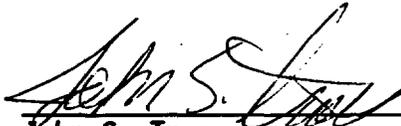
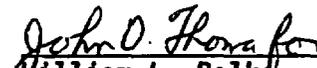


U.S. NUCLEAR REGULATORY COMMISSION
OBSERVATION AUDIT REPORT OA-96-08
OF THE YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION
AUDIT YM-ARC-96-14
OF THE LOS ALAMOS NATIONAL LABORATORY


10/16/96
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Geosciences and Hydrology
Review Section
Engineering and Geosciences Branch
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10/16/96
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Reviewed and approved by:


10/16/96
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ENCLOSURE

MANAGEMENT SUMMARY

This performance-based audit evaluated the adequacy and effectiveness of the LANL QA program for activities related to the probability of magmatic disruption of the potential repository at Yucca Mountain, characterization of volcanic features at and around Yucca Mountain, and the physical processes of magmatism and its effects on the potential repository. These activities have resulted in the draft 1996 Volcanism Synthesis Report that was also audited during this audit.

The audit resulted in five draft performance/deficiency reports regarding (1) lack of identification of version of software package used, (2) untimely submittal of scientific notebooks to DOE's Records Processing Center, (3) lack of verification of calculations in scientific notebooks, (4) failure to clearly identify non-qualified (non-"Q") data in reports, and (5) discrepancies between reported data values within the 1996 Volcanism Synthesis Report and between that report and earlier Los Alamos Milestone reports.

The DOE audit team's overall finding was that LANL's QA performance was "marginally effective." NRC staff agrees with this finding and believes that the above deficiencies have resulted in a product that has an unacceptable level of quality. (Although released by LANL as a "draft," the 1996 Volcanism Synthesis Report had been received by DOE, indicating it had completed internal review.)

The NRC staff has determined that the audit was useful and effective. The audit was organized and conducted in a thorough and professional manner and was generally effective. Audit team members were independent of the activities they audited, they were well qualified in their disciplines, and their assignments and checklist items were adequately described in the audit plan.

1.0 INTRODUCTION

Members of the Nuclear Regulatory Commission Division of Waste Management quality assurance (QA) and geotechnical engineering staff observed the U.S. Department of Energy (DOE), Office of Civilian Radioactive Waste Management (OCRWM), Office of Quality Assurance, Yucca Mountain Quality Assurance Division (YMQAD) audit of the QA program of the Los Alamos National Laboratory (LANL). This performance-based audit, YM-ARC-96-14, was conducted on September 16-19, 1996, at LANL offices in Los Alamos, New Mexico, and on September 20 and 23 at LANL offices in Las Vegas, Nevada. The State of Nevada was also represented at this audit.

The audit evaluated the adequacy and effectiveness of the LANL QA program for selected activities related to Work Breakdown Structures 1.2.3.2.5.1.1, "Probability of Magmatic Disruption of the Repository," 1.2.3.2.5.1.2, "Physical Processes of Magmatism and Effects on the Potential Repository," and 1.2.3.2.5.5.1, "Characterization of Volcanic Features." These activities have resulted in the draft 1996 Volcanism Synthesis Report that was also audited during this audit.

The objectives of this audit by YMQAD were to evaluate the quality of the activities leading to the draft 1996 Volcanism Synthesis Report of the effects of volcanism at Yucca Mountain and its vicinity and to determine whether the LANL QA program and its implementation meet the applicable requirements of the OCRWM Quality Assurance Requirements and Description document (QARD: DOE/RW-0333P) and associated LANL implementing procedures.

The principle objective of the NRC staff was to evaluate the quality of the volcanism work for Yucca Mountain as it relates to the Key Technical issue of "Igneous Activity (Volcanism)." A second objective was to gain confidence that YMQAD and LANL are properly implementing the requirements of their QA programs in accordance with the OCRWM QARD and Title 10 of the Code of Federal Regulations (10 CFR), Part 60, Subpart G (which references 10 CFR Part 50, Appendix B).

