

U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
OFFICE OF QUALITY ASSURANCE

AUDIT REPORT  
OF THE  
CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM  
MANAGEMENT AND OPERATING CONTRACTOR

AT  
SANDIA NATIONAL LABORATORIES  
ALBUQUERQUE, NEW MEXICO  
AND  
THE YUCCA MOUNTAIN SITE, NEVADA

AUDIT NUMBER YM-ARC-96-18  
JULY 17 THROUGH 26, 1996

Prepared by: Richard L. Weeks Date: 8/26/96  
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Enclosure

## 1.0 EXECUTIVE SUMMARY

As a result of Quality Assurance (QA) Audit YM-ARC-96-18, the audit team determined that the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) at Sandia National Laboratories (SNL) is satisfactorily implementing an adequate and effective QA program, except as noted. The audit was conducted in accordance with the U.S. Department of Energy (DOE) Office of Civilian Radioactive Waste Management Quality Assurance Requirements and Description (QARD) document, DOE/RW-0333P, Revisions 4 and 5, as appropriate, and SNL's implementing procedures for QA Program Elements 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 12.0, 15.0, 16.0, 17.0, 18.0 (surveillances only), Supplements I, II, III, and V. Implementation of Program Elements 16.0 and 17.0 were determined to be unsatisfactory and implementation of Program Element 5.0 was determined to be marginal. All other program elements evaluated were determined to be satisfactorily implemented. There was no implementation of Supplement V and SNL currently has no activities to which Program Elements 8.0, 9.0, 10.0, 11.0, 13.0, 14.0, and Supplement IV apply. A technical evaluation of the activities under Work Breakdown Structure (WBS) 1.2.3.2.7.3.4, "In Situ Design Verification," was conducted during the audit. The technical specialist determined that work conducted by SNL was adequate and effective.

The audit team identified 12 deficiencies during the audit that resulted in the issuance of eleven Deficiency Reports (DR), and one Performance Report (PR) by the Yucca Mountain Quality Assurance Division (YMQAD). DR YM-96-D-080 addresses a noncompliance between Section 6 of the QARD, Revision 5, and Quality Assurance Implementing Procedure (QAIP) 20-1, Revision 03, "Technical Procedures." The QAIP does not incorporate all minimum requirements for the expedited change process; DR YM-96-D-081 addresses a non-compliance between Section 5 of the QARD, Revision 5, and QAIP 5-1, Revision 05, "Quality Assurance Implementing Procedures." The QAIP does not adequately describe the sequence of activities followed to initiate and change procedures nor is the Revision History required; DR YM-96-D-082 identifies software change request forms that did not indicate affected baseline elements as required by QAIP 19-1, Revision 02, "Software Quality Assurance Requirements;" DR YM-96-D-083, as required by QAIP 4-1, Revision 07, "Procurement," procurement documents did not describe QA requirements; DR YM-96-D-084 addresses a non-compliance between Section 17 of the QARD, Revision 5, and QAIP 17-1, Revision 02, "Protecting, Preparing, and Submitting YMP QA Records." Minimum requirements for correction of QA records are not met; DR YM-96-D-085 identifies QA records that have been accepted and corrected by the Local Records Center (LRC) that do not meet the minimum requirements of QAIP 17-1, Revision 02; DR YM-96-D-086 addresses completed Document Review and Comment (DRC) forms that have not been submitted to the LRC, and QAIP 17-3, Revision 02, "Processing, Storing, and Protecting YMP QA Records," and QAIP 6-3, Revision 03, "Conducting and Documenting Review of Documents," are

in conflict; DR YM-96-D-087 addresses entries made in a scientific notebook that did not meet requirements of QAIP 20-2, Revision 01, "Scientific Notebooks;" DR YM-96-D-088 addresses technical procedures that do not identify the status of records as lifetime or nonpermanent as required by the QAKD, Revision 5, Section 5; DR YM-96-D-089, review criteria were not specified on DRC forms as required by QAIP 6-3, Revision 03; DR YM-96-D-090 addresses deficiency documents generated by SNL that were not complete; PR YM-96-P-030, acceptance letter for approval of Geokon as a qualified supplier was not generated and issued.

In addition, nine deficiencies identified by the audit team were corrected prior to the postaudit meeting, as described in Section 5.5.4 of this report. Additionally, there were 10 recommendations resulting from the audit, which are detailed in Section 6.0 of this report.

