



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

OCT 28 1996

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

**EVALUATION OF AMENDED RESPONSE AND VERIFICATION OF CORRECTIVE  
ACTION AND CLOSURE OF DR YM-96-D-092 RESULTING FROM YMQA  
SURVEILLANCE YMP-SR-96-022**

The Yucca Mountain Quality Assurance staff has reviewed the amended response and verified the corrective action to Deficiency Report (DR) YM-96-D-092 and determined the results to be satisfactory. As a result, the DR is considered closed.

If you have any questions, please contact either Mario R. Diaz at (702) 794-1489 or Daniel J. Tunney at (702) 794-1353.

*James B. Spence for*  
Richard E. Spence  
Yucca Mountain Quality Assurance

YMQA:MRD-0199

Enclosure:  
DR YM-96-D-092

cc w/encl:  
T. A. Wood, DOE/HQ (RW-14) FORS  
J. G. Spraul, NRC, Washington, DC  
S. W. Zimmerman, NWPO, Carson City, NV  
B. R. Justice, M&O, Las Vegas, NV  
Records Processing Center

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

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U.S. DEPARTMENT OF ENERGY  
WASHINGTON, D.C.

ORIGINAL  
THIS IS A RED STAMP  
Performance Report  
☒ Deficiency Report  
NO. YM-96-D-092  
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PERFORMANCE/DEFICIENCY REPORT

1 Controlling Document:

YMP/JP 95-1, Revision 1 and BAB000000-01717-2200-00146, Revision 01

2 Related Report No.

YMP-SR-96-022

3 Responsible Organization:

Civilian Radioactive Waste Management System  
Management and Operating Contractor

4 Discussed With:

A. G. Burningham, D. L. Edwards, A. J. Mitchell,  
P. S. Hastings

5 Requirement/Measurement Criteria:

- a. Determination of Importance Evaluation BAB000000-01717-2200-0146, "Evaluation," fourth paragraph, sixth sentence, states, in part, "However, the use of tetrafluoroethane will have negligible potential for impact on the waste isolation capability of the geologic repository or the conduct or results of other site characterization testing, for the following reasons: the JP states that concentration of this organic tracer will only be a trace amount (30 ppm +/- 10 ppm)..."
- b. Job Package YMP/JP 95-1, B.2.e.9 states, "Only SF<sub>6</sub> or SUVA-COLD MP (tetrafluoroethane) are approved for use as tracers in hydrochemistry tests and RBT; concentrations are limited to no more than 20 ppm and 30 ppm respectively with a target value of 1.5 ppm for SF<sub>6</sub> and 15 ppm for SUVA-COLD."

6 Description of Condition:

The limits on the use of tetrafluoroethane specified in job package YMP/JP 95-1 (target value of 15 ppm with no more than 30 ppm) conflict with those discussed in Determination of Importance Evaluation BAB000000-01717-2200-0146 (30 ppm +/- 10 ppm.)

7 Initiator

Daniel J. Tunney  
Daniel J. Tunney

Date 8/12/96

9 Is condition an isolated occurrence?

☐ Yes ☐ No ☒ Unknown; Must be Yes if PR

10 Recommended Action: (Not required for PR)

- a. Determine the correct limitations for use of tetrafluoroethane, and revise the Job Package and/or Determination of Importance to be consistent in the specification of the limitations.
- b. Evaluate whether similar conflicts exist, identify any similar deficiencies, and correct these.
- c. Evaluate whether the deficient condition has an impact on any work performed and if affected, take appropriate corrective measures.

11 QA Review:

QAR

Daniel J. Tunney

Date 8/12/96

12 Response Due Date

20 Working Days From Issuance

13 Affected Organization QA manager Issuance Approval: (QAR for PR)

Printed Name RESPECTIVE

Signature

Robert R. Gunkle

Date 8/14/96

22 Corrective Action Verified

QAR

Daniel J. Tunney

Date 10/22/96

23 Closure Approved by: (N/A for PR)

AOQAM

James Blaylock

Date 10/22/96

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PERFORMANCE/DEFICIENCY REPORT RESPONSE

14 Remedial Actions:

Review has determined that no deficiency exists; therefore, no remedial actions are required. See Continuation Pages (following) for supporting information.

15 Extent of Condition: (Not required for PR)

No deficiency exists; therefore no description of "extent of condition" is required.

16 Root Cause Determination: (Not required for PR)

Required

☐

Yes

☒

No

Review has determined that no deficiency exists; therefore, no root cause determination is required.

