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

APR 1 0 1995

L. Dale 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

VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF CORRECTIVE ACTION REQUEST (CAR) YM-94-066 RESULTING FROM YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION'S (YMQAD) AUDIT YMP-94-01 OF THE CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND OPERATING CONTRACTOR (SCPB: N/A)

The YMQAD staff has verified the corrective action to CAR YM-94-066 and determined the results to be satisfactory. As a result, the CAR is considered closed.

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

Richard E. Spence, Director
Yucca Mountain Quality Assurance Division

YMQAD:RBC-2804

Enclosure:
CAR YM-94-066

cc w/encl:
T. A. Wood, HQ (RW-14) FORS
J. G. Spraul, NRC, Washington, DC
S. W. Zimmerman, NWPO, Carson City, NV
R. L. Robertson, M&O, Vienna, VA
Richard Jiu, M&O, Las Vegas, NV
R. P. Ruth, M&O, 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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YMP-5

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WM-11 PDR

ORIGINAL
THIS IS A RED STAMP

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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

3 Responsible Organization
M&O

4 Discussed With
C. Statton/E. Distel

5 Requirement:

NLP-3-16, Revision 0, Paragraph 5.2.2 requires TIE reviews in accordance with the TIE Attachment II. Attachment II, Item 8 requires applicability and completeness of stated limitations of the technical work. Paragraph 5.3.2 requires the Site Characterization Manager to examine the TIE to determine that it conforms to requirements,...that the TIE, WIE and DIE preparers worked together to resolve any discrepancies with waste isolation and determination

6 Adverse Condition:

TIE for the Tunnel Boring Machine (TBM) Operation, Utilities Installation and Support for TBM Operation for Construction of the North Ramp of the Exploratory Studies Facility-Design Package 2C DI#BAB000000-01717-2200-00001, dated 6/24/94, Page 22 of the TIE states that "As long as the controls identified in this test interference evaluation are adhered to, either no construction to test, installation to test, and operation to test results are expected, or interference can be adequately identified in test results for those tests planned within the conceptual repository parameter drift boundary." Not all of the controls identified in the TIE have been incorporated into the DIE. No evaluation has been performed to determine the test interference impacts resulting from not adhering to the controls specified.

9 Does a Significant Condition Adverse to Quality exist? Yes___ No X
If Yes, Check One: ☐A ☐B ☐C ☐D ☐E

10 Does a stop work condition exist? Yes___ No X ; If Yes - Attach copy of SWO
If Yes, Check One: ☐A ☐B ☐C

3 Response Due Date: 20 Working Days From Issuance

11 Required Actions: ☒ Remedial ☒ Extent of Deficiency ☒ Preclude Recurrence ☐ Root Cause Determination

12 Recommended Actions:

7 Initiator Robert L. Howard [signature] 8/3/94	14 Issuance Approved by: QADD [signature] for Date 8.5.94
15 Response Accepted QAR [signature] Date 8/19/94	16 Response Accepted QADD [signature] for Date 8.24.94
17 Amended Response Accepted QAR [signature] Date 11/3/94	18 Amended Response Accepted QADD [signature] Date 11/3/94
19 Corrective Actions Verified QAR [signature] Date 4/5/95	20 Closure Approved by: QADD [signature] for Date 4.6.95

Exhibit QAP-16.1.1

ENCLOSURE

REV. 06/27/94

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

5 Requirements (continued)

of importance evaluations of the same or similar activities, items, and facilities, including TFM use.

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WASHINGTON, D.C.

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Corrective Action Report YM-94-066:

Remedial Action:

Background. This Corrective Action Report was written because some recommended Test Interference controls for Package 2C were not incorporated into the Determination of Importance QA requirements. As NLP-3-16 states the Site Characterization Manager shall determine that TIE, WIE and DIE preparers worked together to resolve any discrepancies, one might assume that all TIE recommended controls would be incorporated into DIE QA requirements. This, however, is not required to mitigate the potential for undetected test interference.

The purpose of a Test Interference Evaluation is (1) to examine testing, construction, and operational activities with respect to their potential to cause test interference and (2) recommend controls that either (a) mitigate the potential for test interference or (b) allow test interference to be identified if it occurs. The recommended controls in TIEs do not ensure that test interference will be avoided, but rather represent ways in which the possibility of undetected test interference can be lowered. As test interference is not the only concern in carrying out site characterization (other concerns are practicality, constructibility, cost-effectiveness), it is not unexpected that some recommended controls will not be implemented as QA requirements.