## **2.0 SCOPE**

The audit was conducted to evaluate the adequacy of, compliance to, and the effectiveness of the SNL's QA program as described in the QARD and the SNL's implementing procedures.

The QA program elements/requirements evaluated during the audit, in accordance with the approved audit plan, are as follows:

### **QA PROGRAM ELEMENTS/REQUIREMENTS**

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Design Control
- 4.0 Procurement Document Control
- 5.0 Implementing Documents
- 6.0 Document Control
- 7.0 Control of Purchased Items and Services
- 12.0 Control of Measuring and Test Equipment
- 15.0 Nonconformances
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits (Surveillances only)
- Supplement I, Software
- Supplement II, Sample Control
- Supplement III, Scientific Investigation
- Supplement V, Control of the Electronic Management of Data

The following QA program elements/requirements were not reviewed during the audit because SNL has no activity for which these elements apply:

- 8.0 Identification and Control of Items
- 9.0 Control of Special Processes
- 10.0 Inspection
- 11.0 Test Control
- 13.0 Handling, Storage, and Shipping
- 14.0 Inspection, Test, and Operating Status
- Supplement IV, Field Surveying

### TECHNICAL AREA

The technical area evaluated during this audit included a specific activity described in WBS 1.2.3.2.7.3.4, "In Situ Design Verification."

### **3.0 AUDIT TEAM AND OBSERVERS**

The following is a list of audit team members and observers and their assigned areas of responsibility:

<u>Name/Title/Organization</u>	<u>QA Program Elements/Requirements, Processes, Activities or End-products</u>
Richard L. Weeks, Audit Team Leader, YMQAD	1.0, 2.0, 15.0, Supplements II and III
Mario R. Diaz, Auditor, YMQAD	1.0, 2.0, 16.0, 17.0, and 18.0
Donald J. Harris, Auditor, YMQAD	2.0, 4.0, 6.0, 7.0, 12.0
Stephen D. Harris, Auditor, YMQAD	3.0, 5.0, Supplements I, III, and V
Jeff J. LeFever, Technical Specialist, CRWMS M&O	WBS 1.2.3.2.7.3.4, "In Situ Design Verification"
James R. Grubb, Observer, State of Nevada	
Susan W. Zimmerman, Observer, State of Nevada	

#### **4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED**

The first of two preaudit meetings was held at the SNL offices located at the Exploratory Studies Facility (ESF), Yucca Mountain Site, Nevada, on July 17, 1996, and the second at Albuquerque, New Mexico, July 22, 1996. A preliminary postaudit meeting was held at the SNL offices located at the ESF on July 19, 1996, to inform management of the results of activities evaluated during this phase of the audit. A daily debriefing and coordination meeting was held with SNL's management and staff, and daily audit team meetings were held to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the SNL's offices in Albuquerque, New Mexico, on July 26, 1996. Personnel contacted during the audit are listed in Attachment 1. The list includes those who attended the preaudit and postaudit meetings.

#### **5.0 SUMMARY OF AUDIT RESULTS**

##### **5.1 Program Effectiveness**

The audit team concluded that, in general, the SNL QA program is adequate and being satisfactorily implemented for QA Program Elements 1.0, 2.0, 3.0, 4.0, 6.0, 7.0, 12.0, 15.0, 18.0, and Supplements I through III. There was no implementation of Supplement V. Implementation of QA Program Element 5.0 was determined to be marginal and implementation of QA Program Elements 16.0 and 17.0 was determined to be unsatisfactory.

##### **5.2 Stop Work or Immediate Corrective Actions Taken**

There were no Stop Work Orders, immediate corrective actions, or related additional items resulting from this audit.

##### **5.3 QA Program Audit Activities**

A summary table of audit results is provided in Attachment 2. The details of the audit evaluation, along with the objective evidence reviewed, are contained within the audit checklists. The checklists are kept and maintained as QA Records.

