

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
QUALITY ASSURANCE AUDIT PLAN

FOR

AUDIT M&O-ARP-98-02

OF THE

CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM  
MANAGEMENT AND OPERATING CONTRACTOR

LAS VEGAS, NEVADA

NOVEMBER 17 THROUGH 21, 1997

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Approved by: *R. G. Horton* Date: 10/24/97  
for Donald G. Horton  
Director  
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## 1.0 SCOPE

This performance based audit of the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) will be a limited scope audit of Repository Design in Las Vegas, Nevada. The audit will be performed by a team of auditors from the Office of Quality Assurance and a Technical Specialist from the Yucca Mountain Site Characterization Office. While some design activities are being performed by CRWMS M&O outside of Las Vegas, the activities have been surveilled by OQA independent of this audit. The audit team will evaluate the effectiveness of selected design processes, and the quality of the resultant end products identified in Section 4.0 of this plan.

## 2.0 AUDIT SCHEDULE

Pre-Audit Team/Observer Meeting	8:00 a.m. November 17, 1997 Las Vegas, NV
Pre-Audit Conference	9:00 a.m. November 17, 1997
Audit Activities	10:00 a.m. - 4:00 p.m. November 17, 1997
	8:00 a.m. - 4:00 p.m. November 18- 20, 1997
	8:00 a.m. to 11:30 a.m. November 21, 1997
Post-Audit Conference	2:00 p.m. November 21, 1997

An Audit Team/Observer meeting will be held at 4:00 p.m. daily to review audit progress. Beginning Tuesday, November 18, 1997, there will also be a daily Audit Team Leader (ATL)/Observer/CRWMS M&O management meeting at 8:15 a.m. to communicate audit progress, discuss potential deficiencies, and establish needed liaison. Both daily meetings will be held at locations provided by CRWMS M&O.

### 3.0 REQUIREMENTS TO BE AUDITED AND APPLICABLE REFERENCES

The processes and activities to be audited will be contained in performance-based checklists. These checklists will be developed based on the management objectives and critical process steps relative to repository design activities and deliverables agreed upon with CRWMS M&O management. The Quality Assurance Requirements and Description Document, CRWMS M&O procedures, and other technical documents will be reviewed and used as background information in the development of performance based checklist questions in the assessment of the process.

The conduct of the audit will be guided by the documents (latest revision) listed below:

- Quality Assurance Procedure 18.2, "Internal Audit Program"
- Administrative Procedure (AP) 16.1Q, "Performance/Deficiency Reporting"
- AP 16.2Q, "Corrective Action and Stop Work"

### 4.0 ACTIVITIES TO BE AUDITED

The audit team will conduct a performance-based audit of activities supporting Work Breakdown Structure (WBS) 1.2.4, "Repository Design." Design analyses, repository drawings associated with the analyses, and a design guide will be evaluated as part of this audit process. They include:

- Repository Thermal Loading Management Analyses
- Repository Subsurface Layout Configuration Analysis
- Overall Development and Emplacement Ventilation Systems
- Repository Surface Design Site Layout Analysis
- Q-Repository Drawings associated with the above analyses
- Drift Design Guide

The critical process steps to be examined in relation to accomplishing these activities include:

1. Control of *design inputs*
2. Control of *design process*
3. Control of *design analyses*
4. *Change control*
5. *Design reviews*
6. Control of *design interfaces*

NOTE: Each of the above critical process steps have been subdivided into greater detail relative to their applicability to "Repository Design" that is reflected in the audit checklists. Also, Design Verification as a critical process step is not applicable at this stage of the project relative to "Repository Design".

The evaluation will attempt to determine if the management objectives agreed to by CRWMS M&O have been realized. They include objectives such as adequate management resources being provided to perform the work; adherence to CRWMS M&O's Design Guidelines Manual; work performed at remote locations is appropriately controlled; and that CRWMS M&O meets the deliverable milestones.

A performance-based audit evaluates products and activity to determine the degree to which they meet program requirements, and management commitments and expectations. The evaluation of process effectiveness and product acceptability will be based upon:

- 1) Satisfactory completion of the critical process steps
- 2) Acceptable results and quality of the end products
- 3) Documentation that substantiates product quality
- 4) Performance of trained and qualified personnel
- 5) Implementation of applicable QA Program Elements (As Applicable)

## 5.0 AUDIT TEAM MEMBERS

Kenneth O. Gilkerson, OQA/QATSS, Las Vegas, NV, Audit Team Leader  
Dan Tunney, OQA/QATSS, Las Vegas, NV, Auditor  
John F. Pelletier, OQA/QATSS, Livermore, CA, Auditor  
Emily Reiter, OQA/QATSS, Las Vegas, NV, Auditor  
Jim Gardiner, DOE/YMSCO, Las Vegas, NV, Technical Specialist

## 6.0 AUDIT CHECKLIST

The following checklists will be used during the audit:

M&O-ARP-98-02-01, Performance Based Checklist(s)