This report addresses the effectiveness of the YMQAD audit and the adequacy of implementation of QA controls for the volcanic studies of Yucca Mountain and its vicinity.

2.0 AUDIT PARTICIPANTS

2.1 NRC

John G. Spraul Observer (Sept. 16-20)
John S. Trapp Observer (Sept. 16-20)
William L. Belke Observer (Sept. 23)

2.2 DOE

Stephen R. Dana	Audit Team Leader (ATL)	YMQAD/QA Technical Support Services (QATSS)/Science Applications International Corporation (SAIC)
Mary G. McDaniel	Auditor	YMQAD/QATSS/SAIC

3.2.2 QA Programmatic Elements

The audit team also evaluated implementation of the M&O's QA program at LANL to determine whether the program meets the requirements and commitments imposed by OCRWM. This was done by determining, within the scope of the technical portion of the audit, the adequacy of LANL's QA program, its implementation, and its effectiveness as well as verifying compliance with requirements. The QA portion of the audit checklist addressed the QA programmatic elements and QARD supplements listed below:

1.0	Organization
2.0	Quality Assurance Program
5.0	Implementing Documents
6.0	Document Control
7.0	Control of Purchased Items and Services
12.0	Control of Measuring and Test Equipment
16.0	Corrective Action
17.0	QA Records
Supplement I	Software
Supplement III	Scientific Investigation

3.3 Conduct Of Audit

The audit team had prepared the audit checklist prior to the audit. The QA portion of the audit checklist (pages 1-14) was prepared and used by the ATL and auditor who made the QA evaluations. Similarly, the technical specialist prepared the technical portion of the checklist (pages 15-63), was the primary interviewer during the technical portion of the audit, and made the technical evaluations. The State of Nevada submitted thirteen inquiries, and two were submitted by the staff. Most of the inquiries dealt with concerns similar to those contained in the original checklist, and they were asked and responded to in the general line of questions to the Principles Investigators. (The attachment to this report lists these inquiries and provides an assessment of the responses.) Following the general question/answer period, the auditors examined the laboratory and field notebooks and other documentation to determine traceability of information from the field to the draft 1996 Volcanism Synthesis Report.

The YMQAD audit team and the observers caucused at the end of each day's audit. The ATL did not meet daily with LANL management (with observers present) to discuss the then-current audit status and preliminary findings of the audit team. This type of meeting did not occur until the preliminary exit meeting held on Wednesday afternoon, September 25, 1996, at Los Alamos. The failure to hold status meetings with LANL management as the audit progressed appeared to result in more than normal friction between the auditors and auditees at the preliminary exit meeting.

The audit was performed in a professional manner. The members of the audit team were well prepared and demonstrated a sound knowledge of their assigned audit areas.

3.4 Timing of the Audit

The audit was not as timely as it would have been if accomplished as originally scheduled. The majority of LANL technical personnel who have worked on this program are no longer funded by the program. In addition, two of the three principle investigators (PIs) will no longer be funded after September 1996. The 1996 Volcanism Synthesis Report is the last output document which is planned for this program and this report has been released by LANL for acceptance review.

The NRC staff noted that YMPO had audited Lawrence Berkeley National Laboratory (LBNL) as its borehole and surface geophysics synthesis report was in the early stages of preparation. This resulted in the report preparers having the opportunity to discuss the handling of "Q" and "non-Q" data with DOE personnel. LANL's 1996 Volcanism Synthesis Report was released prior to this audit (although released by LANL as a "draft," the report had been received by DOE, indicating it had completed internal review), and the preparers of the report did not have the advantage of discussing data reporting that was afforded to LBNL. The NRC staff understands the audit postponements were caused by the lack of availability of a qualified independent technical specialist. DOE should continue to search-out qualified independent technical specialists so that such delays will be minimized.

