

U.S. NUCLEAR REGULATORY COMMISSION
OBSERVATION AUDIT REPORT NO. 91-7
FOR THE YUCCA MOUNTAIN PROJECT
OFFICE AUDIT NO. 91-05 OF THE
U.S. GEOLOGICAL SURVEY

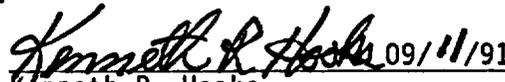

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1.0 INTRODUCTION

From May 20 through 24, 1991, the U.S. Nuclear Regulatory Commission (NRC) staff observed the U.S. Department of Energy (DOE)/Yucca Mountain Site Characterization Project Office (YMPO) Quality Assurance (QA) Audit No. 91-05 of the U.S. Geological Survey (USGS) which was conducted in Denver, Colorado. The USGS, a participant in the Yucca Mountain Site Characterization Project (YMP), is responsible for site characterization activities in the areas of hydrology, geophysics, seismology, geology and geochemistry investigations. Work in these areas is ongoing at the Nevada Test Site (NTS) and the USGS offices in Denver, Colorado; Menlo Park, California; and Las Vegas, Nevada. This report addresses the NRC staff's assessment of the effectiveness of the DOE/YMPO audit and the procedural adequacy and effectiveness of implementation in both programmatic and technical areas under the USGS QA program.

2.0 OBJECTIVES

The objective of the DOE/YMPO audit was to determine the adequacy of procedural controls and effectiveness of implementation of the USGS QA program in meeting the applicable requirements of the Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements Document (QARD), Revision 4 and the USGS Quality Assurance Program Plan (YMP-USGS-QAPP-01) Revision 5. The NRC staff's objective was to gain confidence that DOE and USGS are properly implementing the requirements of their QA programs by evaluating the effectiveness of the DOE/YMPO audit process and determining whether the USGS QA program is in accordance with the applicable requirements of the OCRWM QARD and the USGS QAPP.

3.0 SUMMARY AND CONCLUSIONS

The NRC staff based its evaluation of the DOE/YMPO audit process and the USGS QA program on direct observation of and discussions with the audit team, discussions with USGS YMP personnel and reviews of the pertinent audit information (e.g., audit plan, checklists and USGS documents).

The audit was well organized with minimal logistic delays. The daily caucuses provided a good exchange of information between the programmatic and technical concerns of the auditors and observers. Concerns raised during the caucuses were adequately addressed during the following day. The Audit Team Leader was thorough in developing a complete understanding of any identified discrepancies to be able to adequately advise USGS management personnel during daily meetings. The audit process, including organization, performance, and reporting, provided appropriate information to adequately assess implementation of the USGS QAPP and associated procedures during USGS performance of YMP activities.

The NRC staff found that, overall, DOE/YMPO Audit No. 90-05 of the USGS was useful and effective. The programmatic and technical portions of the audit, including their subsequent integration, were effective. The audit team was well qualified in the QA and technical disciplines, and conducted the audit in a professional manner. The audit team's assignments and checklist items were adequately described in the audit plan. The audit team, in general, made an effective use of its checklists in determining the adequacy of procedural controls and effectiveness of implementation of the USGS QA program.

The NRC staff agrees with the preliminary audit team findings that the USGS QA program, in general, provides adequate procedural controls, and was effectively implemented in the programmatic and technical areas reviewed during this audit. The NRC staff also agrees with the audit team's conclusions that the USGS QA program has improved noticeably in the last two years and that there is evidence of strong management commitment and involvement in implementation of the USGS QA program. The USGS management seemed knowledgeable of the QA requirements for the YMP site characterization work.

The NRC staff also agrees with the audit team's preliminary conclusion that the effectiveness of the USGS QA program implementation under Criterion 12 could not be determined in Denver, Colorado, primarily due to unavailability of the measuring and test equipment that is being used for site investigations. This equipment is available at the NTS, and a DOE/YMPO surveillance was conducted during the week of June 10-14, 1991, to assess the effectiveness of implementation under this criterion.