17 Action to Preclude Recurrence: (Not required for PR)

Required

☐

Yes

☒

No

No deficiency exists; therefore no actions to preclude recurrence is required. Note, however, that the discussion of planned tracer concentration will be amended if/when the subject DIE is revised for other reasons.

18 Corrective Action Completion Due Date:

N/A

19 Response by:

☒ Initial

☐ Amended

Date

Phone

20 Response Accepted

QAR

Date

21 Response Accepted (N/A for PR):

AOQAM

Date

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Draft Job Package JP-95-1 (as attached to "Request to Review TPP 92-13 and JP 95-1," Mitchell to Distribution, July 31, 1995, indicated as Reference 1 in the subject DIE) indicated tracer use at 30+10 ppm of SUVA-COLD MP (tetrafluoroethane). The subject DIE states:

"Tracer gases (SF6 or tetrafluoroethane) are typically added to compressed air to avoid interference, during test configuration and setup, with the test(s) being fielded, based on PI-TCO coordination...As radial borehole drilling essentially comprises configuration of the radial borehole tests, the use of tracer is considered as part of protecting the validity/veracity of the test(s) being fielded, and as such is the responsibility of the PI(s) and outside the scope of this DIE...[T]he use of tetrafluoroethane will have negligible potential for impact on the waste isolation capability of the geologic repository or on the conduct or results of other site characterization testing, for the following reasons: the JP states that the concentration of this organic tracer will only be a trace amount (30 ppm  $\pm$  10 ppm); the tracer is gaseous; its use has been previously evaluated and approved for use (with no specific DIE-generated QA controls) in Surface-Based Testing drilling applications, and its use in radial boreholes in the subsurface ESF is sufficiently similar so as to be bounded by that evaluation; and only a limited number of radial boreholes are expected to be drilled."

In part on the basis of the discussion above, no controls were established on the use of tracer gas and, therefore, no DIE requirement or limit exists to be violated.

Revision 1 of JP 95-1 contains applicable DIE requirements and changes the SUVA-COLD concentration to a maximum of 30 ppm with a target concentration of 15 ppm, based on testing requirements. (Note that this limit is actually more conservative with regard to any potential impact than the value assumed in the DIE.)

It is the responsibility of the JP author to use the applicable inputs and ensure that they are adequate for use as input. The fact that the tracer concentrations discussed in the subject DIE are different from those in the final JP does not constitute a deficiency, based on the conclusion in the DIE that use of trace amounts in this application does not constitute an impact. Adjustment to trace amounts of such material therefore does not appreciably alter the assumptions or conclusions made in the DIE.

As part of this investigation, the subject DIE was reviewed, and the assumptions and conclusions therein were verified to be adequate. JP 95-1 was also verified to contain the applicable DIE controls. The variance in the planned tracer concentration (as compared against the originally assumed concentration) is not considered significant.

As a result of our investigation, and as indicated in Block 17, we have concluded that a deficient condition does not exist; therefore, no actions to preclude recurrence are required. As information, the discussion of planned tracer concentration will be amended if/when the subject DIE is revised for other reasons.

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PR/DR CONTINUATION PAGE

Subject: Response to Deficiency Report (DR)YM-96-D-092

Reference: Letter LV.SED.RFW.09/96-092, Dated September 10, 1996, L. D. Foust to D. Sult

The CRWMS M&O response to the subject Deficiency Report indicates that the stated condition is not a deficiency and requests that the DR be voided. The Yucca Mountain Quality Assurance Division has evaluated and rejected the response. Specific reasons for rejection are as follows:

1. The explanation provided is inadequate. The response indicates that Draft Job Package JP 95-1 was used as a basis for developing the Determination of Importance Evaluation (DIE). The response does not provide an adequate explanation of why information from the approved job package was not incorporated. Revision 1 of this Job Package had an effective date of November 10, 1995 and was placed under controlled distribution on this same date. The preparation, review, check, and approval dates on the DIE Cover Sheet came after the Job Package was effective; these range in date from November 20, 1995, through November 30, 1995. At the time the DIE was developed, NLP-2-0, Revision 1, Paragraph 5.2.3 and Attachment V required the checker to verify that the best available input data are used, referenced appropriately, and are consistent with the referenced data source. The response should acknowledge the described condition as a deficiency which resulted from not using or checking the evaluation against the best available data.
2. The response should state whether similar conditions exists within this DIE or in other DIEs; and identify any similar conditions and any actions which will be taken to correct these. If the extent of condition warrants a root cause determination and action to preclude recurrence, this should be provided also.
3. All statements which indicate that no deficiency exists should be removed from the response. Blocks 14 through 17 of the DR and the last paragraph on the continuation page should be revised to remove this statement. New justification should be provided in Blocks 16 and 17 if a root cause determination or a action to preclude recurrence is not specified.
4. The notes (see Block 17 of the last paragraph of the continuation page) which indicate that the discussion of planned tracer concentration will be amended if/when the subject DIE is revised for other reasons should be removed. Either indicate that the DIE will be revised and a provide specific completion date or provide justification why it is not required to be revised. Further, it is not appropriate to discuss this in the Action to Preclude Recurrence block.
5. A corrective action completion date should be provided in Block 18.
6. Block 19 should include the signature, date and phone number of the responsible manager.

Daniel J. Tunney  
Daniel J. Tunney, QAR

9/24/96  
Date

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**PERFORMANCE/DEFICIENCY REPORT RESPONSE**

**14 Remedial Actions:**

As cited in Block 6 above, the Evaluation Section of DIE for Hydrochemistry and Radial Borehole Tests in the ESF, BAB000000-01717-2200-00146 was changed during Revision 01 (i.e., to make editorial clarifications), but the reference document (YMP/JP95-1 Revision 1) which supports portions of this section, was not updated to its current revision level in the Reference Section of the DIE. As such, the use of "best available data" as required by M&O procedure NLP-2-0 Paragraph 5.1A was not documented in Revision 01 to this DIE. This DIE was subsequently revised on 09/13/96 (i.e., to Revision 02) for other reasons, and was changed at that time to incorporate the current revision level of JP 95-1. This DIE revision satisfies the remedial actions required for this problem, based on the conclusion that there was no impact associated with this DIE processing error. Revision 0 of the DIE concluded that the use of tracer gas resulted in no waste isolation or test interference impact based on the fact that such use is at trace concentrations, and is insensitive to the specific concentration. (continued on continuation page)

**15 Extent of Condition: (Not required for PR)**

NLP-2-0 requires an annual review of all DIEs to evaluate the impact of subsequent revisions to all DIE references. The purpose of this review is to evaluate changes to references that may impact the results or conclusions of DIEs, but this review is also expected to alleviate the types of concerns as documented by this DR. The most recent annual reviews were conducted on 10/07/96, and as of this date, all DIEs with annual-review-required dates prior to January of 1997 have been reviewed. In addition, as a result of investigation associated with this DR, all Category III DIEs prepared/revised since the completion of the annual review have been reviewed again. The result of these reviews is a conclusion that this error was an isolated occurrence. (Continued on continuation page)

**16 Root Cause Determination: (Not required for PR)**

Required ☐ Yes ☒ No

The problem identified in Block 6 is an isolated occurrence: therefore, no root cause determination is required.

**17 Action to Preclude Recurrence: (Not required for PR)**

Required ☐ Yes ☒ No

The problem identified in Block 6 is an isolated occurrence: therefore, no action to prevent recurrence is

**18 Corrective Action Completion Due Date:**

10/14/96

**19 Response by:**

☐ Initial  
☒ Amended

Date 10-14-96

Phone

**20 Response Accepted**

QAR Daniel J. [Signature]

Date 10/15/96

**21 Response Accepted (N/A for PR):**

AOQAM [Signature]

Date 10/28/96

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14. Remedial Actions: (continuation)

So, a reduction in tracer gas concentration in Revision 1 of JP 95-1 is clearly bounded by the conclusions of Revision-0 of the DIE.

15. Extent of Condition: (continuation)

As additional corroboration, it should also be noted that the DIE group is a mandatory in-process reviewer of all output documents which use the DIE as an input. As such, any potential variation from a specified DIE requirement is evaluated during the in-process review. Since DIE requirements are derived from preliminary information which is supplied by the preparers of these output documents, changes of information in the output document from the information in the DIE must be determined to be bounded by the conclusions of the existing DIE.

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**Verification of Deficiency Report YM-96-D-092**

**Verification of Remedial Actions:** Verified that the Evaluation Section of Determination of Importance Evaluation BAB000000-01717-2200-00146 was changed during revision 02 (Approved 9/13/96) removed the conflict with Job Package YMP/JP 95-1, Revision 1.