3.5 Examination of Audited Areas

The interview method of auditing, followed by checking of objective evidence, did not appear to be as effective as when, in earlier performance-based audits, objective evidence was checked as the interviews progressed. However, audit team members did receive thorough responses to the checklist questions and inquiries and raised additional questions as they felt were needed. Appropriate LANL personnel were made available and questioned even as the team reviewed objective evidence in the scientific notebooks. The audit team performed an acceptable audit.

Section 3.5.1 of this report addresses the technical portion of the audit. Section 3.5.2 addresses the audit of the QA programmatic elements.

3.5.1 Examination of Technical Activities

The portion of the check list which had been prepared by the technical specialist had items relating to the three study plans as well as having items dealing with specific types of activities, such as geochronological studies. LANL responses to these items and the inquiries submitted by the observers provided a good general overview of all areas of the program. Responses to all the checklist items and the inquiries were obtained by the end of the audit.

In addition to questioning the various investigators, the audit team examined objective evidence found in scientific (field, laboratory, and sample) notebooks as well as actual samples and air-photos depicting sample locations and various geologic features. This information was compared to results presented in the draft 1996 Volcanism Synthesis Report and in other

publications prepared by the various PIs (for example, in "Entrainment of Country Rock during Basalt Eruptions of the Lucero Volcanic Field, New Mexico," G. A. Valentine and K. R. Groves, *Journal of Geology*, 1996, Vol 104, pp 71-90).

In general it was possible to trace samples from where they were taken in the field, through analysis, to the draft 1996 Volcanism Synthesis report. For example, during the audit of one PI, it was found that in sample notebook TWS-EES-12-LV-12-89-03 the original Lathrop Wells samples were documented; and, on page 26 of scientific notebook TWS-EES-13-LV-12-89-05, it was documented that the original X-ray fluorescence (XRF) data for the composition of these samples had been rejected due to low sodium values. Page 13 of scientific notebook TWS-EES-13-07-93-044 documented the return of these sample from XRF reanalysis, and the attachment to the notebook provided the basic composition data which agreed with the values which were reported in Appendix A to Los Alamos report LA-13113-MS. Similar traceability could be found when a second PI was audited.

In some cases, however, discrepancies and inconsistencies were noted. For example, the ^3He age dating values reported in Tables 2.4 and 2.6 of the 1995 Volcanism Status Report do not agree; and these values also do not agree with the values reported on pages 2-40, 2-45, 2-52 and 2-54 of the same report. These same inconsistent values are in the draft 1996 Volcanic Synthesis Report, and none of these values agree with values published in the open literature in 1992 and 1994. When reviewing the applicable scientific notebooks, one entry could be found which agreed with Table 2.4. However, no entries could be found which agreed with any of the other reported values. In addition, while numerous entries could be found that gave values that appeared to reflect changes in assumed production values or more refined analytical techniques, no indication could be found that any of the data had been superseded, or that any data superseded other data. Discussions with LANL personnel indicated that they were aware of the ^3He age dating reporting discrepancies. However, when funding was reduced at the end of Fiscal Year 1995, many of the investigators were released from the project and no provision was made to fund the finalization and close-out of the scientific notebooks for LANL and DOE records. Attempts to resolve this problem have been unsuccessful to date.

In addition to auditing ^3He age dating techniques, the team also audited U-Th age dating, Ar/Ar age dating, and thermoluminescence age dating. No discrepancies were noted between the scientific notebooks and data presented for the U-Th age dating. Very minor discrepancies were noted between the notebooks and data presented for Ar/Ar and thermoluminescence age dating techniques.

