



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

MAY 24 1996

Robert W. Craig
Acting Technical Project Officer
for Yucca Mountain
Site Characterization Project
U.S. Geological Survey
101 Convention Center Drive
Suite 860
Las Vegas, NV 89109

EVALUATION OF AMENDED SUPPLEMENTAL RESPONSE TO CORRECTIVE ACTION
REQUEST (CAR) YMQAD-96-C002 RESULTING FROM YUCCA MOUNTAIN QUALITY
ASSURANCE DIVISION'S (YMQAD) AUDIT YM-ARP-95-12 OF U.S. GEOLOGICAL
SURVEY (USGS) (SCPB: N/A)

The amended supplemental response, dated May 1, 1996, has been reviewed by the Office of Quality Assurance. The investigative results, which USGS emphasized as defending the technical defensibility of the final technical publication, seems overly optimistic when the independent reviewer's comments are scrutinized. Two examples will be given; however, these examples are not an exhaustive review of the twelve reports that were evaluated.

The twelve reports were selected on the basis that the information/data was quality related and will provide input for other site characterization activities, performance assessment, and modeling. Thus, the independent review comments must be resolved to forestall challenge of the reports at a later date.

Report "Hydrologic Responses to Earthquakes, June 28-29, 1992, at Yucca Mountain, Nevada." Additional reevaluation findings: It appears that the reviewer, G. Patterson, might not agree that the authors had responded appropriately on two of his five major/significant comments.

Report "Relict Colluvial Boulder Deposits as Paleoclimactic Indicators in the Yucca Mountain Region, Southern Nevada." There were problems with both the records package and questions with the technical issues. This response does not indicate that any further action was or will be taken.

The independent technical reviewer appears to have been conscientious in reviewing the USGS technical comments and reviews; there is no evidence that USGS has followed up on any of the comments generated as a result of this effort. This CAR cannot be closed until all comments associated with the independent review have been satisfactorily resolved.

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Robert W. Craig

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MAY 24 1996

An amended supplemental response is required to be submitted to this office within ten working days of the date of this letter. Send the original of your response to Deborah Sult, YMQAD/QATSS, P.O. Box 98608, Mail Stop 455, Las Vegas, Nevada 89193-8608. If an extension to the due date is necessary, it must be requested in writing, with appropriate justification, prior to that date.

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



for Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-1793

Enclosure:
CAR YMQAD-96-C002

cc w/encl:

J. G. Spraul, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
T. H. Chaney, USGS, Denver, CO
D. G. Horton, OQA (RW-3) NV
W. E. Barnes, YMSCO, NV
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: QARD, Rev. 2
2 Related Report No.: YM-ARP-95-12, CARsYM-95-046 & 045

3 Responsible Organization: USGS
4 Discussed With: M. Chornack, J. Whitney, L. Anderson

5 Requirement:
Note: This CAR is issued to supercede CARs YM-95-046 (see A statements) and YM-95-045 (see B statements) in order to implement the revised OCRWM Corrective Action Program. These CARs were combined due to the similar deficient conditions and the proposed corrective actions.

- A. QARD, Rev. 2, Paragraph 2.2.29F, states: "Mandatory comments from the review shall be documented and resolved before approving the document."
- B. 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 Description of Condition:

A. 1. Many of the "non-mandatory" technical comments appeared to be "mandatory." One technical reviewer had six pages of non-mandatory comments which the reviewer indicated had to be incorporated into the report to make the study technically correct.

2. 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.

3. 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 Larry 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 (continued)

7 Initiator: *Kenneth O. Gilkerson* Date: 1/9/96
Kenneth O. Gilkerson
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:
In the extent of deficiency evaluation, determine impact for past deliverables which may not have had technical comments resolved appropriately.

11 QA Review: *Kenneth O. Gilkerson* Date: 1/9/96
Kenneth O. Gilkerson
12 Response Due Date: N/A
~~20 working days from issuance~~ 1/11/96

13 Affected Organization QA Manager Issuance Approval:
Printed Name: ROBERT B. CONSTABLE
Signature: *Robert B. Constable*
Date: 1.16.96

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A. Block 6 - Adverse Condition (Continuation)

procedure QMP-3.04, Rev. 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 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 "non-mandatory" were in fact "mandatory." When six pages of "non-mandatory" comments by a technical reviewer are prefaced by the remarks that incorporation of the non-mandatory 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.

B. Block 6 - Adverse Condition (Continuation)

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 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.

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AMENDED RESPONSE - YMQAD-96-C-002

This amended response rescinds previous responses submitted for this Corrective Action Request (CAR). This response provides a summary of the decisions made in a meeting between the U.S. Geological Survey (USGS) and the Yucca Mountain Site Characterization Project Office on March 7, 1996. In the meeting it was agreed that two principal issues would be addressed by the USGS in an amended response for this CAR.

- 1) The USGS would describe what they believed to be the root cause of review problems, and
- 2) The USGS would propose an approach to re-evaluate the adequacy of technical review comment resolution for the "qualified" USGS reports prepared between 1989 and 1991.

The review process used by the USGS is similar to review processes used throughout the scientific community.

Block 14: Remedial Actions:

The author has revised the manuscript "Paleoseismic Investigations of the Stagecoach Road Fault, Southeastern Yucca Mountain, Nye County, Nevada" per the review comments received from the technical auditor. The manuscript was revised enough that it was determined a new technical review by one of the original technical reviewers was appropriate. This review is now complete. Following QA review and TPO review, the manuscript will be re-submitted to DOE for concurrence and to USGS Headquarters for Director's approval.

Block 15: Investigative Actions:

A 1995 assessment of summary information for reports prepared by the USGS for the Yucca Mountain Project (YMP) was undertaken by:

William W. Dudley, Jr., USGS, Yucca Mountain Project Branch (YMPB) Senior Science Advisor for Hydrology

John S. Stuckless, USGS, YMPB Senior Science Advisor for Geology

William E. Wilson, USGS (Retired 1990), Clear Creek Hydrogeology, Inc.

The assessment concerned 143 reports having Local Records Center submittal dates subsequent to May 1989 (Attachment A) and was performed on tabulated information for these 143 documents. The tabulated information provided for each document included the report number, title, authors, technical reviewers, and time available for, or spent on the review. From this information, along with their familiarity with reviewer education, work experience, and/or

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professional reputation, the assessors were asked to independently evaluate the technical reviewer independence, qualifications, and probable adequacy of the technical reviews. The results of this effort are tabulated in Attachment A and summarized as follows:

Reviewer Independence

For ninety-seven percent of the documents, one or more of the assessors was familiar with one or more of the reviewers of a specific document and could attest to their ability to perform an unbiased, objective review. A further evaluation of the assessment indicated:

- for thirty percent of the documents, all three assessors could attest to the independence of one or more of the document reviewers;
- for forty-five percent of the documents, two of the three assessors could attest to the independence of one or more of the document reviewers;
- for twenty-two percent of the documents, one of the three assessors could attest to the independence of one or more of the document reviewers; and
- for three percent of the documents, none of the assessors were familiar with the document reviews, and therefore none could attest to their independence.

Reviewer Qualifications

For ninety-four percent of the documents, one or more of the assessors could attest to the technical ability of one or more of the document reviewers to adequately perform the review. A further evaluation of the assessment indicated:

- for thirty-two percent of the documents, all three assessors could attest to the technical ability of one or more of the document reviewers to adequately perform the review;
- for forty-two percent of the documents, two of the three assessors could attest to the technical ability of one or more of the document reviewers to adequately perform the review;
- for twenty percent of the documents, one of the three assessors could attest to the technical ability of one or more of the document

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reviewers to adequately perform the review;

- for five percent of the documents, none of the three assessors were familiar with the education and experience of the document reviewers, and therefore could not attest to their technical ability to perform the review; and
- for one percent (2 occurrences) one of the three assessors indicated that one of the document reviewers may not have been technically qualified to perform the specified document review.

Review Adequacy

For seventy-nine percent of the documents, one or more of the assessors could conclude that the publication received an adequate review. A further evaluation of the assessment indicated:

- for seventeen percent the documents, all three assessors could conclude that the publication received an adequate review;
- for twenty-seven percent of the documents, two of the three assessors could conclude that the publication received an adequate review;
- for thirty-five percent of the documents, one of the three assessors could conclude that the publication received an adequate review;
- for eighteen percent of the documents, none of the assessors could conclude that the publication received an adequate review; and
- for three percent (4 occurrences) one or more of the assessors concluded that the publication may not have received an adequate review.