##### **5.4 Technical Audit Activities**

Quality Assurance Checklist YM-ARC-96-18-02, containing 51 questions, was prepared to address technical activities related to WBS 1.2.3.2.7.3.4, "In Situ Design Verification." The checklist questions were based on specific attributes identified in the following SNL Technical Procedures (TP): TP-236, Revision 01, "Operation, Calibration, and Control of Tape Extensometers," TP-237,

Revision 00, "Installation and Verification of Instrument Wiring," TP-238, Revision 00, "Installation of Convergence Pins," TP-239, Revision 01, "Installation of Extensometers," TP-244, Revision 00, "Downloading, Verifying, and Backing-up Electronic Data Taken by Data Logger," TP-248, Revision 00, "Reading, Verifying, and Backup Instruments Using Portable Data Logger", TP-249, Revision 00, "Maintenance, Verification, and Rejection Criteria of Instrumentation," TP-250, Revision 00, "Calibration, Preparation, Installation, and Operations of Instrumented Rock Bolts"; Work Agreement (WA) 0065, Revision 04, "Exploratory Studies Facility Design Verification Activities," and WA 0116, Revision 01, "Design Verification Activities in the Alcove/North Ramp Starter Tunnel and North-Ramp," and selected QAIP's. Interviews were held and objective evidence examined at the ESF Pad and the SNL offices in Albuquerque, New Mexico. SNL personnel that were interviewed are identified in checklist YM-ARC-96-18-02.

In summary, SNL technical personnel are well qualified for their work assignments and responsibilities. This conclusion is based on interviews with technical personnel and examination of personnel qualification and training records. They were very professional in their responses to the proposed questions listed in checklist YM-ARC-96-18-02 and all questions were answered satisfactorily. SNL personnel demonstrated the processes followed in the calibration lab, at instrumented locations in the ESF, and associated test instruments. Examined scientific notebooks, computer data summaries, and other technical data generated as a result of implementation of technical procedures was found to be thorough, neatly compiled, safely stored and readily available for review. Instrumentation that was examined while visiting the ESF was found to be properly installed and maintained. Appropriate lockout precautions to ensure the security of data, instrument recorders, and other hardware were found to be adequate and being used.

## **5.5 Summary of Deficiencies**

The audit team identified 21 deficiencies during the audit for which 11 DRs have been issued. One additional deficiency was identified as a PR and 9 deficiencies were corrected prior to the postaudit meeting.

Synopses of deficiencies documented as DRs and a PR, and those corrected during the audit, are presented below. The DRs have been transmitted under a separate letter, YMQAD:RBC-2356, dated August 7, 1996, and the PR has been issued to the SNL responsible individuals in accordance with Administrative Procedure (AP)-16.1, Revision 1, "Performance/Deficiency Reporting."

**5.5.1 Corrective Action Requests (CAR)**

None

**5.5.2 Deficiency Reports (DR)**

**DR YM-96-D-080**

QARD, Revision 5, Section 6.2.7, describes specific requirements to be incorporated in implementing documents for the control of expedited changes. Contrary to these requirements, QAIP 20-1, Revision 03, did not identify the level of management with authority to make expedited changes, time limits for processing expedited changes through the normal change process, actions to be taken when the procedure work activity results in a change that is different from the expedited change, and methodology for the Principal Investigator to notify the author and others of the variance from the expedited change.

**DR YM-96-D-081**

QARD, Revision 5, Section 5.2.2 C., and 5.2.2 G., requires a sequential description of work to be performed including controls to alter the sequence and methods for demonstrating that work was performed as required. QAIP 5-1, Revision 05, does not adequately describe the sequence for initiating and changing procedures, nor does it require the revision history.

**DR YM-96-D-082**

QAIP 19-1, Revision 02, Section 5.5, Step 5(b), 1., requires that change request forms indicate all affected baseline elements. Change Request forms for computer code Reg CM2 did not indicate baseline elements.

**DR YM-96-D-083**

QAIP 4-1, Revision 07, Section 4.2.3, Step 7, requires a Procurement Planning Checklist (PPC) be attached to Purchase Requisitions to indicate applicable QA requirements. Quality-affecting work identified in Purchase Requisition AS 0296 included a PPC which indicated that QA requirements were not applicable.

DR YM-96-D-084

QARD, Revision 5, Section 17.2.4, A., requires that for corrections made to QA records, the initials or signature and date of the person authorized to make correction shall be included on the corrected document. QAIP 17-1, Revision 02, Section 4.4, allows QA records to be processed into the records management system without full compliance to this requirement.

DR YM-96-D-085

QAIP 17-1, Revision 02, Section 4.2.3, requires specific information to be included on the first page of individual records, and Section 4.4 requires the record source to make corrections in a specified manner. QA records have been processed and accepted by the records management system with required information missing and corrections made by someone other than the record source.

