



Department of Energy

Washington, DC 20585

QA: QA

APR 10 2003

N. H. Williams
Bechtel SAIC Company, LLC
1180 Town Center Drive, M/S 423
Las Vegas, NV 89144

VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF CORRECTIVE ACTION REPORT (CAR) BSC-02-C-090 REGARDING TRACERS, FLUIDS AND MATERIALS THAT HAD NOT BEEN REPORTED AS REQUIRED

The Office of Civilian Radioactive Waste Management, has verified completion of the corrective actions of CAR BSC-02-C-090 and determined the results to be satisfactory. As a result, the Deficiency Report is considered closed.

If you have any questions, please contact either Kerry M. Grooms at (702) 794-1367 or John R. Doyle at (702) 794-5021.

R. Dennis Brown, Director
Office of Quality Assurance

OQA:KMG-1013

Enclosure:
CAR BSC-02-C-090




cc w/encl:
N. K. Stablein, NRC, Rockville, MD
Robert Latta, NRC, Las Vegas, NV (2 cys)
S. W. Lynch, State of Nevada, Carson City, NV
L. W. Bradshaw, Nye County, Pahrump, NV
Leon Fossum, BSC, Mercury, NV, M/S 763
M. J. Mason, BSC, Las Vegas, NV
R. L. Noel, BSC, Las Vegas, NV
J. R. Doyle, NQS, Las Vegas, NV
W. J. Glasser, NQS, Las Vegas, NV
D. G. Opielowski, NQS, Las Vegas, NV
W. J. Arthur, III, DOE/ORD (RW-2W), Las Vegas, NV
S. P. Mellington, DOE/ORD (RW-50W), Las Vegas, NV
B. M. Terrell, DOE/ORD (RW-40W), Las Vegas, NV



OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C.8. ☒ DEFICIENCY REPORT
☒ CORRECTIVE ACTION
REPORT
NO BSC-02-0-090 10/14/02
PAGE 1 OF
QA: L67

DEFICIENCY/CORRECTIVE ACTION REPORT

1. Controlling Document LP-OM-040Q-BSC, Rev. 0, ICN 1		2. Related Report No. Issue #1037 & 1038	
3. Responsible Organization. M&O		4. Discussed With Rudy Johnson, Ed Fitch	
5. Requirement 1. LP-OM-040Q-BSC, paragraph 5.4.2a)2) states, "Responsible Individual: Document quantities of non-quality affecting installed or removed materials used underground that will remain after repository closure on Attachment 3, Non-Quality Affecting Materials Installation Log." 2. LP-OM-040Q-BSC, paragraph 5.4.1c & d states in part, "TFM Designee. Perform data collection for TFM reporting purposes using the data collection processes identified in the following steps to account for TFM use underground and surface. Obtain information to account for TFM usage, emplacement, or loss for the following four major groups. 1) Permanent materials (See Paragraph 5.4.2a))..." 3. LP-OM-040Q-BSC, page 2 Change History for Revision Number 0, Interim Change No. 0 states in part, "....incorporates Expedited Change Notice 001..."			
6. Description of Condition 1. Contrary to item 1 above, quantities of non-quality affecting installed materials have been documented in Work Orders #13309 and 12646 on a Materials Use Tracking Record in lieu of Non-Quality Affecting Materials Installation Log 2. Contrary to item 2 above, the documented non-quality affecting installed materials recorded on the Materials Use Tracking Records in Work Orders #13309 and 12646 have not been collected for TFM reporting purposes by the TFM Designee 3. Contrary to item 3 above, Expedited Change Notice 001 to NWI-ESF-016Q, which added document quantities of non-quality affecting installed materials in the work orders and/or the minor task sheet (AP-OM-006Q) to the process for accounting of TFM's was not incorporated in the initial issue of LP-OM-040Q-0BSC, effective 07/09/01			
7. Initiator: Richard L. Noel <i>[Signature]</i> for Date 03/13/02		9. Does a stop work condition exist? (Not required for a DR) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No NO For CAR 10/4/02 If Yes Check One <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	
10. Recommended Actions Initiate Document Action Request to LP-OM-040Q to Focus on TFM Reports to the TFM Designee when WORK ORDER ACTIVITIES ARE COMPLETE.			
11. QA Review QA: <i>[Signature]</i> Date 03/27/02		12. Response Due Date 10 working days from issuance	
13. DOQA Issuance Approval Printed Name Ram Murthy Signature <i>[Signature]</i> Date 4/1/03		23. Closure Approved by. DOQA <i>[Signature]</i> Date 4/2/03	
22. Corrective Actions Verified QA: <i>[Signature]</i> Date 01 APRIL 03		23. Closure Approved by. DOQA <i>[Signature]</i> Date 4/2/03	

Submittal Page <u>1</u> of <u>1</u> 2. Check if Amended <input type="checkbox"/> 3. Extended Processing <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, submit Extended Processing request)	OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.	1. DR/CAR NO. BSC 02- 14 -690 PAGE CF QA. QA
DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE		
4. Immediate Actions Necessary to Bring the Process Under Control: (If none, provide justification statement) <p>No immediate actions are necessary to bring this process under control because this deficiency is a result of non-compliance with the procedural processes in place.</p>		
Date when process will meet requirements: <u>n/a</u>		
5. Immediate Remedial Actions Completed: <p>An investigation was performed for Conditions 1 & 2 and it was determined that type and quantity of materials installed have been identified and the final reporting records (AP-2.17Q) are in place.</p>		
6. Plan for Determining the Extent of Condition: <p>The LP-OM-040Q-BSC/AP-2.23Q and AP-5.1Q/ECY processes and resulting records for Conditions 1, 2, & 3 will be evaluated to determine the extent of condition, the cause, impact to quality, and the necessary remedial action(s). Additionally, the actions to preclude recurrence to be determined.</p>		
<div style="position: relative;"> <div style="position: absolute; top: 0; right: 0; transform: rotate(30deg); font-size: 1.2em;"> Response dated 5/2/02 </div> <div style="position: absolute; bottom: 0; left: 0; transform: rotate(-30deg); font-size: 1.2em;"> Supplemented by DGO 5/3/02 Does not supersede. </div> </div>		
7. Due Date for Submittal of Completed Response: <p style="text-align: center;">5/1/2002</p>	8. Reasoned by: (Responsible Manager) <div style="display: flex; justify-content: space-between;"> <div> <u>C.M. SPARKS</u> Printed Name </div> <div>  Signature </div> <div> <u>4/17/02</u> Date </div> </div>	
9. QAR Evaluation: <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Partially Accept <input type="checkbox"/> Reject <div style="display: flex; justify-content: space-between;"> <div> <u>JOHN R. DOYLE</u> Printed Name </div> <div>  Signature </div> <div> <u>4/25/02</u> Date </div> </div>	10. QAM Concurrence: <div style="display: flex; justify-content: space-between;"> <div> <u>RAN MURRAY</u> Printed Name </div> <div>  Signature </div> <div> <u>5/10/02</u> Date </div> </div>	