It is reasonable to conclude that the YMP-USGS document review process consistently selects adequately qualified and independent reviewers. The attempt to judge the adequacy of the review based upon the tabulated information provided was only partially successful because not all of the review documentation identified the actual hours expended on performing the review. A large number of the publication packages identified only the dates the reviewer received and returned the package. In some instances, the reviewer retained the document for many months, obviously not a reasonable indicator of the time spent on the actual review.

Twenty-three (23) of the 143 documents (approximately 16%) were selected and reviewed by

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one assessor, W. E. Wilson, to provide an independent, in-depth evaluation of the review process and comment resolution documentation based upon the objective evidence contained in the publication review package.

From these evaluations the review process, as implemented by the authors and fifty-one (51) document reviewers, was assessed.

Table B provides a list of the twenty-three publication review packages evaluated, the number of reviewers for each specified document, and an assessment of the overall review adequacy based upon the documentation contained in the publication review package.

As indicted in the table, of the twenty-three (23) publication review packages the evaluation identified three (3) documents in which the technical adequacy of the review could not be assessed due to lack of review documentation in the publication package. It should be noted that two of these documents were reviewed prior to the YMP-USGS QA Program (May 1989), and none of these reports are identified as qualified in the Automated Technical Data Tracking system.

Based upon the evaluation of the 23 report packages, the assessment identified that uncertainties occurred during comment resolution primarily between 1989 and 1991 (Attachment B). Consequently, during the March 7th meeting, agreement was reached that reports between 1989 and 1991 would be re-evaluated. In subsequent USGS meetings it was decided that 1992 reports would be added to this re-evaluation to increase the number of reports.

Twelve candidate reports have been identified for possible re-evaluation (Attachment C). The reports were those identified by the Automated Technical Data Tracking system as "qualified" USGS data developed between 1989 and 1992 within the Project Records system. Nine of the twelve reports were selected for the re-evaluation (those asterisked on Attachment C) to avoid evaluation of multiple reports with the same or similar authorship. Documentation contained within each report file will be evaluated by comparing the reviewed draft, the reviewer comment sheets, and the final draft to determine if the author addressed reviewer comments and if appropriate changes were included in the final report. Results of this investigation will be reported in a supplemental response and the need for further actions, if any, will be included in that response.

Block 16: Root Cause Determination:

Basically the root cause of the review problems has been a weakness in the management of the comment resolution part of the process. A contributing cause was that the implementing procedure did not require documentation from the reviewer to evaluate an author's response(s) to the review comments.

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Block 17: Actions to Preclude Recurrence:

To deal with the root cause, two actions have been taken already:

The implementing procedure (QMP-3.04) has been revised to require the documentation of the author-reviewer comment resolution process.

Management responsibilities have been re-enforced at weekly meetings between Earth Science Investigations Program (ESIP) Team Chiefs and the ESIP Chief. These meetings have been conducted since the beginning of the FY to discuss managerial oversight issues to try to foresee problems before they occur.

In addition, the following management oversight actions are being implemented:

Milestone progress meetings are being convened with the M&O and DOE to ensure data, ideas, or conclusions are being communicated so technical "surprises" do not occur.

Weekly meetings between ESIP and the Quality Assurance Office are being conducted to discuss quality-assurance-related problems to 1) ensure an ongoing dialogue, 2) address issues before they become problems, and 3) resolve problems that do arise.

All USGS abstracts are sent to the YMPB Senior Science Advisors at the time the report is sent to colleague review. Based upon the Science Advisors' knowledge and experience, they select reports for which they will provide additional reviews.

Block 18: Response by:

Robert W. Craig 4/11/96
Robert W. Craig, Chief, Yucca Mountain Project Branch Date

Block 19: Corrective Action Due Date:

Supplemental Response to be submitted by May 1, 1996.

Report	Independence	Qualifications	Adequacy
LRC 89.M.000072 RPT OFR-84-552	III	III	III
LRC 89.M.000104 RPT OFR-89-1-SCO	SSS	SSS	SSS
LRC 89.M.000105 RPT OFR-89-1-TAY	SSI	SSI	SSI
LRC 89.M.000140 RPT I-1884	SSI	SSI	SSI
LRC 89.M.000141 RPT I-1994	SSS	SSS	SSS
LRC 89.M.000153 RPT HARDEN-89.0153	SSS	SSS	SSS
LRC 89.M.000154 RPT BRADBUR-89.0154	SII	SSI	SII
LRC 90.M.000001 RPT OFR-88-553	SII	SSI	SII
LRC 90.M.000002 RPT OFR-88-570	SII	SSI	SII
LRC 90.M.000004 RPT HOXIE-D-90.0004	SII	SII	SII
LRC 90.M.000008 RPT CZARNEC-90.0008	SII	SII	SII
LRC 90.M.000009 RPT GALLOVA-90.0009	SSI	SSI	SSI
LRC 90.M.000010 RPT THENHAU-90.0010	SSI	SSI	SSI
LRC 90.M.000061 RPT OFR-89-446	SII	SSI	III
LRC 90.M.000062 RPT OFR-88-664	SII	SSI	III
LRC 90.M.000066 RPT OFR-90-113	SII	SII	SII

