



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

QA: L

OCT 18 1994

L. Dale Foust
Technical Project Officer
for Yucca Mountain
Site Characterization Project
TRW Environmental Safety Systems, Inc.
101 Convention Center Drive, Suite P-110
Las Vegas, NV 89109

EVALUATION OF AMENDED RESPONSE TO CORRECTIVE ACTION REQUEST (CAR)
YM-94-075 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE
DIVISION (YMQAD) AUDIT YMP-94-01 OF CIVILIAN RADIOACTIVE WASTE
MANAGEMENT SYSTEM MANAGEMENT AND OPERATING CONTRACTOR
(SCP: N/A)

The YMQAD staff has evaluated the amended response to CAR
YM-94-075. The amended response has been determined to be
satisfactory. Verification of completion of the corrective
action will be performed after the effective date provided.
Any extension to this date must be requested in writing, with
appropriate justification, prior to the date. Please send a
copy of extension requests to Deborah Sult, YMQAD/QATSS,
101 Convention Center Drive, Suite 640, Las Vegas, Nevada 89109.

If you have any questions, please contact either Robert B.
Constable at 794-7945 or John F. Pelletier at 794-7538.

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

YMQAD:RBC-308

Enclosure:
CAR YM-94-075

cc w/encl:
T. A. Wood, HQ (RW-14) FORS
~~G. Spraul~~, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
R. L. Robertson, M&O/TRW, Vienna, VA
R. P. Ruth, M&O/TRW, Las Vegas, NV
Richard Jiu, M&O/Duke, Las Vegas, NV

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

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RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.**

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CORRECTIVE ACTION REQUEST

1 Controlling Document OCRWM QARD DOE/RW-0333P, Revision 01	2 Related Report No. YMP-94-01
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3 Responsible Organization M&O	4 Discussed With P. Eastings/R. Saunders
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5 Requirement:
QARD DOE/RW-0333P, Section 3, "Design Control" states that design documents shall be adequate to support design, fabrication, construction, and operation; and also, that appropriate standards shall be identified and documented.
(Continued on next page)

6 Adverse Condition:
Determination of Importance Evaluation for Package 2C, DI#BAB000000-01717-2200-00005, Revision 00, approved 6/28/94, states that the following requirements have been identified as a result of this evaluation: standard TBM mining practices used for excavation of the TS North Ramp shall be controlled, to conduct these operations "...in such a manner as to limit adverse effects on the long-term performance of the geologic repository to the extent practical" (10CFR60.15(c)(1)). Such controls include qualification of those performing TBM operations, performance to required tunnel line and grade tolerances, and A/E acceptance of TBM tunnel line and grade excavation procedures. The term "standard mining practices" is referenced throughout the DIE and general specification DI#BAB000000-01717-6300-01501, Revision 00, without an adequate identification or definition of mining standards or quantifying acceptance and testing criteria to confirm that criteria of "standard mining practices" has been met.

9 Does a Significant Condition Adverse to Quality exist? Yes <u>X</u> No ___ If Yes, Check One: <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input checked="" 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	3 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:

7 Initiator John F. Pelletier <i>John F. Pelletier</i> 8/4/94	14 Issuance Approved by: QADD <i>AC [Signature]</i> Date 8/5/94
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15 Response Accepted QAR _____ Date _____	16 Response Accepted QADD _____ Date _____
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17 Amended Response Accepted QAR <i>John F. Pelletier</i> Date 10/12/94	18 Amended Response Accepted QADD <i>AC [Signature]</i> Date 10/18/94
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19 Corrective Actions Verified QAR _____ Date _____	20 Closure Approved by: QADD _____ Date _____
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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

5 Requirements (continued)

Further, that drawings, specifications, and other output documents shall contain appropriate inspection and testing criteria.

Partial Response to YM-94-075

Summary of CAR

The use of "standard mining practices" has not been appropriately interpreted into verifiable requirements in design specifications; "standard practices" have not been adequately defined.