Do 13/1/02 ✓

Submittal Page <u>1</u> of <u>1</u>	OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT U.S. DEPARTMENT OF ENERGY WASHINGTON, D.C.	1. DR/CAR NO BSC-02- ² p -090
2. Check if Amended <input checked="" type="checkbox"/>		PAGE OF
3. Extended Processing <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, submit Extended Processing request)		QA QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE

4. Immediate Actions Necessary to Bring the Process Under Control: (If none, provide justification statement)

No change. *Sam response accepted by CAR 4/25/02 JMD 5/03/02.*

Date when process will meet requirements: n/a

5. Immediate Remedial Actions Completed:

No change, *Sam response accepted by the CAR on 4/25/02 JMD 5/03/02*

6. Plan for Determining the Extent of Condition:

Initial investigation of the Extent of Condition for conditions 1 & 2 has determined that the scope of the deficiency is more extensive than first anticipated. A list of some 30 additional Work Orders has been developed and needs to be investigated to determine if they fall under this deficiency.

7. Due Date for Submittal of Completed Response: 5/24/2002	8. Response by: (Responsible Manager) <i>C.M. SPARKS</i> <i>C.M. Sparks</i> 4/29/02 Printed Name Signature Date
9. QAR Evaluation: <input checked="" type="checkbox"/> Accept <input type="checkbox"/> Partially Accept <input type="checkbox"/> Reject <i>JOHN R. DOYLE</i> <i>John R. Doyle</i> 5/01/02. Printed Name Signature Date	10. QAM Concurrence: <i>RAM MURPHY</i> <i>James Blaylock</i> 5/10/02 Printed Name Signature Date

Submittal Page 1 of 2

2. Check if Amended ☒

3 Extended Processing

☐ No ☐ Yes (If yes, submit Extended Processing request)

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

1 DR/CAR NO BSC-02-090
PAGE OF
QA: QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE

4. Immediate Actions Necessary to Bring the Process Under Control: (If none, provide justification statement)

No change from Initial Response accepted by QAR 4/25/2002

Date when process will meet requirements: N/A

5. Immediate Remedial Actions Completed:

No change from Initial Response accepted by QAR 4/25/2002

6. Plan for Determining the Extent of Condition:

The results of the investigation for the Plan for Determining the Extent of Condition identified in the Amended Response dated 4/29/2002 requires amending the plan as follows: Additional investigation will be required to determine the Non-Quality Affecting Material Installation Log (NQAMIL) status for the following Work Orders (WO): WO #13760, WO #13680, WO #13381, WO #12980, WO #12454, WO #12248, WO #11919, WO #11792, WO #11706, WO #11002, WO #11001, WO #9308, WO #10057, WO #9407, and WO #9390. The investigation will require a records search in the RISWeb to determine whether NQAMIL can be found for these packages and whether or not the record is complete. This requires comparison against Daily Shift records and the scope of work in the Work Order. Completion of the investigation for the Extent of Condition and determination of impacts will allow a path forward to be formulated which will be required for the Completed Response.

7. Due Date for Submittal of Completed Response
8/19/2002

8 Response by: (Responsible Manager) BSC QA 7/2/02

CHARLES R. GARRETT Charles R. Garrett 7/2/02
Printed Name Signature Date

9. QAR Evaluation: ☒ Accept ☐ Partially Accept ☐ Reject

10. QAM Concurrence.

John A. Dyer 7/23/02
Printed Name Signature Date

RAM MUZTHY James Blaylock 8/1/02
Printed Name Signature Date

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

200
10/10/02

1 DR/CARNO BSC-02-5-090
PAGE OF
QA QA

REQUEST FOR EXTENDED PROCESSING

3. Extended Actions: (Identify those corrective actions planned for completion beyond 100 days from issuance of the DR/CAR)

1. Completion of the of the Extent of Condition investigation as identified in the Amended Response dated 7/02/2002
2. Completion and submission of the Completed Response.
3. Anticipated remedial actions requiring correction or supplementing records.
4. Anticipated Actions to Prevent Recurrence.
 - a Revision of the LP-OM-040Q to link the non-Quality Affecting Material Installation Log to the Work Orders
 - b Incorporation of work related records accountability into AP-2.23Q, Work Request/Work Order Process

Expected Completion Date: 12/30/2002

4. Justification: (Provide an explanation as to why the required actions cannot be completed within 100 days)

The scope of this problem is greater than that identified in the conditions cited in this deficiency and a considerable amount of time has been spent searching the RISWeb for NQAMIL records to determine what has been reported and what hasn't. Additional work is required to identify whether the WOs identified above are deficient or not. This process is time consuming because the NQAMIL are not linked to the WOs and a comparison must be made to construction station to determine what NQAMIL goes with what WO. Although this process is tedious, the long Expected Completion Date for closure is related to revision of AP-2.23Q which will provide control of records generated during the execution of the Work Orders.

