevent surface water run-on/run-off. The assessment concluded that the potential exists for precipitation run-on run-off events to inundate the LLW disposal units at the SDA; thereby posing potential releases of radioactive material.

Specific concerns regarding surface water control systems at the SDA are as follows:

Surface water run-off is collected in a sump in the operating LLW disposal unit and is transferred to the channel outside the bermed SDA area. A lack of documentation exists to support the adequacy of the design of this engineered system to drain accumulated water from a maximum precipitation event in the disposal units. This condition could result in internal flooding of the LLW disposal unit which in turn could allow the release of the LLW into the environment.

The SDA is located in a topographical low to the surrounding surface water drainage patterns. INEL has constructed an earthen berm or dike to prevent surface water run-on in response to its location. This berm has been surveyed as to location and height, but no as-built drawings exist as to its design and construction specifications. A diversion channel has been constructed to allow surface water to drain around the SDA.

A diversion dam has been placed on the Big Lost River to influence the natural surface water drainage patterns. These water spreading areas are also diked to prevent a backflow of water to the RWMC. Two hydrologic studies have been conducted to address

the adequacy of the berm at the SDA in the event of the probable maximum flood event. These studies have conflicting conclusions and have not provided definitive evidence as to the efficacy of the berm on the diversion controls for the Big Lost River. This condition could result in an external flooding of the SDA which in turn could allow the release of LLW into the environment.

**Risk Ranking:**

The assessment rated the vulnerability as a medium risk level for the performance of the disposal facility. The assessment rated the vulnerability as a low risk level for workers and the environment. Risk from the vulnerability was determined to be not applicable to the public.

**Response:**

It should be noted that the collection sump referred to in the first specific concern is not in the operating LLW disposal unit, but is in a topographical low point near the SDA east access road gate. The pumping station was installed to enhance drainage of the SDA in addition to a gravity flow discharge system. The SDA Pumping Station Design (EDF RWMC 194), provides design criteria for the SDA drainage pumping station.

The United States Geological Survey (USGS) is currently reviewing flood plain studies related to the RWMC. The USGS determined the *Flood Evaluation Study of RWMC at INEL* (Dames and Moore 1993) for the Radioactive Waste Management Complex, Idaho National Engineering Laboratory, 100 year flood plain study is credible and is satisfactory for future use<sup>a</sup>. The Dames and Moore study concludes that the SDA perimeter engineered barriers (dikes) will withstand a 100 year flood event. The USGS is still considering the Dames and Moore analysis of 500 year plus storm/flood events.

The SDA has been flooded three times in the past (February of 1962, January of 1969, and February of 1982) by local runoff from rapid spring thaws. Since 1982, the SDA drainage system has been significantly upgraded. New larger drain culverts were installed,



basalt was removed to enlarge the main drainage channel, berms were constructed around open excavations, the SDA surface was contoured to promote drainage, and existing dikes were raised in height. Various documentation of SDA drainage system upgrades such as Engineering Design Files (EDFs) need to be reviewed and reconciled with the as built status.

**Planned**

**Corrective Action:** INEL will assess all existing documentation regarding the SDA drainage system and will reconcile design documentation as necessary. Furthermore INEL will evaluate the adequacy of the existing system against the appropriate requirements which depend in part on the outcome of the ongoing floodplain study review and propose modifications to the existing drainage system as necessary.

**Schedule and Costs:** Review and reconciliation of existing design documentation will be completed by 3Q FY 1997. Once the ongoing floodplain study review is completed, the adequacy of the existing system will be evaluated. Any proposed modifications will be documented by the end of FY 1998. The cost of generating as-built drawings, specifications, and reconciling information contained in numerous documents is estimated to be \$75K. Costs of further evaluation of the SDA drainage system and any proposed modifications are dependent on the outcome of the ongoing flood plain study work and are unavailable at this time. The proposed corrective action constitutes additional work scope.

**Tracking Mechanism:** LMITCO is adding milestones at the Control Account level (WBS-23601) in ADS 4311-02 to track the above corrective actions.

**References:** SDA Pumping Station Design (EDF RWMC 194); SDA Interior Drainage Design (EDF RWMC 252); Evaluation of Cover and Drainage Improvements for Interim Stabilization of the Subsurface Disposal Area at the INEL RWMC (EDF BWP-SC-03); Dames and Moore, 1993, *Flood Evaluation Study of the Radioactive Waste Management Complex*, Idaho National Engineering

Laboratory, Idaho Falls, ID; SDA Perimeter Maintenance Plan (EDF-RWMC-270); The RWMC Facility Drainage Site Plan (Drawing No. 175608, 6/20/96); <sup>a</sup>Letter of May 24, 1996, C. Parrett, Supervisory Hydrologist USGS to G. Sehlke, LMITCO; EG&G, 1992, *Conceptual Design for Surface Water Drainage Control Upgrades for the RWMC, Watershed and the Transuranic Storage Area*, EGG-ESQ-9994, August 1992; EG&G 1993, A-E Construction Specification, RWMC Local Runoff Flood Channels, A-ECS-40643, September 1993.

---

**Finding No.:** INEL-002

**Finding Description:** Lack of a Closure Plan INEL lacks a closure plan for the implementation of a design of a final cover system. The cover system design must be consistent with the performance objectives of the performance assessment (PA). The lack of a closure plan is of concern when operations cease at the LLW disposal facility.

**Risk Ranking:** The assessment rated the lack of a closure plan as a low risk level for both the environment and the performance of the disposal facility. Risk from the vulnerability was determined to be not applicable to site workers or the public.

**Response:** INEL is aggressively pursuing development of a comprehensive Closure/Post Closure Plan for the SDA. A draft preliminary closure plan has been developed and will be completed in the current fiscal year. The final closure plan must be approved prior to closing the current disposal operations as required by DOE Order 5820.2A and as requested by the State of Idaho<sup>a</sup>. The final Closure/Post Closure Plan will also include the site security and D&D plan for the SDA.

To date, INEL has taken significant steps toward development of a final closure plan for the SDA. In 1991 a task to evaluate

Engineered Barriers for the closure cover of the RWMC SDA was initiated. Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) design guidance documents were consulted in the selection of closure cover alternatives for the RWMC SDA. Neither set of guidance is binding on DOE, but both provide more detailed design guidance than the closure cover guidance provided in DOE Order 5820.2A "Radioactive Waste Management". An adaptation of the CERCLA process for identification and screening of remedial alternatives was used for evaluating closure cover design alternatives. Data needs for detailed analysis and four design alternatives were identified, and field testing of two of the four alternatives identified was proposed. In FY 1996, INEL completed construction of the Engineered Barriers Test Facility and system tests are currently being performed.

#### Planned

#### Corrective Action:

The development of a comprehensive closure plan is a long-term sequential process that requires site-specific studies and demonstrations to ensure adequate performance. INEL will perform the following activities to complete the development of a final comprehensive closure plan:

**Engineered Cover System:** The selection of an engineered closure cover will involve performance testing and analysis of several types of closure covers. A final cover for application at the SDA will be selected on the basis of test data. Evaluation of engineered barriers for the closure cover at the SDA was initiated in 1991. The Engineered Barriers Test Facility was completed this year and system tests have started.

#### **Soil Characterization and Waste Stabilization Methods:**

Characterization of the soil and its effects on waste forms is fundamental to assessing and improving the performance of the LLW disposal units at the SDA. Site specific methods for stabilization of the waste disposal zones and waste units are a

fundamental aspect of closure. The determination of waste stabilization methods will remove the most tenuous aspect of the closure system. The site specific stabilization methods will be included in the Closure Plan.

**Environmental Monitoring Plan:** Post-closure monitoring will be required at the LLW disposal site for at least 100 years per DOE Order 5820.2A. An Environmental Monitoring Plan will be developed for the LLW disposal units at the SDA to provide early warning of potential closure system failure thus allowing for timely remedial response.

**Corrective Measures Plan:** A Corrective Measures Plan will be developed to identify corrective actions that must be taken during the post-closure period to mitigate any release of radioactivity from the disposal facility. The plan will be based on the results of the PA and environmental monitoring data.

**Final Closure Plan:** Finalization of the Closure Plan will incorporate the information from all of the other closure activities discussed above. Final closure cover design will be the last closure activity to be incorporated, when the results of tests from the Engineered Barriers Test Facility will be used in the final cover design.

**Schedule and Costs:**

INEL has scheduled work to perform tests and collect moisture migration data from the test plots at the Engineered Barriers Test Facility until FY 2001 when the closure cover design is scheduled to be completed. The study for soil characterization and soil effects on waste forms is scheduled to be conducted in FY 1997 and FY 1998. The Waste Stabilization Study is also scheduled to be performed in FY 1997 and FY 1998. The development of the Environmental Monitoring Plan is scheduled to be performed in FY 1998 and FY 1999. The development of the Corrective Measures Plan is scheduled to be conducted in FY 1999 and FY 2000. Final closure cover design is scheduled for development in

FY 2000 and FY 2001 with final tests on the closure cover test plots being concluded in FY 2001. The cost of developing the comprehensive Closure/Post-Closure Plan for the SDA is estimated to be \$1.9M over the next 6 year period and does not constitute additional work scope.

**Tracking Mechanism:** The closure Plan activities are tracked at the Control Account level (WBS-23601) in ADS 4311-02.

**References:** <sup>a</sup>Letter of November 15, 1993, S. R. Hill, State of Idaho to A. A. Pitrolo, DOE-ID, "Low-Level Waste Disposal Practices at the Subsurface Disposal Area"; *Draft Preliminary Closure Plan for the SDA Active Low Level Radioactive Waste Disposal Area*, INEL-96/0215, LMITCO, May 1996; Letter of June 12, 1996, T. L. Clements, Jr., Manager LMITCO Transuranic Waste Department to J. T. Case, Manager, Waste Management Programs, DOE-ID, "REPORT ON COMPLETION OF CONSTRUCTION OF ENGINEERED BARRIERS TEST FACILITY", TLC-50-96; LMITCO Work Package Documentation: "5820 Implementation Planning Support, LLW Technical Support", May 1996.

---

**Finding No.:** INEL-003

**Finding Description:** Groundwater Monitoring for Radiological Constituents at the SDA  
Although groundwater monitoring is performed at the RWMC for specific radiological parameters; the groundwater monitoring plan for the RWMC is not consistent with the radiological constituents of concern identified in the PA. Specifically <sup>3</sup>H (tritium), <sup>129</sup>I, and <sup>99</sup>Tc are identified by the PA as radiological constituents of concern; however, these parameters are not included in the current groundwater monitoring plan for the RWMC. The inconsistency is an indication of the potential for releases from the disposal facility that would not be identified in a timely manner. There is an apparent lack of program interaction to provide periodic review

and revision of the groundwater monitoring plan to include all potential radiological constituents of concern based on the source term for the site.

**Risk Ranking:**

Inconsistencies in groundwater monitoring were assessed as a low risk for both the environment and the performance of the disposal facility. Risk from inconsistencies in groundwater monitoring is not applicable to workers or the public.

**Response:**

INEL has an established Groundwater Protection Management Program (DOE 1993a) which meets the requirements of DOE Order 5400.1 *General Environmental Protection Program*. Under the Groundwater Protection Management Program, INEL developed a Groundwater Monitoring Plan (GWMP) to fulfill the groundwater monitoring requirements of DOE Order 5400.1 (DOE 1993b). The INEL GWMP is a dynamic document which is modified as necessary to reflect evolving requirements, to incorporate new information, and to accommodate the changing needs of DOE programs. As required by DOE Order 5400.1, the plan identifies all DOE requirements and regulations applicable to groundwater protection and provides a comprehensive monitoring strategy.

**Planned**

**Corrective Action:**

The PA for the RWMC was not completed until 1994, after the GWMP was issued in 1993; therefore, monitoring concerns raised in the PA were not initially incorporated into the GWMP. The INEL Groundwater Monitoring Program is currently in the process of making the first revision of the GWMP<sup>a</sup>. The revision of the plan is being performed to allow facilities and programs to make input specific to their monitoring requirements. Based on PA results, a monitoring program for radionuclides of concern was initiated in FY 1996 in conjunction with the USGS. The inconsistencies in the GWMP will be corrected by incorporating the newly established monitoring program for the PA into the GWMP.

**Schedule and Costs:** The ongoing revision of the GWMP is scheduled to be completed by September 30, 1996. Subsequent periodic revision of the elements of the INEL Groundwater Protection Management Program including the INEL GWMP will be performed as required by DOE Order 5400.1. The cost estimate for revising the INEL GWMP is \$63K. The revision of the GWMP is a planned activity and does not constitute additional work scope.

**Tracking Mechanism:** Periodic review and revision of INEL Groundwater Protection Management Program elements is required by DOE Order 5400.1. The GWMP activities are tracked under ADS 4313-01.

**References:** DOE, 1993a, *Groundwater Protection Management Program*, U. S. Department of Energy, Idaho Operations Office, DOE/ID-10274, March 1993; DOE, 1993b, *Idaho National Engineering Laboratory Groundwater Monitoring Plan*, U. S. Department of Energy, Idaho Operations Office, DOE/ID-10441, June 1993; <sup>a</sup>LMITCO Interdepartmental Communication of June 10, 1996, M. V. Carpenter to Distribution, "INEL GROUNDWATER MONITORING PLAN REVISION REVIEW REQUEST", MVC-04-96.

---

**Finding No.:** INEL-004

**Finding Description:** Inadequate LLW Storage Conditions/Lack of Path Forward There is no path forward for the planned and current generation and storage of LLW at INEL. Forecasted LLW generation greatly exceeds the disposal capacity of the RWMC. Opportunities for waste minimization and pollution prevention are not being pursued in an aggressive manner. Special case waste (SCW) generated by reactor operations is being stored indefinitely. LLW is being stored on-site in various ad-hoc locations and lacks engineering controls to prevent personnel exposure or environmental releases.

Specific concerns regarding LLW storage are as follows:

Blocks of contaminated beryllium are currently being generated and stored at the Advanced Test Reactor (ATR) that exceed the limits of DOE Order 5820.2A (Greater Than Class C waste) and are treated as SCW. These blocks are not acceptable for disposal at the RWMC.

D&D activities at the Idaho Chemical Processing Plant (ICPP) have created over 2000 boxes of LLW with no disposal path determined. These boxes are in varying stages of disrepair. At one storage area at the ICPP, boxes of LLW were found with the lids partially open (warped wooden covers) exposing the contents to the elements. Radiation surveys of these same boxes were last completed in October 1993.

**Risk Ranking:**

The inadequate LLW storage conditions and lack of a path forward was rated as a low risk to workers and the environment. Risk to the public and disposal facility performance is not applicable.

**Response:**

INEL is in the process of evaluating current and future LLW storage and disposal options. INEL will conduct a comprehensive inventory of all LLW presently in storage across the INEL. Cost-benefit analysis will be performed to evaluate disposition of each LLW stream generated at the INEL. Site-wide LLW minimization and recycling initiatives are being evaluated.

**Planned**

**Corrective Action:**

Problems associated with on site storage of LLW will be corrected through development of company level procedure(s) that provide uniform site-wide requirements for LLW storage including engineering controls, container management and integrity requirements, as well as radiological surveillance requirements for stored LLW.



A disposal path has been determined and implemented for the boxes of LLW at ICPP. The boxes will be repackaged and then are to be shipped for disposal at an off-site LLW disposal facility (Envirocare facility in Utah).

A task to evaluate SCW (e.g. beryllium blocks) storage options is planned to be initiated in FY 1997. This task will investigate storage requirements and propose a preferred storage alternative for long-term storage of SCW that cannot be disposed at RWMC. Options include use of several facilities, consolidation to a single INEL facility, or shipment to an off-site DOE-owned facility.

To effectively address LLW minimization and recycling, INEL is evaluating the following initiatives: (a) incentivize waste minimization by implementing a full recovery charge back system; create a program which establishes a contaminated tool/equipment pool; and require the Radiological Control organization to use reusable material where practicable (b) use volume efficient waste disposal containers such as "zero clearance" (i.e., no bottom spacers) metal boxes instead of the currently used wooden boxes and square 71 gallon drums instead of the round 55 gallon drums.

**Schedule and Cost:**

The company procedure(s) for LLW storage will be developed and implemented in FY 1997 and FY 1998. The repackaging and shipment of the ICPP LLW is scheduled to be completed by the end of FY 1996. Evaluation of SCW storage options is planned to be initiated in FY 1997. The cost of repackaging and shipment of the ICPP LLW is estimated to be \$750K. The cost of evaluation of SCW storage options is estimated to be \$188K. Both of the above activities are planned and do not constitute additional work scope. The estimated cost of developing a comprehensive inventory of all LLW presently in storage across the INEL, performing cost-benefit analysis of each LLW stream generated at the INEL, and developing site-wide procedures is \$130K. These activities constitute additional work scope.

**Tracking Mechanism:** Repackaging and shipment of the ICPP LLW is tracked under ADS 4301. The remaining activities will be tracked under ADS 4311-02 in Control Account 23601.

**References:** ADS 4301 and ADS 4311-02.

---

**Finding No.:** INEL-005

**Finding Description:** Lack of Proceduralized Requirements for the Conduct of Waste Management Compliance Team (WMCT) Audits and Follow-up Corrective Actions to Audit Findings At INEL there is a potential for lack of appropriate LLW generator oversight which could allow disposal of unacceptable wastes that might adversely affect the ability of the disposal facility to meet its performance objectives. Requirements for the conduct of waste management audits of LLW generators, including follow-up corrective actions to audit findings, have not been proceduralized. The audits must be conducted on a periodic basis by the WMCT to meet the requirements of Section 2.3 of the INEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC).

A specific concern regarding the vulnerability was noted. The audit of the Waste Experimental Reduction Facility (WERF), Audit Number DLH-37-95, conducted on August 1, 1995, resulted in a Category II finding. This finding indicates the WERF had not developed a Waste Certification Program (WCP) for the LLW generated during waste processing at the WERF. This finding documented on Quality Program Report No. WMCT-643, remains open. While interviewing INEL personnel, including a RWMC Generator Interface, and a WMCT Auditor, the WGAT determined that an impediment to closing this finding is that WERF management, contrary to DOE 5820.2A, Definition 40, and Section 111.3.e, does not consider waste processing at the WERF,

with the exception of incineration, to be a point of generation of LLW.

**Risk Ranking:**

The assessment rated the vulnerability as a low risk for the performance of the disposal facility. Risk is not applicable to the public, worker, or environment.

**Response:**

WERF is not considered by LMITCO management to be a generator in regard to compacting and sizing operations which provide intermediate volumetric processing capability prior to disposing the waste at the RWMC<sup>a</sup>. WERF is considered a generator with respect to WERF-incinerated waste. WERF-incinerated waste disposed at the RWMC experiences the full characterization process as required by the INEL RRWAC and is handled with WERF classified as the waste generator.

**Planned**

**Corrective Action:**

A procedure for the conduct of waste management audits of LLW generators at INEL has been drafted<sup>b</sup>. The site-wide procedure will be issued as a LMITCO company procedure. The LMITCO draft audit procedure will undergo LMITCO Environmental Management Branch and company-wide review prior to issuance. In addition to the audit procedure, a revision will be submitted to the RRWAC to clarify the requirements that the LLW generators complete the follow-up corrective actions from the audits.

Since WERF is not considered a generator for the case described above and the generic RRWAC therefore does not apply, RWMC is requiring a Memorandum of Understanding (MOU) be generated and approved by both WERF and RWMC management. The MOU will provide specific criteria along with a process accounting for waste stream characteristics and activity content of all waste disposed of at the RWMC. The MOU is currently being negotiated. Completion of the MOU will constitute closure of finding WMCT-643.

**Schedule and Costs:** The LMITCO draft audit procedure will undergo LMITCO Environmental Management Branch and company-wide review in July of 1996. The formal procedure is expected to be issued as final by September 30, 1996. The RRWAC revision request will be submitted by July 31, 1996, and is scheduled to be completed by February of 1997. The MOU is scheduled to be completed and implemented by the end of the current FY. The cost of developing the audit procedure is estimated to be \$2K and does not constitute additional work scope.

**Tracking Mechanism:** The development of the audit procedure is tracked at the Control Account level (WBS-28201) in ADS 4301.

**References:** <sup>a</sup>Interdepartmental Communication of December 12, 1995, G. E. Ellis, General Manager, LMITCO Environmental Management to Distribution, "Waste Experimental Reduction Facility (WERF) Generator Status", GEE-126-95; <sup>b</sup>Draft Procedure for Waste Management Compliance Audits (in revision).

---

**Finding No.:** INEL-006

**Finding Description:** Generators May Not Be Adequately Characterizing Their Wastes for Radiological Constituents Generators of LLW at INEL may not be adequately documenting and justifying radioisotope distributions and radiological quantification methods for their respective waste streams. Therefore, compliance with the performance objectives in the PA may be compromised.

**Risk Ranking:** The assessment rates the inadequate characterization practices as a low risk for the performance of the disposal facility. Risk to the public, workers, and the environment is not applicable.

**Response:** INEL is in the process of improving generator practices for radiological characterization of LLW waste. The work scope of

the effort has been defined through 2003. The ongoing work involves assessing INEL LLW waste generator practices for characterizing LLW and then assisting generators in improving the characterization practices to provide adequate radionuclide data regarding their past, present and future LLW shipments. The characterization data in turn will be used in the RWMC PA. The recently held INEL LLW value engineering session identified additional efforts that will improve radionuclide inventory practices. Results of the value engineering session concluded that INEL should establish a program to adequately characterize major radionuclides of interest. Adequate radionuclide characterization will require defining adequate radionuclide characterization and defining adequate process knowledge. The proposed value engineering resolution recommended that INEL implement a team approach for review and development of the WCP for ongoing and one-time waste streams. The team will use a graded approach to develop adequate requirements for each waste stream. The waste stream requirements will be reviewed on an annual basis in accordance with the RRWAC. The proposed value engineering resolution also recommended future characterization efforts include only radionuclides of concern, i.e., as required by the PA, transportation requirements (49 CFR 173), and manifesting requirements (10 CFR 20). Based on PA results, a list of critical radionuclides will be developed. A team approach will be employed to determine which radionuclides must be measured as part of a waste stream characterization. Guidance will be developed for activity limits of any given radionuclide that must be reported based on the PA for the RWMC.

**Planned**

**Corrective Action:**

INEL will develop and implement uniform radionuclide characterization procedures to ensure waste disposed at the RWMC is adequately characterized. Additionally, previously planned work for the near term includes (a) assessing radiological characterization practices at Argonne National Laboratory-West (ANL-W) and recommending improvements necessary to provide

adequate data regarding future LLW shipments; and (b) assisting the Test Reactor Area (TRA), which was previously evaluated (Akers et al. 1994, Randolph and Akers 1995), to issue revisions necessary for past shipment records regarding the radionuclide inventory in the Radioactive Waste Management Information System (RWMIS). Outyear radionuclide characterization work includes activities to assess the radiological characterization practices of the remaining LLW generators at the INEL: ICPP, NRF, and Test Area North (TAN). Additionally, the planned work includes activities that will be performed to induce all INEL generators to improve their practices sufficiently to provide satisfactory radionuclide data regarding all their past and future LLW shipments.

**Schedule and Costs:**

Development and implementation of uniform radionuclide characterization procedures will be completed in FY 1997. Planned work for FY 1997 includes: (a) assessing radiological characterization practices at ANL-W and recommending improvements; and (b) assisting the TRA to issue revisions necessary for past shipment records regarding the radionuclide inventory in the RWMIS. Follow-up assessment of the radiological characterization practices of ICPP, NRF, and TAN is scheduled to be conducted from FY 1998 through FY 2003. The cost of the planned activities is estimated at \$854K and does not constitute additional scope. The cost of development of uniform radionuclide characterization procedures is estimated to be \$130K and constitutes additional work scope.

**Tracking Mechanism:**

All radionuclide characterization efforts are tracked under ADS 4311-02 in Control Account 23601.

**References:**

Ackers, D. W., Randolph, P. D., and Ottewitte, E. H., 1994, *Evaluation of INEL Facilities' Low-Level Waste Characterization Practices, Part 1: Advanced Test Reactor*, EGG-WM-10987, September 1994. Randolph, P. D. and Ackers, D. W., 1995,

*Evaluation of INEL Facilities' Low-Level Waste Characterization Practices, Part 2: Test Reactor Area Evaluation, June 1995.*

---

**Finding No.:** INEL-007

**Finding Description:** Impact to Groundwater from the Interactive Source Term at the RWMC The interactive source term from the active disposal pits and WAG-7 has not been developed. Furthermore the total source term for WAG-7 is undetermined because historical data are insufficient.

