

U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT  
OFFICE OF QUALITY ASSURANCE  
AUDIT YM-ARP-95-19  
OF  
SANDIA NATIONAL LABORATORY  
ALBUQUERQUE, NEW MEXICO  
AND  
CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM  
MANAGEMENT AND OPERATING CONTRACTOR  
LAS VEGAS, NEVADA  
AUGUST 21 THROUGH 25, 1995

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## 1.0 EXECUTIVE SUMMARY

As a result of Performance Based Quality Assurance (QA) Audit YM-ARP-95-19, the audit team determined that the Sandia National Laboratory (SNL) is satisfactorily implementing an effective QA program and process controls for generation and issuance of "Design Support Analyses:North Ramp Design Package 2C" except for specific activities that were considered marginal and are documented in Deficiency Reports (DR). The audit team determined that the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) is satisfactorily implementing an effective QA program and process controls for utilization of "Design Support Analyses:North Ramp Design Package 2C" as design input except for specific activities that were considered marginal and are documented in DRs. This evaluation included work activities under Work Breakdown Structure (WBS) 1.2.4.7, Subsurface License Application Design which was previously identified as WBS 1.2.4.2.3.2, Design Analysis.

The audit team identified five deficiencies during the audit that resulted in the issuance of four DRs. DR YMQAD-95-D-010 documents that SNL report "Design Support Analyses:North Ramp Design Package 2C" was generated and issued in a manner not described by the SNL QA program and that Work Agreements (WA) controlling the work were not updated. DR YMQAD-95-D-011 addresses the fact that the CRWMS M&O obtained technical data from the Technical Data Base (TDB) without submitting a written request. DR YMQAD-95-D-012 documents that SNL provided Preliminary Data to the CRWMS M&O without indicating the status of the data and stamping the data sheets. DR YMQAD-95-D-013 addresses the use of data for design input by the CRWMS M&O for which objective evidence of a technical review was not provided. Two additional deficient conditions did not require formal documentation by the audit team, based on the fact that SNL and the Office of Civilian Radioactive Waste Management (OCRWM) previously identified these deficiencies (see Section 5.5).

The performance based evaluation of process effectiveness and product acceptability was based on: 1) proper implementation of the procedures' critical process steps; 2) use of trained and qualified personnel working effectively; 3) documentation that substantiated the quality of the products; and 4) acceptable results and the quality of the end products.

There were three recommendations resulting from the audit which are detailed in Section 6.0 of this report.

## 2.0 SCOPE

The performance based audit was conducted to evaluate the effectiveness of SNL's controls for generation and issuance of "Design Support Analyses:North Ramp Design Package 2C" and the effectiveness of CRWMS M&O's controls for utilization of the aforementioned analyses results as design input. The audit was also to determine the

degree to which the resultant products meet the program requirements and management commitments and expectations. The audited organizations completed the work in accordance with DOE/RW0333P, Revision 4, the Quality Assurance Requirements and Description (QARD) Document, Supplement III (SNL) and Section 3.0 (CRWMS M&O).

The processes/activities/end-products evaluated during the audit, in accordance with the approved audit plan, are as follows:

PROCESS/ACTIVITY/OR END-PRODUCT

Generation of the SNL report, "Design Support Analyses:North Ramp Package 2C", Revision 1, and utilization by the CRWMS M&O of report results as design input were evaluated.

The performance based evaluation of process effectiveness and product acceptability was based on:

1. Satisfactory implementation of the critical process steps;
2. use of trained and qualified personnel working effectively;
3. documentation that substantiates the quality of the products, and
4. acceptable results and adequate end products.

The activities audited include (critical steps):

SNL	CRWMS/M&O
Implementation of Work Agreements	Provide Technical Direction
Training and Qualification of Personnel	Design Control Process
Design Support Analyses	Technical Documents
Design Support Analyses Review	Training and Qualification of Personnel
Design Support Analyses Submittal	Designs Verified
	Specifications and Drawings
	Design Analyses
	TBV and TBD Designations

TECHNICAL AREAS

The audit was conducted to evaluate the effectiveness of SNL and CRWMS M&O controls applied to generation and issuance and utilization of design input, respectively, of "Design Support Analyses:North Ramp Design Package 2C".