DR YM-96-D-086

QAIP 17-3, Revision 02, Appendix A, identifies DRCs as QA records and QAIP 6-3, Revision 03, Section 5.3, Step 6, requires DRCs and markups of reviewed documents to be submitted to the LRC. DRCs and markups of procedures QAIP 5-1, Revision 05, and QAIP 1-2, Revision 10, were not submitted to the LRC. Additionally, QAIP 17-3, Revision 02, and QAIP 6-3, Revision 03, are in conflict.

DR YM-96-D-087

QAIP 20-2, Revision 01, Section 4.2, Step 2, requires individuals making entries in a Scientific Notebook (SN) to sign and date the entries. Entries made in the SN for Fracture Properties Experiments were not signed and dated.

DR YM-96-D-088

QARD, Revision 5, Section 5.2.2, requires implementing procedures to identify the status of generated QA records as lifetime or nonpermanent. Several technical procedures listed QA records generated as a result of implementation of the procedure; however, the status of these QA records as lifetime or nonpermanent was not specified.



DR YM-96-D-089

QAIP 6-3, Revision 03, Section 5.1, Step 3, Note 2:, requires the review requester to specify the criteria to be used to perform reviews. Review criteria were not specified for reviews of two WAs and one QAIP.

DR YM-96-D-090

AP-16.1Q, Revision 0, "Performance/Deficiency Reporting," Section 5.3b., requires the responsible individual (RI) to document remedial actions, propose a due date, and sign and date DRs; Section 5.3 e. requires the RI, based on recommended actions, to indicate root cause determination and action to preclude recurrence; Section 5.7 a. requires the QA Representative to perform verification and identify objective evidence reviewed; Section 7.1 states that completed DRs, Continuation Pages, and relevant correspondence are lifetime records.

AP-16.1Q, Revision 0, and AP-16.2Q, Revision 0, "Corrective Action and Stop Work," Section 5.4.5, requires the QA Manager to concur with extension request evaluations by signing the appropriate justification correspondence. QAIP 17-1, Revision 02, Section 4.2, requires the record source to review each record package to ensure it is accurate and complete; Section 4.4 requires the record source to make corrections in a specified manner. Several completed DRs were found to not contain required information as stated in the requirements above. Justification correspondence for an extension request for an SNL CAR did not contain the QA Manager's signature. A deficiency document was corrected by other than the record source.

**5.5.3 Performance Reports (PR)**

PR YM-96-P-030

QAIP 7-3, Revision 01, "Evaluation of Contractor QA Program Documents," Paragraph 4.3, Step 3 and Step 5, requires SNL to generate an acceptance letter to accept contractor QA program documents. Geokon was accepted by SNL; however, the acceptance letter notifying Geokon of this acceptance was not generated.

**5.5.4 Deficiencies Corrected During the Audit**

Deficiencies which are considered isolated in nature and only requiring remedial action can be corrected during the audit. The following

deficiencies were identified and corrected during the audit:

1. QAIP 6-3, Revision 03, Appendix A, requires a reviewer signature after resolution of review comments. QAIP 5-1, Revision 05, "Quality Assurance Implementing Procedures," was reviewed for adequacy using a DRC form; however, the final reviewer signature indicating resolution of comment(s) was missing.

It was verified on July 23, 1996, that a corrected DRC form, including the appropriate signature, was obtained.

2. QAIP 6-3, Revision 03, Section 5.1, Step 3, Note 2:, requires, in part, the requester to specify criteria to be used to perform the review. Contrary to this, the SNL requester did not specify the criteria to be used to perform a review of QAIP 1-2, Revision 10.

The appropriate information was appended to the DRC form on July 25, 1996, with appropriate signature and date.

3. Yucca Mountain Site Characterization Project Administrative Procedure (YAP)-SIII.3Q, Revision 1, "Processing of Technical Data on the Yucca Mountain Site Characterization Project," Section 5.2.1, a), requires that the Affected Organization, "when requested, transfers preliminary data under a cover letter that includes the following statement:

The attached data have not received confirmation of QA compliance, which includes a complete technical review; therefore, these data are considered to be preliminary. If used, these data must be clearly identified as preliminary in nature and tracked by the using Affected Organization until QA compliance has been confirmed and the data have been reported to the ATDT [Automated Technical Data Tracking] System."