DOE must closely monitor the USGS QA program to ensure that future implementation is carried out in an acceptable manner. The NRC staff expects to observe this monitoring and may perform its own independent audit at a later date to determine the adequacy and effectiveness of the USGS QA program.

4.0 AUDIT PARTICIPANTS

4.1 NRC

Tilak Verma	Observer (Lead)
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Abou-Bakr Ibrahim	Observer
Bruce Mabrito	Center for Nuclear Waste Regulatory Analyses

4.2 DOE

James Blaylock	Audit Manager, DOE/YMPO
Charles Warren	Audit Team Leader, MAC Technical Services Company (MACTEC)
Robert Constable	Auditor, DOE/YMPO
Steve Dana	Auditor, Science Applications International Corporation (SAIC)
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Richard Weeks	Auditor, SAIC
Thomas Higgins	Lead Technical Specialist, SAIC
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Joe Coldwell	Observer, MACTEC

4.3 State of Nevada

Susan Zimmerman	Observer
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4.4 Nye County, Nevada

Phil Niedzielski-Eichner	Observer
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5.0 REVIEW OF THE AUDIT AND AUDITED ORGANIZATION

The DOE/YMPO audit was conducted in accordance with OCRWM Quality Assurance Administrative Procedure (QAAP) 18.2, Revision 3, "Audit Program," and OCRWM QAAP 16.1, Revision 3, "Corrective Action Requests."

The NRC staff observation of the DOE/YMPO audit was based on the NRC procedure "Conduct of Observation Audits" issued October 6, 1989. NRC staff findings are classified in accordance with this procedure. Levels 1, 2, and 3, of NRC Observations require a written response from DOE to be resolved.

The NRC findings may also include weaknesses (actions or items which are not deficiencies but could be improved), good practices (actions or items which enhance the QA program) and requests for information required to determine if an action or item is deficient. Written responses to weaknesses identified by the NRC staff will be requested when appropriate. In general, weaknesses and items related to requests for information will be examined by the NRC staff in future audits or surveillances.

5.1 Scope of Audit

The Audit Plan for Audit No. 91-05 stated that the scope of the audit was to evaluate the effectiveness of the USGS QA program in meeting the requirements and commitments imposed by OCRWM by verifying implementation and effectiveness of the procedural controls in place, as well as verifying compliance with the requirements and commitments. In addition, implementation of corrective actions as provided in the responses to open YMPO Standard Deficiency Reports were to be evaluated and, if found satisfactory, were to be closed.

(a) Programmatic Elements

The programmatic portion of the audit utilized checklists based on the requirements in the OCRWM QARD, YMP-USGS-QAPP-01, YMPO Administrative Procedures-Quality (APQ), and USGS Quality Management Procedures (QMPs). The checklists covered QA program controls for 14 of the 18 Code of Federal Regulations Title 10 (10 CFR) Part 50, Appendix B criteria. In addition, the programmatic controls for the USGS Configuration Management System (CMS) were reviewed as a part of the programmatic audit.

The following 10 CFR Part 50, Appendix B, criteria were not included in the scope of the USGS audit since they apply to engineered items outside the scope of the work done by USGS:

- 9.0 Control of Processes
- 10.0 Inspection
- 11.0 Test Control
- 14.0 Inspection, Test, and Operating Status

The NRC staff finds the programmatic scope of the audit acceptable in that it covered the 10 CFR Part 50, Appendix B, criteria for which USGS has responsibility. These programmatic elements addressing the Appendix B criteria were found acceptable by the NRC staff in their review of YMP-USGS-QAPP-01 (ref. Linehan/Stein letter dated June 20, 1989).