Report	Independence	Qualifications	Adequacy
LRC 90.M.000075 RPT SPENGLER-90.0075	SSI	SSI	SII
LRC 90.M.000076 RPT OFR-88-436	SII	SII	SII
LRC 90.M.000077 RPT FAIRER-90-0077	SSI	SSI	SII
LRC 90.M.000081 RPT OFR-89-682ABC	SII	SII	SII
LRC 90.M.000083 RPT OFR-89-3	SSS	SSS	SSS
LRC 90.M.000085 RPT MALDONA-90.0085	SSI	SSI	SSI
LRC 90.M.000086 RPT OFR-89-359	SSI	SSI	SSI
LRC 90.M.000093 RPT OFR-89-234	SSS	SSS	SSI
LRC 90.M.000094 RPT I-2049	SSS	SSS	SSS
LRC 90.M.000095 RPT OFR-89-139	SSI	SII	SII
LRC 90.M.000096 RPT OFR-90-87	SSS	SSS	SSS
LRC 90.M.000097 RPT OFR-89-133	SII	SII	SII
LRC 90.M.000102 RPT OFR-90-356	SSS	SSS	SII
LRC 91.M.000001 RPT OFR-90-354	SSI	SSS	SII
LRC 91.M.000002 RPT SZABO B-91.0002	SSS	SSS	SSS
LRC 91.M.000004 RPT OFR-90-474	SSI	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 91.M.000006 RPT OFR-89-567A	SII	SII	III
LRC 91.M.000007 RPT OFR-90-569	SSS	SSS	SII
LRC 91.M.000008 RPT OFR-91-105	SII	SII	III
LRC 91.M.000009 RPT OFR-90-362	SSS	SSS	SII
LRC 91.M.000010 RPT OFR-91-46	SII	SII	SII
LRC 91.M.000012 RPT OFR-90-369	SSI	SSS	SSS
LRC 91.M.000014 RPT OFR-90-355	SSI	SSS	SSI
LRC 91.M.000015 RPT OFR-90-41	SSS	SSS	SSS
LRC 91.M.000016 RPT OFR-90-500	SSI	SSI	III
LRC 91.M.000019 RPT WRIR-89-4025	SSI	SSI	SSI
LRC 91.M.000020 RPT OFR-92-458	SSS	SSS	SSS
LRC 91.M.000026 RPT HEVESI-91.0026	SSS	SSS	SSS
LRC 91.M.000027 RPT LEWIS R-91.0027	SSI	SII	III
LRC 91.M.000028 RPT NELSON-91.0028	SII	III	III
LRC 91.M.000029 RPT REHEIS-91.0029	SSI	SSS	SSS
LRC 91.M.000030 RPT SCHIMSC-91.0030	SSI	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 91.M.000032 RPT TURRIN-91.0032	SSI	SSI	SII
LRC 91.M.000033 RPT OFR-91-620	SSI	SSI	SSI
LRC 91.M.000035 RPT ODUM J-91.0035	SSI	SSI	SSUS
LRC 91.M.000038 RPT WHITNEY-91.0038	SSI	SSI	III
LRC 91.M.000058 RPT GOMBERG-91.0058	SII	SII	III
LRC 91.M.000059 RPT GOMGERG-91.0059	SII	SII	SII
LRC 91.M.000060 RPT ROSENBA-91.0060	SSS	SSI	SSI
LRC 91.M.000062 RPT OFR-93-269	SSI	SSI	SSI
LRC 91.M.000067 RPT BROCHER-91.0067	SSI	SSI	SII
LRC 91.M.000068 RPT STUCKLE-91.0068	SSS	SSS	SSS
LRC 91.M.000072 RPT OFR-90-615	SSI	SSI	SII
LRC 91.M.000073 RPT GP-1001	SSI	SSI	SSI
LRC 91.M.000074 RPT ZIMMERM-91.0074	SSI	SSI	III
LRC 91.M.000075 RPT WRIR-88-4168	SSI	SSI	SSI
LRC 91.M.000076 RPT OFR-90-49	SSI	SSI	SSI
LRC 91.M.000077 RPT OFR-90-37	SSI	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 91.M.000078 RPT HEVESI-91.0078	SSS	SSS	SSS
LRC 91.M.000081 RPT OFR-91-178	SSI	SII	SII
LRC 91.M.000091 RPT WRIR-92-4016	SSS	SSS	SSS
LRC 91.M.000092 RPT OFR-91-118	SSS	SSS	SSI
LRC 91.M.000094 RPT ZIMMERM-91.0094	SSS	SSS	SII
LRC 91.M.000095 RPT CZARNEC-91.0095	SSI	SIUS	IUSUS
LRC 91.M.000103 RPT FLINT A-91.0103	SSS	SSS	SSS
LRC 91.M.000107 RPT FLINT A-91.0107	SSS	SSS	SII
LRC 91.M.000108 RPT KLENKE-91.0108	III	III	III
LRC 91.M.000113 RPT ZIMMERM-91.0113	SSI	SSI	III
LRC 91.M.000118 RPT ZIMMERM-91.0118	SSS	SSS	SII
LRC 91.M.000132 RPT OFR-91-241	SII	III	III
LRC 91.M.000134 RPT OFR-92-28	SSS	SSS	SII
LRC 91.M.000144 RPT OFR-91-341	SSS	SSS	SSS
LRC 91.M.000149 RPT OFR-87-596	SSI	SSI	III
LRC 91.M.000156 RPT OFR-91-493	SII	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 91.M.000160 RPT OFR-91-623	SSI	SSI	SSI
LRC 91.M.000161 RPT OFR-91-367	SSI	SSI	SII
LRC 91.M.000163 RPT OFR-93-438	SSI	SSI	SII
LRC 91.M.000164 RPT OATFIEL-91.0164	SSI	SSI	SII
LRC 91.M.000172 RPT WRIR-93-4025	SII	SII	SII
LRC 91.M.000174 RPT OFR-91-478	SSI	SSI	SSI
LRC 91.M.000176 RPT I-2201	SSI	SSI	SSI
LRC 91.M.000178 RPT TERHUNE-91.0178	SSS	SSS	SSS
LRC 91.M.000181 RPT KUMAR S-91.0181	SSI	SSS	SSI
LRC 91.M.000188 RPT OFR-92-657	III	III	III
LRC 92.M.000002 RPT OFR-91-572	SSI	SSI	SSI
LRC 92.M.000006 RPT WRIR-92-4065	SII	SII	SII
LRC 92.M.000011 RPT I-1985	SSI	SSI	SSI
LRC 92.M.000023 RPT OFR-86-175	SSS	SSS	SSI
LRC 92.M.000045 RPT OFR-79-277	SII	SII	III
LRC 92.M.000072 RPT OFR-84-649	SSI	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 92.M.000078 RPT OFR-86-420	SSI	SSI	SII
LRC 92.M.000079 RPT WRIR-86-4015	SSS	SSS	SSL
LRC 92.M.000080 RPT WRIR-86-4359	SSS	SSS	SSI
LRC 92.M.000088 RPT MP-1897	SII	SII	III
LRC 92.M.000089 RPT BLAKELY-92.0089	SSI	SSI	SSI
LRC 92.M.000207 RPT OFR-92-137	SSI	SII	SII
LRC 92.M.000208 RPT OFR-92-343	SSI	SSI	SII
LRC 92.M.000217 RPT BALCH A-92.0217	SII	SII	III
LRC 92.M.000219 RPT WRIR-93-4144	SII	III	III
LRC 92.M.000222 RPT OFR-92-340	SSI	SSI	SII
LRC 92.M.000227 RPT OFR-91-125	SSS	SSS	III
LRC 92.M.000233 RPT OFR-92-572	SSS	SSS	III
LRC 92.M.000236 RPT WRIR-93-4000	SSI	SSI	SSI
LRC 92.M.000238 RPT OFR-92-490	SSI	SSI	SSI
LRC 92.M.000246 RPT KWICKLI-92.0246	SSS	SSS	SSI
LRC 92.M.000258 RPT OFR-92-450	SSS	SSI	SSI

Report	Independence	Qualifications	Adequacy
LRC 92.M.000273 RPT OFR-93-60	SSI	SSS	SSS
LRC 93.M.000002 RPT OSTERKA-93.0002	SSS	SSS	SSS
LRC 93.M.000017 RPT OFR-93-73	SSI	SII	IIUS
LRC 93.M.000036 RPT OFR-93-651	SII	SII	SII
LRC 93.M.000048 RPT ISTOK J-93.0048	SSI	SSI	SSI
LRC 93.M.000049 RPT OFR-93-477	SSS	SSS	SSS
LRC 93.M.000069 RPT FRIDRIC-93.0069	SSS	SSS	SSS
LRC 93.M.000092 RPT NELSON-93.0092	SSI	SSI	SII
LRC 94.A.100263 RPT SAVAGE-94.0016	SII	SII	III
LRC 94.A.100550 RPT GILMORE-91.0057	SSI	SSI	SII
LRC 94.A.100651 RPT I-MAP-NO # YET	SSI	SSI	SII
LRC 94.A.100808 RPT KARASAKI-92.204	SSS	SSS	SSI
LRC 94.A.100810 RPT FAUNT C-94.0052	SSS	SSS	SSI
LRC 94.M.000009 RPT OFR-87-121	SSI	SII	III
LRC 94.M.000012 RPT ANDERSON-94.0012	SII	SII	III
LRC 94.M.000020 RPT OFR-93-369	SSI	SSI	SII

Report	Independence	Qualifications	Adequacy
LRC 94.M.000021 RPT OFR-93-690	SSS	SSS	SSS
LRC 94.M.000039 RPT OFR-92-201	SSI	SSI	SSI
LRC 94.M.000041 RPT OFR-94-54	SSS	SSS	SSS
LRC 94.M.000042 RPT OFR-94-312	SSI	SSI	SII
LRC 94.M.000053 RPT DALEY T-94.0053	SSI	SSI	SII
LRC 95.M.000002 RPT OFR-94-303	SII	SII	SII
LRC 95.M.000004 RPT OFR-94-305	SSS	SSS	SSI
LRC 95.M.000005 RPT OFR-93-98	SSI	SSI	SII
LRC 95.M.000006 RPT OFR-94-317	SSI	SSI	SII
LRC 95.M.000007 RPT OFR-94-451	SII	SSI	SII
LRC 95.M.000009 RPT OFR-94-318	SSS	SIUS	SIUS
LRC 95.M.000010 RPT OFR-94-456	SSI	SSI	SII
LRC 95.M.000011 RPT OFR-94-311	III	III	III
LRC 95.M.000012 RPT OFR-93-89	SII	SII	SII
LRC 95.M.000013 RPT OFR-94-342	SSS	SSS	SSS

Legend

S: Satisfactory
 US: Unsatisfactory
 I: Indeterminate

The following table provides a list of the twenty-three publication review packages evaluated, the number of reviewers for each specified document, and an assessment of the overall review adequacy based upon the documentation contained in the publication review package.

