



Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
Las Vegas, NV 89193-8608

JUN 25 1996

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Technical Project Officer
for Yucca Mountain
Site Characterization Project
U.S. Geological Survey
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Las Vegas, NV 89134

**EVALUATION OF VERIFICATION INFORMATION AND VERIFICATION OF
CORRECTIVE ACTION AND CLOSURE OF CORRECTIVE ACTION REQUEST
(CAR) YM-95-051 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE
DIVISION'S (YMQAD) AUDIT YM-ARP-95-20 OF U.S. GEOLOGICAL SURVEY
(USGS) (SCPB: N/A)**

The YMQAD staff has evaluated the verification information received and verified the corrective action to CAR YM-95-051. Based on the evaluation of the response and the transfer of responsibility of Lawrence Berkeley National Laboratory and University of Nevada, Reno, from the USGS Quality Assurance Program, the response is accepted and the CAR is considered closed.

If you have any questions, please contact either Robert B. Constable at (702) 794-5580 or James Blaylock at (702) 794-1420.

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-2032

Enclosure:
CAR YM-95-051

cc w/encl:
J. G. Spraul, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
T. H. Chaney, USGS, Denver, CO
Records Processing Center

cc w/o encl:
W. L. Belke, NRC, Las Vegas, NV
D. G. Sult, YMQAD/QATSS, Las Vegas, NV
James Blaylock, YMQAD, NV

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CORRECTIVE ACTION REQUEST

1 Controlling Document: DOE/RW-0333P, Revision 4
2 Related Report No.: YM-ARP-95-20

3 Responsible Organization: U.S. Geological Survey (USGS)
4 Discussed With: Tom Chaney

5 Requirement:
Section 2.2.1: The Quality Assurance Program established requirements to ensure that work meeting the criteria described in the subsection entitled, "Classifying Items and Applying Quality Assurance Control," is performed under suitably controlled condition including the use of appropriate equipments, suitable environmental conditions for accomplishing the activity and assurance that prerequisites for a given activity have been satisfied.

6 Description of Condition:
Contrary to the above; USGS has failed to assure implementation of USGS QA requirements by extended staff. Examples are as follows:
1. TOUGH2 code development has evolved such that the code is being calibrated with site data; this data is being fed to other quality affecting activities. The TOUGH2 code has had no scientific software requirements or a scientific notebook applied to the development, control, and use of the software as of July 29, 1995.
2. By MOA, USGS delegated the technical review of Lawrence Berkeley Laboratory (LBL) Reports to that organization. The technical review of Development of the LBL/USGS Three-Dimensional Site Scale Model of Yucca Mountain, Nevada, dtd June 1994, failed to identify incorrect assumptions, incorrect equations, and other technical shortcomings.
3. The records package for 2 above reflects only the LBL technical review on the June 1994 report. As a result of a Yucca Mountain Project Office (YMPO) review, the report was revised to correct the technical shortcomings. The records package, GS940908312293.002, and its associated Technical Data Information Form (TDIF)# 303687, do not reflect the current, published report. The TDIF transmitted the incorrect June 1994 version of the report to the technical data base. The TDIF has not been

7 Initiator: James Blaylock
Date: 9/21/95
9. Does a stop work condition exist?
Yes ___ No ; If Yes, Attach copy of SWO
If Yes, Check One: A B C D

10. Recommended Actions:
1. Document the efforts taken to assure LBL implementation of appropriate quality assurance requirements applicable to the unsaturated zone modeling.
2. Complete records package GS940908312293.002 with the YMPO technical review and comment resolution for the June 1995 document.
3. Document actions taken to assure control and implementation of QA requirements by extended staff.

11 QA Review: Jane Blaylock
Date: 9/21/95
12 Response Due Date: 20 working days after issuance

13 Affected Organization QA Manager Issuance Approval:
Printed Name: Richard E. Spence
Signature: [Signature]
Date: 9/25/95

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3. (continued) superseded to reflect the June 1995 report. The records package also does not reflect the 1995 YMPO technical review or resolution of comments.
4. LBL personnel had not been trained to USGS procedures for which LBL personnel has implementation responsibilities.
(re: YMQAD-95-D016)
5. LBL personnel education and experience forms were incomplete.
(re: USGS QDR-95019-2, USGS QDR-940062, and LBL-95-D002)
6. USGS identified similar problems with extended staff at University of Nevada, Reno. Surveillance No. USGS -95036-IS documented seven deficiencies which include calibration, personnel qualifications, personnel training, and equipment shortcomings.