(b) Technical Areas

The DOE/YMPO technical specialists selected the following four technical activities for review and evaluation during the audit:

<u>SITE CHARACTERIZATION PLAN (SCP) REFERENCE</u>	<u>TITLE</u>
8.3.1.2.2.7	Unsaturated Zone Hydrochemistry
Activity (.1)	Gaseous Phase Chemical Investigations
Activity (.2)	Aqueous Phase Chemical Investigations
8.3.1.2.3.1	Site Saturated Zone Ground-Water Flow System
Activity (.2)	Site Potentiometric-Level Evaluation
Activity (.3)	Analysis of Sing- and Multiple-Well Hydraulic-Stress Tests
Activity (.4)	Multiple-Well Interfacing Testing
8.3.1.5.2.1	Quaternary Regional Hydrology
Activity (.3)	Evaluation of Past Discharge Areas
Activity (.4)	Analog-Recharge Studies
Activity (.5)	Studies of Calcite and Opaline Silica Vein Deposits
8.3.1.17.4.1	Historical and Current Seismicity
Activity (.1)	Compile Historical Earthquake Record
Activity (.2)	Monitor Current Seismicity
Activity (.3)	Evaluate Potential for Induced Seis- micity at the Site

These technical activities were selected from a large number (185) of technical activities the USGS is conducting or planning to conduct for the YMP. The selection was based on a number of factors, such as ongoing work for the activity, availability of study plans and technical procedures, priority and importance of the activity, and whether the activity was included in DOE/YMPO Audit 90-05.

The technical checklists were developed from information contained in the USGS Study Plans (SPs), associated technical procedures, and the USGS monthly Project Status Reports.

The audit team technical specialists were instructed to review the following personnel and procedural-type elements common to all the technical (subject) areas:

- o Technical qualifications of USGS Scientific Investigation Personnel (technical staff);
- o USGS technical staff's understanding of technical and QA procedural requirements as they pertain to scientific investigation activities;

- o Adequacy of technical procedures; and
- o Development of SPs, work supporting the SCP, and any related work products.

The NRC staff finds the scope of the technical portion of this audit acceptable as it included a reasonable sample of important technical activities that are being presently conducted or being planned by the USGS for the YMP.

5.2 Timing of the Audit

The NRC staff believes the timing of the QA audit was reasonable. USGS has made a number of improvements in its QA program since the last DOE/YMPO audit during June 1990. There was sufficient implementation of the programmatic and technical procedures for assessing the adequacy and effectiveness of the USGS QA program implementation under YMP-USGS-QAPP-01, Revision 5.

5.3 Examination of Programmatic Elements

The DOE/YMPO programmatic checklists covered the QA program controls for the fourteen elements listed below:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 4.0 Procurement Document Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 7.0 Control of Purchased Items and Services
- 8.0 Identification and Control of Items, Samples and Data
- 12.0 Control of Measuring and Test Equipment
- 13.0 Handling, Shipping, and Storage
- 15.0 Control of Nonconformances
- 16.0 Corrective Action
- 17.0 Records
- 18.0 Audits

The NRC staff observed the audit team's evaluation of selected programmatic elements of YMP-USGS-QAPP-01. Only portions of some elements were observed; the details of program deficiencies identified by the DOE/YMPO audit team members which were not part of the portion observed will not be discussed in this report.

(a) Organization (Criterion 1)

Interviews were conducted by the DOE/YMPO auditors with the USGS Technical Project Officer (TPO), the USGS QA Manager, and SAIC QA support personnel to obtain their description of the USGS participation in the YMP activities and QA organizations. The interviews were based on the audit checklist questions. The auditors also reviewed the USGS project and QA organization charts and QMP-1.01, Revision 3, to gather information for internal and external interfaces.

Based on the depth of questioning and the satisfactory completion of the audit checklist, the auditors adequately reviewed and evaluated the YMP USGS organizational structure for compliance to the QARD and the YMP USGS QAPP. USGS implementation of its QA program under this criterion was adequate.