### 3.0 AUDIT TEAM AND OBSERVERS

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

<u>Name/Title/Organization</u>	<u>QA Program Elements/Requirements, Processes, Activities or End-products</u>
Richard L. Weeks, Audit Team Leader (ATL) Yucca Mountain Quality Assurance Division (YMQAD)	Section 3.0 and Supplement III, Critical Process Steps
John Pelletier, Auditor, YMQAD	Section 3.0 and Supplement III, Critical Process Steps
Frank Tsai, Technical Specialist, CRWMS M&O	Section 3.0 and Supplement III, Critical Process Steps
John Buckley, Observer, U.S. Nuclear Regulatory Commission (NRC)	
Don Dunavant, Observer, NRC, Center for Nuclear Waste Regulatory Analyses (CNWRA)	
Simon Hsiung, Observer, NRC, (CNWRA)	
Susan Zimmerman, Observer, State of Nevada	

### 4.0 AUDIT MEETINGS AND PERSONNEL CONTACTED

A preaudit meeting was held with SNL at the Albuquerque, New Mexico office on August 21, 1995 and with the CRWMS M&O at the Las Vegas, Nevada office on August 23, 1995. A daily debriefing and coordination meeting was held with SNL management and staff while auditing at the Albuquerque, New Mexico offices, and with the CRWMS M&O management and staff while auditing at the Las Vegas, Nevada, offices. Daily audit team meetings were held to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the CRWMS M&O offices in Las Vegas, Nevada, on August 25, 1995. 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, process controls are being effectively implemented by the SNL and the CRWMS M&O with regards to

"Design Support Analyses:North Ramp Package 2C". However, due to the identification of deficiencies, specific areas are considered marginal. This conclusion is based on an evaluation of implemented process controls for generation and issuance of the analyses by SNL and implementation of process controls for utilization of analyses results as design input by the CRWMS M&O.

## **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**

### **SNL**

In general, the content of report "Design Support Analyses: North Ramp Design Package 2C" and the supporting processes that generated it, were determined to be technically adequate and satisfactory. However, there are some specific technical concerns which are presented at the end of this section. A brief description of audit team activities related to the technical evaluation appears below.

Dr. Larry Costin and Mr. Eric Ryder of SNL were interviewed by the audit team regarding the technical aspects of the audited report and its process controls. Dr. Costin is the manager of the department in charge of thermo-mechanical work for Yucca Mountain Site Characterization Project. Mr. Ryder is the current Principal Investigator (PI) of the audited task. The original PI, Dr. Joseph Jung, has left the Yucca Mountain Project however, he was available by telephone during the audit. Dr. Hardy and Dr. Lin of J. F. T. Agapito & Associates, Inc., who conducted most of the numerical analyses described in the report, were also available by telephone during the audit. Costin and Ryder adequately addressed most of the questions however, Jung and Lin were contacted regarding a few specific issues.

The availability and limitation of inputs used for numerical analyses were confirmed by the auditee. A limited amount of data was available to SNL to generate rock mass properties using geostatistics. Sparse data from North Ramp Geologic (NRG) holes was used in a deterministic manner to generate rock mass properties. Most of the analyses were conducted using a linear elastic model. The intention to use a nonlinear model was successful only in

one out of four rock units. Hence, the entire analyses described in the report can only be classified as the first order of approximation.

The QA status of all numerical codes was verified by examination of software QA documents. Software QA personnel were interviewed regarding the maintenance and approval of the use of numerical codes. The technical review and comment resolution process was investigated by examination of documents in the task file. The technical qualifications of the PI and technical reviewers were verified by examination of training files located in the SNL record center.

Based on an evaluation of the technical content of the WA, examination of personnel training and qualification records, and evaluation of the design support analyses of the audited activity, the results are considered technically adequate. The technical adequacy of the design support analyses report is considered to be marginal. The reason for this conclusion is provided by the three concerns described below:

1. The inputs for computer runs were driven from field and laboratory measurements using the methodology described in SAND 92-0450. Geostatistical distribution of rock mass characters are required to drive rock mass properties using this methodology. For the work that has been audited, there are not enough measurements to evaluate by geostatistics. A paucity of measurements from NRG holes were plugged into equations of the given methodology without assessing its validity. Also, the process for developing the rock mass properties was not explained in detail in the report, so that the customer who received this report may not fully understand the limitations of the final conclusions and recommendations of the analyses.
2. The rationale for the use of the following parameters or decisions were not explained in the report: 1) P and S wave velocity in Table 3-1, 2)  $b_1$  in Equation 4-1, 3) upper bound  $\max(\sigma_c/q)$  (Maximum Compressive Stress/Unconfined Compressive Strength) in Table 7-1, 4)  $\sigma_1$  (Major Principal Stress) in Table 7-2, 5) maximum tensile failure ratio in Table 6-3, 6) the choice of critical cases to conduct static analyses, and 7) the selection of stress combinations for dynamic analyses. Additionally,  $b_1$  was not defined in the audited report.
3. The tensile failure analysis in Chapter 6 is not adequate. The use of the value "0" in Table 6-3 for the damage assessment of combined in situ, thermal and dynamic loads does not represent the expected conditions.