The three PIs audited were questioned as to how and what criteria they apply to review of scientific notebooks and reports. In general they replied that they tried to follow the logic of the presentation and to determine if they could reproduce what had been reported. When asked if an independent check of data and calculations was performed, they each indicated that they did not perform such checks and that there was not sufficient funding to have such checks performed. One PI was asked, for example, if anyone went into the

field and checked his selected outcrops to determine if the number and size of clasts was correctly reported. He stated that no such check was performed. No objective evidence was presented to demonstrate that such a check had ever been performed anytime on the program.

Two PIs were questioned as to the qualification of data found in the various chapters of the 1996 Volcanism Synthesis Report with particular emphasis on Chapter 6. The response was that all data contained within that chapter was qualified or "Q." It was determined that unqualified (non-"Q") data was contained within this chapter and that this data had been averaged with qualified data to arrive at a final number. It appears that no provisions had been made to distinguish between qualified and unqualified data in the report.

3.5.2 QA Programmatic Elements

The QA portion of the audit checklist contained questions regarding the QA programmatic elements listed in Section 3.2.2. The questions were asked and responded to with in the technical portion of this performance based audit. The auditor on the audit team generally audited with the technical specialist, asking questions of LANL personnel as breaks occurred during the technical portion of the audit. When the ATL was not actually leading the team, he interviewed LANL personnel and reviewed objective evidence of activities peripheral to the technical work such as training and records.

Several nonconformances regarding QA were found by the audit team during this portion of the audit. The nonconformances were classified as to their importance to safety, they were discussed with involved LANL personnel, and they form the bases of the audit team findings. These findings are presented in Section 3.9 of this report. No other discrepancies regarding the QA programmatic elements were found.

3.6 Audit Team Qualifications and Independence

The qualifications of the ATL and auditor were found to be acceptable in that each met the requirements of QAP 18.1, "Auditor Qualification." The qualifications of the technical specialist were found to be acceptable in that he met the requirements of QAP 18.2, "Internal Audit Program," Section 6.3, "Qualification of Technical Specialists."

Although this was the first YMQAD audit in which the technical specialist participated, he was well prepared for conducting the audit with a reasonable checklist and questions. The audit checklist was adequately formulated and covered the subject matter well. The technical specialist posed several questions during the audit indicating that he was familiar with the subject matter and was well prepared for the audit.

The audit team members did not have prior responsibility for performing the activities they audited. The technical specialist is an M&O employee who is familiar with the technical activities audited, but he stated that he has had no prior direct or oversight responsibility for these activities. The audit team members had sufficient independence to carry out their assigned functions without adverse pressure or influence. The audit team was qualified in the QA

and technical disciplines, and the assignments and checklist items were adequately described in the audit plan.

3.7 Review of Previous Audit Findings

Several audits of LANL were conducted by DOE in 1995 during which deficiencies were identified. The corrective action for these deficiencies were either verified previously by DOE or had not been completed at the time of this audit. Therefore, this audit did not address the open deficiencies.

3.8 NRC Staff Findings

3.8.1 Examination of Technical Activities

Examination of the data related to age dating in the draft 1996 Volcanism Synthesis Report indicated that numerous discrepancies existed for the ³He age dating within the document, between the document and the scientific notebooks, and between the document and publications in the open literature which had been written by the investigators on this project and that minor discrepancies existed between the notebooks and the reports in the case of Ar/Ar and thermoluminescence age dating. It appears that errors and inconsistencies are primarily related to two factors: (1) the fact that inadequate provisions were made to ensure adequate closeout of the various scientific notebooks and projects by the investigators who were released from the project at the end of Fiscal Year 1995 and (2) inadequate implementation of the review procedures. These concerns were noted in the performance/ deficiency reports prepared by the DOE audit team (see Section 3.9).

In addition, as required by procedure, it was possible to determine by review of the scientific notebooks where data had been rejected. However, there does not appear to be a similar procedure to identify data which has been superseded. In the case of age dating, there can be many modifications of the calculations prior to obtaining a final result. For example, there are various helium production rates reported in the open literature, and assuming different production rates can result in different calculated ages. It would be helpful to provide documentation of data that has been superseded and a cross-reference in the new data set that the new data set superseded the previous set in cases such as this where additional information may cause a data set - which has been analyzed in accordance with an approved procedure and is considered qualified - to be superseded. Such information would help minimize confusion and provide a relationship between disparate data sets.

