



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

DEC 27 1994

Larry R. Hayes
Technical Project Officer
for Yucca Mountain
Site Characterization Project
U.S. Geological Survey
101 Convention Center Drive
Suite 860
Las Vegas, NV 89109

ISSUANCE OF CORRECTIVE ACTION REQUEST (CAR) YM-95-020
THROUGH CAR YM-95-022 RESULTING FROM YUCCA MOUNTAIN QUALITY
ASSURANCE DIVISION'S (YMQAD) AUDIT YM-ARP-95-04 OF
U.S. GEOLOGICAL SURVEY (SCPB: N/A)

Enclosed are CARs YM-95-020 through YM-95-022 generated
as a result of YMQAD Audit YM-ARP-95-04.

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 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 Richard L. Maudlin at 794-7290.

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-1491

Enclosures:

1. CARs YM-95-020
Through YM-95-022
2. CAR Continuation Sheets
and Instructions

YMP-5

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PDR WASTE
WM-11 PDR

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Larry R. Hayes

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DEC 27 1994

cc w/encls:

~~J. G. Spraul~~, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
T. L. Badredine, M&O/TRW, Las Vegas, NV
T. H. Chaney, USGS, Denver, CO
R. W. Craig, USGS, Las Vegas, NV
D. D. Porter, USGS/SAIC, Golden, CO
D. G. Horton, OQA (RW-3) NV
R. M. Nelson, Jr., YMSCO, NV

cc w/o encls:

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

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8 CAR NO.: YM-95-20
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CORRECTIVE ACTION REQUEST

1 Controlling Document QARD DOE/RW-0333P, Revision 1		2 Related Report No. YM-ARP-95-04	
3 Responsible Organization USGS		4 Discussed With T. Chaney/A. Lykins	
5 Requirement: QARD Section 4.0, Procurement Document Control, Subsection 4.2.1B2 states in part: Specific documents (such as procedures or instructions) that describe the technical requirements of items or services to be furnished shall be specified. The revision level or change status of these documents shall be specified.			
6 Adverse Condition: Contrary to the cited requirement, the Memorandum of Agreements (MOAs) between Lawrence Berkeley Laboratory and the Water Resources Division, for work performed in support of USGS participation in the YMP (MOAs dated 2/2/93 and 5/23/94) fail to identify specific technical procedures of the SCP 8.3.1.4.2.2.5 and SCP 8.3.1.2.2.8 activities identified in the MOAs.			
9 Does a Significant Condition Adverse to Quality exist? Yes ___ No <u>X</u> 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? Yes ___ No <u>X</u> ; 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: 20 Working Days from Issuance	
11 Required Actions: <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Extent of Deficiency <input checked="" type="checkbox"/> Preclude Recurrence <input type="checkbox"/> Root Cause Determination			
12 Recommended Actions: 1) Revise recently issued MOAs and incorporate technical procedures. 2) Revise remaining MOAs as they become due and incorporate the technical procedures as appropriate.			
7 Initiator D. J. Harris <i>D. J. Harris</i> 12-20-94		14 Issuance Approved by: <i>[Signature]</i> Date 12-23-94	
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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In order to develop the CAR response, perform investigative action (if required in block 11 of the CAR) to determine the extent of the deficiency and to identify root cause. Next, determine the actions required to correct the adverse condition. These actions include remedial action, and in the case of CARs that identify significant conditions adverse to quality, corrective action to preclude recurrence. A review of the recommended actions (if any) provided in block 12 of the CAR may assist in this determination. The response must include the following information:

1. Corrective Action Response for CAR # _____
 - A. Remedial Action - Describe actions required to correct the specific conditions noted. (Required for all CARs)
 - B. Extent of the Deficiency - Describe the investigative actions performed to determine the extent of the condition and the results of the determination. (Required for all Significant Conditions Adverse to Quality or for any Condition Adverse to Quality if requested by OQA)
 - C. Root Cause Determination - Identify the root cause of the condition as determined through investigative action. (Required for all Significant Conditions Adverse to Quality or for any Condition Adverse to Quality if requested by OQA)
 - D. Corrective Action to Preclude Recurrence - Identify the actions required to address the root cause of the condition in order to preclude recurrence. (Required for all Significant Conditions Adverse to Quality or for any Condition Adverse to Quality if requested by OQA)
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If it becomes apparent that any of the corrective action due dates cannot be met, a written request for extension must be provided to the identified CAR Coordinator. This request must include justification for the delay and must be provided to the CAR Coordinator prior to the due date.