(b) Quality Assurance Program (Criterion 2)

The auditors reviewed and evaluated the adequacy and effectiveness of procedural controls under QMPs 2.02, 2.07 and 2.08 for the USGS YMP personnel qualification, experience, indoctrination, orientation, and training from the available records and from the interviews with the personnel and management. A total of 35 USGS YMP personnel files were reviewed. The NRC observer was able to review some of the personnel records directly, and found the sample reviewed to be adequate. The DOE/YMPO auditors concluded that the QMP 2.07 for indoctrination, orientation, and training was being effectively implemented. The audit team also concluded that the QMPs 2.02 and 2.08 for qualification of personnel were effectively implemented.

The USGS YMP management assessment for 1990 was not completed in February 1991 as required by QMP 2.01, and this deficiency was documented by the USGS in USGS CAR-91-06. The NRC staff noted a similar deficiency was documented by the DOE/YMPO audit team from their audit (Audit No. 90-03) of USGS QA program last year.

Based on the extent of the records reviewed and the interviews conducted with the YMP USGS management, Criterion 2 was effectively audited, and the implementation by USGS appeared to be adequate and effective.

(c) Procurement Document Control, and Control of Purchased Items and Services (Criteria 4 and 7)

The DOE/YMPO auditors reviewing these areas used their checklist questions effectively in evaluating the adequacy and effectiveness of implementing QMP 4.01 and QMP 7.01. The auditors had an excellent knowledge of YMP-USGS-QAPP-01 requirements and both of the procedures.

A selected sample of procurement documents was reviewed to check if the procedural requirements for appropriate reviews and signatures had been met. Six record packages of procured services and items from suppliers were reviewed by the auditors. The audit team also reviewed the YMP USGS memoranda which described the rationale for determining the qualifications of these suppliers. The auditors concluded that the reviewed documentation was acceptable and that the USGS and its suppliers were complying with procurement and suppliers requalification requirements. Particular attention was focused on the supplier Certificates of Conformance to assure these were being properly filled out by suppliers and reviewed by the USGS. While some minor problems were attributed to the filling out and review of the supplier Certificates of Conformance, the overall procurement activities and documentations were found acceptable to the auditors.

The auditors were thorough and effective in evaluating the available information and concluded that the implementation of procedures under these two criteria was adequate and effective. The NRC staff agrees with the audit team's conclusion.

(d) Instructions, Procedures, Plans and Drawings (Criterion 5)

The auditor utilized the YMP USGS Technical Procedure Table of Contents to identify audit samples of instructions, procedures, plans, and drawings. An overview discussion took place, then 16 USGS procedures were checked for appropriate signatures, that review comment and resolutions sheets had been completed prior to procedure issuance, and other related items were verified. Some on-the-spot re-assembly of records took place when the auditor noted an incomplete technical review records package in the Local Records Center (LRC).

QMP 5.01 Revision 4 deals with the preparation, review and acceptance of technical procedures for the YMP USGS site characterization activities. The procedure is not clear in the areas of qualifications of the reviewers, and the documentation of criteria for selecting qualified reviewers.

No USGS Scientific Notebooks had been completed at the time of this audit. Copies of partially completed Scientific Notebooks in the LRC were reviewed by the auditor. One Scientific Notebook was identified as not having all pages numbered and dated. Corrective action was taken during the audit to rectify the condition. A USGS Audit Finding Report had also been written prior to the audit identifying the same deficiency and it was being handled internally.

The audit of this criterion was effective, and USGS implementation of the QA controls under this criterion was adequate.

(e) Control of Measuring and Test Equipment (Criterion 12)

The observed portion of the audit of Criterion 12 consisted of a discussion between the auditor and the USGS Instrumentation/Calibration staff member. This discussion determined the status of the activity affected by this criterion, availability of equipment in the Denver area, and traced the calibrated equipment based on the USGS Master Inventory List. Procedure QMP-12.01, Revision 5, was reviewed in detail by the auditor in a step-by-step manner, with numerous questions being asked of the USGS staff member regarding its implementation.