**Verification of Extent of Condition:** Verified that annual reviews were conducted for all DIES with annual-review required dates prior to January of 1997. Evidence reviewed: Verified that all category III DIES prepared/revised since the completion of the annual review have been reviewed again. Evidence of the above review is provided in the Electronic Mail Norman Bartley to Peter Hastings dated 9/19/96. Verified that annual reviews were completed for the following Determination of Importance Evaluations:

B00000000-01717-2200-00123, Rev. 00, Review Completed 6/19/96  
BA000000-01717-2200-00006, Rev. 00, Review Completed 6/10/96  
BAA00000-01717-2200-00008, Rev. 00, Review Completed 3/6/96  
BAA00000-01717-2200-00097, Rev. 00, Review Completed 3/6/96  
BAA00000-01717-2200-00098, Rev. 01, Review Completed 3/6/96  
BAA00000-01717-2200-00099, Rev. 00, Review Completed 3/6/96  
BAA00000-01717-2200-00100, Rev. 00, Review Completed 10/7/96  
BAAA0000-01717-2200-00093, Rev. 00, Review Completed 3/6/96  
BAAAA0000-01717-2200-00002, Rev. 00, Review Completed 3/6/96  
BAAAB0000-01717-2200-00002, Rev. 01, Review Completed 3/6/96  
BAAAC0000-01717-2200-00001, Rev. 00, Review Completed 3/6/96  
BAAAC0000-01717-2200-00002, Rev. 00, Review Completed 3/6/96  
BAAAC0000-01717-2200-00003, Rev. 00, Review Completed 3/6/96  
BAAAC0000-01717-2200-00004, Rev. 00, Review Completed 3/6/96  
BAAAC0000-01717-2200-00005, Rev. 00, Review Completed 6/19/96  
BAAAC0000-01717-2200-00006, Rev. 00, Review Completed 3/6/96  
BAAAC0000-01717-2200-00007, Rev. 00, Review Completed 3/6/96  
BAAAD0000-01717-2200-00001, Rev. 00, Review Completed 4/29/96  
BAAAD0000-01717-2200-00004, Rev. 01, Review Completed 3/6/96  
BAAAD0000-01717-2200-00005, Rev. 02, Review Completed 6/17/96  
BAAAD0000-01717-2200-00006, Rev. 00, Review Completed 4/29/96  
BAAAD0000-01717-2200-00007, Rev. 00, Review Completed 6/19/96  
BAAAD0000-01717-2200-00008, Rev. 02, Review Completed 3/6/96  
BAAAD0000-01717-2200-00010, Rev. 01, Review Completed 3/6/96  
BAAAE0000-01717-2200-00002, Rev. 00, Review Completed 3/6/96  
BAAAE0000-01717-2200-00003, Rev. 00, Review Completed 3/6/96  
BAAAE0000-01717-2200-00004, Rev. 00, Review Completed 3/6/96  
BAAAF0000-01717-2200-00001, Rev. 01, Review Completed 3/6/96  
BAAAF0000-01717-2200-00004, Rev. 01, Review Completed 3/6/96  
BAAAF0000-01717-2200-00007, Rev. 00, Review Completed 3/6/96  
BAB000000-01717-2200-00005, Rev. 05, Review Completed 3/6/96  
BAB000000-01717-2200-00020, Rev. 00, Review Completed 3/6/96



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Verification of Deficiency Report YM-96-D-092 (continued)

BAB000000-01717-2200-00098, Rev. 00, Review Completed 3/6/96  
BAB000000-01717-2200-00108, Rev. 01, Review Completed 4/22/96  
BAB000000-01717-2200-00109, Rev. 01, Review Completed 3/6/96  
BAB000000-01717-2200-00110, Rev. 01, Review Completed 3/6/96  
BAB000000-01717-2200-00112, Rev. 01, Review Completed 3/6/96  
BAB000000-01717-2200-00146, Rev. 01, Review Completed 3/6/96  
BAB000000-01717-2200-00147, Rev. 00, Review Completed 3/6/96  
BABBD000-01717-2200-00029, Rev. 00, Review Completed 10/7/96  
BABEAF000-01717-2200-00002, Rev. 00, Review Completed 3/6/96  
BABEAF000-01717-2200-00003, Rev. 00, Review Completed 3/6/96

The actions taken are satisfactory.

Daniel J. Turner    10/22/96  
QA Representative    Date