Recommended Actions

None

Discussion

The intention of the Package 2C Determination of Importance Evaluation (DIE) is to apply some level of QA control to standard practices in order to clarify that "special processes" are not required in order to adequately limit potential adverse impacts. That is, conventional practices are adequate to limit potential impacts, based on the DIE analyst's understanding of the practices nominally applied in the course of the A/E's definition of excavation methods. Since "standard practices" are adequate, an appropriate level of QA control is needed to ensure that substandard practices are not used. To this end, specific minimum criteria associated with the conduct of these "standard practices" are specified in the DIE requirement (i.e., training of personnel, conformance to required line-and-grade tolerances, etc.).

The current DIE defines "standard practices" in terms of the A/E's specifications (i.e., codes and standards in the specification section). In the absence of explicit codes and standards or specific review criteria for assessing the adequacy of contractor's procedures, however, and since the specification simply parrots the DIE control (including that work shall be done in accordance with "standard practice"), the definition is never clearly made. This apparent inconsistency leads to confusion. Instead of defining specific codes and standards, the A/E will evaluate contractor's procedures against compliance with the requirements of the overall specification and the Q and non-Q requirements described therein. This semantic difference will still result in an acceptable practice, since the ultimate confidence in the process/practice is provided by "taking credit" for the skill and experience of the A/E in evaluating the adequacy of the contractor's procedures and methods.

The DIE requirement will be reworded to clarify this point. Any discussion of "standard practice" will be general in nature, and will be described in terms of the discussion above. The specification should then describe the specific QA criteria, and non-Q criteria associated with ensuring "standard practices" are employed. Any reference to "standard practice" in the DIE requirement(s) should not be parroted in the QA controls documented in the specification.

8/17/94 LV.SED.PSH.8/94-111

1. Corrective Action for CAR YM-94-075
(partial response limited to 2C Phase I "early release")

A. Remedial Action:

1. Revise 2C DIE and specification section 1501 appropriately to clarify requirements 1, 11, 13, and 23 based on discussion above in a manner acceptable to DIE and A/E representatives.

This revision will include:

for req't 1: revision of the discussion in section 10.6 of the DIE to clarify that standard mining practices are those involving the use of commercial-grade items and conventional practice as specified by the requirements of the A/E's specification;

revision of requirement 1 in the DIE to indicate that standard mining practices, as defined by the use of commercial-grade items and conventional practice as specified by the requirements of the A/E's specification, are acceptable subject to minimum QA requirements, which will be listed

for req't 11: clarification of requirement 11 to indicate that water use shall be minimized *as follows*, followed by the specific minimum criteria to be applied to water use

for req't 13: similar clarification as discussed in requirement 11 ^{10/24/94}

(Note: it is not believed, in the cases of requirements 11 and 13, that use of "to the extent practical" can be entirely avoided, in reference to clean-up of spills, or the requirements will be interpreted to apply to clean up of every spill in its entirety as a QA requirement, which is clearly not the intent of the impact evaluations (WIEs and TIEs) or of 10CFR60.15(c)(1). Specificity

for req't 23: the use of the term "standard mining practices" will be clarified consistent with the discussion under requirement 1.

In each case discussed above, specification section 1501 will be revised and reviewed to ensure these controls are applied appropriately, without simply "parroting" the DIE requirements.

(Note: the remedial actions associated with the balance of the 2C release, as well as other non-2C documents, will be provided in an amended response.)

B. Investigative Action/Extent of Deficiency:

Several DIE controls have been identified which could be potentially interpreted as ambiguous:

Req't 1: "Standard mining practices...[for TBM operation]"

Req't 4: "Standard mining practices...[for drill-and-blast excavation]"

Req't 6: "Standard mining practices...[for ground support emplacement]"

Req't 11: "Water use...shall be minimized...to the extent practical..."

Req't 13: "The use of...organics...shall be avoided when practical alternative materials and methods exist..."

Req't 14: "Use of diesel...shall be minimized to the extent practical..."

Req't 18: "Water shall be removed from Swellex rockbolts...to the extent practical within limits of the hydraulic water recovery system."

Req't 20: "The use of chloride shall be limited. Only non-chloride-based ground enhancing material shall be used, and use of chloride-based concrete and grout accelerators shall be limited to the extent practical..."