The concerns with the proper identification of qualified and unqualified data also resulted in a deficiency report by the audit team.

3.8.2 QA Programmatic Elements

The DOE audit team's overall finding was that LANL's QA performance was "marginally effective." NRC staff agrees with this finding and believes that the above deficiencies have resulted in a product that has an unacceptable level of quality. (Although released by LANL as a "draft," the 1996 Volcanism

Synthesis Report had been received by DOE, indicating it had completed internal review.)

3.8.3 Summary

The technical and QA programmatic portions of the audit were conducted in a professional manner, and the audit team adequately evaluated activities and objective evidence. The audit was effective in determining the adequacy and degree of implementation of the LANL QA program, particularly as applied to the technical activities audited.

The initial checklist questions provided an adequate technical basis to conduct a thorough audit of the volcanism studies for Yucca Mountain. The technical specialist went into sufficient detail during the audit to examine the activities related to volcanism performed by LANL. Based on the discussions, it appeared that the technical personnel audited were knowledgeable in their respective fields. The method used by the audit team to perform the audit was an appropriate combination of discussions with the LANL staff and reviews of project files and other reference material requested by the audit team and provided by LANL.

Except as noted in Section 3.3 regarding meetings with management, previously recognized good auditing practices were followed by the ATL and the audit team, and the NRC staff did not observe any deficiencies in the audit process.

3.9 YMQAD Audit Team Findings

The DOE audit team's overall finding was that LANL's QA performance was "marginally effective." Nonconformances reported by the audit team at the post-audit conference are shown below.

- Lack of identification of version of software package used. This was considered by the audit team to be corrected during the audit when LANL issued an approved "QP Action Request" to correct the applicable procedures.
- Untimely submittal of scientific notebooks to DOE's Records Processing Center.
- Lack of verification of calculations in scientific notebooks.
- Failure to clearly identify non-qualified data in reports.
- Discrepancies between reported data values within the draft 1996 Volcanism Synthesis Report and between that report and earlier Los Alamos Milestone reports.

In addition, the audit team added 4 suppliers to an earlier deficiency report (TM-96-D-073, July 19, 1996) regarding LANL's failure to require that each supplier of analytical service implements a QA program that meets the requirements of DOE's QARD.

OBSERVER INQUIRIES

1. Crow's contribution as an expert on the PVHA panel regarding the importance of geochemistry in defining volcanic events seems to contradict statements in the Los Alamos Volcanism Status Report. For example, the VSR uses chemical data to strongly support the polygenetic history of the Lathrop Wells cone. The PVHA contribution by Crowe, however, appears to downplay these results and suggests that there are too many external factors contributing to small geochemical differences to use these results to classify Lathrop Wells as polygenetic. (See attached sheet) -
 - a. Does this change in opinion represent a major policy change for the volcanology program, i.e., that the Lathrop Wells cone is monogenetic? If so, will the Volcanism Status Report be changed? In the Volcanism Synthesis Report, is the Lathrop Wells cone considered to be monogenetic or polygenetic?
 - b. Describe the work that was performed to evaluate the importance of crustal contamination of Lathrop Wells magma.
 - c. What additional work will be done to assess the importance of geochemical variation at Lathrop Wells? (NV)
2. Will the results of the Los Alamos volcanology program be submitted for publication in scientific journals for peer review by the volcanic hazard assessment community? (NV)
3. Are field and/or laboratory studies planned at additional analog sites? If not, has the analog study part of the project been completed? Will these results be incorporated into the Volcanism Synthesis Report? In what ways have these analog studies contributed to the volcanic hazard assessment? (NV)
4. Were the results of the recent seismic line across Crater Flat used to modify spatial models of volcanism or to provide information on the tectonic control of volcanoes in the Yucca Mountain region? How will the results of this geophysical survey be integrated into the Volcanism Synthesis Report? (NV)
5. How will the diverse opinions of the PVHA experts regarding event counts and spatial models be incorporated into the Volcanism Synthesis Report? (NV)
6. Work of F. Perry, G. Yogodinski, and B. Hill that was presented at the PVHA workshops and in various scientific literature indicates that results of basalt mineral and isotopic geochemistry suggest a spatial similarity of volcanic centers in the Yucca Mtn. Region. Neither the VSR or PVHA gives any weight to these models when assessing the volcanic hazard. Since these appear to be credible alternative models supported by empirical data, why have these geochemical models not been considered by Los Alamos in its volcanic hazards assessment? (NV)