Rock Mass Quality data for WBS 1.2.3.2.7.3.4, dated April 24, 1996 through July 9, 1996, was transferred as preliminary data but the required statement was missing from the cover letters. The data was submitted to the Technical Coordinator's Office, the Constructor Kiewit/Parsons Brinkerhoff and Title III Architect Engineer.

SNL prepared a memo advising the organizations that received the data of its preliminary status.

4. QAIP 12-1, Revision 05, "Measuring and Test Equipment Control," Section 4.2, Step 3, f., requires the certification regarding the calibration performed to include the identification of calibration procedure and revision used. Contrary to this, calibration documentation provided by Bechtel (Reynolds Electrical & Engineering Co., Inc./EG&G) during the time frame September 14, 1995 through June 5, 1996 did not include the revision level of the procedure used to conduct the calibration.

It was verified that deficient documentation was corrected by annotating with the appropriate revision of the calibration procedure utilized to conduct calibration.

5. QAIP 2-5, Revision 04, "Training," Section 4.1, Step 3, Step 4, Note 2, and Step 7, describe minimum training requirements and identifies forms and documentation to be completed to provide objective evidence of training. Contrary to these requirements, training documentation to provide objective evidence of assignment of training, completion of training, qualification of trainer, and lesson plan documentation were missing or incomplete.

It was verified that incomplete documentation was corrected and missing documentation either found or generated to fulfill procedural requirements.

6. QAIP 2-6, Revision 03, "Qualification and Certification of Personnel," Sections 4.1, Step 3, and 4.2, Step 3, require the manager to verify the qualifications of SNL personnel, document this evaluation on the appropriate form, and assign training. Documentation of these requirements was either incomplete or missing for SNL personnel and subcontractor personnel working for Agapito Associates Incorporated (AAI).

It was verified that qualification and certification records were generated and signed during the audit for the following personnel:

R.S. Taylor - SNL  
F. J. Schelling - SNL  
R.L. Johnston - SNL  
K.D. Donnelson - AAI  
Dwayne Kicker - AAI

7. QAIP 19-1, Revision 02, "Software Quality Assurance Requirements," Section 5.4, Steps 4 and 5, requires the reviewer to sign the Software Use Form to indicate applicability of the software to the problem being solved and traceability of inputs and assumptions. Contrary to this, Software Use Form for Reg CM2, dated February 24, 1995, was not signed by the reviewer, thus it is not possible to determine if the review was completed.

The responsible reviewer was contacted and his review signature obtained on July 23, 1996, with appropriate justification.

8. Surveillance Report SR-96-03 was issued by SNL to describe actions taken during a visit by the QA Manager to the SNL ESF field offices. As indicated by the author, the intent of the report was to describe what took place during the visit and not conduct a surveillance. Since the surveillance report neither met the requirements of QAIP 10-1, Revision 06, "Surveillances," nor was intended to document surveillance activities, SNL withdrew it as a surveillance report.
9. QAIP 6-1, Revision 03, "Document Control System," Section 4.2.1, Step 6, Note 2:, requires that if a superseded document is kept by a recipient, the front page shall be marked "Superseded." Contrary to this requirement, controlled manuals included superseded copies of WAs for which the superseded status was not indicated on the front page.

It was verified that the superseded copies of the WAs were properly marked to indicate they were "Superseded."

#### **5.5.5 Follow-up of Previously Identified CARs and DRs**

There was no follow-up to previously identified CARs and DRs.

### **6.0 RECOMMENDATIONS**

The following recommendations resulted from the audit and are presented for consideration by the SNL's management.

1. During this audit a large number of deficient conditions were identified, 21 in total, resulting in 12 deficiency documents being issued. It is recommended that sufficient numbers of QA personnel be made available to assist SNL line personnel involved in quality-related activities and a more aggressive surveillance program be

instituted to increase the oversight of program activities. The combination of QA personnel working with line personnel and increased surveillances should increase compliance to program requirements and result in fewer deficiencies being identified during audits.