Since much of the USGS instrumentation is utilized in the field, examples in the Denver area to check were limited. Of the equipment and documentation available for investigation, the documentation of a mass spectrometer calibration standard was questioned by the auditor and, after investigation on the part of USGS personnel, insufficient objective evidence was provided showing traceability to the National Institute of Standards and Technology.

Because of the field use of USGS equipment and instrumentation, a follow-up to the audit of this criterion was conducted during the week of June 10-14, 1991. In that regard, the auditing process was adequate and professionally carried out, but the sample size was not large enough to determine effectiveness of implementation under the QMP 12-01 requirements and therefore, the follow-up work is to be accomplished.

(f) Control of Nonconformance (Criterion 15)

The DOE/YMPO auditors used their audit checklist questions and reviewed nonconformance reports (NCRs) to determine the adequacy and effectiveness of implementation of the requirements under this criterion. The auditors reviewed QMP 15.01 to determine the adequacy

of controls of non-conforming items. The USGS QA and technical personnel were interviewed to assess their knowledge of requirements under this criterion. The auditors evaluated 11 NCR packages for identification, segregation, disposition, verification of corrective action, closure, and trending/tracking of nonconforming items.

The auditors concluded that, with the exception of one minor deficiency concerning YMPO approval of repair and use-as-is dispositions, the procedural controls under this criterion were adequate and were being effectively implemented. The NRC staff agrees with this conclusion, and found the audit of this criterion to be effective.

(g) Corrective Action (Criterion 16)

The DOE/YMPO auditors reviewed selected Corrective Action Reports (CARs) and used their audit checklist questions to assess the adequacy and effectiveness of controls under this criterion. Their review was thorough and effective. The auditors also performed a review of Standard Deficiency Reports (SDRs) and Observations from the last audit to determine if they have been closed out satisfactorily or could be closed. The auditors reviewed supporting documents related to the SDRs, CARs and Observations, and questioned the QA staff when the documentation was unclear.

Based upon their review and evaluation, the auditors concluded that the implementation of procedures under this criterion was adequate and effective. The CARs were dispositioned in a timely and effective manner. The auditors also concluded that the effective use of internal audits and surveillances, the CAR tracking system, and monthly open item and status trend report by the YMP USGS QA staff and management enhanced the effectiveness of implementation of the USGS QA program and procedures.

The NRC staff found the audit of this criterion, and USGS QA program implementation under this criterion, to be effective.

(h) Quality Assurance Records (Criterion 17)

The auditor conducted the Quality Assurance Records portion of the audit in the USGS LRC. The audit began with a general discussion of how the records are validated and processed. The auditor worked his way through the audit checklist, following up with questions in related areas if a weakness was perceived.

A total of 27 QA records packages were reviewed to ensure that the procedural requirements had been complied with in their entirety. Accession numbers, records verification, transmittal and receipt forms, "data trails," and special instructions and packaging (for geophysical logs and indexes) were checked by the auditor.

The auditor checked three LRC safes for their fire ratings, and identified an inconsistency between the USGS QAPP and the implementing QMP regarding the required fire ratings. The USGS current practice of QA records storage meets the latest NQA-1 requirements, however, the procedural inconsistency condition will be identified in a CAR.

Based on the auditor's reviews and evaluations, the auditor concluded that the personnel in the LRC were knowledgeable in their procedural responsibilities and that there was an adequate and effective implementation of procedures under this criterion. The NRC staff agrees with this conclusion, and finds the audit of this criterion to be effective.

(1) Audits (Criterion 18)

This criterion covered the USGS auditing program. Since the last annual DOE/YMPO audit of USGS, four USGS internal audits and eight external audits had been conducted. The DOE/YMPO auditor reviewed and evaluated the four internal audit reports, five external audits, and their associated record packages. Eighteen surveillances had been conducted, of which the auditor reviewed five generated since July 1, 1990.