3. The response must include the dated signature of the Responsible Individual.

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8 CAR NO.: YM-95-21
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CORRECTIVE ACTION REQUEST

1 Controlling Document QARD DOE/RW-0333P, Revision 1		2 Related Report No. YM-ARP-95-04	
3 Responsible Organization USGS		4 Discussed With G. LeCain/W. Rodman/B. Scavuzza	
5 Requirement: QARD DOE/RW-0333P, Revision 1 1) QARD Section 12.2.1 states that: "Measuring and test equipment shall be calibrated, adjusted and maintained at prescribed intervals...." 2) QARD Section 12.2.1C states that: "The methods and interval of calibration shall be defined, based on the type of equipment, stability requirements,...." 3) QARD Section 12.2.1E states that: "Calibrated measuring and test equipment shall be labeled, tagged, or otherwise marked or documented to indicate due date or interval of the next calibration."			
6 Adverse Condition: Contrary to the above statements: 1) A review of the April 1994 calibration data sheets for pressure transducers and thermisters used in the Air Permeability Testing of Borehole UZ 16 indicated no calibration intervals for the HP 3457A Digital Multimeter and Keithley 230 power sources used as standards for the calibration. 2) USGS personnel no longer calibrates these standards but utilizes only performance or operational checks in accordance with HP 270, Revision 2, resulting in no "end" calibration for the standards used. 3) The technical procedures used in this study to calibrate the pressure transducers and thermisters still require an annual calibration of these standards which is no longer being performed.			
9 Does a Significant Condition Adverse to Quality exist? Yes ___ No <u>X</u> 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? Yes ___ No <u>X</u> ; If Yes - Attach copy of SWO If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C	
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11 Required Actions: <input checked="" type="checkbox"/> Remedial <input checked="" type="checkbox"/> Extent of Deficiency <input checked="" type="checkbox"/> Preclude Recurrence <input type="checkbox"/> Root Cause Determination			
12 Recommended Actions: 1) Ensure that standards are calibrated and utilized within the calibration interval. 2) Review procedures and revise as required to meet program requirements. 3) Review usage of any out-of-calibration standards for impact on data.			
7 Initiator K. O. Gilkerson <i>K. O. Gilkerson</i> 20 Dec 94		14 Issuance Approved by QADD <i>[Signature]</i> Date <u>12.23.94</u>	
15 Response Accepted QAR _____ Date _____		16 Response Accepted QADD _____ Date _____	
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5 Requirements (continued)

- 4) USGS technical procedures HP 251, Revision 0; HP 247, Revision 0; and HP 271, Revision 0; para(s) 5.0 all require the Hewlett Packard 3457A Digital Multimeter and the Keithly 230 Programmable Voltage Source to be calibrated annually.

6 Adverse Condition (continued)

DISCUSSION:

M&TE calibrations performed with the bench mounted standards with lapsed calibration intervals includes (but is not necessarily all inclusive):

Pressure Transducers

AK 31229
AK 31226
AK 319861
AK 319861
AK 319863
AK 319865

Thermisters

AKTH 001-AKTA sets

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8 CAR NO.: YM-95-22
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CORRECTIVE ACTION REQUEST

1 Controlling Document QARD DOE/RW-0333P, Supplement III, 2.2, Revision 1	2 Related Report No. YM-ARP-95-04
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3 Responsible Organization USGS	4 Discussed With E. Kwickless
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5 Requirement:
QARD DOE/RW-0333P, Supplement III, 2.2 requires that site characterization activities be governed by either technical procedures, a scientific notebook, or a combination of both.

6 Adverse Condition:
Contrary to the above, the Unsaturated Zone Modeling, SP 8.3.1.2.2.9, is not controlled by either a technical procedure or a scientific notebook. Acquired software that is being modified by UZ Modeling is not controlled by YMP-QMP-3.03, Software.

9 Does a Significant Condition Adverse to Quality exist? Yes <u>X</u> No ___ If Yes, Check One: <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E	10 Does a stop work condition exist? Yes ___ No <u>X</u> ; 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: 20 Working Days from Issuance
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11 Required Actions: Remedial Extent of Deficiency Preclude Recurrence Root Cause Determination

12 Recommended Actions:

- 1) Initiate procedural controls for UZ Modeling.
- 2) Review ongoing activities to assure all site characterization activities are governed by scientific notebooks or technical procedures.
- 3) Establish criteria to determine when code should be placed under QA controls.

7 Initiator <i>James Blaylock</i> James Blaylock	<i>12/20/94</i>	14 Issuance Approved by: QADD <i>[Signature]</i>	Date <i>12/23/94</i>
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15 Response Accepted QAR _____ Date _____	16 Response Accepted QADD _____ Date _____
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GUIDELINES FOR ROOT CAUSE DETERMINATION

When it is established that an investigation to determine root cause is required, the following guidelines may assist in the determination:

- 1) Clarify the specific condition. Pertinent clarifying questions must be asked and answered as accurately as possible.
 - a) What happened?
 - b) Where did the condition occur?
 - c) When did the condition occur?
 - d) What was the extent of the condition?
 - e) Who was involved?
 - f) In what manner did it happen?
 - g) What reasons are given by knowledgeable personnel for why it happened?

- 2) Obtain information related to the identified condition.
 - a) Investigate, in detail, the specific condition adverse to quality.
 - b) Interview personnel.
 - c) Review pertinent documents.
 - d) Use quality tools (cause & effect diagrams, flowcharting, Pareto analysis, comparative analysis, etc.).
 - e) Identify and collect data needed to get to the root cause.

- 3) Most root causes fall into one or more of the following generic categories. Specific review of these areas may be useful in arriving at cause determination:
 - a) Procedures
 - b) Personnel
 - c) Management systems
 - d) Supervision
 - e) Training
 - f) Communications
 - g) Scientific investigation/design methods
 - h) Human factors
 - i) Reliability considerations
 - j) Miscellaneous or multiple areas