5. Impact: (Provide an impact statement to indicate what affect not completing within 100 days will have relative to waste isolation and safety, and impact to other work, if any)

There is no impact relative to waste isolation and safety or other work because all items that have been installed are approved TFM and they can be physically identified and accounted for. Initial investigation shows that the process was in noncompliance with the requirements from 8/15/00 (the effective date of AP-OM-006), to 1/30/02 (the completion date of the corrective action plan resulting from the 2001 ISMS Annual Review Report) The process has been in compliance with TFM reporting requirements since 1/30/02.

Approvals BSC QA CH 7/4/02

6. Responsible Manager:

James Hayes CHARLES R GARRETT 07/02/02
Printed Name Signature Date

7. Senior Manager

Russ Fray MM 7/9/02
Printed Name Signature Date

8. DOE Project Management:

J.R. Dyer J.R. Dyer 8/9/02
Printed Name Signature Date

9. DOQA:

RAM HUNTER RAM HUNTER 8/9/02
Printed Name Signature Date

10. Director, OCRWM (required for scheduled completion dates one year or more from initial issue)

W/12 W/12
Printed Name Signature Date

2003/04/02

Submittal Page 1 of 1

2. Check if Amended ☒

3. Extended Processing

☐ No ☐ Yes (If yes, submit
Extended Processing request)

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

1. DR/CAR NO. BSC-02-090

PAGE 1 OF 1

QA: QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE

4. Immediate Actions Necessary to Bring the Process Under Control: (If none, provide justification statement)

No change from Initial Response accepted by QAR 4/25/2002.

Date when process will meet requirements: N/A

5. Immediate Remedial Actions Completed:

No change from Initial Response accepted by QAR 4/25/2002.

6. Plan for Determining the Extent of Condition:

No change from Initial Response accepted by QAR 7/23/2002.

7. Due Date for Submittal of Completed Response:

12/30/2002

8. Response by: Responsible Manager QA POC H 7/5/02

J. Taylor
Printed Name

JAMES HAES
Signature

07/01/02
Date

9. QAR Evaluation: ☒ Accept ☐ Partially Accept ☐ Reject

John R. Doyle
Printed Name

[Signature]
Signature

05/06/02
Date

10. QAM Concurrence:

[Signature]
Printed Name

[Signature]
Signature

1/01
Date

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

DIR No. 02-15

PAGE 1 OF

QA: QA

DEFICIENCY IDENTIFICATION AND REFERRAL

Date

09/26/02

Open DR/CAR

BSC-02-D-090

Description of Deficiency

LP-OM-040Q-BSC, Rev. 0, ICN1, Subsection 5.4.2a)2) requires the Responsible Individual to document quantities of non-quality affecting installed or removed materials used underground that will remain after repository closure on Attachment 3, Non-Quality Affecting Materials Installation Log.

Contrary to the above requirements, there is evidence that TFM's are being installed without being documented on a Non-Quality Affecting Materials Installation Log. Work Orders 14634, 11370-01, 14573, 13441, 14517, and 14518 are examples of work orders that reference materials that have been installed underground. Examples of materials referenced are: hilti bolts, lifting fixtures, rockbolts, Willex grout (or similar), expansion type anchor, bolts and fasteners.

Also, contrary to the above, the Quality and Non-Quality Affecting Materials Installation Log and the respective Instructions describe the documenting of materials installed, not removed.

See Attached

How Identified

AE Specifications 01501 and 01502 require QC to perform periodic monitoring of QA records identified in the above requirement. (Reference Checklists 01501-03 and 01502-04) No records have been made available for QC to review since January 2002 except for one record dated 04/09/02 for installation of 4 lifting fixtures in the ECRB installed 08/07/01 per Work Order 12646.

During observation of the installation of Hilti-bolts this week, materials were being documented on a Materials Use Tracking Record (attached to WO 14634), however, abandoned bolts were either driven into the rock or bent over with no evidence of record. The Materials Use Tracking Record is not a procedurally required record and not intended to be a TFM tracking record.

Open DR/CAR QAR's Concurrence

John R. Doyle

Printed Name

William J. Glosser FOR

Signature

10/4/02

Date

Prepared by:

Richard L. Noel

Printed Name

Richard L. Noel

Signature

09/26/02

Date

ATTACHMENT TO DEFICIENCY IDENTIFICATION AND REFERRAL

Based upon the significance of this issue it is recommended that referenced DR ^{BSC}~~LVMO~~-02-D-090 be elevated to a significant condition adverse to quality and re-issued as a Corrective Action Report (CAR). ^{RPH} 10/4/02

This recommendation is based upon continued failure to adequately control and document the introduction of Tracers, Fluids and Materials (TFMs) into the Exploratory Studies Facility (ESF) and Enhanced Characterization of the Repository Block (ECRB) as well as eight previous deficiencies identified in the area of TFM control and reporting.

The eight previous deficiencies are:

DR K/PB-98-D-105 issued 06/08/98
DR LVMO-98-D-139 issued 08/12/98
DR LVMO-99-D-017 issued 12/29/98
DR LVMO-99-D-058 issued 05/13/99
DR LVMO-00-D-111 issued 07/19/00
DR LVMO-00-D-108 issued 07/31/00
DR LVMO-01-D-031 issued 01/08/01
DR LVMO-02-D-067 issued 01/25/02

In recognition of the severity of this condition the Site Operations Manager has initiated an administrative stop work to preclude further introduction of unrecorded TFMs into the ESF/ECRB. These controls include notification to the Portal Access Controller to stop any TFM from entering the ESF/ECRB and notification to the Construction Manager to cease all operations, which would introduce TFMs into the system. This stop work will remain in effect until positive controls are instituted assuring control.

Should you have any questions and or concerns regarding this matter please do not hesitate to contact the Site Operations Manager, Leon Fossum and or the Site Quality Manager John Martin.