Req't 21: "Cementitious grouting pressures and quantities shall be limited to the extent practical..."

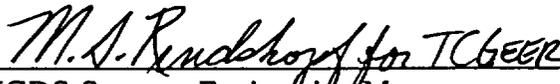
Req't 23: "Maintenance of the conveyor shall be performed...in accordance with standard mining practices."

Only requirements 1, 11, 13, and 23 will require resolution prior to release of Package 2C for Phase I TBM operation. These requirements all flow down to specification section 1501 (no drawings for 2C Phase I release), which may require revision as a result of any DIE control clarification. Revisions will be based on review of the DIE and 1501 by DIE staff and the A/E; the criteria for this evaluation and possible revisions will be the clarity of the control, the A/E's understanding of the control requirements, and the clarity of the resulting specification requirements/criteria.

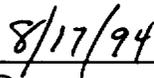
2. Responsible Parties/Schedule of Corrective Actions:

<u>Action</u>	<u>Responsible</u>	<u>Date</u>
Revise 2C DIE and specification section 1501 appropriately to clarify requirements 1, 11, 13, and 23 based on discussion above in a manner acceptable to DIE and A/E representatives.	Hastings Segrest	prior to Phase I release (no later than 30 Aug 94)

3. Response Approved:



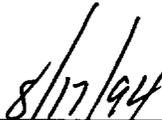
MGDS Systems Engineering Manager



Date



MGDS Development Manager



Date

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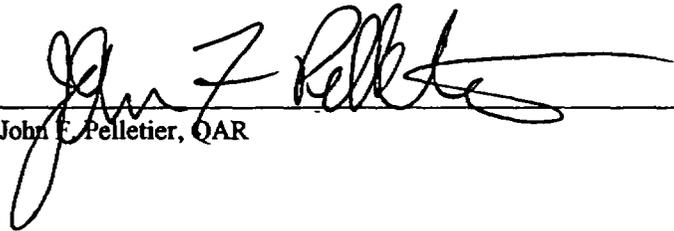
Verification of Partial Remedial Action for CAR YM-94-075

The following Remedial Action commitments associated with the 2C "Early Release" package were verified:

- a) Revise 2C DIE and specification section 1501 appropriately to clarify DIE requirements 1, 11, 13 and 23 based on discussion above in a manner acceptable to DIE and A/E representatives.

The YMQAD staff has reviewed the Determination of Importance Evaluation for ESF Package 2C, DI#BAB000000-01717-2200-00005, which was revised to Rev 2, and determined that the requirements were appropriately clarified. Also, a check was performed to see that the requirements taken from the DIE were appropriately interpreted and incorporated into the Subsurface General Construction specification 1501. The specification was revised and it was determined that some ambiguity of the requirements still existed in Specification 1501 section 3.01P and section 301S.2.e & d these concerns were noted on the OCRWM QAP 6.2 Document Review Record comments #20 and #21 dated 9/14/94. The comments were adequately addressed and shall be incorporated into the next revision of the 1501 specification prior to the release of the 2C package.

Note: As part of the next verification the actions associated with the QAP 6.2 comment incorporation shall be verified.


John F. Pelletier, QAR

9/20/94
Date

Amended Corrective Action Response for CAR YM-94-075

A. Remedial Action

Requirements 1, 11, 13, and 23 (DIE revision 00 numbering) were addressed in the early release portion in DIE revision 01. General Specification Section 01501 was reviewed to ensure these four requirements were successfully translated. To address the rest of the 2C design package, we (DIE/Hastings) will:

- 1) review all 2C DIE requirements for potential interpretation problems,
- 2) clarify the requirements where appropriate,
- 3) and review the design output documents to verify the requirements have been properly incorporated.