2. The current configuration management system (QAIP 19-1, Revision 02) does not clearly show the relationship between certain baseline documents and their associated software items. The cross reference system requires considerable project and document knowledge of the history involved to be able to show which baseline element(s) go with which other baseline element(s) that make up a software item (e.g., Which change documentation goes with a changed software code? The Master Log does not have a flag indicating the status of in-process changes to a specific baseline). These individual issues may be explained for compliance purposes; however, it would be difficult to arrange the status of the configuration of each software item using the current system used on the computer. It is recommended for the next revision of QAIP 19-1 that the process of configuration management be evaluated and a system be created that permits availability of a cross reference report that shows each code and the current version of related baseline documents (and in-process change status) as a package.
3. Various Study Plan and procedure reviews have included a handwritten, marked up draft plan or procedure used to document comments for the review. A DRC form is used, but the form references the attached draft for specific comments. This process could produce incomplete review and resolution of mandatory comments. Although the end result may produce a product satisfactory to the review team, the process and documentation of the process is casual. QARD, Revision 5, Section 2.2.10, F., states, "Mandatory comments resulting from review shall be documented and resolved before approving the document." Without specific mandatory comment documentation and documented resolution, it is difficult to show objective evidence that each one has been resolved. It is recommended that the review process be modified to require specific documentation and resolution of mandatory comments on a separate form without reference to a marked-up draft of the reviewed document.
4. QAIP 20-1, Revision 03, includes Appendix A which describes Technical Procedure content. Additionally, a narrative is provided that allows requirements described in a WA not to be repeated in the technical procedure. It is recommended that technical procedures be written as stand-alone documents not requiring WAs to supplement their implementation. Appendix A should indicate minimum required technical procedure content. Topics that are not appropriate would be indicated as not applicable thus indicating that the topic was considered.

5. It is recommended that SNL management conduct refresher training regarding the implementation of YAP-15.1Q, "Control of Nonconformances." SNL has never generated a Nonconformance Report to address Measuring and Test Equipment (M&TE) although the use of M&TE by SNL personnel has increased continuously since commencement of ESF activities. It should be emphasized that it is required to implement YAP-15.1Q for out-of-calibration M&TE.
6. Revise QAIP 4-1, Revision 07, Paragraphs 4.2.5, Step 12, and 4.3.5, Step 12, to indicate that the Budget Procurement Specialist (BPS) review of issued procurement documents is a nondocumented review. Restrict reviews by the BPS to a comparison of issued documents technical and QA requirements to those specified in the Procurement Request and PPC.
7. Revise QAIP 4-1, Revision 07, "Post-Award Contract," Paragraph 4.4. Change this section to state that the initiation of a PPC form is not required for schedule cost or Limit of Obligation Changes (see QARD Revision 5, Paragraph 4.2.3).
8. Revise TP-245, Revision 00, "Calibration, Preparation, Installation and Operation of Vibrating Wire Rock Bolt Load Cells," to delete the procurement requirements contained in Paragraph 8.1. Supplier qualifications and procurement requirements are contained in SNL's QAIPs; e.g., QAIP 4-1, Revision 07.
9. All QA records forms requiring a signature should be revised to require a printed name in addition to the signature and date. This suggestion is being made because many signatures are illegible. Additionally, samples of SNL personnel signatures and initials should be obtained for future comparison to previously signed and initialed QA documentation. This will facilitate the verification of signatures and initials which are difficult to read.
10. QAIP 2-6, Revision 03, refers to implementation of specific activities to be conducted "periodically." It is recommended that a quantitative unit of time; e.g., annual, biannual, be established for all activities requiring periodic evaluation. Management will then have an objective basis for determining compliance to the established time requirement.

## 7.0 LIST OF ATTACHMENTS

Attachment 1: Personnel Contacted During the Audit  
Attachment 2: Summary Table of Audit Results

