



Department of Energy  
Washington, DC 20585

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for Yucca Mountain  
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**OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT QUALITY  
ASSURANCE (QA) AUDIT USGS/LANL-ARP-98-03 OF THE CIVILIAN  
RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND  
OPERATING CONTRACTOR SUPPORT OF THE YUCCA MOUNTAIN SITE  
CHARACTERIZATION PROJECT AT U.S. GEOLOGICAL SURVEY (USGS)  
AND LOS ALAMOS NATIONAL LABORATORY (LANL)**

Please be advised that a team of auditors from the Office of Quality Assurance will conduct a performance-based QA audit at USGS in Denver, Colorado, and LANL in Los Alamos, New Mexico, December 1 through 10, 1997. The audit will be conducted in accordance with the enclosed Audit Plan.

Observers from the State of Nevada, U.S. Nuclear Regulatory Commission, and other interested parties may also accompany the audit team.

You are hereby requested to arrange for appropriate space to conduct meetings, provide cognizant personnel to support the audit, and provide audit team access to appropriate current USGS and LANL documentation and records, respectively.

The enclosed Audit Plan has been transmitted to L. Dale Foust under separate letter.

If you have any questions, please contact either James Blaylock at (702) 794-1420 or Donald J. Harris at (702) 794-1467.

*R.W. Cel*  
Donald G. Horton, Director  
Office of Quality Assurance

OQA:JB-0269

Enclosure:  
Audit Plan USGS/LANL-ARP-98-03

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**OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**QUALITY ASSURANCE AUDIT PLAN**

**FOR AUDIT USGS/LANL-ARP-98-03**

**OF THE**

**CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM  
MANAGEMENT AND OPERATING CONTRACTOR**

**AT**

**U.S. GEOLOGICAL SURVEY  
DENVER, COLORADO**

**AND**

**LOS ALAMOS NATIONAL LABORATORY  
LOS ALAMOS, NEW MEXICO**

**DECEMBER 1-10, 1997**

Prepared by: Donald J. Harris Date: 11-3-97  
Donald J. Harris  
Audit Team Leader  
Office of Quality Assurance

Approved by: R. W. Horton Date: 11/10/97  
Donald G. Horton  
Director  
Office of Quality Assurance

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ENCLOSURE

## **1.0 SCOPE**

This audit of the Civilian Radioactive Waste management System Management and Operating Contractor (CRWMS M&O) at U.S. Geological Survey (USGS) and Los Alamos National Laboratory (LANL) will be conducted by a team of auditors and Technical Specialists (TS) from the Office of Quality Assurance (OQA). The audit will be a performance-based audit of selected processes and technical activities as specified below.

The performance-based audit will focus on processes and controls related to USGS activities supporting Work Breakdown Structure (WBS) 1.2.3.3.1.1.4, "Regional Hydrological System Synthesis and Modeling, Milestone SP23OM3 Regional Saturated-Zone Synthesis Report;" and WBS1.2.3.3.1.3.3, "Saturated-Zone Hydrologic System Synthesis and Modeling, Milestone SP23NM3, Site Saturated-Zone Synthesis Report." In addition, the processes and controls related to LANL activities supporting WBS1.2.3.4.1.5.1, "Retardation Sensitivity Analysis, Milestone SP25CM3A Saturated-Zone Radionuclide Transport Model;" and the Quality Assurance (QA) Program Elements directly related to Milestone deliverables.

## **2.0 AUDIT SCHEDULE**

Pre-Audit Team/Observer Meeting (USGS)	8:00 a.m., December 1, 1997 Denver, CO
Pre-Audit Conference (USGS)	8:30 a.m., December 1, 1997
Audit Activities (USGS)	9:00 a.m. – 4:00 p.m. December 1, 1997
	8:00 a.m. – 3:00 p.m. December 2-5, 1997
Post-Audit Conference (USGS)	3:30 p.m., December 5, 1997 Denver, CO
Pre-Audit Conference (LANL)	8:00 a.m., December 8, 1997 Los Alamos, NM
Audit Activities (LANL)	9:00 a.m. - 4:00 p.m. December 8, 1997
	8:00 a.m. - 4:00 p.m. December 9, 1997
	8:00 a.m. – 12:00 p.m. December 10, 1997

Post-Audit Conference (LANL)

2:30 p.m., December 10, 1997  
Los Alamos, NM

There will be daily Audit Team/Observer meetings at 4:00 p.m. to review audit progress. Additionally, there will be Audit Team Leader/Observer/USGS/LANL management meetings at 8:15 a.m., after the commencement of the Audit, to communicate audit progress, discuss findings, potential deficiencies and establish liaison. These meetings will be held at locations provided by USGS and LANL, respectively.

### **3.0 REQUIREMENTS TO BE AUDITED AND APPLICABLE REFERENCES**

The requirements to be audited will be contained in the performance-based checklist. These checklists will be developed from USGS/LANL approved and issued program procedures, technical procedures, participant planning sheets, study plans and the performance objectives established and agreed upon with USGS/LANL.

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 the following:

- ☐ WBS1.2.3.3.1.1.4, "Regional Hydrological System Synthesis and Modeling, Milestone SP23OM3 Regional Saturated-Zone Synthesis Report"
- ☐ WBS1.2.3.3.1.3.3, "Saturated-Zone Hydrologic System Synthesis and Modeling, Milestone SP23NM3 Site Saturated-Zone Synthesis Report (USGS)"
- ☐ WBS1.2.3.4.1.5.1, "Retardation Sensitivity Analysis, Milestone SP25CM3A Saturated-Zone Radionuclide Transport Model (LANL)"

Specially, the Milestone Reports and their associated data inputs will be evaluated for the critical process steps identified below:

1. Data source and control.
2. Data analyzed with appropriate reviews and entered into database and checked for accuracy.
3. Software Control.
4. Numerical model.

5. Model codes.
6. Flow model calibrations.
7. Model output reporting.
8. Independent reviews and resolution of comments.
9. Qualified reviewers.
10. Control of data update and changes.
11. Genesis input.

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

- ☐ Satisfactory completion of the critical process steps
- ☐ Acceptable results and quality of the end product
- ☐ Documentation that substantiates quality of products
- ☐ Performance of trained and qualified personnel
- ☐ Implementation of applicable QA Program elements

## **5.0 AUDIT TEAM MEMBERS**

Donald J. Harris, OQA, Las Vegas, NV, Audit Team Leader  
Lawrence W. McGrath, OQA, Las Vegas, NV, Audit Team Leader In Training  
Michael A. Goyda, OQA, Las Vegas, NV, Auditor  
Keith M. Kersch, CRWMS M&O, Las Vegas, NV, Technical Specialist  
Floyd H. Dove, Booz Allen & Associates, Las Vegas, NV, Technical Specialist  
James Blaylock, OQA, Las Vegas, NV, Auditor

## **6.0 AUDIT CHECKLISTS**

The following checklist will be used during the audit:

USGS/LANL-ARP-98-03-01, "Performance-Based Checklist"