Revision 01 of the 2C DIE included a review of all 2C requirements and further clarification of the requirements. The clarifications included: definition of "standard mining practices," inclusion of examples of "extent practical," and combination of controls. Some controls were further enhanced in Revision 02 of the DIE as a result of the DIE group's participation in the interdiscipline review of General Specification Section 01501. Items 1 and 2 described above were completed on 9/7/94. Item 3 is an ongoing activity paralleling the design release of the design output documents. As a result of this CAR, all "Q" specifications and drawings will be reviewed to verify DIE requirements have been clarified sufficiently. The following design documents have been reviewed to support the phased releases of the 2C package to date:

BAB000000-01717-6300-01400 Construction Quality Control/Quality Assurance
Revision 02

BAB000000-01717-6300-01501 Subsurface General Construction
Revision 02

BABEAB000-01717-6300-02165 Rockbolts & Accessories
Revision 04

BABEAD000-01717-2100-40110 TS North Ramp Excavation Layout Profile -
Revision 01 Sheet 1 of 7

BABEAD000-01717-2100-40111 TS North Ramp, Excavation Layout, Profile -
Revision 01 Sheet 2 of 7

BABEAD000-01717-2100-40112 TS North Ramp, Excavation Layout, Profile -
Revision 01 Sheet 3 of 7

12/1/94 LV.SED.DWG. 10/94-129

BABEAD000-01717-2100-40113 Revision 01	TS North Ramp, Excavation Layout, Profile - Sheet 4 of 7
BABEAD000-01717-2100-40114 Revision 01	TS North Ramp, Excavation Layout, Profile - Sheet 5 of 7
BABEAD000-01717-2100-40115 Revision 01	TS North Ramp, Excavation Layout, Profile - Sheet 6 of 7
BABEAD000-01717-2100-40116 Revision 01	TS North Ramp, Excavation Layout, Profile - Sheet 7 of 7
BABEAD000-01717-2100-40120 Revision 01	TS North Ramp Excavation Layout, Plan - Sheet 1 of 10
BABEAD000-01717-2100-40121 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 2 of 10
BABEAD000-01717-2100-40122 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 3 of 10
BABEAD000-01717-2100-40123 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 4 of 10
BABEAD000-01717-2100-40124 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 5 of 10
BABEAD000-01717-2100-40125 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 6 of 10
BABEAD000-01717-2100-40126 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 7 of 10
BABEAD000-01717-2100-40127 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 8 of 10
BABEAD000-01717-2100-40128 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 9 of 10
BABEAD000-01717-2100-40129 Revision 01	TS North Ramp, Excavation Layout, Plan - Sheet 10 of 10
BABEAB000-01717-2100-40151 Revision 01	TS North Ramp Ground Support Master Elevation and Sections

BABEAB000-01717-2100-40152 Revision 01	TS North Ramp Ground Support - Category 1 Elevation and Section
BABEAB000-01717-2100-40153 Revision 01	TS North Ramp Ground Support - Category 2 Elevation and Section
BABEAB000-01717-2100-40154 Revision 01	TS North Ramp Ground Support - Category 3 Elevation and Section
BABEAB000-01717-2100-40155 Revision 01	TS North Ramp Ground Support - Category 4 Elevation and Sections
BABEAB000-01717-2100-40156 Revision 01	TS North Ramp Ground Support - Category 5 Elevation and Sections
BABEAB000-01717-2100-40157 Revision 01	TS North Ramp Rock Bolts & Accessories Details
BABEAB000-01717-2100-40161 Revision 01	TS North Ramp Alcoves Rockbolts & Shotcrete Sections
BABEAB000-01717-2100-40162 Revision 01	TS North Ramp Alcoves Rockbolts & Shotcrete Plan & Sections
BABEAB000-01717-2100-40163 Revision 01	TS North Ramp Alcove Rockbolts & Shotcrete Plan, Sections and Elev.

The review indicates that the applicable DIE requirements have been correctly incorporated and clarified sufficiently.