#### CRWMS M&O

In general, the processes implemented by the CRWMS M&O to utilize results of the subject report for Exploratory Studies Facility (ESF) North Ramp design analyses were determined to be technically adequate and satisfactory. However, specific technical deficiencies (refer to DR YMQAD-95-D-013) exist regarding the selection of data

from the audited report and the technical review of this selection for use in the "Topopah Springs (TS) North Ramp Ground Support Scoping Analysis", Revision 1. A brief description of audit team activities related to the technical evaluation appears below.

Dr. John Pye and Dr. Saeed Bonabian, authors of design analysis reports, of the CRWMS M&O were interviewed regarding the technical aspects of the use of data from the audited report. Dr. Pye is the originator of the "TS North Ramp Ground Support Scoping Analysis" report and Dr. Bonabian is the originator of the "ESF Alcove Ground Support Analysis" report. Tunnel support estimation charts illustrated in Chapter 7 of the audited report were directly adopted as the basis for designing the ground support system described in the "TS North Ramp Ground Support Scoping Analysis" report. Only a qualitative statement about the global stability of rock mass around the North Ramp tunnel is referenced in the "ESF Alcove Ground Support Analysis" report.

A discrepancy (refer to DR YMQAD-95-D-013) was identified while comparing the ground support estimation chart of the audit report that utilized the "TS North Ramp Ground Support Scoping Analysis". This discrepancy occurred because the CRWMS M&O did not compare the previously received Preliminary Data with the corrected data in the final, approved version of the audited report. Preliminary Data within the audited report, specifically, ground support estimation charts were utilized for the "TS North Ramp Ground Support Scoping Analysis". The charts, contained errors which were subsequently identified and corrected during an SNL technical review. The audited report was then submitted to the TDB by Technical Data Information Form (TDIF). However, CRWMS M&O personnel utilizing the Preliminary Data did not detect the incorrect data nor were they aware that the errors had been corrected by SNL. Consequently, Revision 1 of "TS North Ramp Ground Support Scoping Analysis" was issued based on incorrect data. The errors were detected by NRC personnel during a surveillance resulting in issuance of Revision 2 of "TS North Ramp Ground Support Scoping Analysis".

While interviewing CRWMS M&O personnel it became evident that the root cause of the errors was noncompliance with Section 3.2.1, A. of the QARD which states, "Design inputs should be identified and documented, and their selection reviewed and approved by those responsible for the design." Additionally, there is no objective evidence to demonstrate that the CRWMS M&O conducted a technical review of the audited report. (Note: The CRWMS M&O performed a technical review of Revision 0 of "Design Support Analyses: North Ramp Design Package 2C"; however, the audit was limited to Revision 1. Additionally, the ground estimation charts included in Revision 1 of the audited report were generated from completely different sets of numerical analyses as those in Revision 0.) The existence of the errors in Revision 1 of the scoping analysis demonstrates that the technical review for the selection of design inputs was insufficient.

The technical qualification of Dr. Pye and Dr. Bonabian were verified by examination of personnel records and determined to be adequate. The design verification process planned by CRWMS M&O was explained by Dr. Pye. Some drawings and specifications were checked for To Be Determined (TBD) and To Be Verified (TBV) designations. Design analysis conducted by the CRWMS M&O was not investigated during this audit. A previous audit (YMP-94-01), that resulted in the voluntary withdrawal of Design Package 2C, thoroughly evaluated the CRWMS M&O design analyses process. Since reissuance of Design Package 2C, the analyses process has received intense scrutiny by the CRWMS M&O and YMQAD. CRWMS M&O's requirements for the work performed by SNL was checked through WAs 110 and 130.

The audit concluded that the following activities were technically adequate: providing technical direction, training, specifications and drawings, TBD and TBV designations, and verification of design. The design control process is considered to be marginally adequate.

### **5.5 Summary of Deficiencies**

The audit team identified five deficiencies during the audit for which four DRs have been issued.