To address the issue of recommended TIE controls that are not adopted as QA requirements in the DIE, the following remedial action will be taken: For controls not implemented as QA requirements in the DIE, a qualified TIE preparer will review the potential impact of the unimplemented controls and, if deemed necessary, notify potentially affected testing organizations. Specifically:

(a) For those controls recommended in the TIE for Package 2C that were not implemented by the DIE, review the impact of the unimplemented controls and, if deemed necessary, notify potentially affected testing organizations in writing. The review of impacts will be documented in a memorandum to file. (Biggar, to be completed by 26 August 1994).

(b) Compare the TIE for the Procurement of Materials for the Surface and Subsurface Conveyor Belt System with the Package 2C DIE to determine if any recommended controls were excluded. If any recommended controls were not implemented, review their impact and, if deemed necessary, notify potentially affected testing organizations in writing. The review of impacts, if required, will be documented in a memorandum to file. (Biggar, to be completed by 26 August 1994)

(c) Examine other DIEs to determine whether all TIE recommended controls were implemented. Document the results of the examination in a memorandum to file. For any recommended controls that were not implemented by the DIE, review their impacts and, if deemed necessary, notify potentially affected testing organizations in writing. The review of impacts, when required, will be documented in a memorandum to file. (Biggar, to be completed 30 October 1994).

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Extent of the Deficiency:

(a) For the Test Interference Evaluation (TIE) for TBM Operation, Utilities Installation, and Support for TBM Operation for Construction of the North Ramp of the Exploratory Studies Facility (M&O Design Package 2C), six recommended controls were not implemented by the DIE. The test interference impact of excluding these six recommended controls is provided below:

Recommended Control: Section III,B - Activity-Specific Controls, Part 6

"Provide means for visual inspection and/or electrical sensors beneath the pre-cast invert sections to detect water and/or other fluids which may collect in various intervals of the tunnel bottom, to allow potential ponding to be mitigated to the extent practical".

Exclusion of this recommended control will not have a test interference impact because of the following design parameters:

1. The pre-cast invert segments will have visual inspection ports in various sections of the North Ramp interval or such inspection ports can be drilled, if required.

2. Periodic visual inspections can be carried out through visual inspection ports as part of tunnel support operations.

Recommended Control: Section III, A - Higher-Level Requirements-Derived Controls, Part 1

"Critical communications and data circuits shall be protected or shielded from electromagnetic interference from sources within the ESF, and from external sources to the extent specified by manufacturers of sensitive data processing and communications equipment used in the system. (ESFDR 3.2.1.15, Part A)"

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF. More specifically:

1. The Test Coordination Office for the ESF Program has identified that testing equipment can be relocated should measurements of electromagnetic fields indicate that interference could occur.

2. The Testing Organizations have requested that any determination of electromagnetic disturbance be done by designated scientists involved in the ESF Program.

This evaluation also applies to the excluded recommended control in TIE Section III, C.2.d.

Recommended Control Section III.B - Activity Specific Controls, Part 3

"Monitor dust suppression water applied at the conveyor transfer points to prevent excess water from overflowing the conveyor belt and spilling onto the tunnel floor".

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Exclusion of this recommended control will not impact test interference because of the design of the conveyor system transfer chutes and water metering at the spray heads.

Recommended Control Section III.B - Activity Specific Controls, Part 4

"Any perched water samples collected from inflow into the North Ramp tunnel shall be also evaluated for possible drilling polymer content, drilling mud contamination, and tracer presence".

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF.

Recommended Control Section III.B - Activity Specific Controls, Part 5

"Means shall be provided for disposal of oil/water contamination that are removed from compressed air".

As pointed out in the DIE, this excluded control will not impact test interference because of the stipulated design controls for the Wastewater Removal System.

(b) For the Test Interference Evaluation (TIE) for Procurement of Materials for the Surface and Subsurface Conveyor Belt System, one recommended controls was not implemented by the DIE. The test interference impact of excluding this recommended control is provided below:

Recommended Control Section III, Part 6

"Procurement of the spray headers of the dust control and suppression system shall ensure a calibrated method of measuring water usage. The calibrated method is intended to check, standardize, and systematically adjust measurements made by the flow meter".

As pointed out in the DIE, this excluded control will not impact test interference because the water used to suppress dust in the conveyor system will be carried out with the muck.

(c) The extent of the deficiency with respect to other DIE/TIEs will be identified in the remedial action undertaken under (c), described above.

Preclude Recurrence:

Revise NLP-3-16 to add an additional step in which DIEs are examined to determine which TIE recommended controls were implemented as QA requirements. For those controls that are not implemented by the DIE, review their impact and, if deemed necessary, notify affected testing organizations. In addition, revise NLP-3-16 to require that recommended controls be described in terms of potential test interference impacts and to require that quantitative or qualitative bases for the recommended controls be provided. (Biggar, to be completed by November 30, 1994).