Dated 09/26/02

JSM



Submittal Page 1 of 1

2 Check if Amended ☐

3 Extended Processing

☐ No ☒ Yes (If yes, submit
Extended Processing request)

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

1 DR/CAR NO BSC-02-C-090
PAGE OF
QA QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE

4. Immediate Actions Necessary to Bring the Process Under Control (If none, provide justification statement)

I. Upon identification of CR condition, a site stand-down was initiated, 9/27/2002. (Re. DIR 02-018)

Date when process will meet requirements: 10/03/2002

5. Immediate Remedial Actions Completed:

Upon remedial actions being completed, Site Operations reviewed, and based on review, determined that the TCO could be released to return to work, 10/03/2002. This was based on no deficiencies being identified on work TCO was performing

Prior to the lifting of stand-down Site, Field Engineering met with Safety Assurance to discuss the condition and determine a path forward. Evaluating the condition, Field Engineering concluded that the responsibilities set forth in Paragraph 5.4.2, LP-OM-040Q-BSC, were not assigned. Based on this conclusion, Field Engineering lifted the Stand-Down on all materials excepting ground support materials, rock anchors, and survey monuments and spads. Subsequently, Underground Supervisory Personnel were assigned and briefed on the responsibilities set forth in Paragraph 5.4.2. Operations lifted the Stand-Down on the remaining items 10/03/2002. Safety Assurance briefed manual and non-manual personnel on TFM's at the Weekly Safety Meeting 10/07/2002.

6. Plan for Determining the Extent of Condition

I. Perform a Root Cause, (Note, actions to prevent recurrence have been difficult to quantify to date, when attempting disposition previous DR-090), root cause estimated completion 12/12/02

II. Review resulting Corrective Actions the Root Cause identifies

III. Schedule work required to prepare, review, approve and implement corrective actions in an appropriate time frame based on the severity of the causal factors, estimated completion 1/30/03

7. Due Date for Submittal of Completed Response
January 30, 2003.

8 Response by: (Responsible Manager)

Lawrence R. Morrison Lawrence R. Morrison 11/11/02
Printed Name Signature Date

9. QAR Evaluation: ☐ Accept ☐ Partially Accept ☒ Reject

JOHN R. DOYLE John Doyle 11/19/02
Printed Name Signature Date

10. QAM Concurrence.

DENNIS BROWN Dennis Brown 11/21/02
Printed Name Signature Date

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

☒ DR/CAR/QO
☐ SWO

NO BSC-02-C-090

PAGE OF

QA: QA

CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

Evaluation of Initial Response to CAR BSC-02-C-090

1. AP-16.1Q/Rev. 5/ICN 0 "Management of Conditions Adverse to Quality" states in part:

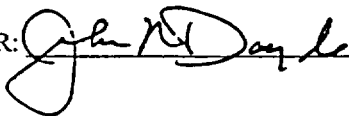
3.14 Responsible Manager: For a CAQ, the individual having management responsibility for the process or activity that is subject of the CAQ. For significant CAQs, the Responsible Manager is a Senior Manager within the organization.

A review of the DR/CAR database and conversations with the Deputy Manager of Projects reveals that the Senior Manager responsible for this CAR is Nancy Williams, Manager of Projects, who has not approved/signed this response.

2. The Request for Extended Processing with the submittal of a complete response by 01/30/03 has not been submitted as per the requirements AP-16.1Q Section 5.6 and described in the transmittal letter to this CAR.

Based on items 1 and 2, recommend rejection of Initial Response to this CAR.

QAR:



Date:

4/19/02

John R. Doyle

Submittal Page 1 of 1

2. Check if Amended ☒

3. Extended Processing

☒ No ☐ Yes (If yes, submit Extended Processing request)

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

1 DR/CAR NO. BSC-02-C-090
PAGE OF
QA QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT INITIAL RESPONSE

4. Immediate Actions Necessary to Bring the Process Under Control: (If none, provide justification statement)

I. Upon identification of CAR condition, a BSC site stand-down was initiated, 9/27/2002. (Re. DIR 02-018)

Date when process will meet requirements: 10/03/2002

5. Immediate Remedial Actions Completed.

Site Operations reviewed, and based on review, determined that the TCO could be released to return to work. 10/03/2002. This was based on no deficiencies being identified on work TCO was performing.

Prior to the lifting of stand-down Site, Field Engineering met with Safety Assurance to discuss the condition and determine a path forward. Evaluating the condition, Field Engineering concluded that the responsibilities set forth in Paragraph 5.4.2, LP-OM-040Q-BSC, were not assigned. Based on this conclusion, Field Engineering lifted the Stand-Down on all materials excepting ground support materials, rock anchors, and survey monuments and spads. Subsequently, Underground Supervisory Personnel were assigned and briefed on the responsibilities set forth in Paragraph 5.4.2. Operations lifted the Stand-Down on the remaining items 10/03/2002. Safety Assurance briefed manual and non-manual personnel on TFMs at the Weekly Safety Meeting 10/07/2002.

6. Plan for Determining the Extent of Condition:

I. Perform a Root Cause, (Note, actions to prevent recurrence have been difficult to quantify to date, when attempting disposition previous DR-090), root cause estimated completion 12/12/02

II. Review resulting Corrective Actions the Root Cause identifies

III. Schedule work required to prepare, review, approve and implement corrective actions in an appropriate time frame based on the severity of the causal factors.

7. Due Date for Submittal of Completed Response.
December 30, 2002

8. Response by: (Responsible Manager) BSC QA 12/11/02
Russ Feay [Signature] 12/11/02
Printed Name Signature Date

9. QAR Evaluation: ☒ Accept ☐ Partially Accept ☐ Reject

10. QAM Concurrence.

JOHN R. Dayce [Signature] 12/13/02
Printed Name Signature Date

[Signature] [Signature] 12/23/02
Printed Name Signature Date

2. Submittal Page 1 of 1

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

1. DR/CAR NO. BSC-02-C-090
PAGE 1 OF 1
QA: QA

REQUEST FOR EXTENDED PROCESSING

3. Extended Actions: (Identify those corrective actions planned for completion beyond 100 days from issuance of the DR/CAR)

Extended processing is requested for those activities required to prepare the Complete Response. Adequate time is required to analyze and provide comprehensive corrective actions for all the causal factors/root causes identified in TapRoot Analysis BSC02C090.