**Risk Ranking:** The assessment rated the lack of an interactive source term analysis as a medium risk for the environment as well as the performance of the disposal facility. Risk to the public from this vulnerability was ranked as low. Risk to workers from the lack of an interactive source term was determined to be not applicable.

**Response:** Per the recommendations of the DNFSB, INEL is preparing a composite analysis to account for radionuclide sources at the SDA not originally required for evaluation by DOE Order 5820.2A, i.e., the interactive source term at the SDA. Whereas DOE Order 5820.2A specifies that PAs are required only for waste disposed after September 1988, the current PA for the RWMC includes LLW disposed from 1984 onward.

Extensive inventory analysis of historical data (LITCO 1995) on wastes disposed in the now inactive portion of the SDA (WAG-7) has been performed by INEL Environmental Restoration. The inventory analysis covers radiological and nonradiological contaminants in waste disposed in the SDA from 1952 through 1983. The existing ER data will be used to facilitate the composite analysis of the SDA source term.

Planned

**Corrective Action:** The DOE-Headquarters (HQ) guidance for performing composite analyses (DOE 1996) was issued in April of 1996. Phase I of the SDA composite analysis effort, "Source Term/Scenario Development", has commenced. The second phase of the composite analysis will be the Performance Analysis, and the third phase will be the Options Analysis. A Composite Analysis Report will be prepared and submitted to DOE-HQ.

**Schedule and Costs:** Phase I "Source Term/Scenario Development", was initiated on April 15, 1996 and is scheduled to be completed in December 1996. Phase II "Performance Analysis" is scheduled to be performed from January through April of 1997. Phase III "Options Analysis" is scheduled to be conducted from May to July of 1997. The Composite Analysis Report is scheduled to be developed from May to December of 1997, with submittal to DOE-HQ scheduled for January 1998. The estimated cost of the composite analysis activities is \$258K. The composite analysis is planned activity; however, \$187K constitutes additional scope based on revised guidance issued in April 1996.

**Tracking Mechanism:** The composite analysis efforts are tracked under ADS 4311-02 in Control Account 23601.

**References:** LITCO, 1995, *A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1952-1983*, Lockheed Idaho Technologies Company, INEL-95/0310, August 1995; DOE, 1996, *Guidance for a Composite Analysis of the Impact of Interacting Source Terms on the Radiological Protection of the Public from Department of Energy Low-Level Waste Disposal Facilities*, U. S. Department of Energy, April 1996; Memorandum of April 10, 1996, J. T. Case, Manager, Waste Management Programs, DOE-ID, to M. Frye, DOE-ID, "Comments on DNFSB 94-2 Implementation Plan Resource/Milestone/Commitment Schedule for INEL", (OPE/WMPO-96-042).



---

**Finding No.:** INEL-008

**Finding Description:** The INEL Performance Assessment is Not Approved The current PA should be revised on the basis of revised waste disposal inventories, and PA documentation (i.e. PA and EDFs). PA revision will only occur through DOE-HQ resolution to Peer Review Panel (PRP) concerns as well as PRP approval; however, DOE-HQ resolution has yet to be received.

**Risk Ranking:** The assessment rated the lack of PA approval as a medium risk for the performance of the disposal facility and a low risk for the public and the environment. Risk to workers is not applicable.

**Response:** In July 1995, the Performance Assessment Task Team (PATT) convened in Grand Junction, Colorado to resolve remaining PA policy issues. Agreement on how to resolve groundwater protection issues was reached by the PRP, PATT, the DOE-HQ, and DOE-ID representatives. In December of 1995, DOE-ID sent a letter to DOE-HQ which requested that DOE-HQ formalize its position on the issues which were resolved in Grand Junction<sup>a</sup>. In June of 1996, DOE-HQ formally responded to DOE-ID<sup>b</sup>.

**Planned Corrective Action:** PRP meetings were held on July 15 and 16 of 1996 to complete detailed review and make recommendations as to the final disposition of the PA. The PRP chairman has communicated to the DOE-ID representative that based on the information provided, the INEL RWMC PA is technically acceptable and complete, and the PRP will recommend DOE-HQ acceptance of the PA.

**Schedule and Costs:** The effort to support completion of the review and approval of the PA is a planned activity estimated to cost \$40K and is expected to be completed by August 1996.

**Tracking Mechanism:** The PA activities are tracked under ADS 4311-02 in Control Account 23601.

**References:** <sup>a</sup>Letter of December 14, 1995, J. T. Case, Manager, Waste Management Programs, DOE-ID to L. Stevens, EM-331, DOE-HQ; <sup>b</sup>Letter of June 20, 1996, S. P. Cowan, Deputy Assistant Director, Office of Waste Management, DOE-HQ to J. T. Case, Manager, Waste Management Programs, DOE-ID.

---

**Condition No.:** 001

**Condition Description:** There is no objective evidence of a formal information exchange between NRF and the RWMC

**Risk Ranking:** Not applicable

**Response:** Although Executive Order 12344 exempts the Naval Nuclear Propulsion program from requirements identified in DOE Order 5820.2A, and the exemption has been interpreted by DOE-ID and NR-IBO as being applicable to LLW generated by NRF, formal communications between NRF and RWMC exist in the form of waste stream characterization information and waste shipment requests. Also the RRWAC requires that Naval Reactors Idaho Branch Office (NR-IBO) conduct audits at the NRF.

**Planned**

**Corrective Action:** DOE-ID will evaluate the adequacy of the information exchange between NRF and RWMC as it relates to environmentally sound LLW disposal practices. Any identified deficiencies will be documented and communicated to DOE management.

**Schedule and Costs:** The review and documentation of current practices will be completed by 2Q FY 1997. The cost of the activity is estimated to be \$15K.

**Tracking Mechanism:** This activity will be tracked under ADS 4311-02 in Control Account 23601.

**References:** DOE Order 5820.2A, Radioactive Waste Management, September 1988.

---

**Condition No.:** 002

**Condition Description:** LLW is not emplaced in a systematic manner at the bulk pit to minimize void space and this practice may lead to subsidence of either the operational or final cover.

**Risk Ranking:** Not applicable

**Response:** The bulk pit constitutes a single disposal unit which is used for the disposal of remote handled odd-sized packages of LLW that cannot be disposed in the concrete vaults for remote handled waste. Remote handled waste presents special radiation exposure concerns ( $> 500$  mR/hr at 0.9 m) and cannot be directly handled, i.e., stacked by workers as is the contact handled waste ( $\leq 500$  mR/hr at 0.9 m). Unlike normal contact handled waste, which is placed in standard-sized boxes, the odd-sized remote handled waste packages in the bulk pit are not readily amenable to orderly stacking. Current operating practices place the odd-sized remote handled waste forms into the bulk pit in a consistent manner in accordance with detailed operating procedures; however, regular stacking is not feasible due to worker safety and DOE-mandated As Low As Reasonably Achievable (ALARA) exposure concerns. The bulk pit is backfilled with soil as required to minimize radiation exposure and is closely monitored for subsidence.

Personnel are not allowed into the bulk pit because it violates safe work and ALARA practices.

**Planned**

**Corrective Action:** INEL will evaluate the waste forms being disposed in the bulk pit to assess the feasibility of reconfiguring waste for disposal in the remote handled LLW concrete vaults.

**Schedule and Costs:** Evaluation of reconfiguring waste forms for vault disposal is an ongoing process. The annual cost of this activity is estimated at \$10K.

**Tracking Mechanism:** This activity is performed under ADS 4311-02 in Control Account 23311.

**References:** INEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria, DOE/ID-10381.

---

**Condition No.:** 003

**Condition Description:** There is a lack of National Environmental Policy Act (NEPA) documentation for Pits 18, 19, and 20

**Risk Ranking:** Not applicable

**Response:** In accordance with NEPA, DOE prepared a programmatic Environmental Impact Statement (EIS) for spent nuclear fuel management and INEL environmental restoration and waste management programs. The EIS analyzed the potential environmental consequences over the next 40 years of alternatives for the transportation, receipt, processing, storage of spent nuclear fuel, as well as environmental restoration and waste management programs. LLW disposal operations are included in the site-wide EIS which provides adequate NEPA documentation. DOE-HQ will

determine what activities are necessary to integrate the LLW program and identify essential LLW management requirements.

**Planned**

**Corrective Action:** The condition is a complex-wide concern which will be addressed by the DOE-HQ Corrective Action Plan as part of the DOE's 94-2 response effort. If any additional requirements are identified by DOE-HQ, INEL will initiate efforts to meet NEPA documentation requirements as necessary.

**Schedule and Costs:** No additional costs are anticipated for the corrective action since the site-wide EIS is in place. Future INEL tasks are dependent on DOE-HQ identification of requirements.

**Tracking Mechanism:** The efforts are tracked in the DOE-HQ Corrective Action Plan.

**References:** Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement, DOE/EIS-0203-F, April 1995.

---

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Idaho National Engineering Laboratory

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
INEL-001	Design of Surface Water Control Systems at the Subsurface Disposal Area (SDA)	Review and reconcile existing design documentation.	10/1/1996	6/30/1997
		Evaluate adequacy of the existing system and document any proposed modifications.	7/1/1997	9/30/1998
INEL-002	Lack of a Closure Plan	Complete Draft Preliminary Closure Plan.	ongoing	9/30/1996
		Perform tests, collect moisture migration data at Engineered Barrier Test Facility.	10/1/1996	9/30/2001
		Study for Soil Characterization and Effect on Waste Forms.	10/1/1996	9/30/1998
		Waste Stabilization Study	10/1/1996	9/30/1998
		Develop Post-Closure Environmental Monitoring Plan	10/1/1997	9/30/1999
		Develop Corrective Measures Plan	10/1/1999	9/30/2000
		Closure Cover Design	10/1/1999	9/30/2001
Finalize Closure Plan	10/1/2000	9/30/2002		
INEL-003	Groundwater Monitoring for Radiological Constituents at the SDA	Revise the INEL Groundwater Monitoring Plan	ongoing	9/30/1996

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE  
(Continued)**

Site Name: Idaho National Engineering Laboratory

INEL-004	Inadequate LLW Storage Conditions/Lack of Path Forward	Repackaging and shipment of ICPP LLW	ongoing	9/30/1996
		Evaluate SCW storage options	10/1/1996	9/30/1998
		Develop and implement procedure(s) for LLW storage and radiological surveillance.	10/1/1996	9/30/1998
INEL-005	Lack of Proceduralized Requirements for the Conduct of Waste Management Compliance Team (WMCT) Audits and Follow-up Corrective Actions to Audit Findings	Finalize and implement audit procedure	ongoing	9/30/1996
		Finalize and implement Memorandum of Understanding between RWMC and WERF.	ongoing	9/30/1996
		Revise RRWAC to clarify generator follow-up corrective actions.	ongoing	2/28/1997
INEL-006	Generators May Not Be Adequately Characterizing Their Wastes for Radiological Constituents	Develop and implement uniform radionuclide characterization procedures.	1/1/1997	9/30/1997
		Assess radiological characterization at ANL-W and recommend improvements and assist TRA in issuing revisions necessary for past shipment records.	10/1/1996	9/30/1997
		Conduct follow-up assessment of radiological characterization practices of ICPP, NRF, and TAN and improve practices.	10/1/1998	9/30/2003

**INEL CORRECTIVE ACTION PLAN  
SUMMARY TABLE  
(Continued)**

Site Name: Idaho National Engineering Laboratory

INEL-007	Impact to Groundwater from the Interactive Source Term at the RWMC	Source term/scenario development	ongoing	12/15/1996
		Performance Analysis	1/2/1997	4/30/1997
		Options Analysis	5/1/1997	7/10/1997
		Prepare and submit Composite Analysis Report to DOE-HQ.	5/1/1997	1/15/1998
INEL-008	The INEL Performance Assessment is Not Approved	Completion of review and approval of the PA.	ongoing	8/31/1996
Condition-001	There is no objective evidence of a formal information exchange between NRF and the RWMC	Evaluate adequacy of information exchange between NRF and RWMC.	10/1/1996	6/30/1997
Condition-002	LLW is not emplaced in a systematic manner at the bulk pit	Evaluate the waste forms being disposed in the bulk pit to assess the feasibility of reconfiguring waste.	ongoing	ongoing
Condition-003	Lack of National Environmental Policy Act (NEPA) documentation for Pits 18, 19, and 20	DOE-HQ completion of essential LLW management requirements document.	ongoing	2/28/1997



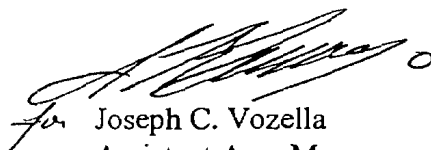
***TAB***

# memorandum

DATE: JUL 26 1996  
REPLY TO:  
ATTN OF: LAAMEP:2BL-013  
SUBJECT: Amended Final Corrective Action Plans from LANL in Response to the Low-Level Waste Vulnerability Assessment Performed February 26-March 8, 1996 (96-07)

TO: Stephen P. Cowan, Deputy Assistant Secretary for Waste Management  
Environmental Management, EM-35, HQ

Attached are the LANL final corrective action plans amended following the July 25, 1996 telephone conference between Bruce LeBrun, Chuck Peper, Adrian Gardner, Doug Tynan, and others. It is our understanding that these corrective action plans now adequately address the findings and concerns resulting from the Los Alamos portion of the Complex-Wide Low-Level Waste Vulnerability Assessment performed earlier this year.



Joseph C. Vozella  
Assistant Area Manager  
Office of Environment and Projects

## Attachment

cc w/attachment:  
Martin Letourneau, EM-35, HQ  
c/o Argonne National Laboratory  
One Bank Street, Suite 250  
Gaithersburg, MD 20878

cc w/o attachment:  
Bruce LeBrun, AAMEP, LAAO  
Charles Peper, CST-14, LANL, MS-J595  
Gloria Zakar, AA-1, LANL, MS-G998  
Leola D'Anna, AA-1, LANL, MS-G998

# Los Alamos

NATIONAL LABORATORY

*Audits and Assessments*  
Appraisal and Performance Analysis (AA-1), G998  
Los Alamos, New Mexico 87545  
(505) 667-6003, FAX 667-5261

Date: July 26, 1996  
Refer to: AA-1-96:040

Mr. Joseph C. Vozella  
Assistant Area Manager  
Department of Energy  
Los Alamos Area Office  
Office of Environment and Projects  
Mail Stop A316  
Los Alamos, NM 87544

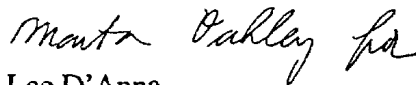
**SUBJECT: COMMENTS ON THE PRELIMINARY REPORT OF THE DOE  
COMPLEX-WIDE LOW LEVEL WASTE REVIEW (96-07)**

Dear Mr. Vozella:

Attached is the final response to the LLW Assessment.

If you have any questions about the contents of the CAP, please contact Chuck Peper, LANL, CST-14, at (505)667-6382, or Lee D'Anna, Audits and Assessments, (505)667-6003.

Sincerely,



Lee D'Anna  
Group Leader

GZ:jk

Attachments: a/s

Cy: Sheila Reed, LAAO, w/att., MS 316  
AA-1 File, w/att., MS G998  
CIC-10, w/att., MS A150

LOS ALAMOS NATIONAL LABORATORY  
CORRECTIVE ACTION PLAN  
FOR THE LLW COMPLEX-WIDE REVIEW

1.0 EXECUTIVE SUMMARY

Los Alamos National Laboratory (LANL) is a multi-disciplinary research and development institution of the DOE. LANL's mission is the application of science and technology to solve national problems including weapons development, energy supply, and conservation programs. A number of these programs generate solid and liquid LLW. Liquid LLW undergoes treatment at TA-21 and at TA-50. Mixed LLW is stored in TA-54 Area L and Area G and solid LLW is disposed in TA-54 Area G.

During the assessment, vulnerabilities in the areas of management and oversight, waste characterization and packaging, performance assessment and site characterization, design and construction, operations and maintenance, and environmental restoration were identified.

In general, the vulnerabilities identified by the WGAT were minor in nature and had been previously identified by the facility. The majority of the items were already in the process of being corrected or were resolved by the facility during the assessment. None of the vulnerabilities require immediate corrective actions.

2.0 INTRODUCTION

The assessment of Los Alamos National Laboratory (LANL) was performed during the period February 26, 1996 through March 8, 1996. The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included generator, treatment, storage, and disposal facilities.

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan responding to DNFSB Recommendation 94-2. The actions described in this CAP are intended to address the findings described in the LANL Site-specific Assessment Report in Volume III of the Final Report. The plan was prepared and issued at the direction and under the guidance of the Assessment Working Group.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

LANL is operated by the University of California under the direction of the Department of Energy (DOE) through the DOE Los Alamos Area Office (DOE-LAAO). This DOE Area Office reports to the Albuquerque Field Office (DOE-AL). DOE-LAAO, as the site DOE representative, has the lead for ensuring that the CAP is implemented by LANL. DOE-AL is responsible for overseeing the effectiveness of implementation of the CAP.

The following personnel are the points of contact for their respective organizations:

<u>Organization</u>	<u>Name</u>	<u>Phone Number</u>
DOE-AL	James Orban	(505) 845-4421
DOE-LAAO	Joseph C. Vozella	(505) 665-5027
DOE-LAAO	Bruce LeBrun	(505) 665-6348
LANL, CST-14	Chuck Peper	(505) 667-6382

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses to and planned actions for each of the six findings and four concerns from Volume III of the CWR Final Report. Detailed responses and rebuttals to the findings were officially transmitted from the DOE-LAAO on May 1, 1996, reference LAAMEP:9BL-006 (LANL response, dated April 30, 1996, reference DAA/96-101).

---

Finding No.: LANL-1

Finding Description: "Management and oversight"

Management areas identified that led to a vulnerability include lack of a management system to oversee the stored waste inventory, a lack of generator/waste treatment coordination when changing process waste streams, and a lack of procedures for consistently processing waste profile forms and chemical waste disposal requests. Oversight concerns include a lack of trending and analysis on identified issues for corrective actions site-wide and minimal DOE programmatic oversight.

**Risk Ranking:** The primary potential receptors include workers and the environment with a likelihood of most exposure/releases considered to be in the less than one year range.

Potential impacts are considered to be negligible to the worker, significant or minor to the environment, and minor to disposal facility performance. The risk level for both of these receptors is considered to be medium to low.

**Response:**

**Management:**

Waste is held at generator sites prior to disposal. During this period the waste is characterized and packaged for shipment. Once a sufficient quantity is available for shipment, the waste is sent to the disposal site. A review of the stored waste inventory was performed after the assessment. The review found that the stored inventory was very low (the volume of waste being stored was consistent with the volume of waste that would be expected to be in processing, based on the annual volumes disposed of by the facility.) The storage was being performed in accordance with facility safety requirements and with 10 CFR 835. The seven identified drums of H-3 waste ("orphaned waste") which were stored out doors in a covered radioactive materials storage area have been characterized and are in processing for disposal. There was some delay in characterizing this waste due to changes in the packaging requirements for tritium during process of the waste. The review also showed that there were minimal findings associated with LLW storage and that additional controls for centralized waste inventory tracking would not be necessary or ALARA.

Waste disposal requests are reviewed and approved by highly skilled and qualified personnel. The personnel have in-depth knowledge of the Waste Acceptance Criteria for the facility. In order to increase the formality of operation, procedures for review and approval of Waste Profile Forms and Chemical Waste Disposal Requests will be prepared.

A review of findings in the LANL Audits and Assessments Tracking System and the LLW disposal facility Non-Conformance Report system showed there were minimal findings (20 occurrences in 3 years, of which 3 involved LLW, during this 3 year period 45,000 packages of waste were processed) and that tracking and closure of the findings occurred at an adequate rate. Due to the low rate of findings, low severity of findings, and minimal repeat findings, it was determined that additional trending activities or modifications to existing systems were not necessary or cost effective. The existing procedures for audits and assessments, root cause determination, action plan preparation, and tracking corrective

actions (DP 111, AP-WASTEMGT-006 and PRD 120-01-0) cover this work. Similarly, the review showed that oversight was effective and sufficient.

**Oversight:**

As a result of this assessment, DOE-LAAO has established a Waste Management Team consisting of five DOE employees who support the DOE Radioactive Waste Manager in providing for complete LLW programmatic oversight at LANL. In addition, the manager's team receives support from both the DOE Facility Representative at LAAO, as well as, from the Waste Management Division at the DOE Albuquerque Operations Office.

DOE-LAAO believes this approach will provide for an even more effective implementation of DOE Orders and regulations affecting the LLW program at LANL.

**Planned Corrective Action:**

Perform review of stored LLW inventory.

Budget and prepare procedures for review and approval of Waste Profile forms and Chemical Waste Disposal Request forms.

Dispose of seven drums of tritium waste that were awaiting characterization.

**Schedule and Costs:**

Inventory review completed 6/15/96.

Procedures, associated lesson plans, qualification programs, and training will be in use by 2nd quarter FY97. Work will be prepared by CST-5. Contact is CST-5 Group Leader Juan Corpion. Cost is estimated at \$95,000. Work will be performed under ADS #4172.

Characterize orphaned tritium waste and process for disposal at a low level waste disposal facility. Cost is approximately \$2,000 and will be worked under ADS #4172. Contact is Chuck Peper CST-14.

**Tracking Mechanism:** Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes tracking all corrective action plans in response to external audits.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

Finding No.: LANL-2

Finding Description: "Waste characterization and packaging"

Waste characterization problems were considered the primary vulnerability of the LANL program. Concerns exist in the areas of generator waste characterization procedures, lack of a comprehensive definition of the term "acceptable knowledge" and procedures for its application, the lack of a comprehensive certification program, the absence of a quality assurance/quality control program, and the program for training of waste management coordinators.

**Risk Ranking:** The primary potential receptors include the environment and disposal facility performance with a likelihood of each exposure/release considered to be in the greater than 100 year range for both environment and disposal facility performance. Potential impacts to the environment are deemed to be minor and potential impacts to disposal facilities performance are deemed to be significant. The risk level for the environment is considered to be low and disposal facility performance is considered to be medium.

**Response:**

LANL recently completed a Performance Assessment (PA) for LLW disposal operations at Area G. Prior to completing the PA, the waste characterization basis relied primarily on DOE guidance and commercial requirements developed by the NRC. LANL's performance assessment showed that for the types and quantities of material disposed of at Area G, the materials are well below threshold values calculated in the PA. There is high confidence that past characterization and current characterization will be adequate for ensuring compliance with the performance objectives in the performance assessment. Nuclide reporting requirements were reviewed to ensure that daughter nuclides (not required to be reported but recognized by the facility to be present in balance with the parent) were being accounted for (buildup over facility and decay) in the PA source term analysis. When generators use Acceptable Knowledge to aid in characterizing waste they must do so in accordance with the requirements in the Waste Acceptance Criteria document.

Training for Waste Management Coordinators (WMC) is specific to the waste stream. Training provided to WMCs who manage chemical waste is different from that provided for WMCs managing LLW. The



Laboratory procedure for WMC requirements was reviewed to determine whether training requirements are appropriate. The review showed training is adequate. It was noted that the WMC program training is not inclusive. Training necessary for WMCs is also provided in several other programs as part of the employee qualification process (e.g., basic health physics training, waste generator training, RCRA training). Since WMC are required to have this training prior to assuming WMC responsibilities, it was determined not to be necessary to specify the requirements in both the WMC program documents and the facility training requirements document.

The disposal process relies on the training and skill set of the WMC (WMC is equivalent to waste certification official at other sites.) when processing waste. This practice is similar to that used at commercial facilities and other DOE sites. It is helpful to the program by ensuring accountability and reducing certification costs.

To provide additional assurance that characterization actions are appropriate, the QA verification activities at the site will be strengthened by performing additional inspections of waste when they are received at the facility.

This item was identified as supporting complex wide vulnerabilities numbers 2 and 6 and may be affected by HQ actions from the complex wide response. The modification of the QA activities, laboratory procedures, will address the concerns associated with characterization and certification in this item.

**Planned Corrective Action:**

Modify quality assurance (QA) activities to provide for a more formal verification program of generator LLW characterization by performing QA measurements of received waste at the treatment storage and disposal (TSD) facility. Program modifications will be described in a Laboratory Standard on TSD facility requirements and quality assurance requirements.