CTStatton
Responsible Manager, C. Thomas Statton

17 August 94
Date

MEMORANDUM TO FILE

To: File Date: 26 August, 1994

From: Norma Biggar

Subject: Review of Impacts caused by Deficiency Identified in CAR YM-94-066

This Memorandum to File addresses two of the three remedial action items identified in response to Corrective Action Report (CAR) No. YM-94-066.

Background. The Corrective Action Report was written because some recommended Test Interference controls for Package 2C were not incorporated into the Determination of Importance QA requirements. As NLP-3-16 states that the Site Characterization Manager shall determine that TIE, WIE and DIE preparers worked together to resolve any discrepancies, one might assume that all TIE recommended controls would be incorporated into DIE QA requirements. This, however, is not required to mitigate the potential for undetected test interference.

The purpose of a Test Interference Evaluation is (1) to examine testing, construction, and operational activities with respect to their potential to cause test interference and (2) to recommend controls that either (a) mitigate the potential for test interference or (b) allow test interference to be identified if it occurs. The recommended controls in TIEs do not ensure that test interference will be avoided, but rather represent ways in which the possibility of undetected test interference can be lowered. As test interference is not the only concern in carrying out site characterization (other concerns are practicality, constructibility, cost-effectiveness), it is not unexpected that some recommended controls will not be implemented as QA requirements.

To address the issue of recommended TIE controls that are not adopted as QA requirements in the DIE, it was agreed with YMQAD that the following remedial actions were to be taken: For controls not implemented as QA requirements in the DIE, a qualified TIE preparer will review the potential impact of the unimplemented controls and, if deemed necessary, notify potentially affected testing organizations. Two of the three specific actions that were identified are:

(a) For those controls recommended in the TIE for Package 2C that were not implemented by the DIE, review the impact of the unimplemented controls and, if deemed necessary, notify potentially affected testing organizations in writing.

(b) Compare the TIE for the Procurement of Materials for the Surface and Subsurface Conveyor Belt System with the Package 2C DIE to determine if any recommended

controls were excluded. If any recommended controls were not implemented, review their impact and, if deemed necessary, notify potentially affected testing organizations in writing.

The results of these reviews are reported below:

A. Review of TIE for Package 2C

For the Test Interference Evaluation (TIE) for TBM Operation, Utilities Installation, and Support for TBM Operation for Construction of the North Ramp of the Exploratory Studies Facility (M&O Design Package 2C), six recommended controls were not implemented by the DIE. The test interference impact of excluding these six recommended controls is provided below:

1. Recommended Control: Section III,B - Activity-Specific Controls, Part 6

   "Provide means for visual inspection and/or electrical sensors beneath the pre-cast invert sections to detect water and/or other fluids which may collect in various intervals of the tunnel bottom, to allow potential ponding to be mitigated to the extent practical".

   Exclusion of this recommended control will not have a test interference impact because of the following design parameters:

   - The pre-cast invert segments will have visual inspection ports in various sections of the North Ramp interval or such inspection ports can be drilled, if required.
   - Periodic visual inspections can be carried out through visual inspection ports as part of tunnel support operations.

2. Recommended Control: Section III, A - Higher-Level Requirements-Derived Controls, Part 1

   "Critical communications and data circuits shall be protected or shielded from electromagnetic interference from sources within the ESF, and from external sources to the extent specified by manufacturers of sensitive data processing and communications equipment used in the system. (ESFDR 3.2.1.15, Part A)"

   Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF. More specifically:

- The Test Coordination Office for the ESF Program has identified that testing equipment can be relocated should measurements of electromagnetic fields indicate that interference could occur.

- The Testing Organizations have requested that any determination of electromagnetic disturbance be done by designated scientists involved in the ESF Program.

3. The above evaluation also applies to the excluded recommended control in TIE Section III, C.2.d.

4. Recommended Control Section III.B - Activity Specific Controls, Part 3

   "Monitor dust suppression water applied at the conveyor transfer points to prevent excess water from overflowing the conveyor belt and spilling onto the tunnel floor".

   Exclusion of this recommended control will not impact test interference because of the design of the conveyor system transfer chutes and water metering at the spray heads.

5. Recommended Control Section III.B - Activity Specific Controls, Part 4

   "Any perched water samples collected from inflow into the North Ramp tunnel shall be also evaluated for possible drilling polymer content, drilling mud contamination, and tracer presence".

   Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF.

6. Recommended Control Section III.B - Activity Specific Controls, Part 5

   "Means shall be provided for disposal of oil/water contamination that are removed from compressed air".

   As pointed out in the DIE, this excluded control will not impact test interference because of the stipulated design controls for the Wastewater Removal System.