7. In the VSR and PVHA, the probability calculations are based in part on a Poisson-distribution of events, i.e., events are random over time. However, volcanic hazard assessment practitioners in the international scientific community tend to favor the Weibel-distribution of events, i.e., event follow a pattern over time. What is the basis for using a Poisson-distribution method? (NV)
8. Geophysical surveys of Yucca Mtn. and the surrounding area by V. Langenheim and others indicate a number of anomalies that could be interpreted as possible buried basalt centers. The VSR and PVHA do not consider these interpreted anomalies as volcanic centers. What effect would there be on the volcanic hazard probability calculations if all geophysical anomalies interpreted to be buried basalt centers were considered distinct events? What plans have been made by Los Alamos to verify whether the geophysical anomalies are indeed buried volcanic centers? (NV)
9. A key parameter in the calculation of the probability of future eruptions in the Yucca Mountain area is the number of distinct volcanic centers that have occurred in the past. Practitioners in volcanic hazard assessments described in the scientific literature have adopted different definitions of a volcanic event, and as a result, may use a different number of events in probability calculations. What is the definition of event used in the VSR and PVHA and the basis for its use instead of other definitions found in the literature? (NV)
10. Information in the VSR and in the "preferred" structural model" discussed in the PVHA places a structural boundary between Crater Flat and Yucca Mountain. This boundary is central to the argument that a volcanic eruption cannot occur under Yucca Mountain. Geophysical survey interpretations presented by the USGS and the CNWRA at the PVHA workshops suggest that, if such a boundary exists, it is under Yucca Mountain. What are the data that support the Bruce Crowe model? (NV)
11. Pederson, et.al., (1995) describes the Quaternary stratigraphy of Crater Flat. Are the volcanic stratigraphy and age dates used in the preferred Los Alamos model of Quaternary volcanism in the Volcanism Status Report (VSR) and considered in the PVHA consistent with the stratigraphy in the Pederson report? If not, why not. (NV)
12. Given the spacing of the site characterization drilling program and the large scale of the geophysical surveys conducted on the Yucca Mtn., what is the probability that a small basalt dike less than a meter in width, similar to the dike trenched at the north end of Solitario Canyon, is present at Yucca Mtn. and not detected? What effect would the presence of such a dike have on the probability calculations of magmatic disruption of the repository? (NV)
13. Tectonic models have been used by volcanic hazard assessment practitioners to constrain the areas subject to volcanic effects. Given that the USGS has yet to provide a tectonic framework description for the Yucca Mtn. area, describe the tectonic models used in the VSR and PVHA

reports and the basis for their use. Are these models conceptual or have they been validated? (NV)

14. The ³He data as reported in Tables 2.4 and 2.6 and as in the VSR 1995 p. 2-40, 2-45, 2-52, and 2-54 do not agree. In addition T16 numbers do not agree with published data in Poths, et al, (1994) and Poths & Crowe (1992). What is the correct data set? Why are the differences? What will be done to correct this problem? (NRC)
15. Request to see the qualifications of the Technical Specialist on the audit team. (NRC)

