



Department of Energy

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

JUN 22 1995

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Technical Project Officer
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Site Characterization Project
U.S. Geological Survey
101 Convention Center Drive
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ISSUANCE OF CORRECTIVE ACTION REQUEST (CAR) YM-95-045 AND CAR YM-95-046 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION'S (YMQAD) AUDIT YM-ARP-95-12 OF U.S. GEOLOGICAL SURVEY (SCPB: N/A)

Enclosed are CARs YM-95-045 and YM-95-046 generated as a result of YMQAD Audit YM-ARP-95-12.

Please identify the corrective actions to be taken and implemented to correct the deficiencies. CAR Continuation Sheets and instructions for completion have been provided. Send the originals of your responses to Deborah G. Sult, YMQAD/QATSS, 101 Convention Center Drive, Suite 640, Las Vegas, Nevada 89109. Responses to the CARs are due 20 working days from the date of this letter. Extensions to due dates must be requested in writing, with appropriate justification, prior to the due dates.

If you have any questions, please contact either Robert B. Constable at 794-7945 or Kenneth O. Gilkerson at 794-7738.

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-3672

Enclosures:

1. CARs YM-95-045 and YM-95-046
2. CAR Continuation Sheets and Instructions
3. Guidelines for Root Cause Determination

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Larry R. Hayes

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JUN 22 1995

cc w/encl 1:

~~J. G. Spraul~~, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
T. L. Badredine, M&O, Las Vegas, NV
T. H. Chaney, USGS, Denver, CO
R. W. Craig, USGS, Las Vegas, NV
D. D. Porter, USGS/SAIC, Golden, CO

cc w/o encls:

W. L. Belke, NRC, Las Vegas, NV
D. G. Sult, YMQAD/QATSS, Las Vegas, NV

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B. CAR NO. YM-95-045
PAGE 1 OF 2
QA

CORRECTIVE ACTION REQUEST

1. CONTROLLING DOCUMENT: QARD, Revision 2	2. RELATED REPORT NO.: YM-ARP-95-12
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3. RESPONSIBLE ORGANIZATION: USGS	4. DISCUSSED WITH: C. Menges, L. Anderson, M. Chornack
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5. REQUIREMENT:
QARD, Rev 2. Paragraph 2.2.9A states: "Review criteria shall be established before performing the review. These criteria shall consider applicability, correctness, technical adequacy, completeness, accuracy, and compliance with established requirements."

6. ADVERSE CONDITION:
Contrary to the above, the technical review of quaternary faulting studies have failed to adequately address the above described requirements resulting in an unacceptable product.

Discussion:

The quaternary faulting studies relative to the Stagecoach Road investigation (SCP 8.3.1.17.4.6) have been completed, reviewed and submitted to YMSCO (DOE) for review and concurrence. Although a technical review and QA review was performed by USGS, the report "Paleoseismic Investigations of the Stagecoach Road Fault, Southeastern Yucca Mountain, Nye County, Nevada," contain numerous technical errors. These errors were discussed with and concurred by the Principal Investigator and author. The report contains numerous technical errors which detract significantly from what is basically a good study. Examples include:

1. Table 1 provides age boundaries for subdivisions of the Quaternary Period, but these are not followed consistently in the text.
2. Tables 4 and 7 list 6 TL dates and 4 U-series dates. The text says that age estimates are derived from 11 TL and 3 U-series dates. Sample HD 1439 is provided a date on table 7 but cannot be located on the trench logs.
3. The dates discussed for sequences D and F in trench SCR-TI are reversed.

9. Does a Significant Condition Adverse to Quality exist? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	10. Does a stop work condition exist? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; If Yes, Attach copy of SWO If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	13. Response Due Date:
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11. Required Actions: Remedial Extent of Deficiency Preclude Recurrence Root Cause Determination

12. Recommended Actions:

7. Initiator Kenneth O. Gilkerson <i>Kenneth Gilkerson</i> 6/21/95	14. Issuance Approved by QADD <i>[Signature]</i> Date 6.22.95
15. Response Accepted QAR _____ Date _____	16. Response Accepted QADD _____ Date _____
17. Amended Response Accepted QAR _____ Date _____	18. Amended Response Accepted QADD _____ Date _____
19. Corrective Actions Verified QAR _____ Date _____	20. Closure Approved by QADD _____ Date _____

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8.
CAR NO. YM-95-045
PAGE 2 OF 2
QA