B. Review of TIE for the Procurement of Materials for the Conveyor Belt System

For the Test Interference Evaluation (TIE) for Procurement of Materials for the Surface and Subsurface Conveyor Belt System, one recommended controls was not implemented by the DIE. The test interference impact of excluding this recommended control is provided below:

1. Recommended Control Section III, Part 6

"Procurement of the spray headers of the dust control and suppression system shall ensure a calibrated method of measuring water usage. The calibrated method is intended to check, standardize, and systematically adjust measurements made by the flow meter".

As pointed out in the DIE, this excluded control will not impact test interference because the water used to suppress dust in the conveyor system will be carried out with the muck.

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Verification of Partial Remedial Action for CAR YM-94-066

The following two remedial action commitments are applicable to Release of Package 2C:

a)"for those controls recommended in the TIE for package 2C that were not implemented by the DIE, review the impact of the unimplemented controls and, if deemed necessary, notify potentially affected testing organizations in writing."

b)"Compare the TIE for the Procurement of Materials for the surface and Subsurface Conveyor Belt System with Package 2C DIE to determine if any recommended controls were excluded. If any recommended controls were not implemented, review their impact and, if deemed necessary, notify potentially affected testing organization in writing."

YMQAD staff has reviewed the memorandum from Norma Biggar to File dated August 26, 1994 "Review of Impacts caused by Deficiency identified in CAR YM-94-066" The memo identifies those requirements identified in the TIE for Package 2C and the TIE for the Procurement of Materials for the Surface and Subsurface conveyor Belt System not implemented by the DIE for Package 2C. The evaluation concluded that no impacts to test interference resulted in not implementing the proposed controls. The evaluation is consistent with the evaluation documented formally in the CAR Response under "Extent of Deficiency". Since no impacts were identified, there was no need to identify the testing This is considered satisfactory for completion of remedial actions 1a and 1b to extent of deficiency.

Robert L. Howard

Robert L. Howard

9/20/94

Date

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Corrective Action Report YM-94-066:

[NOTE: Funding for test interference work has shifted from WBS 1.2.3 (Scientific Program Integration) to WBS 1.2.5 (Regulatory and Technical Evaluation).]

Remedial Action:

A qualified Test Interference Evaluation (TIE) reviewer will identify TIE recommendations not implemented in affected Determination of Importance Evaluations (DIEs) and evaluate the potential impact. Testing organizations will be notified in writing if any controls not implemented may impact or bias required site characterization tests:

(1) in an undetected or unpredictable way.

(2) that cannot be practically repeated with the expectation of collecting the required test results.

The results of these investigations will be documented in memoranda to file for the following items:

(a) TIE and DIE for Design Package 2C. (Biggar, completed August 26, 1994)

(b) TIE for procurement of materials for the surface and subsurface conveyor belt system with the Design Package 2C DIE (Biggar, completed August 26, 1994)

(c) All other previous TIEs and DIEs. (Biggar, to be completed by December 31, 1994)

Extent of the Deficiency:

(a) For the TIE for TBM operation, utilities installation, and support for TBM operation for construction of the North Ramp of the Exploratory Studies Facility (ESF) (M&O Design Package 2C), six recommended controls were not implemented by the DIE. The test interference impact of excluding these controls is provided below:

Recommended Control: Section III, B - Activity-Specific Controls, Part 6

"Provide means for visual inspection and/or electrical sensors beneath the pre-cast invert sections to detect water and/or other fluids which may collect in various intervals of the tunnel bottom, to allow potential ponding to be mitigated to the extent practical".

Exclusion of this recommendation control will not have a test interference impact because of the following design parameters:

1. The pre-cast invert segments will have visual inspection ports in various section of the North Ramp or such inspection ports can be drilled, if required.

2. Periodic visual inspections can be carried out through visual inspection ports as part of tunnel support operations.

Recommended Control: Section III, A - Higher-Level Requirements-Derived Controls, Part 1

"Critical communications and data circuits shall be protected or shielded from electromagnetic interference from sources within the ESF, and from external sources to the extent specified by manufacturers of sensitive data processing and communications equipment used in the system. (ESFDR 3.2.1.15, Part A)"

10/27/94 RV. RTE. JLY. 10/94-153

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF. More specifically:

1. The Test Coordination Office for the ESF Program has identified that testing equipment can be relocated should measurements of electromagnetic fields indicate that interference could occur.

2. The Testing Organizations have requested that any determination of electromagnetic disturbance be done by designated scientists involved in the ESF Program.

This evaluation also applies to the excluded recommended control in TIE Section III, C.2.d.

Recommended Control: Section III, B - Activity-Specific Controls, Part 3

"Monitor dust suppression water applied at the conveyor transfer points to prevent excess water from overflowing the conveyor belt and spilling onto the tunnel floor".