Document Identification	Number of Reviewers	Overall Review Adequacy
90M000004/HOXIED90.0004	2	I
90M000008/CZARNEC9.0008	2	I
90M000075/SPENGL90.0075	2	S
91M000020/OFR92-458	4	S
91M000026/HEVESI91.0026	2	S
91M000060/ROSENBA91.0060	2	S
91M000062/OFR93-269	2	S
91M000068/STUCKE91.0068	2	S
91M000077/OFR90-37	2	I
91M000103/FLINTA91.0103	2	S
91M000160/OFR91-623	3	S
91M000174/OFR91-478	2	S
91M000188/OFR92-657	2	S
92M000078/OFR86-420	2	S
92M000207/OFR92-137	2	S
92M000208/OFR92-343	2	S
92M000219/WRIR93-4414	2	S
92M000227/OFR91-125	2	S
92M000246/KWICKLI92.0246	2	S
93M000002/OSTERKA93.0002	2	S
93M000049/OFR93-477	4	S
94A100263/SAVAGE94.0016	2	S
94A100550/GILMORE91.0057	2	S

LEGEND

S - Satisfactory
I - Indeterminate

ATTACHMENT C

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<u>Data Tracking Number</u>	<u>Title/Description on Technical Data Information Form</u>
* GS930108312212.001	THE INFLUENCE OF LONG-TERM CLIMATE CHANGE ON NET INFILTRATION AT YUCCA MOUNTAIN, NEVADA, BY A.L. FLINT, L.E. FLINT, & J.A. HEVESI
GS930108312312.002	HYDROLOGIC RESPONSES TO EARTHQUAKES, JUNE 28-29, 1992, AT YUCCA MOUNTAIN, NEVADA, BY GRADY M. O'BRIEN AND PATRICK TUCCI. BASED ON DATA FROM USW WELLS H-3, H-5, AND H-6, AND FROM UE-25P #1.
* GS930108312312.003	EARTHQUAKE-INDUCED WATER-LEVEL FLUCTUATIONS AT YUCCA MOUNTAIN, NEVADA, JUNE, 1992 BY G.M. O'BRIEN. BASED ON DATA FROM WELLS USW H-5, USW H-6, USW H-3, AND UE-25 P #1.
GS920508312313.005	"EARTHQUAKE-INDUCED WATER-LEVEL FLUCTUATIONS AT YUCCA MOUNTAIN, NEVADA, APRIL 1992" BY G. M. O'BRIEN.
* GS921208314212.015	GEOPHYSICAL INVESTIGATIONS OF CONCEALED FAULTS NEAR YUCCA MOUNTAIN, SOUTHWEST NEVADA, BY D.A. PONCE
* GS920208315215.009	"STRONTIUM ISOTOPE GEOCHEMISTRY OF CALCITE FRACTURE FILLING IN DEEP CORE, YUCCA MOUNTAIN, NEVADA - A PROGRESS REPORT" BY Z. PETERMAN, J. STUCKLESS, B. MARSHALL, S. MAHAN, AND K. FUTA.
* GS921208315215.028	PALEOHYDROLOGIC IMPLICATIONS OF THE STABLE ISOTOPIC COMPOSITION OF SECONDARY CALCITE WITHIN THE TERTIARY VOLCANIC ROCKS OF YUCCA MOUNTAIN, NEVADA BY JOSEPH F. WHELAN AND JOHN S. STUCKLESS.
GS930108315215.004	LEAD ISOTOPIC COMPOSITION OF PALEOZOIC AND LATE PROTEROZOIC CARBONATE ROCKS IN THE VICINITY OF YUCCA MOUNTAIN, NV, BY R.E. ZARTMAN AND L.M. KWAK.
* GS930108315215.008	PRELIMINARY STUDY OF LEAD ISOTOPES IN THE CARBONATE-SILICA VEINS OF TRENCH 14, YUCCA MOUNTAIN. BY R.E. ZARTMAN AND L.M. KWAK

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<u>Data Tracking Number</u>	<u>Title/Description on Technical Data Information Form</u>
* GS921208316111.002	RELICT COLLUVIAL BOULDER DEPOSITS AS PALEOCLIMATIC INDICATORS IN THE YUCCA MOUNTAIN REGION, SOUTHERN NEVADA, BY JOHN W. WHITNEY AND CHARLES D. HARRINGTON.
* GS920783117412.022	SEISMICITY AND FOCAL MECHANISMS FOR THE SOUTHERN GREAT BASIN OF NEVADA AND CALIFORNIA IN 1991.
* GS920783117461.002	PHOTOGEOLOGIC AND KINEMATIC ANALYSIS OF LINEAMENTS AT YUCCA MOUNTAIN, NEVADA: IMPLICATIONS FOR STRIKE-SLIP FAULTING AND OROCLINAL BENDING, BY J.M. O'NEILL, J.W. WHITNEY, & M.R. HUDSON.

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WASHINGTON, D.C.**

 Corrective Action Request

 Stop Work Order

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QA:L

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AMENDED RESPONSE TO YMQAD-96-C002

This response replaces earlier responses for YMQAD CARS YM-95-045 AND -046

Block 14: Remedial Actions:

The author has revised the manuscript "Paleoseismic Investigations of the Stagecoach Road Fault, Southeastern Yucca Mountain, Nye County, Nevada" per the review comments received from the technical auditor. The manuscript was revised enough that it was determined that a new technical review by one of the original technical reviewers was appropriate. When this technical review phase has been completed, the author will send his responses and a copy of the revised text to the technical auditor for evaluation. QA review, TPO review and re-submittal to DOE for concurrence and to USGS Headquarters for Director's approval has been delayed due to this additional technical review. We anticipate re-submittal to DOE and concurrent re-submittal for USGS Director's approval by March 15, 1996.

Block 15 Investigative Actions:

Although the subject report still contained technical inconsistencies due to unresolved comments, the USGS report process was not fully completed for this report. USGS Director's approval was still required for the report. Evaluation criteria for that approval includes assuring adequate response to reviewer comments. The evaluation for Director's approval is likely to have identified the unresolved technical comments or inconsistencies and should be the final determination for adequate technical review and comment resolution.

The subject report was a FY94 milestone to DOE. The acceptance criteria given in PACs specifically stated that the milestone was met when the report was submitted for USGS approval and DOE concurrence.

Block 16 Root Cause Determination:

The root cause of this condition is that the USGS review procedure (QMP-3.04) did not require reviewer evaluation of the responses. Instead this responsibility was handled as a management review (either Team Chief or Program Chief, depending on which revision of QMP-3.04 was in effect). The management review was to "determine, based on technical adequacy, reviewer's comments, and author's responses, if the documents are ready for further processing". Please note that this management review was not limited to resolution of mandatory comments. Non-mandatory comments that "had to be incorporated into the report to make the study technically correct" would be included in this management review. Resolution of comments was reflected in the revision of the report, if necessary. The particular Team Chief responsible for this report was operating under the assumption that this review was being done on his behalf before he was asked to

1/19/96 Craig G. Spence

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sign the review forms.

Block 17: Actions to Prevent Recurrence:

QMP-3.04 has been revised (Rev. 7) to require reviewer involvement in the resolution of mandatory comments. Also, due to extensive discussions as a result of this CAR, all Team Chiefs now understand this function.

Block 18 Response By:

Robert W. Craig 1/19/96
Robert W. Craig, Chief, Yucca Mountain Project Branch / Date

Block 19 Corrective Action Due Date: March 15, 1996

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SUPPLEMENTAL RESPONSE - YMQAD-96-C-002

This supplemental response is an addendum to the previous response dated April 11, 1996, submitted by Robert W. Craig, Chief, Yucca Mountain Project Branch, U.S. Geological Survey (USGS). The following blocks are updated or amended with modifications or additions as agreed in a meeting between the USGS and the Yucca Mountain Site Characterization Project Office on March 7, 1996, and as proposed by the USGS in the Amended Response of April 11, 1996.

Block 14: Remedial Actions (updated):

The author has revised the manuscript "Paleoseismic Investigations of the Stagecoach Road Fault, Southeastern Yucca Mountain, Nye County, Nevada" per the review comments received from the technical auditor. The manuscript was revised enough that it was determined a new technical review by one of the original technical reviewers was appropriate. This review is now complete. Currently, the manuscript plus review comment responses are being reviewed by the technical auditor. USGS QA and TPO reviews also will be completed and the revised manuscript re-submitted to DOE for concurrence and to the USGS Headquarters for Director's approval.

Block 15: Investigative Actions (addendum):

The twelve candidate reports identified in the amended response of April 11, 1996 have been reviewed by an independent reviewer according to the agreed-upon evaluation process. The reviewer, Deborah R. Jerez-McPherson, is a Senior Project Geologist with Woodward-Clyde Federal Services in Gaithersburg, Maryland, with an extensive background in the Yucca Mountain Project (see Attachment 1). In our assessment, the Woodward-Clyde reevaluation *supports the technical defensibility of the comment resolution process applied to the twelve USGS publications*. With some minor concerns, the Woodward-Clyde reevaluation also *indicates that the technical quality of the final publications was not unduly compromised*. The reevaluation reports for the twelve reports are attached (see Attachment 2).

Block 16: Root Cause Determination (addendum):

The results from the Woodward-Clyde reevaluation supports the root cause identified in the April 11, 1996 response.

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Block 17: Actions to Preclude Recurrence (addendum):

Management oversight will be expanded to include:

- Additional guidance will be given to reviewers to articulate their responsibilities and the criteria that should be used to distinguish between mandatory and non-mandatory technical comments.
- The USGS management oversight will focus on ensuring that high-quality technical reviews are completed and correctly documented.
- The USGS management will review the technical defensibility of both the comments and responses from the reviewers and the authors.
- The USGS management will ensure that the Publications Records Package will contain adequate documentation of the reviews and reflect the substance and final resolution of all significant points.