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Block 6 (continued)

4. Figure references provided in the text for the 108 ± 10 ka date in trench SCR-T3 are incorrect.
5. On table 9 the colluvial wedge listings do not agree with the wedges illustrated on figures 9 and 10. Also the last two events in SCR-T3 are reversed.
6. Table 10 lists stratigraphic separation for the most recent event "Z" for SCR T-1 and T-3. Using the definition of stratigraphic separation on the table this is not possible. Also event T is SCR T-3 is provided a colluvial wedge thickness, but no wedge is indicated on Table 9 or on the figures.
7. On the trench logs (Plates II and III), the measurements provided on Table 10 cannot always be reproduced.
8. The number of faulting events interpreted in the trenches is not consistently presented in the text.
9. On page 94 the text discussed fracture terminations below unit H1, but the figures indicate they terminate below H3c.
10. At the bottom of page 95, event X should be event Y as indicated on the figures.
11. Some of the dates presented on Figure 11 were not used to constrain event timing, but this is not stated in the text on the table.
12. Unit boundary symbols on the logs (solid line boundaries) cannot be substantiated in the field.
13. Trench T2 was excavated but not logged or discussed in the report. The absence of faulting in this trench serves to limit the width of the SCR fault and should be documented.

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B
CAR NO. YM-95-046
PAGE 1 OF 2
QA

CORRECTIVE ACTION REQUEST

1. CONTROLLING DOCUMENT: QARD, Revision 2	2. RELATED REPORT NO.: YM-ARP-95-12
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3. RESPONSIBLE ORGANIZATION: USGS	4. DISCUSSED WITH: M. Chornack, J. Whitney, L. Anderson
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5. REQUIREMENT:
QARD, Rev. 2, Paragraph 2.2.29F, states: "Mandatory comments from the review shall be documented and resolved before approving the document."

6. ADVERSE CONDITION:

- Many of the "nonmandatory" technical comments appeared to be "mandatory." One technical reviewer had six pages of nonmandatory comments which the reviewer indicated had to be incorporated into the report to make the study technically correct.
- There was no documented evidence that the author resolved mandatory comments if the initial disposition of the reviewer's comments was a rejection by the author.
- Discussion: An examination of the Technical and QA reviews of the Stagecoach Road fault, the Bare Mountain fault zone, and the Paintbrush Canyon fault investigations reports performed by USGS resulted in a number of issues requiring consideration for process improvement.

The mandatory comments made by Larry Anderson (USBR Geologist) were responded to by the author with a number of Anderson's comments being rejected. There is no documentation of how these disagreements were resolved. The same observations were made in the technical reviews of the Bare Mountain and Paintbrush Canyon fault investigations. The USGS procedure QMP-3.04, Revision 6, requires that mandatory comments be resolved, but does not require that this resolution of how it was resolved to be documented. The procedure does require that the Chief, ESIP sign the comment sheet indicating that the author's responses to the reviewer comments are adequate, but this does not assure resolution of mandatory comments. Further discussions

9. Does a Significant Condition Adverse to Quality exist? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	10. Does a stop work condition exist? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No; If Yes, Attach copy of SWO If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	13. Response Due Date:
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11. Required Actions: Remedial Extent of Deficiency Preclude Recurrence Root Cause Determination

12. Recommended Actions:
In the extent of deficiency evaluation determine impact for past deliverables which may not have had technical comments resolved appropriately.

7. Initiator Kenneth O. Gilkerson <i>Kenneth O. Gilkerson</i> 6/21/95	14. Issuance Approved by QADD <i>[Signature]</i> Date 6.22.95
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8. CAR NO. YM-95-046
PAGE 2 OF 2
QA

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Block 6 (continued)

with the signatory (for Chief, ESIP) for the reports review disclosed that he only briefly reviewed the reports and did not in fact assure that mandatory comments were resolved. Discussions with one of the reviewers disclosed that no one in USGS ever contacted him about resolving his mandatory comments on this review...or any other.

Another issue denoted in the review of technical comments to this study was that many of the comments depicted as "nonmandatory" were in fact "mandatory." When six pages of "nomandatory" comments by a technical reviewer are prefaced by the remarks that incorporation of the nonmandatory comments will result in the study being technically correct, it would appear that these technical comments should have been "mandatory" comments. It is recommended that management review the definitions for "mandatory" in the procedure for consistent application by the reviewers. All comments relative to technical adequacy and accuracy are mandatory.