Exclusion of this recommendation control will not impact test interference because of the design of the conveyor system transfer chutes and water metering at the spray heads.

Recommended Control: Section III, B - Activity-Specific Controls, Part 4

"Any perched water samples collected from inflow into the North Ramp tunnel shall be evaluated for possible drilling polymer content, drilling mud contamination, and tracer presence".

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF.

Recommended Control: Section III, B - Activity-Specific Controls, Part 5

"Means shall be provided for disposal of oil/water contamination that are removed from compressed air".

As pointed out in the DIE, this excluded control will not impact test interference because of the stipulated design controls for the Wastewater Removal System.

(b) For the TIE for procurement of materials for the surface and subsurface conveyor belt system, one recommended control was not implemented by the DIE. The test interference impact of excluding this recommended control is provided below:

Recommended Control Section III, Part 6

"Procurement of the spray headers of the dust control and suppression system shall ensure a calibrated method of measuring water usage. The calibrated method is intended to check, standardize, and systematically adjust measurements made by the flow meter".

As pointed out in the DIE, this excluded control will not impact test interference because water used to suppress dust in the conveyor system will be carried out with the muck.

(c) The extent of deficiency with respect to other DIE/TIEs will be identified in the remedial action undertaken under (c) described above.

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Preclude Recurrence:

NLP-3-16 (Development of Test Interference Evaluations (TIE)) will be revised as part of a procedure roll-up with the Waste Isolation Evaluations (WIE) line procedure (NLP-3-17) into a revised Determination of Importance Evaluations (DIE) line procedure (NLP-2-0). Under the revised DIE line procedure, waste isolation and test interference information will be incorporated as sections of the DIE rather than separate input documents. The revised DIE line procedure will require that DIEs containing test interference input will be reviewed by qualified individual(s) other than the document preparer(s) to check the test interference recommendations and implementation as DIE controls. Only those individuals for whom test interference review is part of their position description and for whom their education and experience have been verified will be responsible for reviewing the DIE with respect to test interference concerns. (Brandstetter, to be completed by December 31, 1994)

Response Approved: Joan L Younker — Regulatory and Technical Evaluation Manager — 10-28-94 Date

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Corrective Action Report YM-94-066:

[NOTE: Funding for test interference work has shifted from WBS 1.2.3 (Scientific Program Integration) to WBS 1.2.5 (Regulatory and Technical Evaluation).]

Remedial Action:

A qualified Test Interference Evaluation (TIE) reviewer will identify TIE recommendations not implemented in affected Determination of Importance Evaluations (DIEs) and evaluate the potential impact. Testing organizations will be notified in writing if any controls not implemented may impact or bias required site characterization tests:

(1) in an undetected or unpredictable way.

(2) that cannot be practically repeated with the expectation of collecting the required test results.

The results of these investigations will be documented in memoranda to file for the following items:

(a) TIE and DIE for Design Package 2C. (Biggar, completed)

(b) TIE for procurement of materials for the surface and subsurface conveyor belt system with the Design Package 2C DIE (Biggar, completed)

(c) All other previous TIEs and DIEs. (Biggar, to be completed by 2/28/95)

Extent of the Deficiency:

(a) For the TIE for TBM operation, utilities installation, and support for TBM operation for construction of the North Ramp of the Exploratory Studies Facility (ESF) (M&O Design Package 2C), six recommended controls were not implemented by the DIE. The test interference impact of excluding these controls is provided below:

Recommended Control: Section III, B - Activity-Specific Controls, Part 6

"Provide means for visual inspection and/or electrical sensors beneath the pre-cast invert sections to detect water and/or other fluids which may collect in various intervals of the tunnel bottom, to allow potential ponding to be mitigated to the extent practical".

Exclusion of this recommendation control will not have a test interference impact because of the following design parameters:

1. The pre-cast invert segments will have visual inspection ports in various section of the North Ramp or such inspection ports can be drilled, if required.

2. Periodic visual inspections can be carried out through visual inspection ports as part of tunnel support operations.

Recommended Control: Section III, A - Higher-Level Requirements-Derived Controls, Part 1

"Critical communications and data circuits shall be protected or shielded from electromagnetic interference from sources within the ESF, and from external sources to the extent specified by manufacturers of sensitive data processing and communications equipment used in the system. (ESFDR 3.2.1.15, Part A)"

12/22/94 LV. RTE. JLY. 12/94-176

CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF. More specifically:

1. The Test Coordination Office for the ESF Program has identified that testing equipment can be relocated should measurements of electromagnetic fields indicate that interference could occur.

2. The Testing Organizations have requested that any determination of electromagnetic disturbance be done by designated scientists involved in the ESF Program.

This evaluation also applies to the excluded recommended control in TIE Section III, C.2.d.