Two deficient conditions were identified for which OCRWM corrective action program documents were not written during the audit, and are described below:

- a. The CRWMS M&O directed SNL to conduct quality affecting work, specifically the analyses that generated the audited report, without utilizing an approved and controlled process. Letters, which were designated as Non-Q, initiated and described the scope of work. SNL is now working under the CRWMS M&O QA Program and the specific deficient condition will not occur again. Additionally, completion of corrective action to OCRWM CAR YM-95-026 will describe the process by which organizations interface within the CRWMS M&O.
- b. The second deficient condition addressed SNL reviewer independence of technical documents. SNL could not provide objective evidence that reviewers of the audited report were independent of the work. This condition was already documented on SNL DR SNL-95-D13.

A synopsis of deficiencies documented as DRs are detailed below. The four DRs generated during the audit have been transmitted to you under separate letter, number YMQAD:RBC-4480 dated September 6, 1995.

#### **5.5.1 Deficiency Report (DR)**

##### **YMQAD-95-D-010**

QARD, Revision 4, Section 2.2.2, B.,3. requires that a system shall provide positive controls over internal interfaces within an organization;

Section 2.2.4, D. requires planning to be performed to ensure work is completed under suitably controlled conditions and includes the identification and selective application, or development of appropriate implementing documents; and Section 5.2 requires that work be done to controlled implementing procedures. Contrary to the above requirements, "Design Support Analyses:North Ramp Design Package 2C" was issued in a manner not described by the SNL QA program and therefore the criteria for generation and acceptance of this report is indeterminate. Additionally, WAs were not updated to accurately reflect type of deliverable.

#### YMQAD-95-D-011

YMP Administrative Procedure (YAP) SIII.2Q, Revision 0, Section 5.4.1, b) requires that Affected Organizations submit a written request to the appropriate Yucca Mountain Site Characterization Project (YMP) TDB Administrator in order to obtain data. Contrary to this requirement, there is no objective evidence that the CRWMS M&O submitted a written request to the TDB for TDIF #303124.

#### YMQAD-95-D-012

YAP-SIII.3Q, Revision 0, Section 5.2.2, NOTE requires that when preliminary data is provided to a YMP investigator that it be done under cover letter that clearly indicates the status of the data and that data sheets are properly stamped. Contrary to this requirement, SNL provided preliminary data to the CRWMS M&O without indicating the status of the data and stamping the data sheets.

#### YMQAD-95-D-013

QARD, Revision 4, Section 3.2.1 requires that design input be identified and documented and their selection reviewed and approved by those responsible for the design. Contrary to the above requirement, there is no objective evidence that the selection of design input from Revision 1 of "Design Support Analyses:North Ramp Design Package 2C" was technically reviewed.

#### **5.5.2 Deficiencies Corrected During the Audit**

None

#### **5.5.3 Follow-up of Previously Identified CARs**

There were no previously issued CARs that were determined to be applicable to the scope of this audit.

## 6.0 RECOMMENDATIONS

The following recommendations resulted from the audit and are presented for consideration by the CRWMS M&O management.

- 6.1 If SNL continues to implement WAs as planning documents to conduct technical work utilized by the CRWMS M&O for design input, the CRWMS M&O should be included in the review, approval, and revision process for these WAs. The inclusion of the CRWMS M&O in this process would ensure that specified work met the requirements for design input.
- 6.2 Relative to design verification there is no requirement or plan by the CRWMS M&O to optimize the design methodology based on data gathered under design verification. It is recommended to improve design methodology using design verification information.
- 6.3 It is recommended that CRWMS M&O QA conduct periodic surveillances of the use of preliminary data to verify that users and transmitters of data are complying with YAP-SIII.3Q, Section 5.2.2.