Expected Completion Date: 01/18/2003

4. Justification: (Provide an explanation as to why the required actions cannot be completed within 100 days)

Sufficient time is not available to prepare the Complete Response because of the shortened holiday work schedule and the final root cause report (TapRoot BSC02C090) was not issued until 11/22/02. The combination of these factors do not allow adequate time to analyze the causal factors/root causes, develop corrective actions, and prepare the Complete Response.

5. Impact: (Provide an impact statement to indicate what affect not completing within 100 days will have relative to waste isolation and safety, and impact to other work, if any)

There is no impact relative to waste isolation and safety or other work because all items that have been installed are approved TFM and can be physically identified and accounted for. Additionally, the Immediate Remedial Actions identified in Blocks 4 and 5 of the Amended Response are sufficient for the process to meet requirements until all corrective actions are complete.

**Deficiency closed prior to obtaining
signatures and, therefore,
are no longer applicable.**

Deborah J. Opilowski 4/2/03

Approvals

6. Responsible Manager:

Leon K Fossum Leon K Fossum 12/18/02
Printed Name Signature Date

7. Senior Manager:

Deborah J. Opilowski Deborah J. Opilowski 12/19/02
Printed Name Signature Date

8. DOE Project Management:

Printed Name Signature Date

9. DOQA:

Printed Name Signature Date

10. Director, OCRWM: (required for scheduled completion dates one year or more from initial issue)

Printed Name Signature Date

Submittal Page 1 of 2

2 Check if Amended ☐
Check if also Initial Response ☐

3 Extended Processing

☐ No ☒ Yes (If yes, submit
Extended Processing request)

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

1 DR/CAR NO BSC-02-C-090
PAGE OF
QA QA

DEFICIENCY REPORT/CORRECTIVE ACTION REPORT COMPLETE RESPONSE

4. Extent of Condition: (Amended response will be required if all Extent of Condition investigations are not complete and documented herein)

Investigation into the Extent of Condition for this Deficiency for Conditions 1 & 2 in the Description of Condition found that in addition to Work Orders (WO) 13309 and 12646 all WOs for similar work completed from 8/15/2000 to present were affected. The additional WOs identified and researched are: Work Order #s 13760, 13680, 13381, 12459, 12248, 11792, 11706, 11002, 11001, 9308, 10751, 10057, 9207, and 9390. Investigation of the TFM reporting for the above found the records for the installed materials to be missing, incomplete or unidentifiable to the extent that 100% confidence could not be placed in the accuracy of the TFM reporting. In general correlation between WOs and TFM reports is difficult. WOs 12980 and 11919 were found to have been cancelled. Investigation into Condition 3 found to be confined to this instance.

5 Impact: (Provide an impact statement relative to waste isolation and safety, and impact to other work, if any)

There is no impact to waste isolation and safety. Actions taken under this CAR will account for all TFMs. However, quality is impacted by this deficiency due to incomplete TFM records.

6. Remedial Actions. (Document all actions necessary to address the results of the Extent of Condition)

Remedial actions for Conditions 1 & 2 will require "walkdowns" of the areas where the work was completed as identified in the WOs in Block 4. The walkdown will use the plan for a previous walkdown (K/PB-98-D-105) as a "template" to ensure all TFMs are accounted for, properly recorded and reported. This information will be used to supplement/replace affected TFM reports to correct the TFM record.

Remedial action for Condition 3 will require correcting and supplementing the ECN record.

7. ☒ Root Cause (For a significant CAQ, attach results of formal root cause determination prepared in accordance with AP-16 4Q)
☐ Apparent Cause

See attachment 1: TapRoot Incident Report for incident BSC02C090

8. Action to Preclude Recurrence: (Address those actions necessary to prevent the identified cause from recurring)

Also see attachment 2: TapRoot Incident Report BSC02C090 Analyses/Conclusion Summary

1. Revise LP-OM-040Q-BSC to clarify roles and responsibilities for TFM reporting (CA 01, 02, 03, 08, 09)
2. Revise LP-OM-040Q-BSC to institute periodic self-check of TFM reporting by TFM Designee. (CA 04, 10, 11, 12, 13, 14)
3. Provide briefings to Site Personnel on TFM monitoring, recording, and reporting (CA 05)
4. Revise LP-OM-040Q-BSC to add Work Order number to enhance TFM management (CA 06)

9. Due Date for Completion of Corrective Action:

Mar. 15, 2003

10. Responsible Manager

BSC QA ABC 11/29/03
Russ Fick *11/29/03*
Printed Name Signature Date

11. QAR Evaluation: ☒ Accept ☐ Partially Accept ☐ Reject

JOHN R. DOYLE *John Doyle* *01/29/03*
Printed Name Signature Date

12. QAM Concurrence:

Deanne B... *Deanne B...* *1/29/03*
Printed Name Signature Date

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

1 DR/CARNO BSC-02-C-090
PAGE OF
QA QA

REQUEST FOR EXTENDED PROCESSING

3. Extended Actions: (Identify those corrective actions planned for completion beyond 100 days from issuance of the DR/CAR)

Remedial Actions identified in Block 6 of BSC-02-D-090:

1. Walkdown to ensure TFM's are identified and accounted for.
2. Corrections and supplementing records package for ECN of LP-OM-040Q-BSC.

Actions to Preclude Recurrence:

1. Revise LP-OM-040Q-BSC to clarify roles and responsibilities for TFM reporting (CA 01, 02, 03, 08, 09).
2. Revise LP-OM-040Q-BSC to institute periodic self-check of TFM reporting by TFM Designee (CA 04, 10, 11, 12, 13, 14)
3. Provide briefings to Site Personnel on TFM monitoring, recording, and reporting (CA 05).
4. Revise LP-OM-040Q-BSC to add Work Order number to enhance TFM management (CA 06).

Expected Completion Date: 03/15/2003

4. Justification: (Provide an explanation as to why the required actions cannot be completed within 100 days)

Elevation of DR: BSC-02-D-090 to CAR: BSC-02-C-090 required completion of a root cause analysis, evaluation of causal factors and related root causes, and determination of corrective actions. The Extended Actions identified above require completion for close out of the CAR. These additional activities have extended the schedule and require the request for additional time.