Recommended Control: Section III, B - Activity-Specific Controls, Part 3

"Monitor dust suppression water applied at the conveyor transfer points to prevent excess water from overflowing the conveyor belt and spilling onto the tunnel floor".

Exclusion of this recommendation control will not impact test interference because of the design of the conveyor system transfer chutes and water metering at the spray heads.

Recommended Control: Section III, B - Activity-Specific Controls, Part 4

"Any perched water samples collected from inflow into the North Ramp tunnel shall be evaluated for possible drilling polymer content, drilling mud contamination, and tracer presence".

Exclusion of this control from the DIE will not impact test interference because, as pointed out in the DIE, this control more appropriately belongs in relevant Test Planning Packages that will be developed for testing in the ESF.

Recommended Control: Section III, B - Activity-Specific Controls, Part 5

"Means shall be provided for disposal of oil/water contamination that are removed from compressed air".

As pointed out in the DIE, this excluded control will not impact test interference because of the stipulated design controls for the Wastewater Removal System.

(b) For the TIE for procurement of materials for the surface and subsurface conveyor belt system, one recommended control was not implemented by the DIE. The test interference impact of excluding this recommended control is provided below:

Recommended Control Section III, Part 6

"Procurement of the spray headers of the dust control and suppression system shall ensure a calibrated method of measuring water usage. The calibrated method is intended to check, standardize, and systematically adjust measurements made by the flow meter".

As pointed out in the DIE, this excluded control will not impact test interference because water used to suppress dust in the conveyor system will be carried out with the muck.

(c) The extent of deficiency with respect to other DIE/TIEs will be identified in the remedial action undertaken under (c) described above.

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CORRECTIVE ACTION REQUEST (CONTINUATION PAGE)

Preclude Recurrence:

NLP-3-16 (Development of Test Interference Evaluations (TIE)) will be revised as part of a procedure roll-up with the Waste Isolation Evaluations (WIE) line procedure (NLP-3-17) into a revised Determination of Importance Evaluations (DIE) line procedure (NLP-2-0). Under the revised DIE line procedure, waste isolation and test interference information will be incorporated as sections of the DIE rather than separate input documents. The revised DIE line procedure will require that DIEs containing test interference input will be reviewed by qualified individual(s) other than the document preparer(s) to check the test interference recommendations and implementation as DIE controls. Only those individuals for whom test interference review is part of their position description and for whom their education and experience have been verified will be responsible for reviewing the DIE with respect to test interference concerns. (Hastings, to be completed by 2/28/95)

Response Approved: Martha W Goodlette for Jean L. Younker — 12/22/94
Regulatory and Technical Evaluation Manager — Date

3/28/95 LVSI.NEB.3/95-079

SUMMARY TABLE WITH RESOLUTION OF CONCERNS

TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF North Portal Pad (1)	TIE for Extension to the North Portal Pad	The DIE states that blasting will be used to excavate to 12 feet below finish grade. The TIE states that topsoil will be removed and fill applied with normal construction equipment. Blasting may impact site characterization tests and, if it is occurring, it should be controlled.	The only blasting that occurred at the North Portal Pad area was for the box cut and starter tunnel. This was considered by the TIE for Phase 1A Construction - North Portal Area, dated 12/21/92. No blasting occurred for the pad extension. Since no blasting occurred, there has been no Test Interference impact. A subsequent revision of the DIE (Rev. 4; 12/94) removed references to blasting. A memo from DIE to the ESF design and construction offices has been written, requiring DIE notification prior to future blasting.
		The DIE states that the pad is being extended from 14 to 18 acres. The TIE evaluates a 4 acre extension but previous TIEs give the size of the pad as 9.7 acres. Thus a sum of 13.7 acres was evaluated in the TIE and there is a 4.3 acre discrepancy in pad size between the DIE and the TIEs.	The exact size of the pad and pad extension are immaterial to the TIE; the controls identified in the TIE for 13.7 acres are also applicable to the entire area of the present pad. No Test Interference has occurred, nor is likely to occur, as a result of these discrepancies in pad size. The new Surface ESF DIE (anticipated in 4/95) will address the range of possible pad sizes.

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TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF Stormwater System (2)	TIE for the Topsoil and Rock Storage Area	Control 1b was not incorporated by the DIE. It concerns plugging of drainages with topsoil fines leading to ponding of water.	The drains were deleted from the project design for the Topsoil and Rock Storage Area. A liner and berm system was used instead. Therefore, there are no drains that could become plugged. There are no neutron boreholes in the vicinity that could be affected. Therefore, no test interference has occurred. Other features of the design are adequately covered by existing controls. The current DIE for the North Portal Pad (NPP) (issued 12/94) does address inspection for water impoundment of drainage channels, and the stormwwater sytem DIE has similar inspection requirements for the portal channel. The new Surface ESF DIE will also contain a control to inspect for ponding. Therefore, Test Interference is unlikely to occur in the future.