The remaining 2C "Q" drawings and specifications will be reviewed prior to their release to verify that the remaining DIE requirements have been properly translated. These "Q" drawings and specifications that will be reviewed include but are not limited to the following:

BABEAB000-01717-6300-02341	Steel Sets & Accessories, Subsurface
BABEAB000-01717-2100-41101	TS North Ramp Steel Sets & Lagging Elevation
BABEAB000-01717-2100-41102	TS North Ramp Steel Sets & Lagging Sections & Details
BABEAB000-01717-2100-41103	TS North Ramp Steel Sets & Lagging Sections & Details
BABFA0000-01717-2100-41111	TS North Ramp Piping Brackets Installation

BABFA0000-01717-2100-41121	TS North Ramp Cable Tray Supports Elev, Details, Sect
BABFA0000-01717-2100-41130	TS North Ramp, Ventilation Brackets, Elevations, Details
BABE00000-01717-6300-03362	Dry Process Shotcrete
BABE00000-01717-6300-03363	Wet Process Shotcrete
BABEAB000-01717-6300-03601	Tunnel Grouting
BABEAF000-01717-2100-40165	TS North Ramp, Contact RBT Test Alcove Blast Layout, Plan, Sections & Details
BABEAF000-01717-2100-40166	TS North Ramp, Bow Ridge Fault Alcove Blast Layout, Plan, Sections & Elevations
BABEAE000-01717-2100-40167	TS North Ramp, Elect Equip Blast Layout, Plan, Section & Elevation
BABEAE000-01717-2100-40168	TS North Ramp, Sump Alcove Blast Layout, Plan, Elevation & Section
BABEAE000-01717-2100-40169	TS North Ramp, Refuge Chamber Alcove Blast Layout, Plan, Section & Elevation
BABEAD000-01717-6300-02313	Subsurface Drilling and Blasting

Based on the findings of the 2C review, it has been decided that the approach applied to 2C will be used for all previously released DIES. The steps to accomplish to complete the remedial action are identified below:

1. Review all previously released DIES 12/31/94
2. Review design output documents for previously released DIES 12/31/94

These items are to be assigned to DIE/Hastings. Based on the results of these reviews, the applicable DIES and design output documents will be revised as appropriate. The schedule for any necessary revisions will be developed once items 1 and 2 are complete.

B. Investigative Action/Extent of Deficiency

Several controls that were included in the Revision 00 2C DIE were identified which could be potentially interpreted as ambiguous:

Requirement 1: "Standard mining practices..."

Requirement 4: "Standard mining practices..."

Requirement 6: "Standard mining practices..."

Requirement 11: "minimized ... to the extent practical..."

Requirement 13: "practical alternative means..."

Requirement 14: "minimized to the extent practical..."

Requirement 18: "...to the extent practical..."

Requirement 20: "...to the extent practical..."

Requirement 21: "...limited to the extent practical..."

Requirement 23: "...standard mining practices..."

In order to assure that all DIE requirements are unambiguous, all 2C DIE requirements were reviewed. Revisions 01 and 02 are the result of the requirement clarifications. As a result of the revisions, some DIE requirements were combined and renumbered. The verifications that the DIE requirements are properly presented is in the implementing specifications and drawings. The resulting remedial action addresses all previously released DIEs; therefore, no additional investigative action is required.

C. Root Cause Evaluation

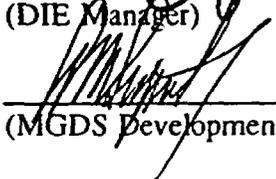
An evaluation based on review of the 2C package and a sample of other (i. e., previous) DIEs indicates that the root cause is due to a lack of communication between the DIE group and the Design group (QAP 16.1 Root Cause Category 3.f). See Section D for further discussion.

D. Corrective Action

The corrective action taken to this point is based on the root cause evaluation discussed above that concluded that there was a lack of communication between the DIE group and the design group. The steps taken to preclude recurrence are to require design interdiscipline reviews on all DIEs and DIE interdiscipline reviews on the "Q" design output documents. These interdiscipline reviews by both groups will improve the communication between the groups. They will allow design to seek clarification in the DIE for requirements before the DIE is approved. Similarly, it will allow the DIE group to review the allocation of DIE requirements and suggest further clarification as appropriate prior to the release of the design document.

Action	Responsible Individual	Due Date
1. Require Design ID reviews on DIEs	DIE/Hastings	10/30/94
2. Require DIE ID reviews on "Q" drawings and specifications	MGDS/Segrest	10/30/94

Response by:  _____ Date: 11 Oct 94
(DIE Manager)

Response by:  _____ Date: 10-11-94
(MGDS Development Manager)