Block 18: Response by:

Robert W. Craig 5/1/96
Robert W. Craig, Chief, Yucca Mountain Project Branch Date

Block 19: Corrective Action Due Date:

Actions to Preclude Recurrence are being implemented by USGS Management. Remedial Actions are anticipated to be completed by June 3, 1996.

Attachment 1

YMP-USGS REVIEWER SELECTION FORM

**for independent reviewer selected to
evaluate technical reports identified in
Corrective Action Request (CAR) YMQAD-96-C-002**

YMP-USGS REVIEWER SELECTION FORM

[To be completed by the appropriate official for reviewers who do not have qualifications documented in accordance with QMP-2.02 or QMP-2.08.]

Manuscript(s) or data to be reviewed: Refer to Attachment C from 4-11-96 USGS response to DOE Corrective Action Request CAR YMOAD-96-C-002 (information copy attached).

Name of Reviewer: Deborah R. Jerez-MacPherson

Title of Reviewer: Senior Project Geologist

Organization of Reviewer: Woodward-Clyde Federal Services

Basis of Qualification for Reviewer: M.A., Geology, Geo. Washington Univ., 1987; B.S., Geology, Geo. Washington Univ., 1981; worked on the Civilian Radioactive Waste Management Program from 1987 through 1995 full-time and from 1995 through present on part-time basis; performed technical reviews on numerous Program-, Project- and other Participant-level documents; managed the QA Verification Review on resolution of comments on the 1988 Site Characterization Plan (SCP) [at that time employed by R.F. Weston Inc.] and assisted DOE IG in their oversight review of the SCP completion process.

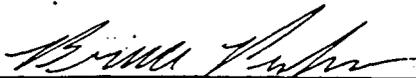
for

R.W. Craig

Printed Name

Chief, Yucca Mountain Project Branch

Title



Signature

4/16/96

Date

ATTACHMENT C

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<u>Data Tracking Number</u>	<u>Title/Description on Technical Data Information Form</u>
* GS930108312212.001	THE INFLUENCE OF LONG-TERM CLIMATE CHANGE ON NET INFILTRATION AT YUCCA MOUNTAIN, NEVADA. BY A.L. FLINT, L.E. FLINT, & J.A. HEVESI
GS930108312312.002	HYDROLOGIC RESPONSES TO EARTHQUAKES, JUNE 28-29, 1992. AT YUCCA MOUNTAIN, NEVADA. BY GRADY M. O'BRIEN AND PATRICK TUCCI. BASED ON DATA FROM USW WELLS H-3, H-5, AND H-6, AND FROM UE-25P #1.
* GS930108312312.003	EARTHQUAKE-INDUCED WATER-LEVEL FLUCTUATIONS AT YUCCA MOUNTAIN, NEVADA, JUNE, 1992 BY G.M. O'BRIEN. BASED ON DATA FROM WELLS USW H-5, USW H-6, USW H-3, AND UE-25 P #1.
GS920508312315.005	"EARTHQUAKE-INDUCED WATER-LEVEL FLUCTUATIONS AT YUCCA MOUNTAIN, NEVADA, APRIL 1992" BY G. M. O'BRIEN.
* GS921208314212.015	GEOPHYSICAL INVESTIGATIONS OF CONCEALED FAULTS NEAR YUCCA MOUNTAIN, SOUTHWEST NEVADA. BY D.A. PONCE
* GS920208315215.009	"STRONTIUM ISOTOPE GEOCHEMISTRY OF CALCITE FRACTURE FILLING IN DEEP CORE, YUCCA MOUNTAIN, NEVADA - A PROGRESS REPORT" BY Z. PETERMAN, J. STUCKLESS, B. MARSHALL, S. MAHAN, AND K. FUTA.
* GS921208315215.028	PALEOHYDROLOGIC IMPLICATIONS OF THE STABLE ISOTOPIC COMPOSITION OF SECONDARY CALCITE WITHIN THE TERTIARY VOLCANIC ROCKS OF YUCCA MOUNTAIN, NEVADA BY JOSEPH F. WHELAN AND JOHN S. STUCKLESS.
GS930108315215.004	LEAD ISOTOPIC COMPOSITION OF PALEOZOIC AND LATE PROTEROZOIC CARBONATE ROCKS IN THE VICINITY OF YUCCA MOUNTAIN, NV. BY R.E. ZARTMAN AND L.M. KWAK.
* GS930108315215.008	PRELIMINARY STUDY OF LEAD ISOTOPES IN THE CARBONATE-SILICA VEINS OF TRENCH 14, YUCCA MOUNTAIN. BY R.E. ZARTMAN AND L.M. KWAK

ATTACHMENT C

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<u>Data Tracking Number</u>	<u>Title/Description on Technical Data Information Form</u>
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* GS920783117461.002	PHOTOGEOLOGIC AND KINEMATIC ANALYSIS OF LINEAMENTS AT YUCCA MOUNTAIN, NEVADA: IMPLICATIONS FOR STRIKE-SLIP FAULTING AND OROCLINAL BENDING. BY J.M. O'NEILL, J.W. WHITNEY, & M.R. HUDSON.

EVALUATION FORMS

for Twelve U.S. Geological Survey Publications

prepared by Woodward-Clyde Federal Services

for the

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "The Influence of Long-Term Climate Change on Net Infiltration at Yucca Mountain, Nevada"

Author(s): A.L. Flint, L.E. Flint and J.A. Hevesi

Report number or outlet: PROCEEDINGS, Fourth Annual International HLRWM Conference, Las Vegas, NV, April 26-30, 1993

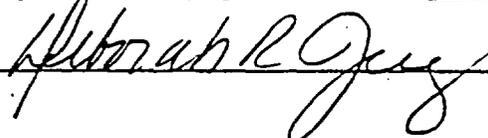
Review History: Review conducted December 7-14, 1992; records package includes comments provided on Review/Comment Resolution Form and manuscript markup; revised manuscript approved for publication by USGS on January 28, 1993 and by YMSCO on February 26, 1993.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: E. Taylor	Reviewer 2: E. D. Gutentag
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The authors indicate their acceptance or rejection of the reviewer comments by check marks or rejection justifications on the comment forms and/or as annotations inserted near the reviewer's markup of the text.	Yes. The authors indicate their acceptance or rejection of the reviewer comments by check marks or rejection justifications on the comment forms and/or as annotations inserted near the reviewer's markup of the text.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Yes. The reviewer provided extensive markup of the preliminary draft text. The authors accepted all but two substantive comments (see discussion below) and four minor comments (see L. Flint memo to J. LaMonaca dated 12/30/92). Nearly all of the editorial and minor technical comments are also traceable into the finalized manuscript.	Yes. There is extremely good correlation between the reviewer's comments and the authors' revisions to the finalized manuscript.

<p>If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?</p>	<p>The authors accepted all four of the reviewer's comments and made appropriate changes to the text in finalizing the manuscript.</p>	<p>The authors accepted four of the five reviewer comments. Two of the accepted comments were adequately addressed by text changes made by the authors. The other two comments were an attempt by the reviewer to have the author address the significance of the water-level fluctuations to the hydrogeology of the Yucca Mountain site. In the Comment #3 response, the authors backed away from a conclusion by deleting the sentence instead of bolstering the discussion. In the Comment #5 response, the authors eliminated a "summary" paragraph but failed to address the reviewer's point that the paper needed more "meat" in the results. The reviewer expected the authors to propose an interpretation about what the water-level fluctuations might indicate about the hydrogeology at Yucca Mountain.</p>
<p>If the author(s) rejected the comment, was justification provided?</p>	<p>None of the four comments provided by the reviewer was rejected.</p>	<p>Yes. On the Review/Comment Resolution Form, the authors provided a defensible justification for the single reviewer's comment that was rejected</p>

Additional reevaluation findings: From our reevaluation, it appears that the reviewer G Patterson might not agree that the authors had responded appropriately on two of his five major/significant comments.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Hydrologic Responses to Earthquakes, June 28-29, 1992 at Yucca Mountain, Nevada"

Author(s): G.M. O'Brien and P. Tucci

Report number or outlet: PROCEEDINGS: Symposium on Waste Management (Waste Management 1993 Conference), Tucson, Arizona, February 28-March 4, 1993.