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¹⁴ Remedial Actions: *see page 4*

¹⁵ Investigative Actions: *see page 4*

¹⁶ Root Cause Determination:
see page 5

¹⁷ Action to Preclude Recurrence:
see page 5

¹⁸ Response by: <i>[Signature]</i> Date <i>10/24/95</i>	¹⁹ Corrective Action Completion Due Date <i>November 30, 1995</i>
²⁰ Response Accepted QAR <i>James Blaylock</i> Date <i>10/30/95</i>	²¹ Response Accepted AOQAM <i>[Signature]</i> Date <i>11/7/95</i>
²² Amended Response Accepted QAR <i>James Blaylock</i> Date <i>6/19/96</i>	²³ Amended Response Accepted AOQAM <i>[Signature]</i> Date <i>6-25-96</i>
²⁴ Corrective Actions Verified QAR <i>James Blaylock</i> Date <i>6/19/96</i>	²⁵ Closure Approved by AOQAM <i>[Signature]</i> Date <i>6-25-96</i>

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Block 14: Remedial Actions:

1. USGS and LBNL had agreed in January 1995 that TOUGH2 code development had reached the stage where its documentation as SES was appropriate. LBNL had originally agreed to document TOUGH2 as SES under YMP-USGS-QMP-3.03 by last spring. However the action was not yet complete at the time LBNL transitioned from the USGS QA Program to the LBNL QA Program in July 1995. Future actions to document the TOUGH2 code are the responsibility of LBNL and will not take place under the USGS auspices. USGS work related to the TOUGH2 code is documented in USGS scientific notebook SN-0082.
2. The YMPO review of the subject report has identified the incorrect assumptions, incorrect equations, and other technical shortcomings.
3. The YMPO reviews and the final report will be submitted to the records system as a package. This package will include a superseding TDIF if appropriate. A superseding TDIF would be appropriate only if the interpretations of data included in the publication actually changed. To date, no TDB submittal has occurred for the data contained within this publication.
4. This deficiency is covered independently under Deficiency Report YMQAD-95-D-016.
5. Investigation is still on-going as to the extent and impact of this deficiency. Investigations are expected to be complete November 17, 1995. A supplemental response will be submitted by November 30, 1995 for this portion of the deficiency.
6. UNR also no longer works for the USGS.

Block 15: Investigative Actions:

1. The USGS will perform a surveillance of USGS/LBNL to be sure all products are identified and proper QA controls were in place. The surveillance should be completed by November 17, 1995 with the results to be incorporated into a supplemental response by November 30, 1995.
2. Investigative actions into the adequacy of LBNL reviews of their reports is not warranted due to the nature of the products completed to date. Technical Data Information Forms associated with LBNL reports submitted to date through the USGS have not been considered qualified data or qualified interpretations of data.
3. YMP-USGS-QMP-3.04 requires a record package of the draft manuscript that was approved for publication along with its reviews, the associated TDIF and other supporting information. This record package precedes the submittal of the actual publication to the records system. The subject manuscript had received DOE approval for publication prior to the YMPO review and therefore the review package was considered complete for submittal to the records system prior

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to the YMPO review.

4. This deficiency is covered independently under Deficiency Report YMQAD-95-D-016.
5. Investigation is still on-going as to the extent and impact of this deficiency. Investigations are expected to be complete November 17, 1995. A supplemental response will be submitted by November 30, 1995 for this portion of the deficiency.
6. UNR no longer works for the USGS.