SUMMARY TABLE WITH RESOLUTION OF CONCERNS

TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
	TIE for Proposed Water Supply and Distribution System for the North Portal Pad	This TIE was not referenced in the DIE though the DIE does include flood protection for the Water Supply Booster Pump Station Pad. The TIE does not address storm water protection.	The Water Booster Pump Station pad has not been started yet; hence no Test Interference has occurred. The water booster pump station will be erected on the North Portal Pad; the controls in the current DIE for the NPP (issued 12/94) adequately address test interference concerns for storm water protection. The new Surface ESF DIE will include controls for prevention of ponding of storm water during construction and use of the Water Booster Pump Station pad.

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TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF Starter Tunnel Steel Arch Section (3)	None	No TIE performed for scope of work in DIE.	The Steel Arch Section (SAS) has not been constructed, hence no Test Interference has occurred. There is a hold on the current design for the SAS; it will not be constructed unless a new design is issued. Design has been notified that the SAS DIE is to be superceded by the ESF Surface DIE, and that re-evaluation of SAS DIE, based on a new portal design, should be included in the existing HOLD on the SAS design. The features of the design are expected to be bounded by existing TI/DI controls specific to the North Portal Pad and Boxcut, provided in the ESF Phase 1A Construction TIE (dated 12/21/92) and the existing surface water controls in the NPP DIE.

SUMMARY TABLE WITH RESOLUTION OF CONCERNS

TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF Rock Storage Area (4)	TIE for the Topsoil and Rock Storage Area	The documents evaluate different scopes; soil and rock storage (TIE) vs rock storage (DIE). Apparently, no DIE has been completed for soil storage since this activity was evaluated by RSN in a Classification Analysis.	Two RSN classification analyses were prepared and approved on 11/10/92 for the Topsoil Storage Area and for the Access Roads, prior to establishment of the DIE process. These analyses discussed input for Test Interference concerns (none were noted). The Surface ESF DIE will include an evaluation of the Top Soil and Rock Storage Areas and will supercede these classification analyses.
		The documents evaluate different construction; material placement on a graded lined pad vs placement directly on the existing surface.	The Rock Storage Area was constructed using a liner and berm design. Because the TIE evaluated a less conservative construction method (no liner), no Test Interference has occurred as a result of using a liner. A visual inspection of the Rock Storage Area by TIE personnel on 3/17/95 confirms that a liner and berms are in place. Therefore, Test Interference is unlikely to occur in the future.
		The documents evaluate different size areas.	The exact size of the Rock Storage Area is immaterial to the TIE; no Test Interference is likely to occur as a result of differences in estimated size of the Rock Storage Area.

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TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF Starter Tunnel Drill-and-Blast Section (5)	Series of letter TIEs on grout and rockbolts (4/7/93, 4/23/93, and 6/15/93).	Controls limiting the amount of grout injected and the injection pressures were not incorporated in the DIE. MPBX data may be impacted depending on the volume of grout material injected.	The purpose of installation of the MPBXs is to monitor drift convergence. Re-evaluation has indicated that because the MPBXs are emplaced to measure effectiveness of the ground support system, no Test Interference is expected from the presence of grout, which is considered part of the ground support for the Starter Tunnel.
	Series of letters on water use for the starter tunnel and alcove #1 (7/23/93, 8/26/93, and 9/16/93)	The TIE-related water use letters set a limit, with TCO concurrence, of 500,000 gallons, exclusive of water use for concrete. The DIE set a limit for the same application of 848,000 gallons.	Less water was used (495,440 gal.) than was discussed in the TIE for Construction of the Starter Tunnel and first alcove. Therefore, no Test Interference has occurred. The test interference concerns were re-evaluated in response to this CAR, and the testing community has accepted the water limits in the DIE. Therefore, no test interference impacts are expected by the limits presented in the DIE. Water use in the bored section of the north ramp is covered by the DIE for Design Package 2C and does not impact the Starter Tunnel section as it does not drain toward it. The new Subsurface ESF DIE (anticipated in mid-'95) will address total water use controls in the subsurface.