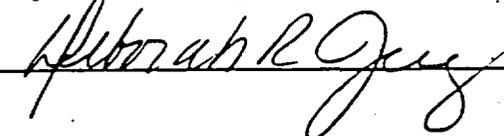
Review History: Review conducted December 23, 1992-January 3, 1993; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by USGS on February 2, 1993 and by YMSCO on February 11, 1993.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: C. Faunt	Reviewer 2: G. Patterson
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer provided four major/substantive comments on a Review/Comment Resolution Form. On that form, the authors indicated their acceptance of all four comments.	Yes. The reviewer provided five major/substantive comments on a Review/Comment Resolution Form. On that form, the authors indicated their acceptance of four comments and rejection of one comment.

<p>If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?</p>	<p>The authors accepted all four of the reviewer's comments and made appropriate changes to the text in finalizing the manuscript.</p>	<p>The authors accepted four of the five reviewer comments. Two of the accepted comments were adequately addressed by text changes made by the authors. The other two comments were an attempt by the reviewer to have the author address the significance of the water-level fluctuations to the hydrogeology of the Yucca Mountain site. In the Comment #3 response, the authors backed away from a conclusion by deleting the sentence instead of bolstering the discussion. In the Comment #5 response, the authors eliminated a "summary" paragraph but failed to address the reviewer's point that the paper needed more "meat" in the results. The reviewer expected the authors to propose an interpretation about what the water-level fluctuations might indicate about the hydrogeology at Yucca Mountain.</p>
<p>If the author(s) rejected the comment, was justification provided?</p>	<p>None of the four comments provided by the reviewer was rejected.</p>	<p>Yes. On the Review/Comment Resolution Form, the authors provided a defensible justification for the single reviewer's comment that was rejected</p>

Additional reevaluation findings: From our reevaluation, it appears that the reviewer G Patterson might not agree that the authors had responded appropriately on two of his five major/significant comments.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Earthquake-induced water-level fluctuations at Yucca Mountain, Nevada, June, 1992"

Author(s): G.M. O'Brien

Report number or outlet: USGS Open-File Report 93-73

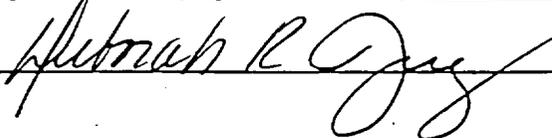
Review History: Review conducted October 28-November 19, 1992; records package includes comments provided on Review/ Comment Resolution Form and manuscript markup; revised manuscript approved for publication by USGS on March 3, 1993 and by YMSCO on March 25, 1993.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: S. Harmsen	Reviewer 2: C. Faunt
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The author indicated acceptance of two of the three major/substantive comments documented on the Review/ Comment Resolution Form. A response or justification statement was provided for all comments, but the author's acceptance or rejection of comment #2 is unclear on the form.	Yes. The author indicated — acceptance of 5 and rejection of 8 of the 13 comments documented on a Review/Comment Resolution Form.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	The text changes proposed by the author on the Review/ Comment Resolution Form were a minimal attempt to address the reviewer's concerns. In reevaluating the comment resolution process, we surmise that the reviewer might not agree that the author had adequately addressed the accepted comments.	The text changes proposed by the author on the Review/ Comment Resolution Form were a minimal attempt to address the reviewer's concerns. In reevaluating the comment resolution process, we surmise that the reviewer might not agree that the author had adequately addressed the accepted comments.

<p>If the author(s) rejected the comment, was justification provided?</p>	<p>As noted above, the author's justification statement for comment #2, as recorded on the Review/Comment Resolution Form, offers a response to the reviewer's information request without incorporating the information into the revised manuscript.</p>	<p>Yes. A justification statement was provided for each of the 8 comments rejected by the author. In this reevaluation of comment resolution, it does not appear that C. Faunt would consider the author's resolution of review comment #1 (and possibly others) to be adequate.</p>
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Additional reevaluation findings: The author's justification statement for many of the rejected comments is based on the need to keep this Open-File Report short and simple. The author further commits to consider many of these comments in more detailed future publications. Looking back at the documentation of the review, these justification statements convey an indifference to reasonable comments offered by the reviewer. However, based on the option selected by the reviewer on the Technical Reviewer's Appraisal Form, a rejection of all comments on the markup appears justifiable. That option characterizes any response made by the author as "minor technical revisions," thereby implying that the comments themselves are "minor" or non-mandatory.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Earthquake-induced Water-level Fluctuations at Yucca Mountain, Nevada, April, 1992"

Author(s): G.M. O'Brien

Report number or outlet: USGS Open-File Report 92-137

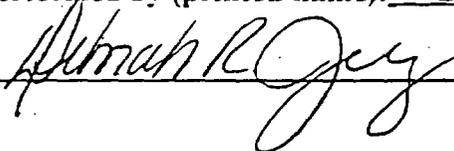
Review History: Review conducted May 13-14, 1992; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by USGS on June 8, 1992 and by YMSCO on June 30, 1992.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: S. Harmsen	Reviewer 2: E. Roeloffs
Did author(s) indicate acceptance or rejection of all major/substantive comments?	The reviewer provided two major/substantive comments on Review/Comment Resolution Forms. The authors indicated their acceptance of both comments on the forms.	The reviewer indicated on a Review/Comment Resolution Form that she had no comments that required resolution.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	The author accepted both comments submitted by the reviewer and made appropriate revisions to the text in finalizing the manuscript.	The reviewer indicated on a Review/Comment Resolution Form that she had no comments that required resolution.

If the author(s) rejected the comment, was justification provided?	Neither of the two comments submitted by the reviewer was rejected.	The reviewer indicated on a Review/Comment Resolution Form that she had no comments that required resolution.
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Additional reevaluation findings: No additional comments

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Geophysical Investigations of Concealed Faults Near Yucca Mountain, Southwest Nevada"

Author(s): D.A. Ponce

Report number or outlet: PROCEEDINGS, Fourth Annual International HLRWM Conference, Las Vegas, NV, April 26-30, 1993.

Review History: Review conducted December 17-18, 1992; records package includes comments provided on Review/ Comment Resolution Form and manuscript markup; revised manuscript approved for publication by USGS on January 20, 1993 and by YMSCO on February 18, 1993.

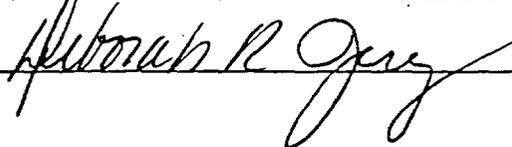
Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: H.W. Oliver	Reviewer 2: V.E. Langenheim
Did author(s) indicate acceptance or rejection of all major/substantive comments?	No. The reviewer provided one Review/Comment Resolution Form that referenced comments recorded on an attachment containing 5 pages of the draft manuscript and 2 figures. In the response column of the Review/Comment Resolution Form, the author provided a generic response statement indicating that he considered all of the comments by Oliver on the attachments as "minor" and that "most" were accepted and incorporated into the revised manuscript.	Yes. The author indicates on the Review/Comment Resolution Form that all Langenheim comments were accepted and incorporated into the revised manuscript.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Three significant technical comments provided by Oliver in his markup of the preliminary draft manuscript were not addressed in the revised manuscript.	It is not clear that Langenheim comment #2 was fully addressed in the revised manuscript (see reference to features at 400 m and 1,000 m distance)

<p>If the author(s) rejected the comment, was justification provided?</p>	<p>Limited justification for rejection of some comments can be found in several terse annotations made by the author on the reviewer's markup of the preliminary draft manuscript.</p>	<p>Neither of the two Langenheim comments were rejected.</p>
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Additional reevaluation findings: Woodward-Clyde's reevaluation of the comment resolution process for this publication determined that the results of the review by Oliver gave clear indications that the reviewer had submitted substantive comments. In this case, the reviewer submitted comments on several pages that were attached to and referenced on the Review/Comment Resolution Forms. The reviewer's markup that was attached to the Review/Comment Resolution Form contained both substantive and minor technical comments and editorial comments. However, the author's global characterization of the Oliver comments as "minor" is at odds with the USGS instructions to the reviewer as well as our reevaluation of the comments. It also suggests a less than conscientious effort on the part of the author to prepare comment responses.

In order to better evaluate the Oliver comments, an M&O/ WCFS senior geophysicist was asked to assess the author's responses to three comments that our preliminary reevaluation had determined were not adequately addressed in the revised manuscript. The geophysicist found that the author apparently had rejected the comments since no change had been made in the revised manuscript, and stated that a short response would have supported the quality of the author's geophysical data if future questions arise regarding calibration of geophysical field equipment, terrain corrections made to the data, and the overprint of a longer wavelength signature (possibly due to basement features) on magnetic readings taken along the line 2 transect. NOTE: The record package available for this reevaluation also provided no evidence that a significant QA review comment on software documentation was addressed. A deficiency report may have been written for the QA comment and documentation of its resolution may be available in a separate records package

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Strontium Isotope Geochemistry of Calcite Fracture Fillings in Deep Core, Yucca Mountain, Nevada -- A Progress Report"

Author(s): Z.E. Peterman, J.S. Stuckless, B.D. Marshall, S.A. Mahan, and K. Futa

Report number or outlet: PROCEEDINGS, Third Annual International HLRWM Conference, Las Vegas, NV, April 12-16, 1992.