# ATTACHMENT 1

## Personnel Contacted During the Audit

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit</u>	<u>Postaudit Meeting</u>
Brady, M.	SNL/Laboratory Lead	X	X	X
Brodsky, N.	SNL/P.I.		X	
Chocas, C.	SNL/P.I./Technical Staff Member		X	
Costin, L.	SNL/Manager Geotechnical Investigations	X	X	
Cox, D.	SNL/Administrative Support Assistant			X
Ehrhorn, T.	SNL/Software QA Coordinator	X	X	X
Fill, S.	SNL/Student Intern	X		
Garcia, M.	SNL/Administrative Assistant	X		
Grubb, J.	State of Nevada/ Observer	X		X
Harrison, K.	SAIC/NWMP Records Lead		X	X
James, E.	SAIC/Lead Technical Data Records Technician		X	X
Jaramillo, C.	SNL/QA		X	
Lee, M.	SNL/P.I.	X	X	
Lum, C.	SNL/Sr. Member, Technical Staff	X	X	
Mallory, M.	SNL/ Document Control Clerk		X	
Martinez, A.	SNL/Training Specialist	X	X	
Olsson, W.	SNL/P.I. Geomechanics Department		X	
Pickering, S.	SNL/Department Manager	X		
Pierson, B.	SNL Technical Reports Manager		X	
Rautman, C.	SNL/P.I./Geo Modeling and Testing		X	
Richards, R.	SNL/QA Manager	X	X	X
Riggins, M.	SNL/Engineer	X	X	X
Schelling, J.	SNL/Manager	X	X	X
Shephard, L.	SNL/Director Center NWM			X
Taylor, R.	P.I./ESF/Testing Coordination Department		X	
Tucker, M.	SAIC/Records Manager	X		
Warner, P.	SNL/Records Manager	X	X	X
Washburn, L.	SNL/Budget/Procurement Specialist	X	X	
Wawersik, W.	SNL/P.I./Geomechanics Department		X	

### LEGEND:

NWMP.....Nuclear Waste management Program  
 NWM.....Nuclear Waste Management  
 SAIC.....Scientific Application International Corporation  
 PI.....Principal Investigator

**ATTACHMENT 2**  
**Summary Table of Audit Results**

**AUDIT YM-ARC-96-18 DETAIL SUMMARY**

**PROGRAMMATIC CHECKLIST**

QA ELEMENT/ ACTIVITIES	DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARC-96-18-01	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE- QUACY	COM- PLIANCE	OVER- ALL
1	QAIP 1-2, Rev. 10	Pg. 1	N	N	N	N	#1	SAT	SAT	SAT
	QAIP 1-4, Rev. 00, ICN 01	Pgs. 2-4	N	N	N	N	N	N/I	N/I	
	QAIP 1-5, Rev. 10	Pgs. 5 & 6	N	N	N	N	N	SAT	SAT	
2	QAIP 2-2, Rev. 02	Pgs. 7-9	N	N	N	N	N	SAT	SAT	SAT
	QAIP 2-4, Rev. 03	Pgs. 10-12	N	N	N	N	N	SAT	SAT	
	QAIP 2-5, Rev. 04	Pgs. 13-19	N	N	N	#5	N	SAT	SAT	
	QAIP 2-6, Rev. 03	Pgs. 20-22	N	N	N	#6	#10	SAT	SAT	
	QAIP 2-9, Rev. 01	Pgs. 23 & 24	N	N	N	N	N	N/A	N/I	
	QAIP 3-12, Rev. 01	Pgs. 25-29	N	N	N	N	N	N/A	N/I	
	QAIP 10-1, Rev. 06	Pgs. 30-34	N	N	N	#8	N	SAT	SAT	
3	QAIP 3-4, Rev. 01, ICNs 01 & 02	Pg. 132a	N	N	N	N	N	SAT	SAT	SAT



**ATTACHMENT 2**  
**Summary Table of Audit Results**

QA ELEMENT/ ACTIVITIES	DOCUMENTS REVIEWED	CHECKLIST DETAILS YM-ARC-96-18-01	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE- QUACY	COM- PLIANCE	OVER- ALL
4	QAIP 4-1, REV. 07	Pgs. 35-43	N	YM-96- D-083	N	N	#6, #7 AND #8	SAT	SAT	SAT
5	QAIP 5-1, REV. 05	Rgs. 44-50	N	YM-96- D-081	N	N	N	MARG.	MARG.	MARG.
6	QAIP 6-1, Rev. 03	Pgs. 51-54	N	N	N	#9	N	SAT	SAT	SAT
	QAIP 6-2, Rev. 03	Pgs. 55-63	N	N	N	N	#3	SAT	SAT	
	QAIP 6-3, Rev. 03	Pgs. 64-66	N	YM-96- D-089	N	#1 and #2	#3	SAT	SAT	
7	QAIP 7-1, Rev. 02	Pgs. 67-69	N	N	N	N	N	SAT	SAT	SAT
	QAIP 7-3, Rev. 01	Pgs. 70-72	N	N	YM- 96-P- 030	N	N	SAT	SAT	
12	QAIP 12-1, Rev. 05	Pgs. 73-78	N	N	N	#4	N	SAT	SAT	SAT
15	YAP-15.1Q, REV. 2	Pgs. 79-82	N	N	N	N	#5	N/A	N/I	N/I
16	AP-16.1Q, Rev. 0	Pgs. 83-88	N	YM-96- D-090	N	N	N	SAT	UNSAT	UNSAT
	AP-16.2Q, Rev. 0	Pgs. 89-94	N	N	N	N	N	SAT	SAT	