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TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
	TIE for Construction of the North Ramp Starter Tunnel (including TFMs and planned tests)	Control 11 concerns standoff distances for sampling due to potential grout contamination. The DIE did not incorporate this control.	The TIE control was directed to the testing community rather than to construction and therefore would not be incorporated in the DIE. Affected PIs have already been notified of the possibility of test interference impacts.
DIEs for ESF Water Supply and Water Distribution Systems (7), (8)	TFM Evaluation for the Use of Pipe-Joint Lubricant for the North Portal Water Supply and Distribution Systems.	Controls for flushing the system to remove lubricant in accordance with AWWA procedures, and use minimization were not incorporated by the DIE.	The "pipe dope" to be used is a non-toxic soap (similar to hand-soap), which must be flushed prior to use of the pipe system per Uniform Plumbing Code and National Fire Code requirements, which are part of the ESF Design Specifications (BAB000000-01717-6300-02665 and -01800). As this issue is addressed in an industry code, no additional QA control is required. No Test Interference is likely to occur as a result of the use of this soap, since flushing must occur.
DIE for ESF H-Road Improvements (10)	TIE for the Widening, Grading, and Paving of the ESF H-Road and the Grading and Paving of the North Portal Pad.	A control concerning interference with surface based tests, particularly two stream flow monitoring stations that may be disturbed by road improvement was not included in the DIE.	Road construction has not yet begun. Affected PIs have been notified of the possibility of test interference impacts.

SUMMARY TABLE WITH RESOLUTION OF CONCERNS

TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for ESF Subsurface Wastewater (Surface portion) and Sanitary Sewer Collection Systems (12)	TIE for the Subsurface Wastewater Pond.	There is mention in the DIE that blasting is anticipated. The TIE does not evaluate blasting.	The Subsurface Wastewater Pond and Sanitary Sewer System have not yet been constructed; thus, no blasting has occurred and no Test Interference has occurred. At the present time, no blasting is planned for their construction. The DIE has been revised; Rev. 2 of the DIE no longer evaluates blasting. A memo from DIE to the ESF design and construction offices has been written, requiring DIE notification prior to future blasting.
DIE for ESF Surface Compressed Air and Standby Power Systems (14)	TIE for the Standby Power System	Control A1 concerns isolating operational leaks and spills and requires rupture basins. The DIE does not incorporate this control.	An ID review was performed by TIE personnel prior to issuance of the DIE. It was judged that the DIE control that calls for minimization of leakage is adequate to contain spills.

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TITLE OF DIE	TITLE OF SUPPORTING TIE	NATURE OF THE DISCREPANCY	RESOLUTION
DIE for USW SD-7 Borehole, Access Road, and Drill Pad (16)	TIE for SD-7 Drill Pad and Access Road Construction	Control 2a of the TIE stipulated that any fill used in road or pad construction was to be free of contamination. This was not incorporated in the DIE. Control 2c concerns isolating the blasting slurry from the subsurface. This control was not incorporated in the DIE. Control 2f concerns limiting the depth of excavations for the road and pad to 10 m unless test controls are re-evaluated The DIE text and DIE Requirement 2f potentially misinterpret this control, allowing blasting to 10m below finished grade and 10m deep blast holes.	An ID review was performed by TIE personnel prior to issuance of the DIE; the DIE controls were judged to be adequate in addressing TIE concerns.

CAR YM-94-066
Corrective Action Verification

Verification of the Corrective Action committments to CAR YM-94-066 was performed by K. O. Gilkerson (YMQAD) on 4-3 through 4-4, 1995. The following actions were taken:

1. All remedial actions were verified as complete. The issues to be resolved were identified in a summary table contained in correspondence LV.SI.NEB. 3/95-079 Foust to Barnes dated 3/28/95. As part of this verification relative to the resolutions identified in this summary, the ESF North Portal Pad DIE rev 4, rev 5 and rev 6 were reviewed; the ESF Starter Tunnel Steel Arch Section DIE, rev 2 was reviewed; the specification BAB000000-01717-6300-02665 was reviewed; the DIE for ESF Subsurface Wastewater, rev 2 was reviewed, the DIE for ESF Surface Compressed Air and Standby Power Systems, rev 0; and, the DIE for USW SD-7 Borehole Access Road and Drill Pad, rev 1 was reviewed. TIE controls were either found to be adequately addressed already or appropriate changes were found to have been made.

2. Memo to file (LV.SI. NED. 3/95-268) from C.T. Statton dated 3/29/95 was also reviewed. This memo documents all actions taken relative to this CAR and contains appropriate references and memos to support these actions.

3. Systems Engineering DIE Group Manager, Peter Hastings was also interviewed during this assessment to determine how concerns were resolved relative to TIE/WIE controls or recommendations being incorporated into the DIESs.

4. Action to preclude recurrence required a change to M&O procedure NLP-2-0 (see revised response dated 12/22/94) relative to addressing incorporation of TIE controls. A review of this procedure (revision 1) found that this had been acccomplished.

Based on the interviews conducted and reviews of appropriate doucments, it is recommended that CAR YM-94-066 be closed.

K O Gilkerson 4/6/95