Submit final PA to DOE for approval in January, 1997.

Review WMC Laboratory standard to ensure training is appropriate for individuals who process LLW waste (i.e., review of training requirements for WMC who perform only RCRA or TSCA processing is not required).

The corrective action plans for CWV2 and CWV6 also address this finding. LANL will participate in the actions developed under the HQ guidance.

**Schedule and Costs:**

Laboratory Standard modified and approved by April 1, 1997. Cost to perform modifications, Laboratory/LAO review, and implementation plan is approximately \$84,000. Work will be performed by CST-14, the project lead is Chuck Peper, funding will be under ADS #4172.

Submit final PA to DOE for approval in January, 1997. Work will be performed by CST-14, the project lead is Diana Hollis. Funding will be under ADS #4172 and is approximately \$200,000.

WMC laboratory standard review for adequacy of training program requirements completed on 6/15/96.

Refer to CWV2 and CWV6 for complex wide actions.

**Tracking Mechanism:**

Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes tracking all corrective action plans in response to external audits.

Refer to CWV2 and CWV6 for complex wide actions.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** LANL-3

**Finding Description:** "Performance Assessment and site characterization vulnerability

The performance assessment (PA) vulnerability centered around the lack of an approved PA. Additionally, the PA is not incorporated into the waste acceptance criteria, a closure plan has not been approved for the facility, an analysis has not been completed for the impacts of co-located sources, and (per DOE Order 5820.2A) the pre-1988 source term has not been included in the PA analysis.

**Risk Ranking:** The potential receptors include the public, the environment, and disposal facility performance. The likelihoods for all receptors and scenarios are in the greater than 100 year range. Impacts to the public are moderate to low; impacts to the environment are minor for most scenarios; and impacts to

disposal facility performance are significant for most scenarios. The risk level for the public and the environment is low, and the risk level for disposal facility performance is generally medium.

**Response:**

LANL has worked closely with the PA development teams and has performed additional work to ensure the disposal activities at LANL follow industry standards and ensure environmentally safe disposal.

The current PA was prepared as ordered by the DOE and contains all the information required by the order. Modifications will be made to the PA scope and content as instructions are developed by DOE HQ and work is authorized by the DOE operations office. The Waste Acceptance Criteria (WAC) document is modified when results of the PA indicate the need. The current WAC does not currently require revision to ensure compliance with the technical basis used in the PA. This item was identified as supporting complex wide vulnerability number 6 and will be addressed consistent with the complex wide response.

The PA is on track for final DOE approval in accordance with the schedule developed with DOE administrators. The PA will include work for collocated sources and pre 1988 waste as this guidance is developed by DOE HQ. Draft work has been done in both these areas. Preliminary results show the affects will not significantly affect the performance objectives. The amount of pre-1988 waste and the former disposal techniques do not differ significantly from current day operations. The performance assessment impact is not expected to be significant due to the large safety margins associated with performance assessment performance objectives and the quantities and concentrations of materials actually disposed of.

**Planned Corrective Action:**

See the corrective action plan for CWV6 relating to HQ responsibilities to develop PA guidance. LANL will implement the HQ requirements for pre 1988 waste and collocated sources as they are promulgated.

**Schedule and Costs:**

Headquarters is to provide PA guidance by 9/30/96. Activities will be developed based on promulgated guidance and needs at the site. Cost and schedule will be determined after issuance of guidance using the existing budgeting process. Final PA is scheduled for submittal to DOE for approval in December 1996. The final PA will include pre-1988 waste.

A full composite analysis including affects from offsite sources will be completed by 12/31/97. Contact for work is Diana Hollis

CST-14. Cost is estimated at \$500,000 and is covered under ADS #4172

Refer to CWV6.

**Tracking Mechanism:**

Refer to CWV6.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** LANL-4

**Finding Description:** "Design and construction"

The primary vulnerability in this area is the intermittent exceedence of derived concentration guide (DCG) limits and the potential for uncontrolled liquid waste releases to the environment due to single-walled piping for a portion of the liquid waste transport system. Design of the LLW facilities needs to be improved in the areas of fire water availability and shaft disposal for TA-54.

**Risk Ranking:** The primary potential receptors include the public, workers, and the environment with a likelihood of each exposure/release considered to be in the 1-10 year range, 10-100 year range, and the less than one year ranges respectively. Potential impacts to these receptors are considered to be moderate to the public, marginal to workers, and significant to the environment. The risk level is considered to be medium to the public and environment and low to workers.

**Response:**

The periodic discharge of liquids at levels above DOE guidelines was evaluated. Although, the practice was determined to be ALARA and to not present a notable environmental risk, plans are underway to modify the facility. The new methods will reduce discharges to values less than the DCGs. The use of double wall piping was determined not to be required by DOE, necessary, or cost effective.

A review of the LLW fire hazard analysis and safety analysis report showed that current operations are acceptable and that improvements to the fire water system would be helpful for protecting non-nuclear structures but would not significantly reduce risks during accidents that involve the release of radioactive materials. A

modification to the fire main is being made to address non-LLW fire protection issues at the chemical waste processing facility, to allow for storage of mixed waste in a dome, and to improve TRU fire protection systems. For a TRU storage dome and for the Transuranic Waste Inspectable Storage Project, it is planned to install fire suppression equipment in the associated TRU domes.

At the chemical waste facility, it was found that under certain conditions fire main pressure could drop within certain areas at the chemical waste disposal facility. Before mixed waste can be placed in a storage dome the modification will need to be completed. A planned modification to the fire main will address the chemical waste fire protection issue. The fire main modifications are in construction and should be completed by the first quarter in FY97.

For LLW activities the use of fire suppression for the accident scenarios was not used. This simplifying assumption was used because it provided for a very conservative boundary for the credible accident scenarios. When LLW is received at the site, it is processed for disposal in a pit or shaft. The LLW disposal facility does not accept waste that does not meet the Waste Acceptance Criteria, there is no LLW stored at the site. Prior to disposal some material may be staged to optimize the disposal operations and heavy equipment use. For example dumpsters are staged until their is sufficient waste available to make the disposal operation efficient. In the Area G Hazards Analysis scenarios considering vehicle fires and pit fires were evaluated. The storage of smaller quantities (i.e. smaller than pit volumes) of material out-of-doors is bounded by the Hazard Analysis.

Shaft disposal operations were reviewed by a Certified Health Physicist after the assessment. For waste with high external dose rates, careful ALARA decisions must be made to minimize external exposure while handling the waste and minimizing the potential for internal exposures that could occur during an unanticipated container failure. To minimize the potential for external and internal exposure, shaft waste is routinely handled remotely via shielded casks and remote handling equipment. Operators are typically 10-20 feet away from the waste during the disposal operation.

The procedure for placement of high dose rate material into shafts was reviewed to determine whether controls were adequate and whether the practice followed the ALARA principle. Additionally, a fiber scope was used to remotely examine packages that had dropped unretarded for 65 feet. No indicators of major container failure

or the release of material outside the impact site was noted. Some minor package failure was expected and was observed. The review also included an examination of environmental monitoring results, operational monitoring results, and personnel dosimetry results. It was determined that material did not leave the disposal site and the disposal operation is safe and ALARA.

**Planned Corrective Action:**

Modify liquid waste facility to discharge liquid waste at levels that are less than DCGs.

Evaluated need for double walled piping.

Review shaft disposal operations to determine whether operation described in detailed operating procedure 009 needs modification in order to further minimize the potential for the emission of radioactive materials from the shaft.

Fire hazard analysis for LLW concerns review was completed. It was determined no additional action is required for LLW disposal or storage concerns. However, the fire main will be modified to provide greater protection for TRU activities, mixed waste storage, non-nuclear structures, and non safety related facilities. Fire main modifications to allow storage of mixed waste in a storage dome with a fire suppression system will be performed.

**Schedule and Costs:**

DCG modification will be completed by 9/1/97 at \$1,500,000 under ADS #4172.

If double walled piping is used, cost is approximately \$1,000,000. Funding would not occur prior to 1999. Construction would not be complete until 2001. Cost will be controlled under ADS #4172.

Shaft disposal operations review completed.

Fire main modifications for fire suppression in the Area L yard mixed waste dome and for support of non-nuclear administrative facilities completed by January 1, 1997 cost is \$750,000 and will be controlled under ADS #4172. Contact for project is CST-5 Group Leader Juan Corpion.

**Tracking Mechanism:**

Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes

tracking all corrective action plans in response to external audits.

Reference: CWR Final Report , DOE/EM-0280, May 1996

---

Finding No.: LANL-5

Finding Description: "Operations and maintenance"

Control of work activities and conduct of operations were found to be lacking especially in the area of standard operating procedures being used in lieu of radiological work permits. While this is an acceptable practice for use in radiation areas, not all of the requirements for radiological work permits are being incorporated into the standard operating procedures.

Risk Ranking: The affected potential receptors are the public, worker and the environment with a likelihood of exposure of 1-10 years for the public and environment and less than one year for workers. The potential impact is considered to be moderate for the public, marginal for workers, and minor to the environment. The risk level is considered to be medium for the public and workers and low for the environment.

**Response:**

A review of work control practices and operations was performed. Although, it was found that work control programs are adequate and that radiation exposures for LLW activities are near background, some procedures were modified in order to more clearly specify and document work control requirements. This action is being taken to formalize operations in accordance with the facility's conduct of operation program. The changes will clarify responsibilities and actions. This will aide in maintaining a quality program within the site.

Also, the Radiation Work Permit (RWP) is currently being modified to better address ALARA. The RWP form will address trigger levels for formal ALARA reviews. A graded approach will be used with respect to requiring ALARA reviews that are commensurate with risk.

The need to increase the scope and complexity of the radiation work process was determined not to be necessary. Tracking work practices to a component, job, and job craft level can be helpful in reducing exposures at large or complex facilities. This practice is routinely used in commercial facilities where annual

man-rem totals are in the hundreds of rem and thousands of workers are present. Annual exposures for personnel processing LLW is virtually undistinguishable from background (1994 and 1995 dose records < 10 mrem). The work processes are very routine with little variance from year to year. The man-rem totals for the LLW workers is under 100 mrem. The additional expense associated with tracking exposure to finer levels of work detail was considered not to be cost affective or ALARA.

**Planned Corrective Action:**

Review of work control practices and operations, modify policies and procedures as necessary.

Modify Radiation Work Permit forms to better address requirements for formal ALARA reviews.

**Schedule and Costs:**

Review of work control activities and modification of disposal procedure completed 6/17/96 at a cost of \$2,000 under ADS #4172.

Modify Radiation Work Permit by 9/30/96.

**Tracking Mechanism:**

Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes tracking all corrective action plans in response to external audits.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** LANL-6

**Finding Description:** "Environmental restoration LLW volume projections"

The primary concern with the interface between the environmental restoration and waste management program is the LLW volume projections and the limited disposal capacity. While LANL is not confined to disposal on-site, at this point LLW off-site disposal capability has not been completed.

**Risk Ranking:** The potentially affected receptors are the worker and the environment with a likelihood of exposure of 1 - 10 years for workers and environment. Impacts are considered to be



negligible to workers and minor to the environment. The risk level is considered to be low for both workers and the environment.

**Response:**

LANL has existing constructed capacity for another four years of operations (includes base line work and planned Environmental Restoration (ER) projects). Within the current disposal area, another 50-100 years of capacity exists. With an expansion of the existing area, the capacity would increase to 200 years. New construction within some areas will not be performed until completion of the Site Wide Environmental Impact Statement (SWEIS).

A Specific Project Review for the LLW disposal area was completed in June 1996 and it does not appear that a finding of other than No Significant Impact will be forthcoming from the SWEIS.

ER volume projections are adequate for planned and funded projects.

However, because of instability for the out-year funding at the congressional level, confidence in volume projections for the out-years is marginal. There is no apparent solution to improving out year funding projections or volume projections. Additional actions for new ER projects will be dependent on long range funding and planning.

The use of an off-site disposal facility at this time is not necessary. The DOE-AL office has established the protocol for obtaining an exemption from the requirements of 5820.2A for off-site disposal. The protocol promulgated can be readily completed by LANL. Due to the costs associated with obtaining an exemption, the use of off site disposal will not be implemented until the need for off site disposal is clearly demonstrated.

**Planned Corrective Action:**

Continue to monitor progress of SWEIS. Provide technical support to organizations responsible for preparing document.

Obtain approval for off-site disposal if SWEIS appears to be delayed significantly or a potential problems with continued construction at the current LANL facility is discovered.

Continue to develop ER volume projections based on planning that reflects DOE/ER funding. Update volume projections to coincide with changes in out-year funding.

**Schedule and Costs:**

None required, activities are on going throughout the life of the facility and are part of management's routine responsibilities and activities.

**Tracking Mechanism:**

None required.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** Concern LANL-1

**Finding Description:** "Waste packaging integrity"

Much of the LLW destined for on-site disposal at TA-54 Area G is packaged in cardboard boxes. The boxes and other waste packages are subjected to "in-situ" compaction to reduce the potential for disposal pit subsidence. However, this practice ruptures many containers, especially the cardboard boxes.

**Risk Ranking:** N/A

**Response:**

Wastes are shipped to the facility in containers that have containment properties that are commensurate with the properties (risk) of the material. Waste that have small risks are packaged in appropriate DOT approved containers (e.g. fiberboard). By using containers that are commensurate with risk, generator costs are kept low and facility performance is enhanced due to low void spaces in the waste matrix. The use of no containers or containers which have minimal void spaces is similar to practices used at commercial disposal facilities for low risk waste.

After the assessment, a review of the practice was performed by a Certified Health Physicist. The review included an examination of environmental monitoring results, operational monitoring results, and personnel dosimetry results. It was determined the operations are safe and ALARA and that long term facility performance is enhanced by using containers, which as disposed of, have minimal void spaces. The Performance Assessment does not take credit for and does not require the use of containerized waste throughout the 10,000 year evaluation period.

**Planned Corrective Action:**

Performed review of disposal practice for cardboard and unpackaged waste to determine whether anticipated failure of container or lack of a container causes a concern.

**Schedule and Costs:**

Activity completed 5/15/96.

**Tracking Mechanism:**

Corrective action completed 5/15/96.

**Reference:**

CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** Concern LANL-2

**Finding Description:** "Closure plan"

A closure plan for TA-54 Area G is currently being developed with a preliminary version being circulated for review. The importance of the closure plan in preparing the PA and establishing reasonable waste acceptance criteria is recognized but as yet has not been addressed. The PA cannot be expected to demonstrate compliance with the performance objectives of DOE Order 5820.2A until an approved closure plan that will provide protection to the public and an inadvertent intruder has been developed and approved.

**Risk Ranking:** N/A

**Response:**

The current PA describes the site closure and the parameters used in the final cap design. The PA made very conservative assumptions regarding the closure design. This allowed the PA to show compliance with the performance objectives of DOE Order 5820.2A under very conservative assumptions. Due to the highly favorable geophysical disposal conditions at the site, the use of an engineered cover was not necessary.

**Planned Corrective Action:**

A closure plan separate from the PA will be prepared. The plan will be integrated with the PA. The plan will be a controlled document and will be approved using the existing controls within the configuration management program.

**Schedule and Costs:**

Plan completed by 9/30/96 at a cost of \$12,000 under ADS #4172  
Work will be performed by Diana Hollis CST-14.

**Tracking Mechanism:**

Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes tracking all corrective action plans in response to external audits.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** Concern LANL-3

**Finding Description:** "Voids in deep disposal shafts"

Waste packages disposed in deep shafts at the TA-54 disposal facility are dropped or lowered into the shafts in a manner that does not allow for minimizing of voids. The random placement of the packages in columns 60 feet or more in height with little or no intermittent backfill is likely to lead to substantial voids in the waste matrix and subsequent subsidence.

**Risk Ranking:** N/A

**Response:**

A review was performed of the disposal practices used over the last fifty years. During this period the same disposal techniques were used. No subsidence with detrimental effects has been observed to date. The effects of subsidence need not necessarily result in an adverse impacts. Any observed subsidence is normally corrected during the operational and closure periods. Subsidence would need to be large and not corrected to have a deleterious effect. Additionally, water must be present in large quantities and water must migrate through the surface. It was determined that notable subsidence has not occurred and that minor subsidence in shafts has not constituted a problem due to the favorable geophysics of the disposal site. However, since adding additional fill material to a shaft does not incur a large expense, this practice will be incorporated into disposal operations and will be performed as necessary.

**Planned Corrective Action:**

Modify disposal procedure for shaft disposal operations to add fill material as needed as indicated by shaft inspections.

**Schedule and Costs:**

Procedure revision completed by 9/1/96 at a cost of \$2,000 under ADS #4172 Work will be performed by Chuck Peper in CST-14

**Tracking Mechanism:**

Open actions will be tracked by the LANL Audits and Assessments Division as part of their normal work process, which includes tracking all corrective action plans in response to external audits.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

---

**Finding No.:** Concern LANL-4

**Finding Description:** "Application of the ALARA program to public exposures and environmental releases"

ALARA program guidance does not include detailed program elements to minimize radiation exposure to the general public and radiation releases to the environment. Current efforts to limit the public's radiation exposure and environmental release are primarily compliance driven. While this is written as a site issue, applying ALARA to the public and the environment is a new concept in the DOE complex.

**Risk Ranking:** N/A

**Response:**

LANL strongly supports the ALARA principle and takes proactive action when exposures are not as low as reasonably achievable. A review of the environmental activities and potential for public exposure was performed to determine whether the addition of more formal procedures, programs, projects reviews, or other activities would result in exposures being reduced using the constraints of the ALARA principle. The review determined that exposures are already very low and that any modifications to existing activities, programs, procedures, or other "detailed program elements" would not be ALARA and are not necessary.

**Planned Corrective Action:**

Perform review of whether environmental programs require additional measures to further ensure potential public exposures are ALARA.

**Schedule and Costs:**

Activities completed 6/15/96.

**Tracking Mechanism:**

Corrective actions completed 6/15/96.

**Reference:**

CWR Final Report , DOE/EM-0280, May 1996

---

**CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Los Alamos National Laboratory

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
LANL-1	Management and oversight: a. Management of stored waste inventory b. Management and oversight of the LLW program has not been effective	1. Perform review of stored LLW inventory. 2. Budget and prepare waste form review and approval procedures. 3. Characterize stored H-3 waste	3/11/96 3/11/96 7/1/96	6/15/96 3/31/97 10/1/96
LANL-2	Waste characterization and packaging: a. Waste characterization b. Waste certification program c. Quality assurance/Quality control for waste management is inadequate d. Training of waste management coordinators e. Adequacy of the use of "acceptable knowledge" for determining waste characteristics	3. Develop Laboratory standard on treatment storage and disposal facility requirements and quality assurance requirements. 4. Perform QA measurements of received waste at the treatment storage and disposal facility. 5. Submit final PA to DOE for approval. 6. Review WMC Laboratory standard to ensure training is adequate. 7. Refer to CWV2 and CWV6.	8/1/96 8/1/96 3/11/96	4/1/97 7/31/97 1/31/97 6/15/96

LANL-3	<p>Performance assessment and site characterization:</p> <ul style="list-style-type: none"> <li>a. Performance Assessment not approved by Peer Review Panel and DOE Headquarters</li> <li>b. Waste Acceptance Criteria and Performance Assessment not integrated</li> <li>c. Collocated sources not included in existing TA-54 Area G Performance Assessment</li> <li>d. Performance Assessment All Source Term Analysis for TA-54 Area G</li> </ul>	<ul style="list-style-type: none"> <li>8. Final PA Submittal</li> <li>9. PA Composite Analysis</li> <li>10. Refer to CWV6.</li> </ul>	<p>1/1/94 6/1/96</p>	<p>1/1/97 12/31/97</p>
LANL-4	<p>Design and construction:</p> <ul style="list-style-type: none"> <li>a. Waste packages dropped into disposal shaft</li> <li>b. Fire Protection at TA-54</li> <li>c. Liquid LLW Treatment</li> </ul>	<ul style="list-style-type: none"> <li>11. Modify fire main for Area L yard fire suppression needs.</li> <li>12. Modify liquid waste facility to ensure material discharged is less than DCGs.</li> <li>13. Evaluate need for double walled piping.</li> <li>14. Review shaft disposal operations.</li> </ul>	<p>6/1/96 3/11/96 3/11/96 3/11/96</p>	<p>1/1/97 9/1/97 9/15/97 6/15/96</p>
LANL-5	<p>Operations and maintenance:</p> <ul style="list-style-type: none"> <li>a. Control of work activities and conduct of operations</li> </ul>	<ul style="list-style-type: none"> <li>15. Review work control practices.</li> <li>16. Modify Radiation Work Permit forms.</li> </ul>	<p>3/11/96 5/15/96</p>	<p>6/17/96 9/30/96</p>



LANL-6	<p>Environmental restoration and LLW volume projections:</p> <p>a. Projected LLW volumes exceed existing disposal capacity</p>	<p>17. Continue to monitor progress of SWEIS</p> <p>18. Obtain approval for off-site disposal if SWEIS appears to be delayed or a potential problem with continued construction at the facility is discovered.</p> <p>19. Continue to develop ER volume projections based on planning that reflects DOE/ER funding.</p> <p>20. Refer to CWV1 and CWV6.</p>	<p>Ongoing</p> <p>Based on #1</p> <p>Ongoing</p>	
Concern-LANL-1	Waste packaging integrity	21. Perform review of disposal practice for cardboard and unpackaged waste.	3/11/96	5/15/96
Concern-LANL-2	Closure plan	22. Prepare separate closure plan.	7/1/96	9/30/96
Concern-LANL-3	Voids in deep disposal shafts	23. Modify disposal procedure for shaft disposal to add fill material as indicated by shaft inspections.	7/1/96	9/1/96
Concern-LANL-4	Application of the ALARA program to public exposures and environmental releases	24. Review environmental activities to determine whether additional procedures, programs, project reviews or other activities would result in exposures being reduced	3/11/96	6/15/96

***TAB***



**Department of Energy**

Nevada Operations Office  
P.O. Box 98518  
Las Vegas, NV 89193-8518

**JUL 29 1996**

Stephen P. Cowan, Deputy Assistant Secretary for Waste Management, DOE/HQ  
(EM-30) FORS

**PREPARATION OF CORRECTIVE ACTION PLANS FOR ISSUES IDENTIFIED  
THROUGH THE COMPLEX-WIDE REVIEW OF DOE'S LOW-LEVEL WASTE  
MANAGEMENT ES&H VULNERABILITIES**

Reference: Memorandum, Cowan to Distribution, dtd 6/24/96

Enclosed you will find a hard copy of the above plan as well as a disk copy in WordPerfect 6.1.  
Comments generated from your office have been included.

If you need additional information or assistance, please call Carol A. Shelton, of my staff,  
at (702) 295-0286.

A handwritten signature in cursive script that reads "G. Leah Dever".

G. Leah Dever, Assistant Manager  
for Environmental Management

WMD:CAS

Enclosures:

1. Hard Copy
2. Diskette

cc w/encl. 1 only:

M. J. Letourneau, DOE/HQ  
(EM-35) TREV

NEVADA TEST SITE  
CORRECTIVE ACTION PLAN FOR CONCERNS  
IDENTIFIED BY THE  
COMPLEX-WIDE REVIEW OF DOE'S LOW-LEVEL WASTE MANAGEMENT ES&H  
VULNERABILITIES

**1.0 EXECUTIVE SUMMARY**

The Working Group Assessment Team (WGAT), which consisted of U.S. Department of Energy (DOE) and contractor personnel with knowledge and experience in low-level waste (LLW) management systems, evaluated the LLW management programs and activities at the Nevada Test Site (NTS). The WGAT did not identify any vulnerabilities at the NTS. However, the WGAT did identify nine concerns for management attention. These concerns are as follows:

- a. Status of the consolidation of standard operating procedures (SOPs);
- b. Completion of site characterization and Performance Assessment (PA) efforts for the Area 3 Radioactive Waste Management Site (RWMS);
- c. Implication of other source terms in the completion of the PA for the Area 5 RWMS;
- d. Subsidence of pits, trenches, and craters;
- e. Slope stability of pits and trenches;
- f. Road 5-01 construction;
- g. Fire protection for the Transuranic (TRU) Pad Cover Building (TPCB);
- h. Environmental remediation/restoration cleanup of Pu-contaminated soil; and
- i. Evaluation of inactive disposal sites.