**ATTACHMENT 2**  
**Summary Table of Audit Results**

QA ELEMENT/ ACTIVITIES	PROCESS STEPS	CHECKLIST DETAILS YM-ARC-96-18-01	CAR (5.5.1)	DR (5.5.2)	PR (5.5.3)	CDA (5.5.4)	REC (6.0)	ADE- QUACY	COM- PLIANCE	OVER- ALL
17	QAIP 17-1, Rev. 02	Pgs. 95-99	N	YM-96- D-084/ YM-96- D-085	N	N	#9	UNSAT	UNSAT	UNSAT
	QAIP 17-2, Rev. 02	Pgs. 100-103	N	N	N	N	N	SAT	SAT	
	QAIP 17-3, Rev. 02	Pgs. 104-108	N	YM-96- D-086	N	N	N	MARG.	MARG.	
Supplement I	QAIP 19-1, Rev. 02	Pgs. 109-117	N	YM-96- D-082	N	#7	#2	SAT	SAT	SAT
Supplement II	QAIP 20-3, Rev. 02	Pgs. 118-122	N	N	N	N	N	SAT	SAT	SAT
Supplement III	QAIP 20-1, Rev. 03	Pgs. 123-125	N	YM-96- D-080 D-088	N	N	#4	MARG.	SAT	SAT
	QAIP 20-2, Rev. 01	Pgs. 126-128	N	YM-96- D-087	N	N	N	SAT	MARG.	
	YAP-SIII.3Q, Rev. 1	Pgs. 129-132	N	N	N	#3	N	SAT	SAT	
Supplement V	QARD, Rev. 05	NONE	N	N	N	N	N	N/A	N/I	N/I

**ATTACHMENT 2**  
**Summary Table of Audit Results**

**TECHNICAL CHECKLIST**

<b>TOTAL</b>		132	0	11	1	9	10			<b>SAT</b>
<b>QA ELEMENT/ ACTIVITIES</b>	<b>PROCESS STEPS</b>	<b>CHECKLIST DETAILS YM-ARC-96-18-02</b>	<b>CAR (5.5.1)</b>	<b>DR (5.5.2)</b>	<b>PR (5.5.3)</b>	<b>CDA (5.5.4)</b>	<b>REC (6.0)</b>	<b>ADE- QUACY</b>	<b>COM- PLIANCE</b>	<b>OVER ALL</b>
<b>WBS 1.2.3.2.7.3.4, "In-Situ Design Verification."</b>	TP-236, Rev. 01	Pgs. 1 & 2	N	N	N	N	N	SAT	SAT	<b>SAT</b>
	TP-237, Rev. 00	Pgs. 3-5	N	N	N	N	N	SAT	SAT	
	TP-238, Rev. 00	Pgs. 6-9	N	N	N	N	N	SAT	SAT	
	TP-239, Rev. 01	Pgs. 10 & 11	N	N	N	N	N	SAT	SAT	
	TP-244, Rev. 00	Pgs. 12-14	N	N	N	N	N	SAT	SAT	
	TP-248, Rev. 00	Pgs. 15-17	N	N	N	N	N	SAT	SAT	
	TP-249, Rev. 00	Pgs. 18-20	N	N	N	N	N	SAT	SAT	
	TP-250, Rev. 00	Pgs. 21 & 22	N	N	N	N	N	SAT	SAT	
	Miscellaneous	Pgs. 23-24	N	N	N	N	N	SAT	SAT	
<b>TOTAL</b>		24	0	0	0	0	0			<b>SAT</b>

**Legend:**

CDA . . . . Corrected During the Audit  
N . . . . . None  
N/A . . . . Not Applicable  
N/I . . . . . Not Implemented

REC . . . . Recommendations  
SAT . . . . Satisfactory  
UNSAT . . Unsatisfactory