The auditor was especially careful and detailed in his completion of the audit checklist. Each USGS audit report was scrutinized with emphasis on findings, corrective actions, and objective evidence to confirm those facts. The 1990-91 USGS Surveillance Log Book was utilized to make the sampling selection of surveillance reports to review.

The auditor obtained a list of lead auditors and auditors available to the USGS and reviewed qualification forms for seven of them. Each piece of documentation was evaluated in light of the respective surveillance, lead auditor and auditor qualification requirements of the USGS QMP.

The NRC staff found the audit of this criterion, and the USGS program implementation under this criterion, to be effective.

(j) Conclusions

(1) Audit Effectiveness

The programmatic portion of the DOE/YMPO audit of the YMP USGS QA program was conducted in an effective and professional manner. The DOE/YMPO audit team members used detailed and complete checklists covering their assigned areas and were able to complete all items. The auditors asked questions to ascertain complete understanding of the QA Program by USGS personnel, and when discrepancies were noted, recommendations were offered on ways to improve compliance and effectiveness of implementation.

(2) USGS QA Program

Significant improvements were noted in the USGS QA Program as compared to earlier audit results. It was obvious that much management and staff efforts had been applied to correcting previously noted DOE audit and surveillance concerns. The NRC observers noted a strong USGS YMP management commitment and involvement in making the implementation of their QA program effective. It was apparent during the audit that USGS YMP QA personnel had a complete understanding of their assigned implementation elements, and were familiar with the requirements of the total QA Program.

Overall, USGS has developed and implemented a QA Program in compliance with the OCRWM QARD and YMP-USGS-QAPP-01.

5.4 Examination of Technical Activities

(a) Historical and Current Seismicity (8.3.1.27.4.1)

The NRC staff only observed the audit team's evaluation in the technical area of Historical and Current Seismicity (SCP Section 8.3.1.17.4.1). The DOE/YMPO technical specialists and programmatic auditor working together as a team evaluated both the compliance to programmatic and procedural requirements (adequacy and implementation of procedural controls) and the degree to which the technical activities carried out the investigations outlined in the SP. The DOE/YMPO technical specialist reviewed and evaluated the qualifications of the YMP USGS personnel involved in the monitoring of current seismic activity in the Yucca Mountain region (Activity .2), the approach taken to the work, the soundness of technical

procedures, the manner in which the work was being performed, and the techniques of data reduction and analyses. The NRC observer had the opportunity to briefly review the technical procedures, QA records and other supported documentation given to him at the meeting that were reviewed and evaluated by the DOE/YMPO auditors for this activity. The NRC technical observer evaluated the technical procedures associated with this study. The DOE/YMPO auditors and the NRC staff discussed these procedures with the USGS staff. From this discussion and evaluation, the NRC observer found these procedures adequate to be followed to perform the technical work in this area.

Under the other two activities of SCP Section 8.3.1.17.4.1 (Activities .1 and .3), there was no technical work being done due to the stop work order which was lifted in April 1991, and the USGS staff were mainly engaged in writing Study Plans. Therefore, the adequacy and effectiveness of procedural implementation in these technical areas were found to be indeterminate.

(b) Conclusion

(1) Audit Effectiveness

For the portion of the technical audit observed by the NRC observer, the technical portion of the audit was effective. The technical checklist for this area was of sufficient detail and was completed during the audit. The audit team conducted the audit in a professional manner and asked questions to ascertain complete understanding of the technical program and applicable QA requirements by the YMP USGS Principal Investigators (PIs) and their staff. The technical specialist and the programmatic auditor worked well as a team and had a good knowledge of the YMP USGS technical program and procedural requirements.

(2) YMP USGS Technical Program

The YMP USGS technical personnel appeared well qualified, and had a sound understanding of QA requirements in their areas of technical work.

5.5 Conduct of Audit

The audit team members were generally well prepared and demonstrated a sound knowledge of the QA and technical aspects of the USGS program. The audit checklists included the important QA controls addressed in the OCRWM QARD that are applicable to USGS. In general, the audit team used the checklists effectively in their interviews with USGS personnel and review of documents. The technical and programmatic portions of the audit were effective, and integration of the technical and programmatic portions of the audit was effective.