The root causes of the concerns identified above can be attributed to a variety of factors. Bechtel Nevada (BN) became the Performance-Based Management contractor at the NTS as of January 1, 1996. The administrative problem of consolidating procedures from three different companies is the root cause of the delay in issuing a unified SOP. The issues related to PAs are recognized within the DOE complex and are associated with the existing review and approval process. The need to consider other more appropriate standards in the PA development and approval process is recognized and appears to be supported by recent DOE/Headquarters action via a proposed exemption process to DOE

supported by recent DOE/Headquarters action via a proposed exemption process to DOE Order 5820.2A, "Radioactive Waste Management," requirements. This DOE action recognizes that commercial disposal sites adequately protect the environment without complying with the rigorous PA process currently imposed by DOE upon DOE sites. Finally, issues of slope stability, road safety analysis, fire protection, Pu-contaminated soil, and inactive disposal site evaluation have been previously identified through internal assessments as safety conditions that require remediation. The Corrective Action Plan (CAP) that follows will provide details of the NTS assessment, points of contact within the implementing organization, and the WGAT concerns including BN's response to each concern and planned corrective actions (CAs).

## 2.0 INTRODUCTION

The NTS assessment was performed from February 27 through March 7, 1996. The assessment has been documented and the results published in the "Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities," dated May 1996. Facilities and activities assessed included storage and disposal of LLW and associated activities and infrastructure.

The WGAT reviewed the Site Evaluation Survey response reference documents (e.g., specific procedures, occurrence reports, requirement documents, safety analysis reports, management plans, audit/surveillance/assessment/inspection reports, environmental reports), which resolved a number of questions and concerns generated from reviewing the Site Evaluation Survey responses.

The team conducted interviews with DOE and contractor management and staff personnel associated with LLW management activities; toured Areas 3, 5, and 6 LLW management facilities; and observed the receipt, off-loading, and staging of three off-site-generator LLW shipments.

As mentioned in the Executive Summary, nine concerns were identified as a result of the WGAT activity. CAs addressing each of the concerns have been developed and are identified in Section 4.0, "Findings, Responses, and Planned Action." *The findings, finding description, discussion, and risk ranking text contained in Section 4.0 are as written by the WGAT and are included in this document to provide the reader with a better understanding of each issue and the basis for each finding.*

## 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

Implementing CAs outlined in the CAP will be conducted by BN, the Performance-Based Management contractor at the NTS. Responsibility for this implementation falls under the purview of BN's Environmental Management (EM) Waste Management Program (WMP).

The DOE Nevada Operations Office (DOE/NV), Waste Management Division, will provide oversight for the implementation of these CAs.

The following individuals are the points of contact for their respective organizations:

<u>Organization</u>	<u>Name</u>	<u>Telephone</u>
DOE/NV	Carol A. Shelton	(702) 295-0286
BN EM/WMP	Lee S. Sygitowicz	(702) 295-5888

#### 4.0 FINDINGS, RESPONSES, AND PLANNED CORRECTIVE ACTIONS

**Finding:** Concern related to Management and Oversight, Section 6.1.1, (Volume III)

**Finding Description:** The contractor's process for review, acceptance, and approval of company and SOPs appears to be inadequate.

**Discussion:** BN, the M&O contractor for the NTS, began a new contract with DOE/NV on January 1, 1996. Previously, three separate contractors provided support to DOE for managing and controlling activities at the NTS, and each maintained an independent set of procedures. The transfer of procedures from Reynolds Electrical & Engineering Co., Inc. (REECo); Raytheon Services Nevada; and EG&G (NTS contractors prior to January 1, 1996) to BN is commonly referred to as "The Blue Sheet Process." This process has been completed for the WMP, but not for all other organizations. BN has not set a firm deadline for full completion of the Blue Sheet Process.

**Risk Ranking:** N/A

**Response and Planned Corrective Action:** At no time were LLW operations conducted in a degraded manner. The LLW operations fell under the cognizance of a single (REECo) incumbent contractor prior to January 1, 1996. Those same people and procedures are in place today. Therefore, the blue-sheeting process had little effect on waste management operations. NTS is cognizant of this generic issue and is presently implementing proactive measures to mitigate the weakness. Shortly after assuming responsibility for the Performance-Based Management

contract, BN adopted a consolidated, consistent set of procedures via a formal approval process called "Blue Sheeting." This set of procedures will remain in effect until replaced with formal BN documents.

Blue-sheeted procedures are listed on an automated database. The database provides for developing a cross reference to new company procedures. The new company procedures will be prepared in accordance with the provisions of the new company procedure covering the development and approval of policies, plans, and procedures.

This company procedure entitled, *Development and Approval of Policies, Plans, and Procedures*, Number C-J15.002, underwent final review on July 2, 1996. Distribution of this new company procedure is anticipated to be completed by July 31, 1996.

- Schedule and Cost:** The current procedure development/conversion schedule is to have company procedures in the new BN format by September 30, 1996. The estimated cost of the company procedure preparation process is about \$1,000K. Local Implementing Documents (division/department-level documents) will be completed by December 31, 1996.
- Tracking Mechanism:** This activity is being tracked by the company Automated Deficiency Tracking System.
- Reference:** Draft BN SOP, *Development and Approval of Policies, Plans, and Procedures*, Number C-J15.002.

**Finding:** Concern related to PA and Site Characterization, Section 6.1.3, (Volume III)

**Finding Description:** Completion of the site characterization effort and the PA for Area 3 RWMS is critical to documenting the basis for Waste Acceptance Criteria for this disposal site and demonstrating the site is well designed and operated safely. Because the Area 3 PA is not scheduled for completion until September 1997, it will also be important to begin developing the pre-1988 inventory for inclusion in the interacting (composite) sources analysis for the Area 3 RWMS.

**Discussion:** While disposal activities have continued at both the Area 3 and 5 RWMSs since 1988, funding priorities have favored site characterization and PA activities conducted for Area 5 because of its more significant inventory and impact on DOE operations at the NTS and throughout the DOE complex. With the completion and submittal of the PA for the Area 5 RWMS, priority has now shifted to Area 3. However, failure to conduct site characterization for the Area 3 RWMS in prior years has complicated the analysis.

It is important that the priority and the available resources remain focused on Area 3 activities until these studies are completed.

**Risk Ranking:** N/A

**Response and Planned Corrective Action:** DOE will continue to emphasize the priority on Area 3 activities until these studies are completed. New DOE/HQ guidelines that will provide minimum criteria for an acceptable PA and that will recognize the need to consider other more appropriate standards in the PA development and approval process are necessary. The need to consider other more appropriate standards in the PA development and approval process is recognized and appears to be supported by recent DOE/HQ action via a proposed exemption process to DOE Order 5820.2A requirements. This DOE action recognizes that commercial disposal sites are adequately protecting the environment without complying with the rigorous PA process.



CAs currently in process include the following:

An Area 3 inventory analysis, including pre-1988 waste, is currently in draft form and undergoing internal review.

The pre-1988 inventory of the Area 3 RWMS has been initiated as part of the Composite Analysis for this facility and is expected to be complete by August 1996.

Site characterization is also well underway in Area 3. Multiple bore holes have been drilled, and some samples have been collected for characterization purposes.

A working draft of the Area 3 RWMS PA is expected by September 1997.

**Schedule and Costs:**

A concerted effort will begin in September 1996 on the Composite Analysis for the Area 3 RWMS and is expected to be completed by September 1997 at a cost of \$239K under ADS 345. A Composite Analysis for the Area 5 RWMS is to begin in September 1997 and is expected to be completed in March 1999, at an estimated cost of \$1,117K, under ADS 345.

**Tracking Mechanism:**

This activity will be tracked through the DOE/NV Performance Measurement Information System/Project Tracking System/(PMIS/PTS) monthly reporting system.

**References:**

Area 3/5 LLW PA Task Plan WBS Number:  
345.09RR9603/1.3.5.2.11.09.

DOE memorandum from James V. Antizzo to Distribution, *Use of Commercial Facilities for the Disposal of DOE Low-level Waste*, July 2, 1996.

<b>Finding:</b>	Concern related to PA and site characterization, Section 6.1.3, (Volume III)
<b>Finding Description:</b>	Completion of the PA for the Area 5 RWMS operation will require an analysis of the other source terms that potentially add to the doses calculated for the receptor. Therefore, the PA for the active and planned LLW disposal facilities in the Area 5 RWMS is to include an analysis of LLW disposed of prior to September 26, 1988, as well as other sources of radioactive contamination in the ground (e.g., spills, leaks, liquid discharge plumes). Such an analysis will identify the pathways that exist for superimposition of plumes emanating from nearby disposal and will determine the levels of exposure and dose that occur as a result of releases from these sources.
<b>Discussion:</b>	<p>The Defense Nuclear Facilities Safety Board Recommendation 94-2 requires the analysis of all past, present, and future waste disposed of in the vicinity of an active or planned disposal facility. It is logical to perform the (composite) sources analysis and demonstrate the presence or absence of superimposed plumes and composite impacts. However, the level of effort necessary to document and justify estimates of pre-1988 waste inventories may be significant.</p> <p>Failure to obtain DOE/HQ approval of the PA for the Area 5 RWMS in a timely fashion could adversely affect the ability of the NTS to accept off-site shipments of LLW and may affect its ability to dispose of on-site-generated waste. DOE/HQ approval of a PA currently requires an interacting (composite) sources analysis to be prepared, submitted, and approved with the PA. Assuming guidance from DOE/HQ does not change, it will be important to complete this analysis as soon as possible in order to obtain DOE approval of the Area 5 RWMS PA. This effort will require management attention to ensure priority and resource commitments.</p>
<b>Risk Ranking:</b>	N/A

**Response and Planned  
Corrective Action:**

A Composite Analysis for the Area 5 RWMS is planned to begin in September 1997 and is expected to take approximately 15 months to complete. The Composite Analysis will use recent DOE/HQ guidance.

**Schedule and Cost:**

Begin Area 5 Composite Analysis in September 1997; projected completion date, March 1999, at a cost of \$1,117K, under ADS 345.

**Tracking Mechanism:**

This activity will be tracked through the DOE/NV PMIS/PTS monthly reporting system.

**Reference:**

Area 3/5 LLW PA Task Plan WBS  
Number: 345.09RR9603/1.3.5.2.11.09.

<b>Finding:</b>	Concern related to PA and site characterization, Section 6.1.3, (Volume III)
<b>Finding Description:</b>	Subsidence of pits, trenches, and craters containing packaged LLW may be greater than foreseen and could lead to long-term impacts on final cover integrity.
<b>Discussion:</b>	<p>Failure to account for subsidence and to engineer a high integrity final cover could result in greater long-term releases of radon and atmospheric pathway exposures and easier near-term vectors to intruders. Subsidence of both wastes and covers could also result in localized infiltration to waste depths and sediment profiles sufficient to escape the influence of evaporation or transpiration processes that extracts moisture from the soil profile. This would, in turn, alter conclusions regarding the vadose zone and groundwater pathway. The absence of a final design at this time does not represent a threat to human health. Management attention will be needed over several years to ensure that studies are completed, that long-term data sets are collected on the performance of the prototype, and that a valid, final cover design is developed.</p>
<b>Risk Ranking:</b>	N/A
<b>Response and Planned Corrective Action:</b>	<p>A study of the subsidence situation at the Area 5 RWMS has been submitted to the Peer Review Panel (PRP) for consideration. This study concludes that:</p> <p>Subsidence from two to seven m (seven to 24 ft), depending upon location, is predicted in the Area 5 RWMS trenches and pits containing LLW. The U3ax/bl conceptual cap design, contemplated for use in the Area 3 RWMS, may be inadequate for use in locations where substantial subsidence is anticipated, such as in Area 5.</p> <p>Potential measures to mitigate the possibility of subsidence at the site include:</p> <ul style="list-style-type: none"> <li>● Use of containers, and filling and stacking methods which provide for maximum density of the disposed</li> </ul>

waste stream. Avoiding overpacks, whenever possible.

- In-filling voids within containers during packaging or at disposal site with naturally dense, nondegradable materials. In-filling voids between containers with sand or grout using air slurring.
- Avoiding disposal of shipping dunnage in the trenches. For example, a separate method of disposal could be used for shipping dunnage, or wood could be crushed or chipped prior to being disposed.
- Employing void-reducing techniques on existing disposal cells to encourage subsidence during active operations. These techniques could include supercharging, dynamic compaction, etc.
- Not requiring that all waste be disposed of in containers.

The final cap will be designed to take into consideration the subsidence problem identified above. A series of studies and simulations will be required before a final cap design is selected. This activity is expected to take several years to complete.

**Schedule and Cost:**

A study of the subsidence situation at the Area 5 RWMS was provided to the PRP on June 21, 1996. Further action will depend on how soon the PRP provides comments/concurrence on the NTS response. This activity is being performed under ADS 345.

**Tracking Mechanism:**

This task will be tracked through the DOE/NV PMIS/PTS monthly reporting system.

**References:**

Program Management Plan, *Integrated Closure Program for the Area 3 and Area 5 RWMSs*, NTS, September 1994.

Response to the Second Request for Information on the PA for the Area 5 RWMS at the NTS, Nye County, Nevada, June 21, 1996.

**Finding:** Concern related to design and construction, Section 6.1.4, (Volume III)

**Finding Description:** Side-slope stability has been identified as a safety issue in the safe construction and operation of trenches, pits, and craters for waste disposal.

**Discussion:** A geotechnical engineer conducted a study of the soils in which trenches and pits are constructed at the Area 5 RWMS. It was found that side-slopes of one-to-one would be safe, and trenches and pits deeper than 25 feet should have benches at the 25-foot level as the excavation was deepened. Based on radon emission at the land surface, it has been determined that disposal of some thorium wastes requires depths in excess of 25 feet (approximately 48 feet to the base of the trench). Accordingly, existing trenches (i.e., P03U, T03U, and P06U) require reengineering to correct side-slope or bench safety issues. This activity is underway, and the issue is raised here only because it is an open issue requiring CA.

The slope-stability analysis prepared by the geotechnical engineering professional gave rise to the need to reevaluate and reengineer existing trenches with side-slopes steeper than one-to-one and without benching at the 25-foot depth for deeper trenches.

Safety of side slopes is an operational safety issue. Certainly, narrow and deep trenches offer a greater safety hazard to workers than wide and shallow pits. While work is underway to correct this safety issue, management attention to this issue will ensure priority and resource commitments necessary to establish the operation safety.

**Risk Ranking:** N/A

**Response and Planned Corrective Action:**

Trench 3 (T03U) has been backfilled and is effectively closed. There was insufficient room to reconfigure within the required slope as a result of adjacent pits and trenches.

Planned CA to remediate side-slope concerns in Pit 03 (P03U) is to construct a three-foot-high berm at a distance from the interior walls of the pit that will equate to 1.5:1

side-slope ratio. The area between the berm and the pit wall will be a personnel exclusion zone that will meet the requirements of the Occupational Safety and Health Administration.

Suggested CA for side slope of Pit 06 (P06U) is to modify the slope of the west wall of the pit to bring it into compliance. This option has been analyzed by BN and is being reviewed by Bechtel Corporate for concurrence.

**Schedule and Cost:**

Trench 03 backfill took place during May 1996, at an estimated cost of \$10K, as an operational maintenance activity under ADS 333.

Work to correct the side-slope concern in Pit 03 by construction of an exclusion zone is planned for the period of July through September 1996 as an operational maintenance activity under ADS 333.

Work to correct the side-slope concern in Pit 06 will run from August through December 1996, at an estimated cost of \$15K, under ADS 333, as an operational maintenance activity.

**Tracking Mechanism:**

This activity will be tracked by the company Automated Deficiency Tracking System.

**References:**

Final Assessment Report, Areas 3 and 5 RWMSs, Investigation Number PSS-ENV-001, REECo, August 1995.

*Geotechnical Evaluation, Shallow Land Disposal Facility, Nevada Test Site, Area 5, Mercury, Nevada, Western Technologies Inc., December 1994.*

**Finding:** Concern related to design and construction, Section 6.1.4, (Volume III)

**Finding Description:** The road from Mercury Highway to the Area 5 RWMS (5-01) (approximately ten miles long) has been the subject of an accident analysis and deficiencies were identified.

**Discussion:** A registered civil engineer conducted an accident analysis of the road leading from the Mercury Highway to Area 5. The road to the disposal facility was not designed to carry the degree of traffic currently using the roadway. Four conditions were noted that require correction: narrow lane width, insufficient line of sight, poor road shoulder integrity, and shallow flooding following significant storm events. A new road is being designed to connect the disposal facility with the Mercury Highway. The new route will be approximately three miles long.

An unsafe condition has been identified and is being remedied. However, it will require continued management attention to ensure that priority and resource commitments are maintained and the new road is constructed and opened to traffic.

**Risk Ranking:** N/A

**Response and Planned Corrective Action:** Funding has been secured as a line item for this road construction and design of the road is in progress. The Environmental Assessment (EA) for this project has been reviewed by the State. State comments are currently being evaluated by DOE/NV. Upon approval of the EA, design will be completed and construction will begin.

**Schedule and Costs:** The schedule for completion of this project is contingent upon prompt resolution of the comments and issues raised by the State and immediate approval of the EA. Under this scenario, construction will begin in August 1996 and is expected to be 90 percent completed by October 1996. The remaining 10 percent is a bridge over the RWMS channel which will be completed in FY97. If the EA is not approved immediately as indicated above, the schedule may



be delayed. Funding for this activity was secured as a FY96 line item at a cost of \$3,500K under ADS 339.

**Tracking Mechanism:**

This project will be tracked through the DOE/NV PMIS/PTS monthly reporting system.

**References:**

Area 5 RWMS Access Improvement at the Nevada Test Site.

ADS NV-339-AA, WBS 1.3.8.2.9, Cane Spring Road Extension (formerly Road 5-01 Reconstruction).

**Finding:** Concern related to design and construction, Section 6.1.4, (Volume III)

**Finding Description:** Fire Protection for the TPCB is being reevaluated and recommendations will be forthcoming in a report. It is apparent at this time that the forthcoming report will recommend installation of a fire detection system. Currently, there is no fire detection system installed in the TPCB.

**Discussion:** After the TPCB was designed, but before its construction was complete, DOE/NV requested that the Area 5 RWMS be managed as though it was a nuclear facility using a graded approach. Aspects of the design and operation of the TPCB have since been reviewed by the contractor in light of this request. As a result, a study of the building's fire prevention systems have been conducted and will be released soon. Installation of a fire detection system (i.e., an ultraviolet and infrared-based system) within the structure will be recommended. Currently, the building does not have a fire detection system; however, extensive planning and efforts have created a facility with apparently minimal fire hazard. For example, TRU containers are all metal, metal pallets are employed in the facility, the facility is grounded for lightning, and electrical boxes are located well away from any flammable material. The outer fabric of the structure is flammable but must be exposed to open flames before it will ignite. Four-by-four wood posts are used as spacers in the facility; however, they are widely spaced and not located near an ignition source.

Because the facility is now managed as a nuclear facility, the use of nonflammable materials (e.g., metal waste containers, metal pallets) and the separation of ignition sources and flammable material has been deemed insufficient, and a fire detection system is required and will be installed in the near future.

Logical and thorough efforts have been implemented to protect against fire in the TPCB. However, absence of a fire detection system implies that if ignited through an unforeseen event, a fire may go undetected for a period of time. While the likelihood of such an event may be remote, it is important that management attention is maintained

until the issue is resolved. This will ensure that, once identified, the fire detection system is procured and installed in a timely manner.

**Risk Ranking:**

N/A

**Response and Planned Corrective Action:**

A compliance assessment of Areas 3 and 5 in July 1995 recognized the need for a fire hazard analysis of the TPCB. When completed in April 1996, this analysis recommended fire protection elements at the TPCB as an acceptable "equivalency" to DOE fire protection criteria. A letter dated June 12, 1996, from the DOE/NV Safety and Health Division stated in part that, "... we agree with the FHA conclusion that completion of all FHA recommendations, particularly the installation of a flame detection system, will provide a level of fire protection for the TPCB which will meet current DOE fire protection criteria."

A flame detection system is in the process of being procured and will soon be installed in the TPCB.

**Schedule and Costs:**

The fire detection system estimated to cost \$20K is presently in procurement with anticipated receipt by August 1996. The fire detection system installation, estimated to cost \$5K, will begin by August 1996 and be completed by September 1996. Procurement and installation will be under ADS 333.

**Tracking Mechanism:**

This activity will be tracked through the DOE/NV PMIS/PTS monthly reporting system.

**References:**

Fire Hazards Analysis for Nevada Test Site Area 5 RWMS TPCB, BN, April 11, 1996.

BN Letter A110-GWS-96-029J, G. W. Suenkel to Lester P. Skousen, *Request for Acceptable Equivalency Concurrence for TPCB Fire Protection Requirements*, April 18, 1996.

DOE/NV Letter 008965, Lester P. Skousen to Garry W. Suenkel, *Request for Acceptable Equivalency Concurrence for TPCB Fire Protection Requirements*, June 12, 1996.

<b>Finding:</b>	Concern related to Environmental Restoration (ER), Section 6.1.6, (Volume III)
<b>Finding Description:</b>	Cleaning up and managing the ER Program's Pu-contaminated soil may create unnecessary risk to workers. However, due to unknown future land use and potential loss of institutional control in the long term, if cleanup activities are not conducted, additional risks to the public and the environment may result.
<b>Discussion:</b>	The FY96 <i>NTS Waste Stream Baseline Monitoring Report</i> estimates that 38,310,00 cubic feet (1,084,790 cubic meters) of Pu-contaminated soil may be generated as a result of ER cleanup at a level greater than 40 picocuries per gram at the NTS. This volume will have a significant impact on LLW management planning for disposal. Also, if a large area of the Pu-contaminated soil is disturbed, higher airborne exposure may be introduced, industrial risk to workers may be significantly higher than the current Pu exposure to public and workers, and sensitive ecosystem may potentially suffer damage.
<b>Risk Ranking:</b>	N/A
<b>Response and Planned Corrective Action:</b>	<p>Like any industrial activity, remediation of Pu-contaminated soils will be carried out on the schedule currently outlined in the Baseline Environmental Management Report (BEMR). The availability of funds and reprioritization of sites to be cleaned up will influence this schedule.</p> <p>Any remediation activity creates risks to those workers involved in the activity. Pre-job risk analysis and safety assessments are performed by BN before starting a remediation project to identify and eliminate/reduce the hazards of that project. All work is performed under a Site-Specific Health and Safety Plan. The work force is trained to specific procedures required to perform the work. The requirements necessary to control worker exposure to radiation are detailed in a Radiological Work Permit. The work force is monitored on a daily basis for radiation exposure and heat stress.</p>

This general approach has proven very successful in mitigating risks on BN environmental remediation projects.

**Schedule and Costs:**

The ER cleanup schedule for the following sites will be initiated and completed in the FY indicated:

Double Tracks, TTR, FY 1996, \$3,381K, ADS 211  
Clean Slate 1, TTR, FY 1997, \$6,762K, ADS 225  
Clean Slate 2, TTR, FY 1998, \$20,285K, ADS 225  
Clean Slate 3, TTR, FY 1999, \$1,890K, ADS 225

**Tracking Mechanism:**

Tracking of these ER activities will be through the DOE/NV PMIS/PTS monthly reporting system.

**Reference:**

*The 1995 BEMR, DOE, Office of Environmental Management, March 1995.*

<b>Finding:</b>	Concern related to ER, Section 6.1.6, (Volume III)
<b>Finding Description:</b>	There has been no formal evaluation to identify if there are any inactive disposal sites that have potential to contribute to or interact with the Area 3 and 5 RWMS.
<b>Discussion:</b>	The August 1995 "Environmental Restoration Sites Inventory" identified 2,384 sites including 908 actual events. It stated that "The cavities were added as ER sites representing underground nuclear test event locations where a local or regional impact to groundwater resources has resulted or might result." Several ER sites have been identified within Areas 3 and 5, but no evaluation has been made to determine if these sites may contribute to, or interact with, the disposal facility's source term. However, the potential for interaction with the ER industrial sites is very low due to the apparent absence of a groundwater pathway, according to DOE/NV contractor technical personnel.
<b>Risk Ranking:</b>	N/A
<b>Response and Planned Corrective Action:</b>	<p>Several environmental surveys have been conducted at the NTS to identify sites that may require environmental remediation, including inactive disposal sites. The results of those surveys were included in a site-wide environmental remediation database maintained for DOE/NV by IT Corporation. In addition to the results of previous surveys, that database contains the results of a review of engineering records, interviews with employees, and field reconnaissance and location of each identified site. The sites identified are listed in the appendices to the Federal Facilities Agreement and Consent Order between the state of Nevada, DOE/NV, and Defense Nuclear Agency.</p> <p>Composite Analysis, which includes interactive sources from all sites including inactive disposal sites, will be conducted for the Area 3 facility beginning in September 1996. A similar analysis will be conducted for the Area 5 facility. A pre-1988 inventory has been completed for Area 3.</p>

These analyses will identify any sources that have the potential to contribute to, or interact with, the Area 3 or 5 RWMSs.