5. Impact: (Provide an impact statement to indicate what affect not completing within 100 days will have relative to waste isolation and safety, and impact to other work, if any)

Allowing additional time to complete these activities will not have an adverse affect on waste isolation and safety, nor impact other work. The Immediate Remedial Actions identified in Blocks 4 and 5 of the Amended Initial Response are sufficient for the process to meet requirement until all corrective actions are complete.

Approvals

6. Responsible Manager:

Leon K. Bossum Leon K. Bossum 1/20/03
Printed Name Signature Date

7. Senior Manager:

Russ Fraley Russ Fraley 1/21/03
Printed Name Signature Date

8. DOE Project Management:

J. Russell Dyer J. Russell Dyer 2/3/03
Printed Name Signature Date

9. DOQA:

R. Dennis Brown R. Dennis Brown 1/31/03
Printed Name Signature Date

10. Director, OCRWM: (required for scheduled completion dates one year or more from initial issue)

N/A N/A
Printed Name Signature Date

INTRODUCTION

This analysis was completed to evaluate the root causes determined by the root cause investigation, TapRoot Incident Report BSC02C090, by Tommy Wall, et al. To meet its objective of evaluating the causal factors to develop the corrective actions for BSC-02-C-090 the following methodology was employed. The TapRoot Report was broken down by causal factor and related root causes were evaluated and corrective actions addressing the root cause(s) developed. The causal factors correspond to those in the TapRoot Report whereas the corrective actions developed are numbered consecutively for clarity.

This evaluation is presented in three parts:

Part I: Corrective Action Summary; presents a summary of the identified corrective actions

Part II: Root Cause-Corrective Action Evaluation; present the root cause(s) evaluation for each causal factor identified in the TAProot Report and corrective actions developed.

Part III: TapRoot Incident Report BSC02C090 (attachment 1)

PART I: CORRECTIVE ACTION SUMMARY

Corrective Action(s) for Causal Factor 01

Corrective Action: 01

The immediate corrective action is revision of LP-OM-040Q-BSC to clarify roles and responsibilities to prevent recurrence.

Additional reinforcement of clear roles and responsibilities is being provided by implementation of the Site Transition Plan and Management Improvement Initiative.

Corrective Action(s) for Causal Factor 02

Corrective Action: 02

The corrective action to meet the root causes above requires revision of LP-OM-040Q-BSC clarify roles and responsibilities will ensure tasks are performed appropriately. This will be done by responsibilities being assigned to a Field Engineer.

This action will be reinforced by parallel actions implemented under the Site Transition Plan.

Corrective Action: 03

See Corrective Action 02, no additional corrective actions required.

Corrective Action: 04

Revision of LP-OM-040Q-BSC providing for periodic checks to ensure the procedural process is being executed properly. Revision of LP-OM-040Q to incorporate this action will be completed as an action to prevent recurrence.

Corrective Action(s) for Causal Factor 03

Corrective Action: 05

Clarification of the process can be achieved through revision of LP-CON-040Q and ensure the requirements are met. In addition briefings provided as a supplement to the Daily Safety/POD meetings at the site as an action improve understanding of the subject. These actions address the root cause to prevent recurrence.

Corrective Action(s) for Causal Factor 04

Corrective Action: 06

To enhance TFM and materials management revision of LP-OM-040Q-BSC will include addition of the Work Order number to the NQAMIL and associated reports.

Corrective Action(s) for Causal Factor 05

Corrective Action: 07

No additional corrective actions are required.

Corrective Action: 08

No additional corrective actions are required.

Corrective Action: 09

Corrective Actions required here are met by Corrective Actions 01 & 02 with no additional actions required.

Corrective Action: 10

Corrective Actions required here are met by Corrective Actions 04 with no additional actions required.

Corrective Action: 11

Corrective Actions required here are met by Corrective Actions 04 with no additional actions required.

Corrective Action: 12

Corrective Actions required here are met by Corrective Action 04 with no additional actions required.

Corrective Action: 13

Corrective Actions required here are met by Corrective Action 04 with no additional actions required..

Corrective Action: 14

Corrective Actions required here are met by Corrective Action 04 with no additional actions required.

PART II: ROOT CAUSE – CORRECTIVE ACTION EVALUATION

Causal Factor: 01

Lack of Procedural Adherence

Root Cause:

Human Performance Difficulty (1H)
Procedures (3P)
Not followed/Not used

Evaluation:

Lack of procedural compliance or procedures not being followed in this instance, results from unclear roles and responsibilities within the procedure, i.e., the assignment of tasks to the “responsible individual.” It was determined that no one was identified or assigned responsibility for completing the “Non-Quality Affecting Materials Installation Log” (NQAMIL).

Corrective Action 01:

The immediate corrective action is revision of LP-OM-040Q-BSC to clarify roles and responsibilities to prevent recurrence.

Additional reinforcement of clear roles and responsibilities is being provided by implementation of the Site Transition Plan and Management Improvement Initiative.

Causal Factor: 02

Field Engineering Staffing deficiencies

Root Cause:

Human Performance Difficulty (1H)
Work Direction (3I)
Preparation (4PR)

Evaluation:

Field Engineering staffing deficiencies coupled with organization changes impacted the ability to clearly assign responsibility, tasks were not re-assigned, within the procedure for the completion of the NQAMIL. The TFM Designee responsibilities were clearly assigned and met, however the use of “responsible individual” to assign the

responsibility for completion of the NQAMIL is ambiguous and no assignment to meet this responsibility was made.

Corrective Action 02:

The corrective action to meet the root causes above requires revision of LP-OM-040Q-BSC clarify roles and responsibilities will ensure tasks are performed appropriately. This will be done by responsibilities being assigned to a Field Engineer.

This action will be reinforced by parallel actions implemented under the Site Transition Plan.