RESPONSE ASSESSMENT

With the exception of inquiries 14 and 15, the observers and the audit team were satisfied with the responses to these questions. LANL personnel were able to explain verbally (and, when appropriate, provide objective evidence to substantiate) the LANL views and positions. The response to inquiry 14 was deferred to the response to the pertinent deficiency reports (see Section 3.9 of the report). The response to inquiry 15 was reviewed and found acceptable by the NRC staff.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 24, 1996

Mr. Ronald A. Milner, Director
Program Management and Integration
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

SUBJECT: OBSERVATION AUDIT OF LOS ALAMOS NATIONAL LABORATORY

Dear Mr. Milner:

I am transmitting the U.S. Nuclear Regulatory Commission Observation Audit Report OA-96-08 of the U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Office of Quality Assurance, Yucca Mountain Quality Assurance Division (YMQAD) audit of the quality assurance (QA) program of the Los Alamos National Laboratory (LANL). The audit, YM-ARC-96-14, was conducted on September 16-23, 1996, at LANL offices in Los Alamos, New Mexico, and Las Vegas, Nevada. The audit evaluated the adequacy and effectiveness of the LANL QA program for selected activities related to Work Breakdown Structures 1.2.3.2.5.1.1, "Probability of Magmatic Disruption of the Repository," 1.2.3.2.5.1.2, "Physical Processes of Magmatism and Effects on the Potential Repository," and 1.2.3.2.5.5.1, "Characterization of Volcanic Features." These activities have resulted in the draft 1996 Volcanism Synthesis Report that was also audited during this audit. The State of Nevada was also represented at this audit.

The audit resulted in five draft performance/deficiency reports regarding: (1) lack of identification of version of software package used; (2) untimely submittal of scientific notebooks to DOE's Records Processing Center; (3) lack of verification of calculations in scientific notebooks; (4) failure to clearly identify non-qualified (non-"Q") data in reports; and (5) discrepancies between reported data values within the draft 1996 Volcanism Synthesis Report and between that report and earlier Los Alamos Milestone reports.

The DOE audit team's overall finding was that LANL's QA performance was "marginally effective." NRC staff agrees with this finding and believes that the above deficiencies have resulted in a product that has an unacceptable level of quality. (Although released by LANL as a "draft," the 1996 Volcanism Synthesis Report had been received by DOE, indicating it had completed internal review.) We request that DOE inform the NRC of what is being done to ensure that an acceptable level of quality will be achieved in the future, not only with the audited report but with similar work products.

The NRC staff has determined that YMQAD Audit YM-ARC-96-14 was useful and effective. The audit was organized and conducted in a thorough and professional manner. Audit team members were independent of the activities

R. Milner

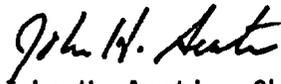
- 2 -

they audited, they were well qualified in their disciplines, and their assignments and checklist items were adequately described in the audit plan.

YMQAD should continue to closely monitor implementation of the LANL QA program to ensure that the deficiencies identified during this audit are corrected in a timely manner and that future QA program implementation is effective. The NRC staff expects to participate in this monitoring as observers and may perform its own independent audits at a later date to assess LANL implementation of its QA program.

As noted above, a written response to this letter is requested. If you have any questions, please call Jack Spraul of my staff on (301) 415-6715.

Sincerely,



John H. Austin, Chief
Performance Assessment and High-Level
Waste Integration Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

cc:

R. Loux, State of Nevada	B. Price, Nevada Legislative Committee
C. Johnson, State of Nevada	J. Meder, Nevada Legislative Counsel Bureau
S. Zimmerman, State of Nevada	M. Murphy, Nye County, NV
M. Baughman, Lincoln County, NV	D. Bechtel, Clark County, NV
B. Mettam, Inyo County, CA	P. Niedzielski-Eichner, Nye County, NV
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T. Burton, NIEC	