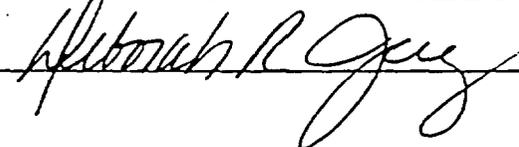
Review History: Review conducted December 17-26, 1991; records package includes comments provided on Review/ Comment Resolution Form and manuscript markup; revised manuscript approved for publication by USGS on January 16, 1992 and by YMSCO on February 20, 1992.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: E.D. Gutentag	Reviewer 2: W.W. Dudley
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer provided three on a Review/Comment Resolution Form that applied to the manuscript figures. On the same form, the reviewer referenced a two-page attachment that contained an additional twelve comments. On the Review/ Comment Resolution Form, the authors indicated their acceptance of all 3 comments, and in the left margin of the attached sheets, the authors indicate acceptance of 11 comments and rejection of one comment.	Yes. The reviewer provided 16 comments on Review/ Comment Resolution Forms. On those forms, the authors indicated their acceptance of 14 comments and rejection of 2 comments.

<p>If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?</p>	<p>Yes. Responses to the accepted comments can be traced to appropriate changes made by the authors in finalizing the manuscript.</p>	<p>Yes. Responses to the accepted comments can be traced to appropriate changes made by the authors in finalizing the manuscript. In many cases, authors directly incorporated suggested changes provided by the reviewer.</p>
<p>If the author(s) rejected the comment, was justification provided?</p>	<p>A technically defensible justification for the one rejected comment was provided by the authors on the Review/ Comment Resolution Forms.</p>	<p>A technically defensible justification for the two rejected comments was provided by the authors on the Review/ Comment Resolution Forms.</p>

Additional reevaluation findings: Both reviewers provided focused and concisely stated comments (many with suggested "fixes"). The authors responses to each comment are well documented and technically defensible.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Paleohydrologic Implications of the Stable Isotope Composition of Secondary Calcite within the Tertiary Volcanic Rocks of Yucca Mountain, Nevada"

Author(s): J.F. Whelan and J.S. Stuckless

Report number or outlet: PROCEEDINGS, Third Annual International HLRWM Conference, Las Vegas, NV, April 12-16, 1992

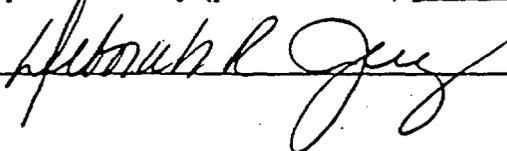
Review History: Review conducted November 27-December 6, 1992; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by YMSCO on January 16, 1992 and by YMSCO on January 27, 1992.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: B. Marshall	Reviewer 2: T. McConnaughey
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer submitted 7 major/substantive comments. On the Review/Comment Resolution Forms, the authors indicate that 5 of the 7 comments were accepted and 2 of the 7 were rejected.	Yes. The reviewer submitted 10 major/substantive comments. On the Review/Comment Resolution Forms, the authors indicate that 8 of the 10 comments were accepted and 2 of the 10 were rejected.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Yes. Each of the 5 accepted comments can be traced to appropriate revisions made by the authors in finalizing the manuscript. The authors also incorporated most of the editorial and minor technical comments in the final manuscript.	Yes. For 5 of the 8 accepted comments, the reviewer provided suggestions for rewording of text that were incorporated by the authors. The authors adequately addressed the 3 other accepted comments by making appropriate revisions in the final manuscript.

If the author(s) rejected the comment, was justification provided?	Yes. A technically defensible justification statement for each of the two rejected comments was provided by the authors on the Review/Comment Resolution Forms.	Yes. A technically defensible justification statement for each of the two rejected comments was provided by the authors on the Review/Comment Resolution Forms.
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Additional reevaluation findings: The McConnaughey review comments are a good example of focused comments by the reviewer supplemented by proposed responses for the authors' consideration. Overall documentation of the comment resolution process is excellent; however, neither reviewer found any major problem with the manuscript. Significant reviewer comments were focused on the need for expanding the description of a process that might have affected the oxygen isotope ratios observed at depth or suggesting an alternative process that may have affected the observed ratios. Authors justifications for rejected comments were well reasoned.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Lead Isotope Composition of Paleozoic and Late Proterozoic Marine Carbonate Rocks in the Vicinity of Yucca Mountain, Nevada"

Author(s): R.E. Zartman and L.M. Kwak

Report number or outlet: PROCEEDINGS, Fourth Annual International HLRWM Conference, Las Vegas, NV, April 26-30, 1993.

Review History: Review conducted December 9-14, 1992; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by USGS on February 6, 1993 and by YMSCO on February 24, 1993.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: J. Whelan	Reviewer 2: Z. Peterman
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer submitted one major/substantive comment on a Review/Comment Resolution Form. The author indicated his acceptance of that comment.	Yes. The reviewer submitted four major/substantive comments on Review/Comment Resolution Forms. The author indicated his acceptance of all four comments.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Yes. The authors' response to the accepted comment is traceable to appropriate text revisions made in finalizing the manuscript.	Yes. The authors' responses to the four accepted comments are traceable to appropriate text revisions made in finalizing the manuscript.

Reevaluation of reports under YMQAD-96-C-002

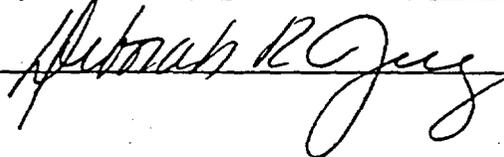
"Lead Isotope Composition of Paleozoic and Late Proterozoic Marine Carbonate Rocks in the Vicinity of Yucca Mountain, Nevada"

Page 2 of 2

If the author(s) rejected the comment, was justification provided?	No comment submitted by the reviewer was rejected by the author.	None of the four comments submitted by the reviewer was rejected by the author.
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Additional reevaluation findings: No addition comments.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Preliminary Study of Lead Isotopes in the Carbonate-silica Veins of Trench 14, Yucca Mountain, Nevada"

Author(s): R.E. Zartman and L.M. Kwak

Report number or outlet: USGS Open-File Report 93-690

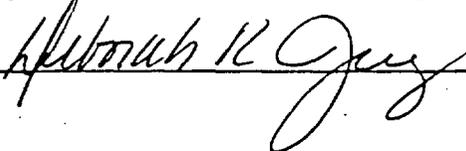
Review History: Review conducted April 13-24, 1990; records package includes comments provided on Technical Reviewer's Appraisal Form and manuscript markup; revised manuscript approved for publication by USGS on December 6, 1993 and by YMSCO on June 10, 1994.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: Z. Peterman	Reviewer 2: D. Unruh
Did author(s) indicate acceptance or rejection of all major/substantive comments?	No. The Technical Reviewer's Appraisal Form recommends publication with "minor" technical revisions as noted on the accompanying reviewer's markup of the preliminary draft manuscript. However, significant comments were submitted by the reviewer on the markup. The authors provide no indication of having accepted or rejected each comment on the reviewer's markup. (No separate Review/Comment Resolution Form was available in records package.)	No. The Technical Reviewer's Appraisal Form recommends publication with "minor" technical revisions as noted on the accompanying reviewer's markup of the preliminary draft manuscript. However, significant comments were submitted by the reviewer on the markup. The authors provide no indication of having accepted or rejected each comment on the reviewer's markup or on the single page containing 2 significant comments that the reviewer inserted into his markup.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Yes. Responses to nearly all of the Peterman comments were evident in the revisions made by the authors in finalizing the manuscript.	Yes. Responses to most of the Unruh comments were evident in the revisions made by the authors in finalizing the manuscript.