## 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>
Kim Ayotte	SNL/SAIC, Technical Assistant Records Management	X		
Ronald B. Berlien	CRWMS M&O, QA Surveillance Lead	X		X
Michaele C. Brady	SNL, Laboratory Lead	X	X	X
Saeed Bonabian	CRWMS M&O, ESF, Design		X	
John T. Buckley	NRC, Observer	X		X
Laurence S. Costin	SNL, Technical Manager	X	X	X
R. Dragomir-Ramos	SNL/SAIC, Tech.Data/Records			X
Donald W. Dunavant	NRC/CNWRA, Observer	X		X
Thomas F. Ehrhorn	SNL, QA		X	X
James Gardiner	DOE, Observer			X
Hank T. Greene	YMQAD/QATSS, QA Division Mgr.			X
Paul G. Harrington	DOE, YMSCO, AMEFO		X	
Kevin G. Harrison	SNL/SAIC, Lead Record Tech.	X		
Dave Hawkinson	SNL/MACTEC,QAD	X	X	X
Simom Hsiung	NRC/CNWRA, Observer	X		X
Celister J. Houston	CRWMS M&O Engineering Specialist		X	
Eloise M. James	SNL/SAIC, Lead Technical Data Records	X	X	X
Claudette Jaramillo	SNL/Technadyne, QA Coordinator	X	X	X
Joseph Jung	SNL, PI		X	
Judy B. Justice	CRWMS M&O Records Manager		X	
Ming Lin	JFT Agapito & Associates, Inc. Senior Engineer		X	
Michael J. McGrath	CRWMS M&O, Manager Level 3 CM		X	
John H. Pye	CRWMS M&O, ESF/LDE Geotech.	X	X	
Robert R. Richards	SNL, QA Manager		X	X
Eric Ryder	SNL, SMTS	X	X	X
Alden M. Segrest	CRWMS M&O, AE/MGDS Development Manager	X	X	X
Sarah Sharpton	SNL, Manager	X		
Richard D. Snell	CRWMS M&O, Engineering Operations Manager			X
Richard E. Spence	DOE/YMQAD, Director YMQAD			X
Marlene R. Tucker	SNL/SAIC, Records Supervisor	X		X
George P. Vaslos	CRWMS M&O/QA, Principal Engineer	X		X
Ronald E. Wagster	CRWMS M&O, MGDS Development Sys. Inter	X		X

ATTACHMENT 1

Personnel Contacted During the Audit (continued)

<u>Name</u>	<u>Organization/Title</u>	<u>Preaudit Meeting</u>	<u>Contacted During Audit</u>	<u>Postaudit Meeting</u>
Charles C. Warren	YMQAD/QATSS, Verification Lead	X		X
Joe W. Willis	CRWMS M&O, QA Manager	X	X	
Donald Wrobel	SNL, QA	X		
Susan Zimmerman	State of Nevada, Observer	X		X

**LEGEND:**

AE . . . . .	Architect/Engineer	MGDS ..	Mined Geologic Disposal System
AMFEO . . .	Assistant Manager for Engineering and Field Operations	QATSS ..	Quality Assurance Technical Support Services
CM . . . . .	Configuration Management	QAD . . .	Quality Assurance Division
DOE . . . . .	US Department of Energy	SAIC . . .	Science Applications International Corporation
LDE . . . . .	Lead Discipline Engineer	SMTS . . .	Senior Member of Technical Staff
MACTEC ..	MAC Technical Services		

ATTACHMENT 2

AUDIT YM-ARP-95-19 DETAIL SUMMARY

Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS (CHECKLIST)	DR	CDA	RECOM-MENDATION	ADE-QUACY	COMPL- IANCE	OVER -ALL
SNL Activities  General - Design Support Analyses: North Ramp Package 2C	Work was completed in accordance with requirements of Supplement III, "Scientific investigation" of the QARD	Item 1 p. 1 of 26	N	N	N	SAT	N/A	SAT
	Assigned work was adequately described as to scope and purpose, deliverables identified	Item 2, and 31 pp. 1 and 18d of 26	YMQA D-95- D-010	N	6.1	UNSAT	N/A	
	Design interfaces clearly identified and described	Item 3 p. 2 of 26	* YM- 95-026	N	6.1	UNSAT	N/A	
	Controls for changes to work scope	Items 4 & 9 pp. 2 & 5 of 26	YMQA D-95- D-010	N	N	UNSAT	N/A	
	QA oversight of SNL work	Item 5 p. 3 of 26	N	N	N	SAT	N/A	
	Personnel conducting work were qualified and trained	Item 6 p. 3 of 26	N	N	N	SAT	N/A	

CDA: Corrected During Audit    N: None    SAT: Satisfactory    UNSAT: Unsatisfactory