**Schedule and Costs:**

A concerted effort will begin in September 1996 on the Composite Analysis for the Area 3 RWMS and is expected to be completed by September 1997 at a cost of \$239K under ADS 345. A Composite Analysis for the Area 5 RWMS is to begin in September 1997 and is expected to be completed in March 1999, at a estimated cost of \$1,117K, under ADS 345.

**Tracking Mechanism:**

These activities will be tracked through the DOE/NV PMIS/PTS monthly reporting system.

**References:**

Federal Facilities Agreement and Consent Order, effective May 10, 1996.

IT Corporation Task Plan for ER Site Survey.

5.0 SUMMARY TABLE

Nevada Test Site

Vulnerability/Concern	Title	CA Activities/Status	Start Date	Completion Date
Adequacy of Contractor SOPs	Contractor SOPs	(1) Distribute SOP for developing procedures	01/96	7/31/96
		(2) Complete company-level documents	7/31/96	9/1/96
		(3) Complete operating SOPs	7/31/96	12/31/96
Completion of the Area 3 PA	Area 3 PA	(1) Composite Analysis for the Area 3 RWMS	09/96	09/97
		(2) Composite Analysis for the Area 5 RWMS	09/97	03/99
Analysis of LLW disposed of prior to 1988 not included in PA for Area 5 RWMS	Area 5 PA	Composite Analysis for the Area 5 RWMS	09/97	03/99
Subsidence rate of pits, trenches, and craters containing LLW	Subsidence Rates	PRP review of a study of the subsidence situation at the Area 5 RWMS; finalization dependent upon PRP input (TBD)	06/96	TBD
Side-slope stability in pits, trenches, and craters	Side-slope Stability	Correct Trench 03 (Backfill)	05/96	05/96
		Correct side slope Pit 03	07/96	09/96
		Correct side slope Pit 06	07/96	12/96



Adequacy of 5-01 road from the Mercury Highway to the Area 5 RWMS	Adequacy of 5-01 Road	Manufacturing aggregate Road construction Bridge construction	07/96 08/96 10/96	08/96 09/96 (90%) 12/96 (job complete)
Adequacy of TPCB Fire Protection	TPCB Fire Protection	Detection system procurement Detection system installation	07/96 08/96	08/96 09/96
Cleaning up and managing the ER Program's Pu-contaminated soil may create unnecessary risk to workers	Pu-contaminated soil management	ER cleanup schedule at TTR: Double Tracks Clean Slate 1 Clean Slate 2 Clean Slate 3	10/95 10/96 10/97 10/98	09/96 09/97 09/98 09/99
Evaluation of Inactive Disposal Sites which may interact with Areas 3 and 5 RWMSs	Inactive Disposal Sites	(1) Composite Analysis for Area 3 RWMS (2) Composite Analysis for Area 5 RWMS	09/96 09/97	09/97 03/99

***TAB***



## Department of Energy

Oak Ridge Operations Office  
P.O. Box 2001  
Oak Ridge, Tennessee 37831— 8620

July 23, 1996

Mr. Marty Letourneau  
c/o Argonne National Laboratory  
1 Bank Street, Suite 250  
Gaithersburg, Maryland 20878

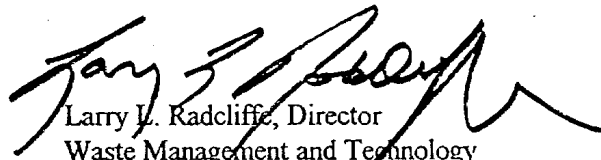
Dear Mr. Letourneau:

### **CORRECTIVE ACTION PLAN FOR DEFENSE NUCLEAR FACILITIES SAFETY BOARD 94-2 COMPLEX-WIDE REVIEW**

Enclosed you will find the Oak Ridge Corrective Action Plan prepared in response to the Defense Nuclear Facilities Safety Board 94-2 Complex-Wide Review.

If you have any questions, please contact Bill Gilbert of my staff at (423) 576-1817.

Sincerely,



Larry L. Radcliffe, Director  
Waste Management and Technology  
Development Division

Enclosure

**OAK RIDGE RESERVATION  
CORRECTIVE ACTION PLAN  
RESULTING FROM  
THE  
COMPLEX-WIDE REVIEW**

## 1.0 EXECUTIVE SUMMARY

The Oak Ridge Reservation (ORR) encompasses three major facilities (ORNL, Y-12 Plant, and K-25 Site) where low-level waste (LLW) is managed. All three facilities were reviewed during this assessment. LLW activities at the ORR include over 100 generators, 130 storage facilities, seven treatment facilities, and one active disposal operation. The 1996 ORR waste forecast includes approximately 100,000 ft<sup>3</sup> (2,830 m<sup>3</sup>) of LLW and 600,000 ft<sup>3</sup> (16,990 m<sup>3</sup>) of MLLW. The 1996 disposal volume (pre-treatment) is expected to be in the range of 30,000 ft<sup>3</sup> (850 m<sup>3</sup>). Treatment of LLW by volume reduction prior to disposal will be conducted primarily by off-site private-sector vendors. MLLW is primarily stored awaiting treatment and disposal.

The Working Group Assessment Team (WGAT) identified a total of eight vulnerabilities. Three of the vulnerabilities were related to management and oversight, two were concerned with waste characterization, and one each focused on performance assessment, design and construction, and operations and maintenance.

A number of actions and initiatives are either underway or planned to address issues related to the vulnerabilities identified during the Complex-Wide Review. Most of the potential vulnerabilities were identified internally during the Site Evaluation Survey conducted during September 1995 and those for which site-level actions were sufficient those were already the subject of programmatic corrective activity. Others, whose root causes lie in the arena of national program decisions and/or policy, remain to be addressed.

The WGAT concluded that overall, waste management on the ORR is sound and LLW operations on the ORR represent a medium to low overall risk. Vulnerabilities for which a medium risk was identified related to potential environmental and disposal facility performance impacts.

## 2.0 INTRODUCTION

The assessment of the Oak Ridge Reservation (ORR) was conducted during the period of March 4, 1996, through March 15, 1996. The assessment and resulting vulnerability identification has been documented and published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. The assessment included treatment, storage and disposal facilities and operations, all three ORR sites (K-25, ORNL, & Y-12) as well as programmatic, management and oversight functions.

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan responding to Defense Nuclear Facility Safety Board (DNFSB) Recommendation 94-2. The actions described in this plan are intended to address reduction and/or elimination of the vulnerabilities identified in the ORR Site-Specific Assessment Report, DOE/EM-0280, Volume III, May 1996.

## 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The LLW management facilities on the Oak Ridge Reservation are operated by two subsidiary corporations of the Lockheed Martin Corporation. Lockheed Martin Energy Systems (LMES) operates the K-25 Site and the Y-12 Plant, while Lockheed Martin Energy Research (LMER) operates the Oak Ridge National Laboratory (ORNL). These site operations are conducted under the direction of the U.S. Department of Energy through the DOE Oak Ridge Operations Office (DOE-ORO). DOE-ORO, as the site DOE representative, has the lead for ensuring that the CAP is implemented by both LMES and LMER.

The following personnel are the points of contact for their respective organizations:

<u>Organization</u>	<u>Name</u>	<u>Telephone Number</u>
LMES	K. A. Balo	(423) 574- 9014
LMER	F. C. Kornegay	(423) 574-6688
DOE-ORO	W. C. Gilbert	(423) 576-1817

#### 4.0 VULNERABILITIES AND PLANNED ACTIONS

Provided below are the actions, either planned, in-progress or completed, for each of the eight ORR vulnerabilities contained in Volume III of the Complex-Wide Review Final Report.

---

<b>Vulnerability Number:</b>	<b>ORR-ORNL-MO-DSI "Special case waste with no disposal path forward"</b>
<b>Description:</b>	Special case wastes and some higher activity wastes are being stored in generator facilities such as hot cells. Further movement of these wastes into the waste management process (characterization, etc.) has not occurred primarily due to the lack of a defined path forward for disposal of these wastes.
<b>Risk Ranking:</b>	The potentially affected receptors include the public, worker, and environment, with a likelihood of occurrence of 1-10 years for the public and the environment and less than 1 year for the worker. The risk level is considered low for the environment; it is considered medium for the public and worker. The risk to the disposal facility is considered not applicable. This vulnerability falls under the operations and maintenance functional area.
<b>Planned Corrective Action:</b>	LMES in conjunction with LMER has submitted a Baseline Change Proposal (BCP) to reprogram FY 96 funds to begin a comprehensive effort to:  <ol style="list-style-type: none"><li>(1) update the special case waste (SCW) inventory, including all three ORR sites;</li><li>(2) improve the forecast of future SCW generation;</li><li>(3) identify technical paths forward to disposal for substreams;</li><li>(4) identify those SCW streams for which repository-type disposal is required;</li><li>(5) develop life-cycle cost profiles for primary SCW sub-streams;</li></ol> and

(6) establish out-year program goals for disposal of SCW sub-streams for which viable technical paths forward have been identified. Wastes that are determined to require geological repository disposal will be stored in a safe configuration until a complex-level programmatic disposal option becomes available. This vulnerability cannot be completely addressed until actions are implemented at the DOE complex level to respond to Complex-Wide Vulnerability No. 5, "LLW and other materials for which there is no identified or technical path forward."

**Schedule and Cost:**

Items (1), (3), and (4) are expected to be accomplished during the remainder of FY 96. This activity will be carried out under Activity Data Sheet (ADS) 8203 and is estimated to cost approximately \$200K. Items (2), (5), and (6) will carry over into FY 97 with full execution of item (6) likely extending into FY 98 and FY 99. Associated costs for these activities in FY 97-FY 99 are not fully identified at this time, but are expected to be \$500K annually.

**Tracking Mechanism:**

This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.

**Reference:**

- (1) Complex-Wide Review, DOE/EM-0280, May 1996
- (2) ORNL/TM-13129, "Special Case Waste Located at Oak Ridge National Laboratory Facilities Survey Report", November 1995.

---

<b>Vulnerability Number:</b>	<b>ORR-OM-WT1 “Emergency management planning for natural phenomenon impacting ORR LLW management facilities”</b>
<b>Description:</b>	The occurrence of natural phenomena or catastrophic events (e.g., tornadoes, hurricanes, etc.) could potentially expose site workers, the environment, and the general public to radiation. The ORR is in a geographical region which from time to time comes under tornado warnings. Safety analysis reports and basis for interim operation documents which address the effects of natural phenomena have been developed for individual LLW management facilities and site specific Safety Analysis Reports (SARs) (e.g., SAR for the Y-12 Plant) are currently in development. Emergency management planning for natural phenomena impacting ORR LLW management does not appear to be comprehensive to the extent of addressing outdoor storage of LLW and materials in the scrap metal yard.
<b>Risk Ranking:</b>	The potentially affected receptors include the public, worker, environment, and disposal facility performance, with a likelihood of occurrence of 10-100 years for each exposure or release. The risk level is considered low for the public, worker, and disposal facility, and medium for the environment. This vulnerability falls under the operations and maintenance functional area.



**Planned****Corrective Action:**

The ORR is in a geographical area in which the incidence rate for extremely destructive weather events, such as tornadoes, is very low. This low rate combined with probabilities that such an event would affect one or more of the ORR sites and a LLW or MLLW storage area or facility within a site, results in an extremely low total probability for this postulated event. Safety documentation and site-specific emergency plans have been prepared to address a variety of postulated events involving Waste Management (WM) facilities, including those that would result from the impact of natural phenomena such as tornadoes. Upgrades and improvements to safety documents and emergency planning are routinely incorporated into the overall WM activity scope to ensure that an appropriate state of readiness exists to respond to events of this type, should they occur. The following, specific activities are examples of these efforts to address areas related to this vulnerability:

(1) K-25 Site - The facilities at the K-25 Site have been part of the Safety Analysis Report Update Program, which has applied a graded approach to the evaluation of natural phenomena impacts on storage operations. The depth of the evaluations depend upon facility complexity and the nature of the operational activities routinely performed in the facility and range from qualitative to detailed, quantitative evaluations. The resulting consequences are documented in each safety document along with the mitigating actions. Basis of Interim Operation (BIOs) documents have been developed for WM facilities and these BIOs incorporate the latest DOE order requirements for the evaluation of the adverse impacts of natural phenomena.

The K-1066-H facility is a temporary, outdoor storage pad and as such, is not covered by the SAR program described above. Consequently, an Auditable Safety Analysis (ASA) will be generated for the K-1066-H facility that will address the impacts of natural phenomena and resulting mitigative action more specifically than current safety documentation. Similarly, an ASA for the Contaminated Scrap Metal Storage Yard was completed in FY 95.

(2) ORNL - The BIOs address the possible impact of violent natural phenomena (i.e., tornadoes) on WM facilities and incorporate standard analysis procedures for determining external initiating events for releases. The analysis methodology eliminates tornado or other violent weather scenarios when the result of another postulated scenario presents the limiting, upper-bound planning case.

(3) Y-12 Plant - Safety documentation similar to that at K-25 and ORNL is in place for the facilities at Y-12 which provides analysis of the impact of natural phenomena for emergency planning use. A BIO is in place for the Uranium Oxide Vaults, with a SAR completed. A SAR is in process for the LLW compactor and a SAR is scheduled for the Above-Grade Storage Facility and the Old Salvage Yard. Other WM facilities also have appropriate documentation.

As a result of these previously initiated program actions to upgrade WM facility documentation, the subsequent routine reviews and updates coupled with the fact that site-specific emergency planning encompasses responses to natural phenomena impacts, no additional commitments beyond these routine reviews and revisions are considered necessary to address this vulnerability.

**Schedule and Cost:**

The ASA for the K-1066-H outdoor storage pad is scheduled for completion in August 1997 under ADS 4201. The associated cost is expected to be \$50K. Completion of the safety documentation for the Y-12 LLW Compactor and the Above-Grade Storage Pad SAR is scheduled for FY 97, the Old Salvage Yard is scheduled for FY 98, and the Uranium Oxide Vaults SAR is complete. The cost for these activities is approximately \$600K and is addressed under ADS 2201.

**Tracking Mechanism:**

This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.

**Reference:**

Complex-Wide Review, DOE/EM-0280, May 1996.

---

**Vulnerability Number:** ORR-WC-DT1 "Uncharacterized legacy waste managed at the ORR "

**Description:** A significant volume of LLW, considered legacy, has accumulated in ORR storage facilities for which radiological characterization data is lacking or minimal. Additional characterization will probably be required before disposition can occur.

**Risk Ranking:** The potentially affected receptors include the worker and the environment. The likelihood of occurrence is less than one year for each exposure/release and the vulnerability is considered a medium risk level to the workers and environment. The risk to the public and disposal facility is considered not applicable. This vulnerability falls under the waste characterization and packaging functional area.

**Planned**

**Corrective Action:**

Actions to address this item include:

(1) K-25 Site: At the end of FY 96, 6966 legacy waste containers will have been processed via the Non-Destructive Assay (NDA) facility. Primary characterization will have been performed, as a service to generators, for an additional 683 containers. This effort will complete the NDA of all legacy waste, under WM programmatic control at the K-25 Site.

(2) Y-12 Plant: During FY 96, NDA capability has been substantially upgraded for the purposes of characterizing existing wastes and assisting Defense Program (DP) generators with primary characterization of wastes in their possession and not adequately characterized for transfer to WM.

The use of this facility, which became operational in April, 1996, along with physical sampling of some containers, has enabled the initiation of transfer of these wastes from the generator to WM. WM and DP have committed to the development of a project plan to address the strategy and specific actions necessary for disposition of the entire stockpile of these wastes. Actions contained within the project plan that are DP responsibilities, and required to be completed prior to transfer of the waste to WM will be outside of the scope of commitments contained within this corrective action plan. All legacy waste under WM programmatic control is being fully characterized.

(3) ORNL: A plan of action for disposal of wastes stored in the SWSA-5S pad, including off-site treatment, characterization and packaging has been completed and those wastes began to be processed in July 1996 and will be completed by September 30, 1996. A plan for the wastes associated with Building 7841 has been prepared, including characterization, and work has started removing some of the waste stored in that building. Building 7841 also contains waste that will be difficult to move as it is in highly contaminated lead lined containers. The current planning addresses this difficult waste and the budget is being requested to target completion of this project by the end of FY 97.

**Schedule and Cost:**

(1) The K-25 Waste Management Division will complete their legacy characterization effort, under ADS 4201 in FY 96 at a cost of \$2.9M. (2) The WM Division at the Y-12 Plant is scheduling the completion of the project plan for June 1997. Specific actions and completion dates will be contained in the project plan and will be under ADS 2201. Total costs for the project are estimated to be \$5M - \$10M to transition the backlog, as well as newly generated waste, during this period to WM. (3) The Waste Management and Remedial Action Division at ORNL projects completion of their activities, under ADS 3201 by the end of FY 97. Costs are expected to be approximately \$2.6M.

**Tracking Mechanism:**

This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.

**Reference:** (1) Complex-Wide Review, DOE/EM-0280, May 1996  
(2) ORNL/TM-13129, "Special Case Waste Located at Oak Ridge National Laboratory Facilities Survey Report," November 1995.

---

**Vulnerability Number:** ORR-MO-JA1 "Lack of disposal options for LLW"

**Description:** High volumes of waste are accumulating on the ORR in waste management storage areas. These areas have some potential for releases to the environment due to degradation of containers stored outdoors, and some potential for worker exposure. Many of the waste streams have no clear path forward for permanent disposal.

**Risk Ranking:** The potentially affected receptors include the worker and the environment, with a likelihood of occurrence of 1 - 10 years for the worker and the environment. The risk level is considered low for each receptor. The risk to the public and disposal facilities is considered not applicable. This vulnerability falls under the management and oversight functional area.

**Planned**

**Corrective Action:**

This vulnerability is related to both vulnerabilities ORR-ORNL-MO-DS1 and ORR-WC-DT1. Those wastes whose path forward is hampered by lack of characterization are being addressed in the corrective actions described under ORR-WC-DT1. Those wastes whose characteristics or origin have resulted in no clear technical path to disposal are being addressed in actions described in response to ORR-ORNL-MO-DS1. Additional actions aimed at moving wastes to final disposition include:

(1) Improvements and upgrades to waste certification programs for newly generated wastes. K-25 and Y-12 are completing a two-year implementation of a substantially more rigorous certification program to improve the process quality of waste characterization and classification data. ORNL is currently in the process of implementing an improved waste certification program to provide similar process improvements. These actions directly affect the quality and reliability of waste data thus improving the ability of waste management to exercise disposal options that are available both on-site and off-site.

(2) Off-site disposal facilities are being aggressively pursued for wastes that do have a technical path forward. An application to dispose of a major LLW stream at the Nevada Test Site (NTS) has received technical approval. Only DOE-HQ approval is required to initiate shipment. Additional applications for NTS disposal are under development.

Parallel to the NTS effort, soils, cooling tower sludge, compacted dry-active waste, depleted uranium oxide, and treatment residuals in the form of incinerator ash and metal melt slag are all being profiled and considered for disposal at the Envirocare of Utah facility in Clive, Utah. Other disposal outlets, such as the Hanford Reservation, are also being evaluated.

(3) On-site disposal at the Interim Waste Management Facility (IWMF), following treatment, of Process Waste Treatment Plant (PWTP) sludge that is currently stored at both ORNL and the K-25 Site began this fiscal year, and all LLW generated at the ORNL that meets the acceptance criteria (including performance assessment limits) is disposed of on the IWMF.

(4) Planning is also in progress for future on-site disposal capability in West Bear Creek Valley, in a facility designed to address both WM and Environmental Restoration (ER) disposal requirements. Additionally, a design and draft performance assessment will be completed for a proposed successor facility to the IWMF.

**Schedule and Cost:**

(1) Cost to implement the certification program at the K-25 Site and Y-12 Plant was approximately \$1.2M with annual operating costs expected to be approximately \$400K. These were conducted under ADSs 4201 and 2201 respectively. The implementation cost of the ORNL certification program is anticipated to be approximately \$750K - \$1M and will be conducted under ADSs 3201, 3203 and 3252. The schedule for implementation is, pilot implementation by February 1997 and full implementation by June 1998.

(2) Off-site disposal activities this fiscal year include efforts to maintain the NTS certification status of the Melton Valley Storage Tank (MVST) solidified supernatant (\$300K, ADS 3201), preparation and disposal of 9,000 ft<sup>3</sup> (255m<sup>3</sup>) of LLW at Envirocare, primarily composed of depleted U oxide and incinerated ash (\$210K, ADS 8203).

(3) PWTP sludge is being treated and disposed of, with half of the stored inventory scheduled for disposal this year (\$2.5M, ADS 8203) and the remainder in FY 97 (\$2.5M, ADS 8203).

(4) Aggressive planning is presently under development to disposition the remaining LLW inventory on the ORR between now and 2006 to 2010. Associated funding requirements for this effort are also being developed. These planning profiles are expected to be completed during FY 96.

**Tracking Mechanism:** This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.

**Reference:** Complex-Wide Review, DOE/EM-0280, May 1996.

**Vulnerability Number:** ORR-SWSA6-PA-ML1 "Performance Assessment indicators for SWSA-6 Disposal Facilities." "Do not include impacts from waste disposed on-site before 1988"

**Description:** The SWSA-6 performance assessment concludes that SWSA-6, which accepts ORNL LLW, is marginal in meeting the performance objectives of 5820.2A. The performance assessment does not include impacts of waste disposed on the site before 1988.

- Risk Ranking:** The potentially affected receptors include the public, environment, and disposal facility performance, with a likelihood of occurrence of 10-100 years for the environment and disposal facility, and greater than 100 years for the public. The risk level is considered low for the public and medium for the environment and disposal facility. The risk to the worker is considered not applicable. This vulnerability falls under the performance assessment functional area.
- Planned Corrective Action:** For FY 97, LLW program activity already includes within its work scope the development of a composite analysis to address the impact of interacting source terms with the active disposal operations currently ongoing in SWSA-6. This analysis will be performed in accordance with DOE Guidance dated April 1996.
- Schedule and Cost:** This activity is budgeted at \$250K and will be conducted under ADS 8203. Completion of the composite analysis is scheduled for September 30, 1997.
- Tracking Mechanism:** This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.
- Reference:**
- (1) Complex-Wide Review, DOE/EM-0280, May 1996
  - (2) "Guidance for a Composite Analysis of the Impact of Interacting Source Terms on the Radiological Protection of the Public from Department of Energy Low-Level Waste Disposal Facilities," April 1996.



---

<b>Vulnerability Number:</b>	<b>ORR-ER-DL1 "Waste storage pads continuing release"</b>
<b>Description:</b>	The waste storage pads and scrap metal storage areas at the ORR were observed to have releases to the environment due to current waste storage activities.
<b>Risk Ranking:</b>	The potentially affected receptors include the public, worker, and environment, with a likelihood of occurrence of less than 1 year for the worker and the environment, and 1-10 years for the public. The risk level is considered low for the worker, and medium for the public and the environment. The risk for disposal facility performance is considered not applicable. This vulnerability falls under the Environmental Restoration functional area.
<b>Planned Corrective Action:</b>	FY 97 LLW program scope of work includes a re-evaluation of the entire spectrum of LLW storage on the ORR. This effort will include the development of programmatic recommendations concerning both the continued use of outdoor LLW storage and the disposition of those wastes currently stored outside via a range of options including: (1) treatment and re-location indoors such as K-33 storage, (2) treatment and shipment to disposal or (3) direct shipment to disposal. Following the development of these recommendations, specific program milestones will be developed to support the implementation of those accepted recommendations.

**Schedule and Cost:** Issuance of the recommendations resulting from the re-evaluation is scheduled for December 1996. Implementation schedule development for those recommendations accepted by DOE-ORO will occur during the first quarter of CY 97. Cost of the re-evaluation is estimated at \$75K, and the work will be performed under ADS 8203.