Root Cause:

Human Performance Difficulty (1H)
Work Direction (3I)
Selection of Worker (4SW)

Evaluation

Field Engineering staffing deficiencies coupled with organization changes impacted the ability to clearly assign responsibility within the procedure for the completion of NQAMIL. The TFM Designee responsibilities were clearly assigned and met, however the use of "responsible individual" to assign the responsibility for completion of the NQAMIL is ambiguous and no assignment to meet this responsibility was made.

Corrective Action 03:

See Corrective Action 02, no additional corrective actions required.

Root Cause:

Human Performance Difficulty (1H)
Work Direction (3I)
Supervision During Work (4SD)

Evaluation:

The absence of NQAMIL equivalent to the work effort submitted into the records system or to the TFM Designee and the duration of this condition suggests that an assessment of the process is appropriate to ensure reporting requirements are being met.

Corrective Action 04:

Revision of LP-OM-040Q-BSC providing for periodic checks to ensure the procedural process is being executed properly. Revision of LP-OM-040Q to incorporate this action will be completed as an action to prevent recurrence.

Causal Factor: 03

Historical Processes have been continued without appropriate review and integration.

Root Cause:

Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls NI (need improvement)
Confusing or incomplete (5CI)

Evaluation:

The subject of TFM's is a complex subject and there is not a common understanding of the requirements among site personnel. These are set forth in LP-OM-040Q-BSC but may require "tribal" knowledge of the specific Determination of Importance requirements before the procedure/process is understandable.

Corrective Action 05:

Clarification of the process can be achieved through revision of LP-CON-040Q and ensure the requirements are met. In addition briefings provided as a supplement to the Daily Safety/POD meetings at the site as an action improve understanding of the subject. These actions address the root cause above to prevent recurrence.

Causal Factor: 04

Lack of a Materials Management Program.

Root Cause:

Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls NI (4SL)

Evaluation:

In fact LP-OM-040Q is the materials management plan for the present. Future activities under the Site Transition Plan will provide more in terms of warehousing and property control, but in regard to TFM's the current process will suffice.

Corrective Action 06:

To enhance TFM and materials management revision of LP-OM-040Q-BSC will include addition of the Work Order number to the NQAMIL and associated reports.

Causal Factor: 05

Procedural Inconsistencies.

Root Cause:

Human Difficulty (1H)
Procedures (3P)
Wrong (4WI)
Facts Wrong (5FW)

Evaluation:

AP-2.17Q, AP-2.23Q and LP-OM-040Q-BSC were reviewed and requirements cross-walked to ensure there are no inconsistencies between the procedures. This review (Attachment 3) did not find evidence of inconsistencies between the procedures. Additionally, this procedure is subject to reviews under AP-5.1Q and an acceptance review by Engineering.

Correction Action 07:

No additional corrective actions are required.

Root Cause:

Human Performance Difficulty (1H)
Procedures (3P)
Followed Incorrectly (4FI)

Evaluation:

Lack of procedural compliance or procedures being followed incorrectly in this instance, results from unclear roles and responsibilities within the procedure, i.e., the use of responsible individual. It was determined that no one was identified or assigned responsibility for completing the "Non-Quality Affecting Materials Installation Log" (NQAMIL).

Corrective Action 08

Corrective Action 02 will prevent recurrence for the root cause above, no additional corrective actions required.

Root Cause:

Human Performance Difficulty (1H)
 Procedures (3P)
 Followed Incorrectly (4FI)
 Ambiguous Instructions (5AI)

Evaluation:

The root causes above identify the procedural weaknesses similar to those identified by the root causes for Corrective Actions 01 & 02. Revision of LP-OM-040Q-BSC focused on clear roles and responsibilities will prevent recurrence.

Corrective Action 09:

Corrective Actions required here are met by Corrective Actions 01 & 02 with no additional actions required.

Root Cause:

Human Performance Difficulty (1H)
 Quality Control (3Q)
 QC NI (4QL)
 Inspection Techniques NI (5QZ)

Evaluation:

This root cause is considered to parallel that of Corrective Action 04 to the extent that no means exist to measure the success or the "quality" of the process. The preferred method is to build the quality into the process and provide self-inspection. The corrective actions identified for Corrective Action 04 will prevent recurrence.

Corrective Action 10:

Corrective Actions required here are met by Corrective Actions 04 with no additional actions being required.

Root Cause:

Human Performance Difficulty (1H)
 Management System (3M)

Standards, Policies, or Admin. Controls NI
Not Strict Enough (5NS)

Evaluation:

The corrective action for the root cause will be provided in the revision of LP-OM-040Q-BSC to self assess process performance. Should deficiencies be identified where lack of procedural compliance is an issue or other instances of this nature are identified where disciplinary actions are warranted, BSC HR Policies would apply. Reinforcement is provided here through the MII Program and Site Transition Plan.

Corrective Action 11:

Corrective Actions required here are met by Corrective Actions 04 with no additional actions required.

Root Cause:

Human Performance Difficulty (1H)
Management System (3M)
Standard, Policies, or Admin. Controls Not Used (4SN)
Enforcement NI (5EL)

Evaluation:

The corrective action will be provided in the revision of LP-OM-040Q-BSC to self assess process performance. Should deficiencies be identified where lack of procedural compliance is an issue or other instances of this nature are identified where disciplinary actions are warranted, BSC HR Policies would apply. Reinforcement is provided here through the MII Program and Site Transition Plan.

Corrective Action 12:

Corrective Actions required here are met by Corrective Action 04 with no additional actions required.

Root Cause:

Human Performance Difficulty (1H)
Management System (3M)
Standard, Policies, or Admin. Controls Not Used (4SN)
Accountability NI (5AL)

Evaluation:

The corrective action will be provided in the revision of LP-OM-040Q-BSC to self assess process performance. Should deficiencies be identified where lack of procedural compliance is an issue or other instances of this nature are identified where disciplinary actions are warranted, BSC HR Policies would apply. Reinforcement is provided here through the MII Program and Site Transition Plan.

Corrective Actions 13

Corrective Actions required here are met by Corrective Actions 04 with no additional actions required.