5.6 Qualification of Auditors

The qualifications of the QA auditors on the team were previously accepted by the NRC staff (ref. NRC Observation Audit Report for USGS dated August 22, 1988) or were acceptable based on QMP-02-02, the DOE procedure for qualifying auditors. In general, the technical specialists appeared knowledgeable in the technical areas which they reviewed and of the USGS QA program requirements.

5.7 Audit Team Preparation

The QA auditors were well prepared in the areas they were assigned to audit and knowledgeable of YMP-USGS-QAPP-01 and implementing procedures. The technical specialists were familiar with the technical activities of the USGS as described in the SPs and monthly Project Status Reports. Audit Plan 91-05 overall was complete and included: (1) the audit scope; (2) a list of audit team personnel and observers; (3) a list of all the audit activities; (4) the audit notification letter; (5) YMP-USGS-QAPP-01 and past audit report; and (6) the programmatic and technical checklists.

5.8 Audit Team Independence

The audit team members did not have prior responsibility for performing the activities to carry out their assigned functions in a correct manner without adverse pressure or influence from the USGS personnel.

5.9 Review of Previous Audit Findings

- (a) The previous audit identified nine SDRs (553 to 561). All these SDRs have been closed as a result of implementation of USGS corrective actions.
- (b) The NRC had no observations resulting from the June 1990 audit, and all NRC observations from previous audits were effectively resolved prior to the June 1990 audit.
- (c) Based on discussions between the State of Nevada and NRC observers, the State of Nevada observations from previous audits appeared to have been resolved prior to this audit.

5.10 Summary of NRC Staff Findings

(a) Observations

The NRC staff did not identify any observations relating to deficiencies in either the DOE/YMPO audit process or the USGS QA program.

(b) Weaknesses

- o Tardiness to complete the required management assessment for each year since the beginning of the implementation of the YMP USG QA program (see Section 5.3(b)).
- o QMP 5.01 Revision 4 deals with the preparation, review and acceptance of technical procedures for the YMP USGS site characterization activities. The procedure is not clear in the areas of qualifications of the reviewers, and the documentation of criteria for selecting qualified reviewers (see Section 5.3(d)).

(c) Good Practices

- o Strong management commitment and involvement in making the USGS QA program effective.
- o The USGS has assigned personnel experienced in QA to various technical groups to assist in the implementation of the QA program.
- o Programmatic and technical portions of the audit were well integrated.

5.11 Summary - DOE/YMPO Audit Team Findings

During the course of the audit, the audit team identified approximately 15 deficiencies in the USGS QA program. All but four of these deficiencies were resolved prior to the post-audit conference. The unresolved deficiencies identified by the audit team include: qualification of a technical reviewer not in compliance with QAPP or procedural requirements; documentation for developed/modified software that does not meet minimum procedural requirements; an inconsistency between the QAPP and procedures in the area of records storage; and missing calibration documentation for two USGS mass spectrometers. The unresolved deficiencies were documented on CARs YM-91-050, -051, -052, and -053 respectively.

The audit team concluded that the QA program implementation was adequate and effective under criteria 1, 2, 3, 4, 5, 6, 7, 8, 13, 15, 16, 17, and 18. The team was unable to determine the effectiveness of procedural implementation under Criterion 12, primarily due to small sample size of measuring and test equipment availability in Denver. The effectiveness of implementation for this criterion will be determined by evaluating the measuring and test equipment at NTS during a DOE/YMPO surveillance scheduled for June 10-14, 1991.

These are preliminary findings which will be further evaluated by the audit team and YMPO management prior to becoming final. These deficiencies were not considered serious by the DOE/YMPO audit team or the NRC staff, and if corrected in a timely manner, they should not adversely impact the quality of the YMP USGS site characterization work.