**Tracking Mechanism:** This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the referenced ADS. Additionally, the specific actions will be tracked on the Business Expectations Milestone Tracking and regular progress reports delivered as part of the Bi-Monthly Program Reviews conducted by the DOE-ORO.

**Reference:** Complex-Wide Review, DOE/EM-0280, May 1996.

---

**Vulnerability Number:** ORR-ORNL-MO-DS2 "Process tracking and trending at ORR"

**Description:** Process tracking and trending is not fully developed at ORR. A program was recently initiated to track waste process deficiencies such as solid waste package certification rejects and nonconformance records, but it is in its initial stages and includes only one part of the waste management process.

**Risk Ranking:** The only potentially affected receptor is the worker, with a likelihood of occurrence of less than one year. The risk level is considered medium for the worker. The risk to the public, environment, and disposal facility is considered not applicable. This vulnerability falls under the management and oversight functional area.

**Planned****Corrective Action:**

During the WGAT on-site visit, several discussions were held with the team concerning the issues related to this vulnerability. Those discussions focused on concerns at the process level, specifically those activities intended to ensure, to the extent practicable, that waste identification by generators was accurate. The concern also was intended to include the tracking of program attributes that would identify nonconforming conditions and indicate program-level trends. Verification related to process monitoring was a major area of interest to the WGAT. Verification was an element of the waste certification program being implemented at the K-25 Site and Y-12 Plant during the on-site visit and program elements to address waste verification were being implemented as part of that effort. The K-25 Site verification activities are conducted in accordance with a site procedure, developed to guide the verification aspects of the certification program.

The Y-12 Plant verification activities are guided by a similarly developed plant procedure which forms the basis of their verification efforts under the certification program.

Output from these verification activities will be tracked and trended for purposes of providing management tools for both operational and programmatic uses.

ORNL is expanding their Nonconformance Report (NCR) tracking/trending program beyond the Waste Management and Remedial Action Division (WMRAD) into the other waste-generating divisions at the Laboratory (i.e., Chemical Technology Division, Metals and Ceramics Division, etc.). This effort will provide tracking and verification management tools to the ORNL that are similar to those developed for the other ORR sites.

**Schedule and Cost:**

The K-25 Site and Y-12 Plant procedures are completed and deployed and the associated costs were enveloped in waste certification program costs discussed in response to vulnerability ORR-MO-JA1.

ORNL is scheduled for completion of the implementation of the NCR tracking/trending program in December 1996. The expected costs for implementing this program are addressed in ADSs 3203 and 3252 and are expected to be approximately \$100K.

**Tracking Mechanism:** This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the applicable ADS.

**Reference:** Complex-Wide Review, DOE/EM-0280, May 1996

---

**Vulnerability Number:** ORR-IWMF-WC-CC1 "Disposal curie inventory at the X-10 IWMF (Bldg. 7886) "

**Description:** Radionuclides important to the performance of the Interim Waste Management Facility (IWMF) may not be accounted for in the IWMF disposal inventory.

**Risk Ranking:** The affected receptors include the public, environment, and disposal facility performance, with a likelihood of occurrence of greater than 100 years for each potential exposure/release. The risk level is considered low for the public and environment; it is considered medium for the disposal facility performance. The risk to the worker is considered not applicable. This vulnerability falls under the Waste Characterization functional area.

**Planned**

**Corrective Action:** The radionuclides of significance to this item are  $^{129}\text{I}$  and  $^{231}\text{Pa}$ . The question of Iodine was discussed during the development of the SWSA-6 performance assessment and, in response to a similar Peer Review Panel question during that effort, a technical basis supporting the fact that this isotope of iodine was not a major player in ORNL waste streams was presented to the satisfaction of that review body (Response to Recommendation 8, Appendix I, ORNL-6783, February 1994). Additionally, virtually all of the Pa in the disposal facility is the result of U decay (daughter product buildup is accounted for in the dose analysis) and not the result of primary waste constituents.

The waste acceptance criteria are being revised to require that these radionuclides be reported if present, regardless of quantity, along with the other performance-sensitive radionuclides already carrying this reporting requirement.

- Schedule and Cost:** This action is expected to be completed by the end of FY 96. The associated cost is negligible.
- Tracking Mechanism:** This action will be tracked via the site budget and management systems used for tracking all activities and expenditures under the applicable ADS.
- Reference:** Complex-Wide Review, DOE/EM-0280, May 1996, ORNL-6783, "Performance Assessment for Continuing and Future Operations at Solid Waste Storage Area 6," February 1994.

**OAK RIDGE RESERVATION CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Oak Ridge Reservation

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
ORR-ORNL-MO-DS1	Special case waste with no disposal path forward	(1) Update SCW Inventory (2) Improve SCW Forecast (3) Identify Path Forward for Disposal (4) Identify SCW Needing Repository (5) Develop Life-Cycle Cost (6) Out-Year Disposal Goals	July, 1996 July 1996 July 1996 July 1996 July 1996 July 1996	September 1996 July 1997 September 1996 September 1996 October 1996 September 1999
ORR-OM-WT1	Emergency management planning for natural phenomenon impacting ORR LLW management facilities	(1) Complete Auditable Safety Analysis for the K-1066-H outdoor storage pad (2) Complete safety documentation for the Y-12 LLW compactor and Above Grade Storage Facility	October 1996 October 1996	August 1997 September 1997
ORR-WC-DT1	Uncharacterized legacy waste managed at the ORR	(1) Characterize K-25 Legacy Inventory (2) Develop a Project Plan to disposition the DP "in-process" wastes	October 1995 October 1996	September 1996 June 1997
ORR-MO-JA1	Lack of disposal options for LLW	(1) Implement Certification Improvements at K-25 & Y-12 Implement ORNL program (2) Establish Off-Site Disposal Options (3) Dispose PWTP Inventory	September 1994 October 1994 October 1995	Complete June 1998 Continuing September 1997
ORR-SWSA-6-PA-ML1	Performance assessment indicators for SWSA-6 disposal facilities do not include impacts from waste disposed on-site before 1988	Develop a Composite Analysis for the IWMF	October 1996	September 1997
ORR-ER-DL1	Waste storage pads continuing release	LLW Storage Plan Development	July 1996	December 1996

Vulnerability/ ConcernNumber	Title	Corrective Action Activities/Status	Start Date	Completion Date
ORR-ORNL-MD-DS2	Process tracking and trending at ORR	(1) Implementation of Verification Procedures at K-25 and Y-12 (2) Expansion of NCR Tracking/Trending Program at ORNL	September 1995 September 1995	Complete December 1996
ORR-IWMF-WC-CC1	Disposal curie inventory at the X-10 IWMF (Bldg 7886)	Revise WAC Reporting Requirements	July 1996	September 1996

***TAB***



United States Government

Department of Energy  
Rocky Flats Field Office

# memorandum

DATE: JUL 23 1996

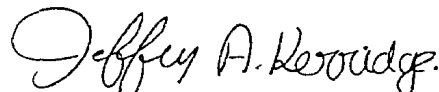
REPLY TO  
ATTN OF: PLD:LO:09361

SUBJECT: Preparation of Corrective Action Plans for Issues Identified Through the Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities

TO: Stephen P. Cowan, Deputy Assistant Secretary for Waste Management

Per your request of June 24, 1996, please find attached the Rocky Flats Environmental Technology Site's (Site) Corrective Actions Plans (CAPs) which address the four ES&H vulnerabilities identified by the Site Working Group Assessment Team (WGAT). In addition, you will find CAPS for eight concerns also identified.

If there are any questions, please contact Lisa O'Mary of my staff at (303) 966-3780.

  
Jeffrey A. Kerridge, Director  
Program Liaison Division

Attachment

cc: w/attach:  
K. Klein, DMTP, RFFO  
S. Olinger, AMPPI, RFFO  
L. O'Mary, EPD, RFO  
B. Williamson, CD, RFFO  
R. Sarter, CD, RFFO  
J. Hill, K-H  
C. Kennedy, K-H

## 1.0 EXECUTIVE SUMMARY

The Rocky Flats Environmental Technology Site (RFETS or the Site), formerly known as the Rocky Flats Plant, has generated radioactive, hazardous, and mixed waste since it began operations in 1952. Such wastes were the byproducts of RFETS original mission to produce nuclear weapons components. Since 1989, when weapons component production ceased, waste has been generated as a result of the RFETS's new mission of environmental restoration and deactivation, decontamination and decommissioning (D&D) of buildings.

The RFETS currently stores some 48,000 containers of waste in various sizes for a total of 930,171 cubic feet (26,343 cubic meters). Approximately 193,146 cubic feet (5,470 cubic meters) is low-level radioactive waste (LLW), 625,552 cubic feet (17,716 cubic meters) is mixed low-level radioactive waste (MLLW), and the balance is transuranic waste. Due to much of the legacy MLLW not being properly characterized, much of it must be sampled and analyzed in order to ship it off-site.

The RFETS currently does not have an on-site burial facility for LLW or MLLW. One approach being considered by RFETS at this time to resolve some of their vulnerabilities is the development of on-site disposal facilities for much of this waste. However, this option is in its earliest stages and considerable discussion and involvement of stakeholders will be required to develop and operate this facility in the ever-expanding Denver metropolitan region. It is questionable whether the site will obtain these facilities as quickly as expected, if at all, and thus does not have a path forward for much of their LLW and MLLW. The option for continuing off-site disposal is discussed in the RFETS Accelerated Site Action Project (ASAP).

As a result of DOE's complex-wide review of its low-level waste management system, the RFETS Working Group Assessment Team (WGAT) identified four vulnerabilities. These included many of the potential vulnerabilities previously identified by the Site Assessment Team (SAT). They are:

- RFETS path-forward issue-management/ treatment/disposal of LLW and MLLW
- Less waste is being shipped off site than is being generated
- Large amounts of LLW and MLLW have not been properly characterized
- Projections of decontamination and decommissioning (D&D) waste amounts and types are not well known

The site was aware and currently working on all of these issues. In some cases, the corrective actions have been delayed or extended due to funding cuts, however, these actions are still expected to continue.

## 2.0 INTRODUCTION

The assessment of Rocky Flats Environmental Technology Site (RFETS) was performed during the period of February 26, 1996, through March 7, 1996. The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included treatment and storage facilities.

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan responding to Defense Nuclear Facility Safety Board (DNFSB) Recommended 94-2. The actions described in this CAP are intended to resolve the findings described in the RFETS Site-Specific Assessment Report in Volume III of the Final Report.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The RFETS is managed by the Kaiser-Hill Corporation under direction of the Department of Energy (DOE) Rocky Flats Field Office (RFFO). The RFFO currently reports to the Office of Waste Management (EM-30), the Office of Environmental Restoration (EM-40), and Nuclear Material and Facility Stabilization (EM-60). The DOE/RFFO has the lead for ensuring that the CAP is implemented by Kaiser-Hill. EM-30 is responsible for over-seeing the effectiveness of implementation of the CAP.

The following personnel are the points of contact for their respective organization:

<u>Organization</u>	<u>Name</u>	<u>Phone Number</u>
RFFO	Lisa O'Mary	(303)966-3780
Kaiser-Hill	Colburn Kennedy	(303)966-7543

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

**Finding No.:** RFETS-HLP-01- RFETS PATH FORWARD ISSUES

**Finding Description:** The RFETS has a path forward issue with the management/treatment/storage of LLW and MLLW. Disposal of LLW/MLLW in an on-site landfill does not now occur. Siting, permitting, and construction of a planned Corrective Action Management Unit (CAMU) facility is believed to be cost ineffective and impractical. Consideration should be given to directing use of budgeted dollars to treatment and disposal of LLW/MLLW through development of disposal options in private commercial sector and/or DOE complex facilities, not continued storage and management.

**Risk Ranking:** The risks associated with this vulnerability are low for both the worker and the environment.

**Response:** This vulnerability is being addressed with the actions that follow. We believe that these actions adequately resolve the WGATs concerns because they increase disposal actions.

The RFETS has drafted a plan for a path forward which addresses the management of LLW and MLLW. The plan is thorough, detailed, and based on sound technical judgment. The development of this plan began in the fall of '95 (which coincides with the beginning of the Accelerated Site Action Project (ASAP) planning), and is due to be finalized by July 31, 1996, along with the new 10-Year Plan.

The plan includes continued shipment of saltcrete to Envirocare as funding permits. Three mega-loads of saltcrete (~15 trucks per mega-load), totaling 730.5 m<sup>3</sup>, have been shipped to Envirocare since December 1995. An additional two mega-loads of LDR compliant MLL wastes are available for shipment and disposal in the fourth quarter of FY 1996.

In addition, the Accelerated 904/750 Pad Disposal Project has been conceptually developed and proposed to DOE/HQ. If funding is available, either in late FY 1996 or beginning in FY 1997, the execution of this project could enable DOE/RFEO to ship two large MLLW streams off-site for treatment and disposal, and reduce the MLL inventory by 70 percent or more, when compared to the FY 1996 inventory data.

In addition, in order to enhance the Site's disposal opportunities and capabilities, an exemption to DOE Order 5820.2A that could allow RFETS to dispose of LLW at commercial facilities is presently in progress.

The RFETS continues to pursue a CAMU designation from the state of Colorado as a future disposal option for RFETS waste. A draft Decision Document and Conceptual Design Report have been informally submitted to the State for their review.

**Planned  
Corrective Action:**

The RFETS will continue to make progress on the path forward plan for LL and LLM waste in concert with the 10-Year Plan.

Actions include investigation of new waste disposal options, pursuing exemption to DOE Order 5820.2A to dispose of LLW at commercial facilities, and increased shipments of LLW and MLLW.

**Schedule and Costs:**

The 10-Year Plan is expected to be finalized by July 31, 1996. Planning activities for waste management are being conducted under ADS 3812 for FY96. ADS 3812 has approximately \$1.5 million for Environmental Restoration and Waste Management planning for FY 1996.

The RFETS will make two mega-load shipments of saltcrete to Envirocare in FY96 and plans to ship pondcrete and saltcrete to Envirocare in FY97. Schedules depend on availability of funding. The off-site shipment and disposal work is being conducted under ADS 3821. Each mega-load shipment costs approximately \$900 thousand.

The RFETS plans to issue the CAMU Decision Document for public comment in the September 1996 time frame. RFETS will spend approximately \$1.5 million on CAMU planning in FY 1996.

The letter to request exemption from 5820.2A was sent to HQ June 3, 1996.

**Tracking Mechanism:  
Reference:**

These actions are being tracked in ADSs 3812 and 3821. CWR Final Report, DOE/EM-0280, May 1996 Accelerated Site Action Project, Phase II-Choices for Rocky Flats, Draft Revision 1, February 1996

**Finding No.:** RFETS- JMC- 01- LESS WASTE SHIPPED OFF SITE THAN BEING GENERATED

**Finding Description:** The site ships less waste than it creates from normal operations, thus increasing the backlog and associated storage requirements. The Site inventory of LLW and MLLW is increasing at RFETS. This is substantiated by Site reports and is expected to continue until the year 2003. The longer RFETS stores this waste before off-site disposal, the greater the cost in terms of exposure to personnel and ultimate disposal.

**Risk Ranking:** The risks associated with this vulnerability are low for the worker.

**Response:** Significant progress has been made in this area. Our goal for FY 1996 is to have shipped more MLL waste than we generated.

The following activities highlight the emphasis by RFFO on decreasing the LL/MLL inventory backlog, lowering regulatory exposure for mixed waste management activities, and increasing LLW storage capabilities while capturing the economic benefits of reduced storage costs. Current goals for waste disposal include significantly expanding the number of facilities which will accept RFETS LLW and MLLW through a national solicitation. Also, most of the LL waste being generated currently meets the waste acceptance criteria for available treatment and disposal facilities, and is being staged for shipment pending availability of funding allocation.

1) In the first quarter of FY 1996, low level waste (LLW) shipments from RFETS to the Nevada Test Site (NTS) were suspended due to NTS concerns during a surveillance of the RFETS LLW Program. Corrective Actions in response to the surveillance concerns were completed in March 1996, and verified by NTS for compliance with their waste acceptance criteria (WAC). DOE, Nevada (NV) has issued approval to RFETS to resume shipments of LLW.

2) In order to enhance the Site's disposal opportunities and capabilities, an exemption to DOE Order 5820. 2A that could allow RFETS to dispose of LLW at commercial facilities is presently in progress.

3) Three mega-loads of saltcrete (~15 trucks per mega-load), totaling 730.5 m<sup>3</sup>, have been shipped to Envirocare since December 1995. The shipments of MLL has contributed to decreasing the regulatory liability and baseline operational cost of the MLL permitted storage areas. An additional two mega-loads of LDR compliant MLL wastes are available for shipment and disposal should funding become available in the fourth quarter of FY 1996.

4) The Accelerated 904/750 Pad Disposal Project has been conceptually developed and proposed to DOE/HQ. If funding is available, either in late FY 1996 or beginning in FY 1997, the execution of this project could enable DOE/RFFO to ship two large MLLW streams off-site for treatment and disposal, and reduce the MLL inventory by 70 percent or more, when compared to the FY 1996 inventory data.

**Planned**

**Corrective Action:**

Actions include investigation of new waste disposal options, pursuing exemption to DOE Order 5820.2A to dispose of LLW at commercial facilities, and increased shipments of LLW and MLLW.

**Schedule and Costs:**

RFETS will make two mega-load shipments of saltcrete to Envirocare in FY96 and plan to ship pondcrete and saltcrete to Envirocare in FY97. Schedules depend on availability of funding. The off-site shipment and disposal work is being conducted under ADS 3821. Each mega-load shipment costs approximately \$900 thousand.

The letter to request exemption from 5820.2A was sent to HQ June 3, 1996.

**Tracking Mechanism:**

This action is being tracked in ADS 3821 as referenced above.

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:**

RFETS-AAF/HLP/DPH/WHR-01- LARGE AMOUNTS OF LLW AND MLLW IMPROPERLY CHARACTERIZED

**Finding Description:**

A significant portion of the stored waste inventory at RFETS cannot be characterized for disposal or treatment with sufficient confidence using only process knowledge and available documentation. RFETS does not have the capability to perform full characterization of its waste in preparation for treatment and off-site storage or disposal, as required by the Federal Facility Compliance Agreement II. The vulnerability associated with this issue is that Rocky Flats must continue to manage and store the legacy LLW until sufficient waste characterization information is collected to substantiate that the waste does not contain any prohibited materials as identified in NTS's waste acceptance criteria.

**Risk Ranking:**

The risks associated with this vulnerability are low for both the worker and the environment.

**Response:**

1) This finding primarily addresses the backlog (legacy) waste since there are now programs in place that ensure that waste is properly characterized as it is generated. There have been significant efforts in the past to better characterize the backlog waste stored at RFETS. However, at this time, there is a population of waste at the Site for which the known characterization information tells us that there is no identified eligible disposal option. It is best not to attempt to further characterize the waste since final waste acceptance criteria (WAC) when known, may dictate additional analysis, thus requiring additional handling, exposure and opportunity for release. RFETS is currently researching disposal options for this waste.

2) For those backlog wastes for which there are disposal options available, there is an aggressive program in place to characterize the waste in accordance with waste acceptance criteria.

3) Finally, this finding identified excess chemicals as lacking proper characterization. While there are continuous efforts to identify, characterize, and dispose of excess chemicals, the Site recognizes that there is a larger problem regarding chemicals that have not yet been declared excess, and therefore have not been characterized. A plan is being developed to address that concern and is due for completion by October, 1996.

**Planned**

**Corrective Action:**

1) Interim actions for waste not eligible for disposal are to continue to safely store the waste in accordance with the RCRA permit issued by the state of Colorado until a disposal option becomes available. RFETS is actively seeking disposal facilities to accept the waste. NTS and Waste Control Specialists (WCS) are two options we are exploring for disposal of our MLL waste which exceeds Envirocare's WAC.

2) The RFETS has developed an aggressive program to characterize backlog waste for which there are disposal options available. RFETS prepared a document in 1995 called the Backlog LLW Work-off Plan which addresses the characterization, certification, and eventual off-site disposal of legacy LLW, and is working toward implementing this plan. The program utilizes a graded approach beginning with evaluation of existing data and process knowledge, and, if necessary, formal sampling.

3) An Excess/Reactive Chemicals Management Plan has been drafted and includes the methods for managing and processing excess reactive chemicals. The final is due for completion by October, 1996.

4) In addition, emergency permits were issued by the state of Colorado to deactivate or stabilize 37 chemicals by August 3, 1996.

**Schedule and Costs:**

All stated actions are currently in progress. The completion schedules will be determined by availability of funding for all actions. There will be no additional costs allocated to DNFSB 94-2 as a result of this action.

**Tracking Mechanism:**

These actions are being tracked in ADSs 3812 and 3812-2.

**Reference:**

CWR Final Report, DOE/EM-0280, May 1996  
Backlog Low-Level Waste Work-off Plan, (Rev. 0, 2-17-95)  
Excess/Reactive Chemicals Management Plan (due October 1996)

---

**Finding No.:** RFETS-WHR-01 - PROJECTIONS OF D&D WASTE AMOUNTS UNKNOWN

**Finding Description:** The volume and types of waste (LLW, MLLW, Hazardous, etc) from future facility decommissioning are known to be very uncertain. Planning for decommissioning is underway; however, major uncertainties will continue to exist until such time as: site end-status is decided, characterization of facilities is accomplished, and schedules are developed and agreed to by all parties.

**Risk Ranking:** The risks associated with this vulnerability are low for both the worker and disposal facility performance.

**Response:** Projections for the total amount of D&D waste to be generated are being prepared. They are being developed in concert with the Accelerated Site Action Project (ASAP) and the 10-Year due to be completed July 31, 1996.

**Planned Corrective Action:** Complete LLW and MLLW projections from D&D activities. Further action on this will result from the resolution of Complex-Wide Vulnerability #1, on which guidance is expected by December 31, 1996.

**Schedule and Costs:** The 10-Year Plan is expected to be finalized by July 31, and will contain data on LLW and MLLW projections from D&D activities. Planning for future D&D waste projections is being conducted under ADS 1233 for FY96. There will be no additional costs allocated to DNFSB 94-2 as a result of this action.

See Complex-Wide Vulnerability # 1 for schedule and cost information.

**Tracking Mechanism:** This action is being tracked in ADS 1233 as part of environmental restoration program support and planning.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996  
Accelerated Site Action Project, Phase II-Choices for Rocky Flats,  
Draft Revision 1, February 1996



---

**Finding No.:** RF-01

**Finding Description:** Examination of the document Rocky Flats Plant RCRA Permit and Compliance Documents, Controlled Document #205, September 1995 revealed the following concerns:

- 1) The Introduction continues to reflect operation by EG&G. It should reflect the new Integrated Management approach with K-H as the lead and a responsibility matrix to the facility level to allow easy understanding of responsibilities for operations, physical facilities, etc.
- 2) The definition for residues is dated.

**Risk Ranking:** N/A

**Response:** The RCRA permit expires in October 1996. The new application will incorporate these changes.

**Planned Corrective Action:** Incorporate changes into the new RCRA permit application.

**Schedule and Costs:** Submit new RCRA permit application by September 3, 1996. There will be no additional costs allocated to DNFSB 94-2 as a result of this action.

**Tracking Mechanism:** RCRA permit activities are performed under ADS #3813

**Reference:** CWR Final Report, DOE/EM-0280, May 1996  
Rocky Flats Plant RCRA Permit and Compliance Documents,  
Controlled Document #205, September 1995

---

**Finding No.:** RF-02

**Finding Description:** Building 964 personnel stated the roof leaked and had not been repaired due to the weakness of roof joists, and were concerned for the safety of the roofers who might fall through

**Risk Ranking:** N/A

**Response:** This is currently in engineering for structural review. If upgrades to the structure are needed, the project will go into the Davis Bacon cycle for completion. The engineering review is scheduled to be completed around 7/25/96. Based upon analysis, additional work may be necessary.