If the author(s) rejected the comment, was justification provided?	No significant technical comment made by Peterman was rejected by the authors. No justification was provided by the authors when they rejected insignificant comments.	No significant technical comment made by Unruh was rejected by the authors. No justification was provided by the authors when they rejected insignificant comments.
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Additional reevaluation findings: The Table of Contents for the required Publication Records Package includes adequate documentation to permit a knowledgeable individual to reconstruct the resolution of each technical comment. As noted above, all significant technical comments were addressed in the final manuscript text. However, the procedure(s) in place when this manuscript was technically reviewed (in April 1990) did not require the authors to obtain reviewer approval of the final resolution of each comment or even to provide a written response or justification for each review comment except as those responses might have been incorporated into revision of the final manuscript text. This problem has been corrected by modification to the technical review procedure subsequent to April 1990.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Relict Colluvial Boulder Deposits as Paleoclimatic Indicators in the Yucca Mountain Region, Southern Nevada"

Author(s): J.W. Whitney and C.D. Harrington

Report number or outlet: Geological Society of America Bulletin, v. 105, p. 1008-1018, August 1993

Review History: Review conducted August 28-September 25, 1990; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by USGS on January 17, 1991 and by YMSCO on July 18, 1991.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: P. Carrara	Reviewer 2: S. Reneau
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer submitted two major/substantive comments; both were accepted by the authors.	No. The reviewer submitted three comments on a Review/Comment Resolution Form and attached two type-written pages containing an additional 7 comments. The authors indicate acceptance of two of the three comments on the Review/Comment Resolution Form. However, there is no indication of acceptance or rejection of the additional 7 comments, and there is no indication that the reviewer considered those comments to be less significant than the other 3.

<p>If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?</p>	<p>Apparently. The records package for this publication available in the USGS archives did not contain a copy of the draft manuscript upon which the reviewer's comments were based. Therefore, the Woodward-Clyde reevaluation could not compare the draft and revised manuscripts to identify specific changes made by the author in response to accepted comments. Our reevaluation of the published manuscript, however, indicates that text appropriately addresses the technical concerns raised in the reviewer comments.</p>	<p>Apparently. The records package for this publication available in the USGS archives did not contain a copy of the draft manuscript upon which the reviewer's comments were based. Therefore, the Woodward-Clyde reevaluation could not compare the draft and revised manuscripts to identify specific changes made by the author in response to accepted comments. Our reevaluation of the published manuscript, however, indicates that text appropriately addresses the technical concerns raised in the reviewer comments.</p>
<p>If the author(s) rejected the comment, was justification provided?</p>	<p>None of the reviewer's comments was rejected.</p>	<p>Yes. Justification was provided for the single comment indicated as rejected on the Review/Comment Resolution Form. It appears that none of the addition 7 comments was rejected.</p>

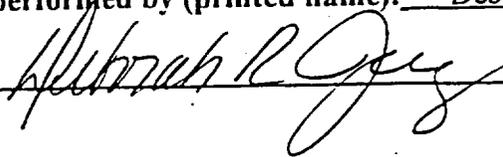
Additional reevaluation findings: The records found in USGS archives for this publication include a USGS internal memorandum dated November 20, 1990 from B. Mvers to the report authors, transmitting the USGS policy review that is required prior to publication of a USGS manuscript in an outside journal (non-USGS publication). That policy review memorandum contains a number of substantive technical comments, some of which take issue with the authors' basic premise regarding the process by which the "relict colluvial boulders" were formed. On the two-page memorandum, the authors have attached two "sticky notes" containing counter-argument responses. While this policy review memorandum is not included in the Publication Records Package submitted to YMSCO, this record in the USGS archives is unique among the files of the twelve publications reevaluated by Woodward-Clyde in that the policy review memorandum contains no reference to points of policy but identifies several technical issues that were not identified or resolved as part of the YMP-USGS technical review process. USGS management may need to assess the guidance given to policy reviewers to more narrowly focus their review, or consider including a USGS manager as a third technical reviewer (if the USGS higher management determines that scientific/technical issues are a part of the organization's policy concerns)

Reevaluation of reports under YMQAD-96-C-002

"Relict Colluvial Boulder Deposits as Paleoclimatic Indicators in the Yucca Mountain Region, Southern Nevada"

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Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Seismicity and focal mechanisms for the Southern Great Basin of Nevada and California in 1991"

Author(s): S.C. Harmsen

Report number or outlet: USGS Open-File Report 92-340

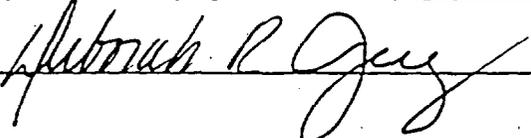
Review History: Review conducted March 5-April 20, 1992; records package includes comments provided on Review/ Comment Resolution Form and manuscript markup; revised manuscript approved for publication by USGS on May 19, 1992 and by YMSCO on October 8, 1992.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: J. Gombert	Reviewer 2: H. Benz
Did author(s) indicate acceptance or rejection of all major/substantive comments?	The reviewer provided no major/substantive comments requiring acceptance or rejection by the author.	Yes. However, the records package for the review contains a bothersome error. The reviewer submitted comments numbered 1 through 4 on a Review/ Comment Resolution Form. The reviewer numbered that form as page 1 of 2. Only one Review/Comment Resolution Form sheet was found in the USGS records package. The Table of Contents for the Publication Records Package contains a hand-written correction indicating that only one sheet of comments was submitted by the reviewer.

<p>If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?</p>	<p>Apparently. The records package for this publication available in the USGS archives did not contain a copy of the draft manuscript upon which the reviewer's comments were based. This reviewer apparently provided a draft manuscript markup that she characterized as "suggestions mostly for grammatical changes." The markup was not available in the USGS records archives. Our reevaluation of the published manuscript, however, indicates that the text appropriately addresses the technical concerns raised in the reviewer comments.</p>	<p>Apparently. The records package for this publication available in the USGS archives did not contain a copy of the draft manuscript upon which the reviewer's comments were based. Therefore, the Woodward-Clyde reevaluation could not compare the draft and revised manuscripts to identify specific changes made by the author in response to accepted comments. Our reevaluation of the published manuscript, however, indicates that the text appropriately addresses the technical concerns raised in the reviewer comments.</p>
<p>If the author(s) rejected the comment, was justification provided?</p>	<p>No major/substantive comments were submitted by the reviewer; therefore, none was rejected by the author.</p>	<p>None of the four major/substantive comments submitted by the reviewer was rejected by the author.</p>

Additional reevaluation findings: The absence of either reviewer's draft manuscript markup in the USGS archives precluded an attempt to identify any additional major/substantive comments submitted by the reviewer that were not contained on the Review/Comment Resolution Form. It should be noted, however, that the USGS technical review procedure in place at the time of the review did not require retention of the reviewer markups.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996

REEVALUATION OF REPORTS UNDER YMQAD-96-C-002

Report title: "Photogeologic and Kinematic Analysis of Lineaments at Yucca Mountain, Nevada: Implications for Strike-slip Faulting and Oroclinal Bending"

Author(s): J.M. O'Neill, J.W. Whitney and M.R. Hudson

Report number or outlet: USGS Open-File Report 91-623

Review History: Review conducted March 21-April 17, 1991; records package includes comments provided on Review/Comment Resolution Forms and manuscript markup; revised manuscript approved for publication by USGS on December 10, 1991 and by YMSCO on October 8, 1992.

Evaluation criteria:	Name of technical reviewer:	
	Reviewer 1: M.C. Reheis	Reviewer 2: K.S. Kellogg
Did author(s) indicate acceptance or rejection of all major/substantive comments?	Yes. The reviewer provided 16 comments on Review/Comment Resolution Forms. On those forms, the authors indicated acceptance of 10 comments and rejection of five comments.	Yes. The reviewer provided 16 comments on Review/Comment Resolution Forms. The authors' notations on the Review/Comment Resolution Forms indicate acceptance of eleven comments, partial acceptance of one comment, and rejection of four comments.
If the author(s) accepted the comment, were appropriate changes incorporated into the manuscript?	Yes. The authors indicated the substance of their responses on the Review/Comment Resolution Forms. Accepted comments are traceable to appropriate revisions made by the authors in finalizing the manuscript.	Yes. The authors indicated the substance of their responses on the Review/Comment Resolution Forms. Accepted comments are traceable to appropriate revisions made by the authors in finalizing the manuscript.

Reevaluation of reports under YMQAD-96-C-002
"Photogeologic and Kinematic Analysis of Lineaments at Yucca Mountain, Nevada:
Implications for Strike-slip Faulting and Oroclinal Bending"

Page 2 of 2

If the author(s) rejected the comment, was justification provided?	Yes. A technically defensible justification for the five rejected comments was provided by the authors on the Review/ Comment Resolution Forms or on the attached sheets containing comments with diagrams.	Yes. A technically defensible justification for the four rejected comments was provided by the authors on the Review/ Comment Resolution Forms.
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Additional reevaluation findings: No additional comments.

Reevaluation performed by (printed name): Deborah R. Jerez-MacPherson

Signature:  Date: April 22, 1996