Block 16: Root Cause Determination:

1. The DOE Assistant Manager for Scientific Programs was fully cognizant of the TOUGH2 status. LBNL required additional funds in order to complete the documentation necessary for TOUGH2. The LBNL Project Manager made the decision to wait until the LBNL QA Program was approved because the additional funds were not immediately available and the LBNL QA Program was close to approval.
2. USGS was given responsibility for processing LBNL products but not authority to establish work scope, set milestones, or take management actions to force project decisions.
3. The YMPO review is not a part of the YMP-USGS QA Program and therefore our procedures do not require this review as part of the package. The contents of the record package was in accordance with approved procedures.
4. This deficiency is covered independently under Deficiency Report YMQAD-95-D-016.
5. Investigation is still on-going as to the extent and impact of this deficiency. Investigations are expected to be complete November 17, 1995. A supplemental response will be submitted by November 30, 1995 for this portion of the deficiency.
6. UNR no longer works for the USGS.

Block 17: Actions to Preclude Recurrence:

1. LBNL no longer works to the USGS QA Program. In July 1995 LBNL work fell under the direction of the M&O.
2. The USGS has been actively working to severe all relationships where it has been given responsibility but not the authority to manage a technical task. At present, there are no more such situations in place.

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3. There are no actions to prevent recurrence necessary. The submittal of the record package was in accordance with approved procedures.
4. This deficiency is covered independently under Deficiency Report YMQAD-95-D-016.
5. LBNL no longer works under the USGS QA Program.
6. UNR no longer works for the USGS but the USGS identified deficiencies against UNR are currently still identified as USGS deficiencies. The YMP-USGS QA Office will coordinate with both the YMQAD and the M&O QA Offices to determine the best means of handling these deficiencies in light of the UNR transition. Possibilities include transferring them to YMQAD or M&O deficiencies. Any USGS identified deficiencies that are closed based on a transfer of responsibility to a new organization will reference the replacement deficiency document by unique identifier. The supplemental response due November 30, 1995 will identify the plans for the deficiencies against UNR.

Plans for most of the outstanding LBNL deficiencies identified by the USGS are for LBNL and/or USGS to complete the necessary actions and the USGS to verify and close the deficiencies.

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Block 19: Corrective Action Completion: 11/30/95; (2/15/96 per 12/12/95 Extension Request)

The following is a status of completed actions, committed to on 10/24/95:

Investigations as to the extent and impact of this deficiency are complete. A USGS/LBNL, surveillance has been completed to ensure all products were identified and proper QA controls were in place. No adverse effect on quality were identified, as documented by the enclosed letter from LBNL.

Verification and validation for the current version of TOUGH2 was completed by LBNL in accordance with their software QA program requirements on 2/7/96.

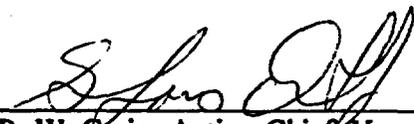
The records package for the subject report will be supplemented with a copy of a June 1995 report, the M&O review comments, and LBNL responses to those comments. At this time the TDIF will be updated to reflect inclusion of the final report. This will be completed by 3/1/96

Twenty technical data record packages associated with USGS/LBNL were identified. Only five of these were for qualified data. All five were for LBNL acquired data and were submitted after 7/21/95, under the YMP-LBNL QA Program.

Corrective actions relative to LBNL personnel qualifications as identified in YMQAD-95-D-016 were completed 2/15/96.

All deficiencies relative to UNR have been identified and are being resolved on a case-by case basis as time and staff permit. These are identified in the USGS/M&O/UNR transition Plan. A copy of the approved UNR Transition Plan will be submitted under separate cover. by 2/23/96.

The outstanding LBNL deficiencies identified by the USGS are in the process of resolution/closure. Their respective resolutions and closure also are on a case-by-case basis, as time and resources permit. At present 3 deficiencies are awaiting verification and is still waiting for completion of actions (95-D-016). These are tracked through the deficiency system.



R. W. Craig, Acting Chief, Yucca Mountain Project Branch

2/20/96
Date

2/20/96 CRAIG TO SPENCE

VERIFICATION OF CORRECTIVE ACTION FOR CAR YMOAD-95-C051

Based on the evaluation of the verification information received and the transfer of responsibility of Lawrence Berkeley National Laboratories and University of Nevada at Reno, from the USGS QA Program, this response is accepted and the CAR is considered closed.

James Blaylock
James Blaylock, QAR

6/19/96
Date