**Planned Corrective Action:** Complete an engineering review and analysis by July 25, 1996.

**Schedule and Costs:** Complete an engineering review and analysis by July 25, 1996.

**Tracking Mechanism:** This action will be tracked in ADS 6750.  
**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-03

**Finding Description:** The waste stored in Building 964 is MLLW originating from vacuum filter sludge and bypass sludge that has been solidified with cement. Approximately 200 containers are stored in this facility. The solidified bypass sludge did not solidify with the addition of cement due to the physical process of mixing used at that time. Although it is stated to pass the paint filter test for hazardous waste, it is known that the material is of "jelly Like" or "pudding like" consistency. All containers in this facility were processed through Real Time Radiography (RTR) equipment for liquids content; some 50 containers failed and were sorted out for further treatment. Any additional containers will also be surveyed for free liquids prior to storage in this facility. Both types of sludge stored in this facility will not pass the Land Disposal Restrictions (LDR) for land disposal. To perform further solidification/treatment of this material may require the physical removal of the sludge from containers for treatment, increasing potential for spill and worker exposure.

**Risk Ranking:** N/A

**Response:** Interim actions for this waste are continued safe storage of the waste in accordance with the RCRA permit issued by the state of Colorado. Additionally, RFETS is currently negotiating the Site Treatment Plan (STP) strategy with the state of Colorado and is proposing to defer treatment of this waste and use available resources to ship saltcrete in FY 1996 and 1997.

**Planned Corrective Action:**

- 1) Continue to store the waste in a safe and compliant manner.
- 2) Continue STP negotiations with the State of Colorado.

**Schedule and Costs:** The STP is currently being negotiated under ADS 3812.

**Tracking Mechanism:** These actions will be tracked in ADS 3812.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-04

**Finding Description:** The concern associated with Building 906 is that the facility was apparently permitted for storage of both liquids and solids. The floor is coated with an epoxy sealer to prevent saturation of the concrete floor by liquid spills. Only solids are currently stored in the facility at this time. It is a requirement of the Rocky Flats Plant RCRA Permit that weekly inspections be performed at the facility and that the floor covering be maintained. The epoxy sealer has been damaged by forklift tines. We were told by a worker that a work order was submitted to repair this deficiency, but it appears to have been outstanding for some time.

**Risk Ranking:** N/A

**Response:** The WGAT found through further checking of the permit requirements for this facility indicate that it is permitted for solid materials storage only at the time of inspection and floor sealant is not required. If liquid storage is allowed in the future, permit modifications will be sought and such material will be stored in secondary containment systems as part of the pallet storage configuration.

**Planned Corrective Action:** Permit modifications will be sought if liquid storage is allowed in the future.

**Schedule and Costs:** N/A

**Tracking Mechanism:** N/A

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-05

**Finding Description:** Approximately 5,000 containers are stored on the 904 Pad according to the facility Team Leader. Many, if not most, of these containers had previously been stored outside under tarps. It was determined that this method of storage was insufficient. After conducting an engineering review of using tents or butler buildings, tents were chosen due to the presumed temporary requirement for storage prior to disposal and a better cost factor as tents did not require the foundations of the butler building design considered. This temporary storage began in 1990. The tents had a guaranteed service life of 5 years. The design factor for wind was to wind speed of 109 miles per hour. In January 1996, these tents experienced massive failures of panels at wind speed to 89 miles per hour. This would appear to be a potential noncompliance with permit conditions in an area storing MLLW.

**Risk Ranking:** N/A

**Response:** The preventive maintenance program is replacing tent panels at a sufficient frequency so as to avoid their in-service design life from being achieved. As of July 11, 1996, all open to the air tent panels were repaired. Operations for puling the inner panel in underway. Contingency plan and preventative maintenance is being addressed and will be resolved shortly. The labeling issue has been resolved.

In addition, the Accelerated 904/750 Pad Disposal Project has been conceptually developed and proposed to DOE, RFFO and DOE/HQ. If funding is available, either in late FY 1996 or beginning in FY 1997, the execution of this project could enable DOE/RFFO to ship two large MLLW streams off-site for treatment and disposal.

**Planned Corrective Action:** Continue to replace tent panels until the waste can be shipped and disposed of.

**Schedule and Costs:** Activities will continue as funding becomes available.

**Tracking Mechanism:** Storage management is tracked under ADS 3812.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-06

**Finding Description:** Radiation exposures at Building 371 are not As Low As Reasonably Achievable (ALARA) due to the widespread storage of residues and mixed residues (however, this is not a LLW or MLLW problem, per se, since it has to do with TRU waste). There are some LLW or MLLW drums stored in the Building 371 storage area, but even if these drums were removed to a LLW or MLLW storage area, it wouldn't free up sufficient space to remove the higher radiation level residue drums from the Building 371 rooms to storage area.

**Risk Ranking:** N/A

**Response:** As stated above, this is not a LL or MLL waste ES&H concern. This issue is being addressed under the TRU waste management program.

**Planned Corrective Action:** N/A

**Schedule and Costs:** N/A

**Tracking Mechanism:** N/A

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-07

**Finding Description:** Final Safety Analysis Report (FSAR) for Buildings 906 may not be current and complete to reflect current conditions and operating practices. Stacking practices in Building 906 that do not conform to the Building 906 FSAR identified typical drum layouts call into question the document review process and the level of implementation of these documents.

**Risk Ranking:** N/A

**Response:** The stacking in Building 906 was changed via an Unresolved Safety Question Determination (USQD) with Nuclear Safety stating that a page change to reflect restacking would not be necessary as it would be picked up during the annual FSAR update.

**Planned Corrective Action:** This concern was resolved with the above action.

**Schedule and Costs:** N/A

**Tracking Mechanism:** N/A

**Reference:** CWR Final Report, DOE/EM-0280, May 1996

---

**Finding No.:** RF-08

**Finding Description:** Quantities of LLW and MLLW materials being offered for storage are approaching storage facility capacity. This has resulted in the use of possibly less than desirable facilities for storage [For example, Building 964 has questionable roof integrity, and LLW is being stored in Building 371 near transuranic waste (TRU-) waste drums]. This may result in excessive handling and incidental exposure of workers conducting inspections. In addition, the stacking practices in Building 906 that do not conform to the typical drum layout depicted in the facility FSAR and location of equipment storage/charging location practices in Tent 12 are further indicative of storage space limitations which may also increase the potential for spills and/or worker exposure. The FY 1995 CWMP projected RFETS would exceed the 1995 storage capacity in 1996.

**Risk Ranking:** N/A

**Response:** Conversion of various existing facilities is currently being analyzed for additional storage capability in concert with the 10-Year Plan planning process. Preliminary analysis was documented in the Environmental Assessment, Finding of No Significant Impact, and Response to Comment: Radioactive Waste Storage, April 1996.

**Planned Corrective Action:** The RFETS will continue to evaluate conversion of existing facilities for new storage for LL and LLM waste in concert with the ASAP and the 10-Year Plan. Building 440 is currently being modified to provide additional waste storage capacity and is scheduled to be available for waste storage by November 1996.

The RFETS continues to make shipments of waste to alleviate storage problems. The RFETS will make two mega-load shipments of saltcrete to Envirocare in FY96 and plan to ship pondcrete and saltcrete to Envirocare in FY97.

**Schedule and Costs:** The 10-Year Plan is expected to be finalized by July 31, 1996. Planning activities for waste management are being conducted under ADS 3812 for FY96. ADS 3812 has approximately \$1.5 million for Environmental Restoration and Waste Management planning for FY 1996.

Shipping schedules depend on availability of funding. The off-site shipment and disposal work is being conducted under ADS 3821. Each mega-load shipment costs approximately \$900 thousand.

The Building 440 modification is scheduled to be completed by November 1996. The total project cost is \$2.7 million and is funded under ADS 3823.

**Tracking Mechanism:** These actions are being tracked in ADSs 3812 and 3823.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996  
Accelerated Site Action Project, Phase II-Choices for Rocky Flats,  
Draft Revision 1, February 1996

**Environmental Assessment, Finding of No Significant Impact, and  
Response to Comment: Radioactive Waste Storage, DOE/EA-  
1146, April 1996**

**RFETS CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Rocky Flats Environmental Technology Site

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
RFETS-HLP-01	RFETS Path Forward Issues	1)Develop path forward for LLW/MLLW treatment/storage/disposal 2)Ship two mega-loads of saltcrete to Envirocare in FY96 (see JMC-01) 3)Ship saltcrete to Envirocare in FY97 (see JMC-01)	Fall 1995	July 1996 (10-Year Plan) Sept. 30, 1996  Sept. 30, 1997
RFETS-JMC-01	Less Waste Shipped Off-site Than Being Generated	1)Investigation of new waste disposal options 2)Ship two mega-loads of saltcrete to Envirocare in FY96 3)Ship saltcrete to Envirocare in FY97	FY96	on-going  Sept. 30, 1996  Sept. 30, 1997
RFETS-AAF/HLP/DPH/WHR-01	Large Amounts of LLW and MLLW Improperly Characterized	1) Continue safe, compliant storage of legacy waste & continue to seek disposal options 2)Characterize backlog waste with available disposal option by implementing Backlog LLW Work-off Plan 3)Complete Excess/Reactive Chemicals Management	FY95	on-going  on-going  Oct. 1996



		Plan 4)Treat 37 reactive chemicals		August 1996
RFETS-WHR-01	Projections of D&D Waste Amounts Unknown	Complete LLW and MLLW projections	Fall 1995	July 1996 (10-Year Plan)
RF-01	RCRA Permit Revisions	Incorporate suggested changes in the new RCRA Permit application		Sept. 3, 1996
RF-02	Building 964 Leaking Roof	Complete an engineering review and analysis		July 25, 1996
RF-03	Vacuum Filter Sludge Concern	1)Continue safe, compliant storage 2)Continue STP negociations with the state		on-going  on-going
RF-04	Building 906 Storage Concern	Permit modifications will be sought if liquid storage is allowed in the future. No action required at this time.		N/A
RF-05	904 Pad Storage Concern	Replace tent panels as necessary.		on-going
RF-06	TRU Waste ALARA Concern	No action taken under LL/MLLW program.		N/A
RF-07	Drum Stacking Concern in Building 906	Stacking concern was resolved through the USQD process. No further action necessary.		N/A

RF-08	Storage Capacity Concern	1) Continue to evaluate conversion of existing building to storage facilities. 2) Complete Bldg. 440 conversion to LLW storage. 3) Continue waste shipments to alleviate storage capacity problems.(see JMC-01)		on-going  Nov. 1996  on-going
-------	--------------------------	---	--	---

***TAB***



Savannah River Site  
LLW Complex Wide Review  
Corrective Action Plan

Approved: W. A. Z. Hall Date 7/22/96  
(Director, Solid Waste Division)

# SAVANNAH RIVER SITE CORRECTIVE ACTION PLANS

## 1.0 EXECUTIVE SUMMARY

Low-level waste activities at the Savannah River Site (SRS) include over 40 on-site waste generators, nine off-site generators, nine waste storage facilities, three treatment facilities, and two disposal facilities. The 1996 SRS waste generator forecast includes approximately 600,000 cubic feet (16,990 cubic meters) of LLW and 40,000 cubic feet (1,130 cubic meters) of mixed low-level waste. The majority of LLW is processed at either on-site or off-site volume reduction facilities before disposal. The projected 1996 disposal volume is approximately 100,000 cubic feet (2,830 cubic meters). The majority of MLLW is stored on-site awaiting treatment and disposal.

While a few of the vulnerabilities addressed treatment/disposal of waste, the site had already developed a treatment plan that specified treatment for most of the wastes of concern. Implementation of this plan is on-going and will continue into the next century.

Overall, the complex-wide review determined the state of the SRS LLW and MLLW management system program in place provides for the safe generation, treatment, storage, and disposal. All of the SRS vulnerabilities and conditions were classified as low risks to the workers, public, and the environment. The vulnerabilities identified were caused by both programmatic and technical factors as their primary or contributing causes. Programmatic factors identified included lack of policies and requirements and lack of funding, as evidenced in the following findings involving maintenance of PAs, disposal of some stored materials, and lack of updated closure plans for the E-Area Vaults. SRS findings that were primarily caused by technical factors involved waste certification and validation of performance assessments.

## 2.0 INTRODUCTION

The assessment of the Savannah River Site (SRS) was performed during the first quarter of calendar year 1996. The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996. Facilities assessed included treatment, storage, and disposal facilities.

The Corrective Action Plans (CAPs) contained in this report document SRS's response to the DOE complex-wide review of LLW management. The actions described in this CAP are intended to resolve the findings described in the SRS Site-Specific Assessment Report in Volume III of the Final Report.

## 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The SRS is operated by the Westinghouse Savannah River Company (WSRC) under direction of the Department of Energy (DOE through the DOE-Savannah River Field Office (DOE-SR)). DOE-SR, as the site DOE representative, has the lead for ensuring that the CAP is implemented by WSRC. The following personnel are points of contact for their respective organization:

<u>Organization</u>	<u>Name</u>	<u>Phone Number</u>
WSRC	Goldston	803-557-6314
DOE-SR	Noll	803-725-2219

#### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses to and planned actions for each of the seven SRS findings from Volume III of the CWR Final Report.

Finding No: SRS-V-96-01

Finding Description: "Inadequate Program to Maintain and Validate PA"

SRS does not have a formalized process or procedure in place to ensure that performance assessments are maintained. Additionally, no procedures exist to provide studies to validate the assumptions used in the PA. Detailed guidance has not been provided by DOE on the maintenance of PAs for the DOE complex. This guidance is necessary to ensure the consistent maintenance of PAs.

Risk Ranking: The risk level for the public, environment, and disposal facility performance is considered to be low. The potentially affected receptors include the public, environment, and disposal facility performance, with a likelihood of occurrence of each exposure/release considered to be greater than 100 years. Potential impacts to the worker are considered to be not applicable.

Response: SRS has implemented an ongoing PA maintenance program. Specific activities relating to PA maintenance were conducted in Fiscal Year 1995. SRS has funded ongoing PA activities in FY 1996 and identified funding needs in out-year planning documents. Additionally, procedures are in place to evaluate facility changes (inventory or operational) against the PA. Although, these procedures were designed for the overall technical baseline and not specifically the PA.

Planned Corrective Action:

In addition to these interim actions by SRS, DOE has committed to the DNFSB the following action in the approved Implementation Plan (Rev. 1, April 1996): The Department will issue performance assessment guidance that will provide minimum criteria for an acceptable performance assessment, and guidance on the preparation and approval of LLW radiological performance assessments. The guidance will address:

- Performance Assessment Format and Content
- Standard Review Plan for Performance Assessments
- Performance Assessment Maintenance Program.

The guidance on performance assessment maintenance program will specify criteria for periodic review of the performance assessments to ensure that the waste acceptance criteria and design and operational requirements derived from the performance assessments remain viable, as well as providing criteria for determining when revisions to the performance assessments are necessary. The

performance assessment maintenance guidance will also address the need to reduce uncertainties in predictions about the long-term performance of disposal facilities.

SRS will implement the guidance document once DOE Headquarters has issued it. In addition, SRS will develop a program to validate the PA assumptions and results utilizing groundwater monitoring data and environmental monitoring studies.

**Schedule & Costs:**

The costs budgeted for ongoing PA maintenance activities are \$187K in FY 1996 under ADS# 42AA and are identified at about that level in out-year planning documents based upon the assumption that the level of effort for PA maintenance remains constant. The milestones under this ADS include review and completion of several PAs including Ashcrete and Naval Reactor Components (i.e., Milestone Tracking #s: SWC 36, SWC46, and SWC47). All of these milestones have been completed on schedule.

The costs for the DOE guidance document will be managed by DOE-HQ. The two milestones are:

- 1] Publish PA maintenance guidance document - 9/30/96;  
Responsibility - DOE-HQ.
- 2] Publish PA format and content, and standard review plan documents - 1/31/97; Responsibility - DOE-HQ.

The costs for SRS to implement the guidance are TBD once the requirements of the guidance document are known. The cost for SRS to develop a PA validation program is estimated at \$200 K. The funding for this corrective action is subject to change based upon the finalized budget. The SRS milestones are:

- 3] Implement DOE Headquarters Final PA Maintenance Guidance Document - 8 months after final guidance document is issued;  
Responsibility - DOE-SR/WSRC.
- 4] Develop a program to validate PA assumptions and results - 7/31/97; Responsibility - DOE-SR/WSRC.

**Tracking Mechanism:** SR corrective actions will be tracked via the Annual Operating Plan (AOP) and by the Solid Waste Commitment Tracking System, as appropriate.

**References:**

- Implementation Plan - Defense Nuclear Facilities Safety Board Recommendation 94-2; Revision I -April 1996.
- Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).

Finding No: SRS-V-96-02

Finding Description: "Undetermined effect of interactive source terms on active LLW disposal facility"

The SRS PA did not take into account the potential effects from source terms emanating from adjacent existing low-level burial grounds. In accordance with existing guidance, the EAVs PA excluded any consideration of the existing Burial Ground Complex (643-E and 643-7E) next to the site of the EAVs. The Burial Ground Complex is an inactive disposal facility (old burial trenches) located up-gradient of the active EAV Disposal Facility. Monitoring well data indicates radionuclides present in the groundwater are above background levels but below regulatory limits.

Risk Ranking: The risk level is considered low. The potentially affected receptors include the public, environment, and disposal facility performance, with a likelihood of occurrence of greater than 100 years for each exposure/release. The risk to the worker is considered not applicable.

Response: The "EAVs and Burial Ground Complex Interaction Study (U)" was completed in March 1995 (WSRC-RP-92-224). This study determined which of the radionuclides considered in the EAVs PA analysis have the potential to be released from the Burial Ground Complex and interact with releases with the EAVs. This study also recommended a more rigorous study using the modeling methodology of the EAVs PA be conducted. The Burial Ground Complex is undergoing CERCLA closure which is expected to significantly slow releases from the inactive disposal sites. The interaction study was intended to be bounding and did not consider the CERCLA actions. The results of the study indicated that the cumulative dose from both the Burial Ground Complex and the EAV did not significantly increase the radiation exposure to workers or the public or releases of radioactive materials to the environment.

Planned Corrective Action:

SRS has planned to complete a composite analysis that accounts for other sources of radioactivity that were not accounted for in the performance assessment for the E-Area Vault Disposal Facility. The composite analysis process, including an options analysis, if required, and recommendations for further action will support the DOE decision-making process to ensure that continuing LLW disposal will not compromise future radiological protection of the public. No other interim actions are planned beyond the EAV interaction study prior to completion of the composite analysis.

DOE has also committed to the DNFSB the following actions in the approved Implementation Plan (Rev. 1, April 1996):

- DOE has already issued to the sites a document providing guidance on the preparation of the composite analyses. The guidance addresses sources of radioactive contamination that are to be considered in the composite analyses, rationale for excluding



certain sources, critical assumptions applicable to the composite analyses, and the preparation of an options analyses if performance criteria are exceeded. The guidance was developed so that it will be usable for the varied situations that exist at DOE sites.

- DOE will prepare a documented description of the process for Headquarters' review of the composite analyses and the criteria for evaluating the acceptability of the analyses.
- The Department will complete assessments for active and pending disposal facilities, whether they are operating under Order DOE 5820.2A or CERCLA. Sites with LLW disposal facilities operating under Order DOE 5820.2A will prepare performance assessments in accordance with the requirements of the Order. In addition, the sites will prepare a companion, composite analysis. The complete radiological assessment (i.e., PA and composite analysis) will be reviewed and form the basis for issuance of the disposal authorization statement to document any limits on design or operations for the facility.

Schedule & Costs: Guidance costs will be managed by DOE-HQ.

- 1] DOE-HQ issued guidance for conducting composite analyses - 5/31/96 (Completed).
- 2] Issue a description of the process and criteria for Headquarters' review of composite analyses - 10/31/96; Responsibility - DOE-HQ.

SR costs for completion of the composite analysis have been estimated to be approximately \$30 K in FY96, \$250 K in FY97, and \$40 K in FY98 under ADS# 42AA. The FY97 and FY98 costs are not finalized and are subject to change based upon the approved budget.

- 3] Submit composite analyses to Headquarters for review - 9/30/97; Responsibility - DOE-SR/WSRC.

Review costs will be managed by DOE-HQ.

- 4] Issue disposal authorization statement or direction to resolve issues or concerns - 3/31/98; Responsibility - DOE-HQ.

Tracking Mechanism: SR Composite Analysis is an Annual Operating Plan milestone.

References:

- Implementation Plan - Defense Nuclear Facilities Safety Board Recommendation 94-2; Revision I - April 1996.
- Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).

**Finding No:** SRS-V-96-03

**Finding Description:** "Inadequate Program to address stored materials with no Disposal Path Forward"

SRS does not have a program in place to dispose of LLW that exceeds existing on-site disposal facility waste acceptance criteria. SRS does not have a RCRA disposal facility for treated MLLW due to the indefinite postponement of the mixed/hazardous waste disposal vaults project. There are several mixed wastes at the SRS which do not meet the WAC of any currently available disposal facilities. The LLW, MLLW, and radioactive materials that are being stored with no disposal path forward include boxes that contain failed, spare equipment that has not yet been declared as waste, sealed radioactive sources (Co-60), cadmium control rods, tritiated waste oils, silver saddles, reactor deionizers, and in-tank precipitation filters.

**Risk Ranking:** The risk level is low. The potentially affected receptors include the public, worker, and the environment. The likelihood of occurrence for each exposure/release is estimated to be 10-100 years with a risk level of low. Potential impacts to the disposal facility performance were considered to be not applicable.

**Response:** These MLLW streams have been identified in the state-regulated and approved SRS Treatment Plan. Treatment is scheduled or has already been performed to established treatment standards to stabilize the waste form in preparation for final disposal. Final disposal options have not been identified but are being investigated by DOE/HQ. There are several issues that must be resolved before a disposal path can be determined. These issues include: 1) specific guidance from EPA on treatment of the waste (e.g., criteria for determining acceptability of macroencapsulation), 2) funding of Site Treatment Plan, and 3) funding of a mixed waste disposal facility. (Some waste streams, even after treatment, will not be able to meet the WAC of commercial disposal facilities due to the high radioactivity).

DOE has committed to the DNFSB in the 94-2 Implementation Plan to issue guidance to direct the preparation of volume projections and develop a program to routinely evaluate LLW disposal capacity and to assess the merits of privatization of LLW disposal facilities. Once these commitment are met, DOE will be better able to evaluate the need for the funding of a mixed waste disposal facility.

A treatment/disposal plan for some LLW streams, such as failed large equipment, is in the process of being developed. A more comprehensive plan will be developed to include all LLW streams that are currently being stored awaiting treatment/disposal.

**Planned Corrective Action:**

- 1) SR has proposed how it will treat mixed waste that is now stored on-site and mixed waste that will be generated in the future in the SRS Site Treatment Plan (STP). The STP identifies schedules

for implementation of preferred treatment options for the mixed waste streams. If a preferred option cannot be identified, the STP presents a schedule for identifying an option. If technology does not exist to treat the mixed waste, a research program to develop a treatment is proposed. If a waste stream is not sufficiently characterized to select a preferred treatment option, the STP offers a schedule for characterizing the waste and developing a treatment plan. Since the STP has been approved by the State of South Carolina, DOE has entered a compliance order with the State of S.C. The compliance order contains enforceable commitments to treat mixed waste.

- 2] DOE commitments in the 94-2 Implementation Plan (Rev. 1, April 1996) regarding waste projections and commercial disposal will aid in the decision-making process for the need of on-site mixed waste disposal facility. The projections program will describe the interrelation between volume projecting and disposal capacity planning and will become a consideration in the approval of future DOE projects. The commercial disposal study will identify the safety issues associated with waste disposal in seven functional areas (siting, design, operations, closure, waste form, performance assessment, and approval and oversight) and establish criteria for determining when disposal at a private facility is desirable from a safety perspective. The results of this study will then be used to establish guidelines for sites to use when considering disposal options.
- 3] SR will develop a plan to evaluate options for treating and disposing of LLW streams that do not have a proposed path forward for treatment /disposal. These waste streams include boxes that contain failed, spare equipment that has not yet been declared as waste, sealed radioactive sources (Co-60), cadmium control rods, tritiated waste oils, silver saddles, reactor deionizers, and in-tank precipitation filters.

Schedule & Costs: The funding for the STP is broken down into treatment costs for individual waste streams which are specifically identified under ADS# 42AA.

- 1] The SR STP contains schedules for the waste treatment programs. The schedules include construction and start-up of new facilities, refurbishment of existing facilities, and contracting with vendors. The schedules in the STP have not yet been integrated with those of other DOE sites from a technical, complex-wide perspective. DOE expects that schedules documented in the STP will be revised based on funding constraints.

Costs for developing the Waste Projections Program and privatization guidelines will be managed by DOE-HQ.