\* Addressed in existing OCRWM CAR YM-95-026

ATTACHMENT 2

AUDIT YM-ARP-95-19 DETAIL SUMMARY

Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS (CHECKLIST)	DR	CDA	RECOMMENDATION	ADEQUACY	COMPLIANCE	OVER-ALL
SNL Activities  General - Design Support Analyses: North Ramp Package 2C (cont.)	Appropriate reviews were conducted	Items 7 & 10 pp. 4 & 5 of 26	YMQA D-95-D-010	N	N	UNSAT	N/A	SAT
	Reviewers were independent and qualified	Item: 8 p. 4 of 26	** SNL-95-D13	N	N	UNSAT	N/A	
	Software was developed under and/or maintained in accordance with a QA program	Item: 12 pp. 5 & 6a of 26	N	N	N	SAT	N/A	
	Transfer of technical data was controlled	Items 28 & 29 pp. 18b & 18c of 26	YMQA D-95-D-012	N	N	UNSAT	N/A	
	Transfer of Technical Data to TDB	Items 32 & 33 p. 18e of 26	N	N	N	SAT	N/A	
	Basis for choice of numerical codes	Item 11 p. 6 of 26	N	N	N	SAT	N/A	
	Validity of codes	Item 13 p. 7 of 26	N	N	N	SAT	N/A	

CDA: Corrected During Audit    N: None    SAT: Satisfactory    UNSAT: Unsatisfactory

\*\* Addressed in existing SNL DR SNL-95-D13

ATTACHMENT 2

AUDIT YM-ARP-95-19 DETAIL SUMMARY

Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS (CHECKLIST)	DR	CDA	RECOM-MENDATION	ADE-QUACY	COMPL-IANCE	OVER-ALL
SNL Activities  General - Design Support Analyses: North Ramp Package 2C (cont.)	Selection of design inputs	Items 15, and 39 pp. 9, 9a and 22a of 26	N	N	N	SAT	N/A	SAT
	Use of data	Items 16, 18 - 28 pp. 9, 9a, 11 - 18b	YMQA D-95-D-013		N	UNSAT	N/A	
	Recommendations for design	Item 17 p. 10 of 26	N	N	N	SAT	N/A	
	Use of analyses results	Item 30, 14 pp. 8 and 18c of 26	N	N	N	SAT	N/A	
	Technical adequacy of design support analyses report	Items 15, 16, 22, 25, 26, and 27 pp. 9, 15 and 17-18a of 26	N	N	N	MAR-GINAL	N/A	

CDA: Corrected During Audit    N: None    SAT: Satisfactory    UNSAT: Unsatisfactory

\* Addressed in existing OCRWM CAR YM-95-026

ATTACHMENT 2

AUDIT YM-ARP-95-19 DETAIL SUMMARY

Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS (CHECKLIST)	CAR	CDA	RECOM-MENDATION	ADE-QUACY	COMPL-IANCE	OVE-R-ALL	
M&O Activities  General - Design Support Analyses: North Ramp Package 2C	Analyses was conducted in accordance with QARD, Section 3.0, Design Analysis	Item 34 p. 19 of 26	N	N	N	SAT	N/A	SAT	
	Technical direction was provided to SNL in accordance with a controlled process	Item 2 p. 1 of 26	See section 5.5	N	6.1	UNSAT	N/A		
	Design control process was controlled	Items 34 - 37, 40 - 42 and 47 and 48 pp. 19-21, 23, 24 and 26a of 26	YMQA D-95-D-011 and 013	N	N	UNSAT	N/A		
	Technical documents were adequate and appropriate for the work	pp. 26d, 26e and 26f of 26		N	N	N	SAT		N/A
	Training and qualifications of personnel	Items 44 & 45 p. 25 of 26		N	N	N	SAT		N/A
	Design verification	Item 49 p. 25b of 26		N	N	6.2	SAT		N/A

CDA: Corrected During Audit    N: None    SAT: Satisfactory    UNSAT: Unsatisfactory

\* Addressed in existing OCRWM CAR YM-95-026

ATTACHMENT 2

AUDIT YM-ARP-95-19 DETAIL SUMMARY

Summary Table of Audit Results

QA ELEMENT/ACTIVITIES	PROCESS STEPS	DETAILS (CHECKLIST)	CAR	CDA	RECOMMENDATION	ADEQUACY	COMPLIANCE	OVERALL
M&O Activities  General Design Support Analyses: North Ramp Package 2C (cont.)	Specifications	Item 46 p. 25 of 26	N	N	N	SAT	N/A	SAT
	Drawings	Item 46 p. 25 of 26	N	N	N	SAT	N/A	
	TBV's and TBD's	Item 38 p. 22 and 22a of 26	N	N	N	SAT	N/A	
	Acquisition of data for design input	Item 50 p. 25c of 26	YMQA D-95- D-012	N	6.3	UNSAT	N/A	
	QA oversight	Item 43 p. 24a of 26	N	N	N	SAT	N/A	

CDA: Corrected During Audit    N: None    SAT: Satisfactory    UNSAT: Unsatisfactory

\* Addressed in existing OCRWM CAR YM-95-026