- 2a] Completion of DOE Low-Level Waste Projections Program Documentation - 12/31/96; Responsibility - DOE-HQ.

2b] Preparation of privatization guidelines - 9/30/96; Responsibility - DOE-HQ.

The option evaluation is estimated to cost \$100 K and will be funded under ADS# 42AA. The funding for this activity is subject to change based upon the finalized budget.

3] Develop a plan to evaluate treatment/disposal options for currently stored LLW (LLW Treatment/Disposal Plan) -8/30/97; Responsibility - DOE-SR/WSRC.

Tracking Mechanism: "Timely" implementation of the Site Treatment Plan is an award fee milestone and many of the waste streams listed in the STP are Annual Operating Plan milestones. The LLW Treatment /Disposal Plan activities will be tracked by the Solid Waste Commitment Tracking System, as appropriate.

- References:
- SRS FY1996 Solid Waste Management Plan (U), Rev. 5, WSRC-RP-93-1448.
  - Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).

Finding No: SRS-C-96-01

Finding Description: "The lack of detailed closure plans for the E-Area Vaults"

Currently, no final closure plan has been approved for that part of the EAV in use, the Low-Activity Waste Vaults, and no plan has been formalized that addresses a schedule for construction of additional low-activity waste vaults and/or alternate disposal facilities. The current closure cap design is based on scenarios in the PA that were modeled when the SRS primary mission was that of a production facility and assumed 30 vaults would be required for LLW. This mission has since changed to an environmental restoration site, and LLW and MLLW forecasts are substantially reduced. The EAV currently used for disposal has at least a 10-year capacity based on this mission change. No design change or change to the PA has been initiated relative to the final closure based on this change in mission.

Risk Ranking: NA

Response: As indicated in the complex-wide review, the EAV has a conceptual closure cap design based on the original waste forecasts as referenced in the existing PA. However, a new design will not be developed and incorporated into the PA until several issues are resolved. The unresolved issues include 1) land use assumptions, 2) changing design of the vault based on conservatism used in developing the PA, 3) changing waste inventory, and 4) new developments in closure cap technologies. DOE-HQ has programs and activities underway which begin to address the issue of disposal capacity relative to the amounts of waste requiring disposal. As soon as a more accurate method for forecasting waste has been determined, SR will be able to make better decisions on the disposal capacity required in future years. Land-use assumptions are being determined in an effort to complete the composite analysis for WSRC, also part of the DOE-HQ commitments to the DNFSB. After these issues have been resolved and concurred upon, WSRC will have a more coordinated planning approach to evaluate EAV closure considerations. However, it is recommended that the closure design be finalized nearer to the time when the vaults will be ready for closure due to the evolving technology involved with closure cap design.

Planned Corrective Action:

As indicated in the response, a conceptual design for closure of the E-Area Vaults is included in the current PA. The EAV closure plans will be finalized nearer to the time when the EAV disposal facility is completely filled, estimated to be beyond 2006. The advantages of waiting to complete the detailed closure plans for the EAV are incorporation of improved closure cap technologies and resolution of land use assumptions.

**Schedule & Costs:** The EAV closure plans will be finalized nearer to the time when the EAV disposal facility is completely filled, estimated to be beyond 2006. The cost for the final closure plan will be determined at that time based on improved closure cap technologies.

**Tracking Mechanism:** A tracking mechanism will be determined prior to the time when the EAV disposal facility is completely filled, estimated to be beyond 2006.

**References:** SRS FY1996 Solid Waste Management Plan (U), Rev. 5, WSRC-RP-93-1448. Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).

Finding No: SRS-C-96-02

Finding Description: "The Waste Characterization Board (WCB) responsibilities and interfaces have not been incorporated into the WAC."

A condition was noted over the lack of incorporation of the interface of the WCB with the generator certification process. The WCB does have a charter and administrative controls (724-WCAM-5) to perform their activities. However, the SRS IS Manual does not require that a characterization plan be submitted to the WCB for review. The IS Manual also does not identify the approval step for the characterization plan. Both of those aspects are important for the generator to be aware of as they develop and proceed through the certification process. Since the WCB performs a crucial function in verifying the acceptability of the waste being received at the SRS disposal areas, this interface should be incorporated into the IS Manual.

Risk Ranking: NA

Response: The corrective action to this finding has been completed. The SRS IS Manual was updated to include the approved WAC 1.01 and 2.01 that included the WCB information. The effective date of approval and implementation was 5/31/96.

Planned Corrective Action: N/A

Schedule & Costs: N/A

Tracking Mechanism: N/A

References:

- Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).
- SRS IS Manual, Savannah River Site Waste Acceptance Criteria Manual.

Finding No: SRS-C-96-03

Finding Description: "No Verification is conducted for Waste Received by the Solid Waste Management Department (SWMD)"

No verification (e.g., assay X-ray, visual) is conducted for waste received by SWMD. It was determined that this condition, which was identified by SRS prior to the arrival of the WGAT members, is an area that might need further evaluation by SRS to determine the full extent of the impact. It was decided that WAC limits for radiological constituents were sufficiently conservative to ensure that the PA limits are not exceeded. The main area of this condition is the possibility that RCRA-type material which does not meet the WAC may be disposed in a LLW disposal facility. However, it was the opinion of the WGAT members evaluating this area that this condition was not within the scope of the WGAT site assessment. Information was not presented to the WGAT members that would lead to an ES&H vulnerability. In addition, a project has been initiated with a vendor that will provide 100 percent visual verification on waste handled by that vendor. Information gained from the visual verification will provide SRS with a baseline of the types, frequency, and amounts of any prohibited materials found in their radioactive waste streams.

Risk Ranking: NA

Response: SWMD has formulated a plan to enable verification of waste received from the generators. SWMD will develop and implement a program known as the Verification/Trending Program to identify generator deficiencies in waste characterization/certification. The program will consist of three independent verification checks conducted each by 1) the generators, 2) SWMD, and 3) the treatment facility. SWMD verification will consist of radiation/dose readings, external visual inspection, and random intrusive inspection and sampling per ANSI standards. The treatment facility will utilize visual sort/segregation for the third level of verification. The verification program will provide generator feedback and support trending. Until the program is implemented, waste will be "spot-checked" by a Waste Certification Validation Team to verify proper segregation and packaging.

Planned Corrective Action:

- Implement random "Spot Check" program by the Waste Certification Validation Team to verify proper segregation and packaging until the integrated Verification/Trending Program is defined and implemented. Random spot checks will be determined per ANSI standards.
- Develop and implement Verification/Trending Program with 3 independent checks to identify generator deficiencies. Program will require generator verification in the work area. Independent verification will follow utilizing radiation/dose readings and



random intrusive inspections and samplings followed by visual sorting/segregation at the treatment facility.

- Schedule & Costs:
- 1] Implement generator "Spot Check" Program - 10/96;  
Responsibility - DOE-SR/WSRC.
  - 2] Develop and implement Verification/Trending Program - 12/96;  
Responsibility - DOE-SR/WSRC.

Verification costs are estimated to be a minimum of \$ 1.5 MM/yr under ADS# 42AA.

Tracking Mechanism: These activities will be incorporated into the FY97 Baseline Schedule.

- References:
- Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).

Finding No: SRS-C-96-04

Finding Description: "Waste is being Accumulated and Stored Outdoors"

Waste is being accumulated and stored outdoors by generators (e.g., H-Tank Farm). A lack of specific requirements to dispose of LLW, absence of time limits on the storage of LLW, and competing management priorities, result in indefinite storage of LLW even if there is an identified path forward for disposal. WGAT members noted LLW is accumulated in areas where rainfall may infiltrate either accumulation containers or plastic waste bags. Water infiltration could lead to possible noncompliance with WAC limits for free liquids.

Risk Ranking: NA

Response: Waste generators, specifically, the High-Level Waste Tank Farm, plan to accumulate/store waste in weather-resistant containers. This effort will minimize the potential for water infiltration that could possibly lead to noncompliance with WAC limits for free liquids.

Planned Corrective Action: Tank Farm Operations plan to acquire weather-resistant containers for waste accumulation.

Schedule & Costs: Costs for acquisition of the Tank Farm containers are insignificant.

1] Acquisition of Tank Farm containers is scheduled to be completed by 3/97; Responsibility - DOE-SR/WSRC.

Tracking Mechanism: This corrective action will be tracked by the High-Level Waste Commitment Tracking System.

References:

- Volume III - Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities, Chapter 9, (May 1996).
- Phone conversation with P. Allen of H-Tank Farm on July 16, 1996.

## 5.0 SUMMARY TABLE

This table lists the corrective actions planned for SRS, as well as the schedules for each.

Finding #	Title	Corrective Action/Status	Completion Date
SRS-V-96-01	Inadequate Program to Maintain and Validate PAs	1. Publish PA maintenance guidance document.	9/30/96
		2. Publish PA format and content, and standard review plan documents.	1/31/97
		3. Implement DOE-HQ Final PA Maintenance Guidance Document.	8 months after final guidance is issued
		4. Develop a program to validate PA assumptions and results.	7/31/97
SRS-V-96-02	Undetermined Effect of Interactive Source Terms on active LLW Disposal Facility	1. Issue guidance for conducting composite analysis.	Complete
		2. Issue a description of the process and criteria for DOE review of composite analyses.	10/31/96
		3. Submit composite analyses to DOE-HQ for review.	9/30/97
		4. Issue disposal authorization statement or direction to resolve issues or concerns.	3/31/98
SRS-V-96-03	Inadequate Program to address stored materials with no Disposal Path Forward	1. Implement the SR-Site Treatment Plan.	per STP 12/31/96
		2a. Complete DOE LLW Projection Program.	9/30/96
		2b. Prepare privatization guidelines.	8/30/97
3. Develop a plan to evaluate treatment/disposal options for currently stored LLW.			
SRS-C-96-01	The Lack of Detailed Closure Plans for EAV	NA	NA
SRS-C-96-02	The WCB responsibilities and interfaces have not been incorporated into the WAC	1. Incorporate WCB responsibilities into the SRS IS Manual.	Complete
SRS-C-96-03	No Verification is conducted for Waste Received by SWMD	1. Implement generator "Spot Check" Program.	10/30/96
		2. Develop and implement Verification/Trending Program.	12/31/96
SRS-C-96-04	Waste is Accumulated and Stored Outdoors	1. Complete Acquisition of Tank Farm weather-resistant containers.	3/30/97

***TAB***

**Defense Nuclear Facility Safety Board  
Recommendation 94-2**

**Corrective Action Plan  
For The Low-Level Waste Complex-Wide Review**

**of**

**Sandia National Laboratories-New Mexico**

**Prepared by  
Maureen J. Lincoln  
Waste Management and Pollution Prevention Project Department  
Sandia National Laboratories, New Mexico**

*Earl D Conway, July 22, 1996*  
*Approval signature and date*  
**Earl D. Conway,  
Waste Management Program Manager  
Sandia National Laboratories**

**Sandia National Laboratories-New Mexico  
CORRECTIVE ACTION PLAN  
FOR THE LLW COMPLEX-WIDE REVIEW**

**1.0 EXECUTIVE SUMMARY**

The low level waste management program at Sandia National Laboratories, New Mexico (SNL-NM) was reviewed during March 1996. Over the past several years, SNL-NM has generated approximately 2,119 cubic feet (60 cubic meters) of low-level waste (LLW) per year. LLW has not been disposed onsite at the SNL-NM since 1988. LLW is now temporarily stored onsite awaiting shipment to a DOE-approved disposal site. Current disposal sites under consideration include NTS, Envirocare, Diversified Scientific Services, Inc. (DSSI) and others. The primary methods used to characterize LLW at SNL-NM include process knowledge and limited sampling and analysis.

A vulnerability was identified concerning the lack of a path forward for disposition of MLLW that is high-activity or security classified. High-activity MLLW can usually be treated onsite, but must be retained in storage until a disposal capacity is identified. Similarly, security classified MLLW that could be treated to LDR requirements (such as, by macroencapsulation) must be retained onsite for lack of treatment to eliminate the classified nature of the material. There is no disposal site for treated MLLW that remains classified.

This vulnerability is included in the Complex-Wide Vulnerability #5 and will be addressed through the Complex-Wide Vulnerabilities Corrective Action Plan.

**2.0 INTRODUCTION**

The SNL-NM LLW management program was evaluated during March 1996. The vulnerability identified for the SNL-NM site in the *Final Report Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280, May 1996)* is included in one of the complex-wide vulnerabilities and will be addressed through the Complex-Wide Vulnerabilities Corrective Action Plan.

Until a path forward for disposal of high-activity or security classified MLLW becomes available, Sandia will store the waste onsite in its LDR-treated state, when practical (i.e., in accordance with RCRA Interim Status or Part B permit, and ALARA), in facilities that are protective of workers, the public and the environment. Storage facilities available onsite include limited access underground bunkers that are currently in the process of being approved as nuclear facilities, with a comprehensive Safety Assessment Report now in the final stages of development.

Sandia is also pursuing options to have classified MLLW incinerated at another DOE facility (offsite). After incineration, the unclassified residue would be treated to meet the LDRs, and then disposed at the NTS as LLW, if appropriate, (assuming no RCRA codes for listed waste, and that

any toxic characteristics, such as for leachable metals, are below regulatory thresholds). If the residue remains regulated by RCRA, it may be returned to Sandia to be retained in storage until MLLW disposal is either made available within the DOE complex, or an exemption from DOE Orders can be approved for disposal at a commercial facility that could accept the radionuclide inventory and activity of the waste.

Similarly, high activity waste may be treated onsite (for example, by macroencapsulation as appropriate for toxic characteristic debris with heavy metals) and retained in storage until such time as there is a disposal site available for high activity MLLW. This approach has been used for reactor control rods that are very high activity and composed, in part, of RCRA-regulated cadmium.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

The only vulnerability identified at SNL-NM is addressed in part by the Complex-Wide Vulnerability #5, "LLW for which there is no identified or technical path forward for disposition."

Implementation of corrective actions resulting from the Complex-Wide Vulnerability #5 Corrective Action Plan will occur at the site when disposal options become available, as part of the Sandia waste management program under the responsibility of the Albuquerque Operations Office.

**Organization** DOE Albuquerque Operations Office  
**Name** Jim Orban, WMD  
**Phone Number** 505 845-4421

**Organization** Sandia National Laboratories Waste Management Program Manager  
**Name** Earl Conway, Organization 7571, MS-1314  
**Phone Number** 505 848-0381

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the responses to and planned actions for each of the SNL-NM findings from Volume III of the CWR Final Report.

---

<b>Finding No.:</b>	SNL-M01 - Disposal options for mixed high activity and mixed classified wastes
<b>Finding Description:</b>	SNL-NM is generating small volumes of MLLW of high-specific-activity or that is security classified. Such wastes may be treated to meet RCRA land disposal restrictions but SNL-NM must continue to store these wastes until there is a path forward for disposal.

**Risk Ranking:**

The risk level for workers is considered to be low. The affected receptor is the worker with a likelihood of occurrence for potential exposures considered to be 1 to 10 years. The impacts to workers would be negligible injury from repeated inspections of these wastes in storage, and there would not be any applicable impacts to the public, environment, and disposal facility performance.

**Planned**

**Corrective Action:**

Sandia will store the waste onsite, in its LDR-treated state when practical (i.e., in accordance with RCRA Interim Status or Part B permit, and ALARA) in facilities that are protective of workers, the public and the environment. Storage facilities available onsite include limited-access underground bunkers that are currently in the process of being approved as nuclear facilities, with a comprehensive Safety Assessment Report now in the final stages of development.

Sandia is also pursuing options to have classified MLLW incinerated at another DOE facility (offsite). After incineration, the unclassified residue would be treated to meet the LDRs, and then disposed at the NTS as LLW, if appropriate, (assuming no codes for listed waste, and any toxic characteristics such as for leachable metals are below regulatory thresholds). If the residue remains regulated by RCRA, it may be returned to Sandia to be retained in storage until MLLW disposal is either made available within the DOE complex, or an exemption from DOE Orders can be approved for disposal at a commercial facility that could accept the radionuclide inventory and activity of the waste.

Similarly, high activity waste may be treated onsite (for example, by macroencapsulation) and retained in storage until such time as there is a disposal site available for high activity MLLW.

This vulnerability will be initially addressed through the Complex-Wide Vulnerability #5 Corrective Action Plan (CAP). Sandia will implement the changes necessary from the CAP that are applicable to the site.

**Schedule and Costs:**

Sandia will continue to include in its waste management program costs for appropriate storage of treated mixed waste, classified mixed waste and mixed waste residues until such time as changes



are made by DOE Headquarters for disposal options. At that time, costs for changes to the waste management program at Sandia for implementation of the corrective actions will be identified at the site.

See also, Complex-Wide Vulnerabilities CAP for Complex-Wide Vulnerability #5. The final milestone identified in that CAP is for a strategy to address outstanding LLW technical and R&D needs, and is scheduled to be completed September 30, 1997.

**Tracking Mechanism:** Corrective action for this vulnerability will be tracked through the Complex-Wide CAP until disposal options are made available and changes to the Sandia waste management program are identified for implementation of the CAP.

**Reference:** CWR Final Report , DOE/EM-0280, May 1996

**SNL-NM CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

Site Name: Sandia National Laboratories-New Mexico

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
SNL-M01	Disposal options for high-activity MLLW, and classified MLLW	<p><b>Activities:</b> This vulnerability is addressed in part by the Complex-Wide Vulnerability #5 CAP.</p> <p><b>Status:</b> There is no Site-Specific Corrective Action Plan. SNL/NM will store high activity MLLW and classified MLLW (in an LDR-treated state when possible) until disposal options become available.</p>	N/A	N/A

***TAB***

**WEST VALLEY DEMONSTRATION PROJECT**  
**CORRECTIVE ACTION PLAN**  
**FOR THE LOW-LEVEL WASTE COMPLEX-WIDE REVIEW**

Approved: H. R. Moore  
Herman Moore  
DOE-WVAO

7/31/96  
Date

**WEST VALLEY DEMONSTRATION PROJECT  
SITE-SPECIFIC CORRECTIVE ACTION PLAN  
FOR THE COMPLEX WIDE REVIEW**

**1.0 EXECUTIVE SUMMARY**

The West Valley Demonstration Project (WVDP) is located about 30 miles south of Buffalo, New York. The Project involves the decontamination and decommissioning (D&D) of a commercial nuclear fuel reprocessing plant. WVDP is owned by the State of New York and operated by West Valley Nuclear Services Co. (WVNS) for the Department of Energy (DOE) under management of the Office of Environmental Management (EM-30).

The WVDP generates low-level radioactive waste (LLW) and mixed-LLW (MLLW) from high level waste (HLW) processing, and various environmental restoration (ER) and decontamination operations. The wastes are contaminated with activation and fission products from the former fuel reprocessing operations. Solid and liquid LLW/MLLW are both treated and stored at the site.

The overall D&D project is expected to generate significant volumes of LLW and MLLW. LLW generated may be transported to an approved off-site commercial treatment facility for volume reduction. MLLW will be treated on-site or at an approved off-site facility.

An assessment of the WVDP Low-level Waste Management activities was performed and one vulnerability was identified. This vulnerability identified the pre-engineered fabric structure (LSA-3) used to store waste on-site as a weakness. Damage to LSA-3 by high winds could have resulted in an unnecessary exposure of workers or a minor release to the environment.

**2.0 INTRODUCTION**

The assessment of the West Valley Demonstration Project (WVDP) was performed during the period February 26, 1996 through March 8, 1996. The assessment has been documented and the results published in the Final Report, Complex-Wide Review of DOE's Low-Level Waste Management ES&H Vulnerabilities (DOE/EM-0280), May 1996.

This Corrective Action Plan (CAP) was prepared to meet the commitment in DOE's Implementation Plan. The actions described in the CAP are intended to resolve the findings described in the WVDP Site-Specific Assessment Report in Volume III of the Final Report.

### 3.0 ORGANIZATION AND MANAGEMENT STRUCTURE TO IMPLEMENT THE CORRECTIVE ACTION PLAN

West Valley Nuclear Services Co. Inc. (WVNS) operates as the prime contractor for the DOE. The WVDP is operated by the United States Department of Energy (DOE) through the DOE-West Valley Area Office (WVAO) pursuant to the West Valley Demonstration Act (P.L. 96-368). This DOE Area Office, WVAO, reports to the Ohio Field Office. The Office of Environmental Management (EM-30) is responsible for overseeing the effectiveness of implementation of the CAP.

Organization	Name	Phone Number
DOE-WVAO	Herman Moore	716-942-4814
WVNS	Frank A. Tarantello	716-942-2025
WVNS	John J. Hollinden	716-942-4970
EM-30	Ted McIntosh	301-903-7189

### 4.0 FINDINGS, RESPONSES AND PLANNED ACTIONS

Provided below are the response to and planned actions for the WVDP finding from Volume III of the CWR Final Report.

---

<b>Finding No:</b>	WVDP-LSA-1
<b>Finding Description:</b>	Damage to the WVDP's LSA-3 fabric structure that is used for storing LLW and MLLW could have resulted in unnecessary exposure of workers or a release to the local environment due to loss of package integrity by the containers.
<b>Risk Ranking:</b>	The risks associated with this vulnerability are low for both the worker and the environment.
<b>Response:</b>	<p>West Valley Demonstration Project has determined that the likelihood of an environmental release was and still is minimal. In order for a release to occur, the waste containers would have to have been either punctured, blown/knocked over, or cause a release on their own due to degradation.</p> <p>The risk of a container being punctured or blown/knocked over during the structure failure was minimal. This was primarily due to the structure failure occurring in the outer fabric material. Fabric in motion could cause no harm to carbon steel containers.</p>

The risk associated with containers being blown or knocked over is also very low. This can be attributed to packaging configuration, stacking height requirements and the typical gross weights of the waste containers.

The chances of a container causing a release due to degradation is very minimal. Package degradation due to the freeze thaw cycle and exposure to the environment would not create a problem as minimal liquids are contained in waste containers. Additionally, routine inspections are made to check package integrity on all containers. Any potential problems are noted and repackaging of containers is performed if needed.

The exposed containers are within the bermed floor area of the structure and are inspected on a minimum of a weekly basis to check for degradation of the container surfaces. If excessive degradation is noted, the containers will be tarped or repackaged to prevent potential breaching or release of radioactive materials.

The proposed replacement structure will meet the engineering requirements developed and required by WVNS. These requirements were developed through the use of current codes to ensure its design adequacy.

The 80 MPH design requirement selected is consistent with the Uniform Building Code and New York State building requirements. The rationale for the 100 MPH design requirement for the fabric structures was a result of conservatism.

Design and fabric consultants inspected the other 2 pre-engineered fabric structures (LSA-1 and LSA-4) and found the design of, and the material used for LSA-1 to be of superior design and in excellent shape.

Modifications including retensioning of cables, padding between steel and fabric, and patching of deteriorated areas of fabric were recommended for LSA-4 to provide an additional 15 years of service life from the LSA-4 structure. These modifications are currently being implemented for LSA-4.

#### **Planned**

#### **Corrective Action:**

The following corrective action is based on replacement of the LSA-3 tent structure with a metal structure.

The replacement structure will have the same footprint, have a slightly lower roof, have the same storage capacity, and serve the same purpose as the previous structure. This new metal structure will be designed to withstand snow loads of 40 lbs/sq. ft., a basic wind velocity of 80 mph, and have an expected useful life of 20 years or more.

**Schedule and Costs:** The replacement structure is currently on track for a beneficial occupancy date on or before December 31, 1996. The functional design requirements, special provisions, and cost estimate have all been completed. The bid cycle is expected to be completed by July 30, 1996.

The current total project cost is estimated to be \$900,000.

**Tracking Mechanisms:** The status of the replacement of LSA-3 with a metal structure will be tracked through the WVNS Open Items Tracking System (OITS). In addition, the WVPO will conduct regular meetings and project walkdowns to status the progress of the replacement of the storage structure.

**Reference:** CWR Final Report, DOE/EM-0280, May 1996



5.0 SUMMARY TABLE

**SITE-SPECIFIC CORRECTIVE ACTION PLAN  
SUMMARY TABLE**

SITE NAME: West Valley Demonstration Project

Vulnerability/ Concern Number	Title	Corrective Action Activities/Status	Start Date	Completion Date
WVDP-LSA-1	Storage of low-level radioactive waste (LLW) and mixed low-level (MLLW) in tent facilities.	Construct a metal LSA-3 replacement structure	9/5/96	12/31/96