Root Cause:

Human Performance Difficulty (1H)
Management System (3M)
Oversight/Employee Relations (4OE)
A&E lack Depth (5LD)

Evaluation:

The root cause is considered to parallel that of Corrective Action 04 to the extent that no means exist to measure the success or the "quality" of the process. The preferred method to ensure this is to build the quality into the process and provide self-inspection. The corrective actions identified for Corrective Action 04 will prevent recurrence.

See Corrective Action 14:

Corrective Actions required here are met by Corrective Action 04 with no additional actions required.

TapRoot® Incident Report

Incident: BSC02C090
TFM Reporting Deficiency
Date of Incident: 10/04/2002
Date Investigation Started: 11/11/2002
Date Draft Report Sent for Approval: 11/21/2002
Date Final Report Issued: 11/22/2002
Incident Classification: Audit
Facility Affected: Exploratory Studies Facility

Incident Summary:

An initial Deficiency Report was initiated on 3/13/2002. This report, BSC-02-D-090 reported a failure to comply with procedure LP-OM-040Q-BSC, Rev 0, ICN 1. There was a failure to document installed materials as required. That documentation is then reported to Safety Assurance.

After an investigation of extent of condition and in consideration of repeated instances of non-compliance, the Deficiency was changed to BSC-02-C-090.

Initial Conditions:

Work Order #13309 and #12646 documented use of materials that were not recorded in the proper logs and were not reported by the TFM designee as required by LP-OM-040Q-BSC

Causal Factor: 01
Lack of Procedure Adherence

Procedures, while containing numerous inconsistencies (see CF 5), were still not utilized appropriately as required.

Root Cause: Human Performance Difficulty (1H)
Procedures (3P)
Not Used / Not Followed (4NU)

Corrective Action: 1

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**

Procedure non-compliance occurred during the period preceding the 480V near miss incident. Management is implementing corrective actions under the Root Cause for that event in the areas of roles, responsibilities and accountability. Those activities should include a review of this incident to ensure the procedures involved in this incident are given the same attention

Causal Factor: 02
Field Engineering Staffing deficiencies

Staffing changes from Plan B site reductions resulting from Plan B refocus resulted in a reduction of Field Engineering resources.

Root Cause: Human Performance Difficulty (1H)
Work Direction (3I)
Preparation (4PR)

Corrective Action: 06

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**

Management has a responsibility to assign a TFM Designee for each work package, work instruction, etc. and include a sign-off for TFM approval. Management shall review the staffing levels and ensure they are appropriate to perform these tasks.

TapRooT® Incident Report

Root Cause: Human Performance Difficulty (1H)
Work Direction (3I)
Selection of Worker (4SW)

Corrective Action: 07

Date Due:	Responsible Dept.:
Date Complete:	Responsible Person:
See CA 06	

Root Cause: Human Performance Difficulty (1H)
Work Direction (3I)
Supervision During Work (4SD)

Corrective Action: 08

Date Due:	Responsible Dept.:
Date Complete:	Responsible Person:

Periodic reviews of TFM records by site internal oversight shall be conducted to ensure work is being properly executed. It is not sufficient to rely on the QA/QC system as the first line of defense in discovering error.

Causal Factor: 03

Historical Processes have been continued without appropriate review and Integration

Going back to Kiewit, there have been various performance parameters generated for TFM (Performance Assessment/Waste Isolation) by Technical groups, DOE, etc. who directed implementation of these regulatory and technical parameters, which became the basis for requirements regarding the planned/actual use and reporting of TFM. This has resulted in confusing procedures, unclear requirements, and the documentation of TFM requirements during a period of site characterization/site recommendation activities.

Root Cause: Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls NI (4SL)
Confusing or incomplete (SCI)

Corrective Action: 10

Date Due:	Responsible Dept.:
Date Complete:	Responsible Person:

Develop a graded approach to TFM monitoring, collection, and reporting in response to the Technical Direction Letter submitted by the DOE to BSC received 11/1/02 titled: Determinations of Importance Evaluations, Revision 2, TDL NO 03-004.

Definitions, procedures, and requirements must be clearly defined and communicated to site personnel specific to monitoring, recording and reporting.

Procedures created for this purpose must be human engineered to ensure usability, so the Site is not set up for failure.

Corrective Action: 11

Date Due:	Responsible Dept.:
Date Complete:	Responsible Person:

To cover the current situation and period of time until a response to the TDL is complete, eliminate LP-OM-040Q and operate the site TFM program in accordance with AP-2.17Q. Organizational assignments in accordance with AP-2.17Q will need to be made by management to ensure successful implementation. All procedures that reference

TapRooT® Incident Report

LP-OM-040Q shall be updated. Procedures similar to LP-OM-040Q should be reviewed to determine their applicability in light of these changes.

Causal Factor: 04

Lack of a Materials Management Program

allows There is currently no viable method in place to control the use, distribution and accountability of (Q and non-Q) material(TFM) used at the Yucca Mountain Site. This lack of a material management program uncontrolled use of materials. This could effect the ability of the site to store nuclear waste safely, and could interfere with performance confirmation testing activities.

Root Cause: Human Performance Difficulty (1H)

Management System (3M)

Standards, Policies, or Admin. Controls NI (4SL)

No SPAC (5NO)

Corrective Action: 12

Date Due:

Responsible Dept.:

Date Complete:

Responsible Person:

Establish a rigorous Site Materials Management Program integrated with DIE and hazardous materials controls/requirements. This program shall be implemented by all personnel utilizing materials at the site. Programs in use at commercial nuclear power stations should be benchmarked

Causal Factor: 05

Procedural Inconsistencies

There are numerous inconsistencies among the various procedures associated with TFM. These include but are not limited to LP-OM-040Q, AP-2.17Q, AP-2.23Q

Root Cause: Human Performance Difficulty (1H)

Procedures (3P)

Wrong (4WI)

Facts wrong (5FW)

Corrective Action: 13

Date Due:

Responsible Dept.:

Date Complete:

Responsible Person:

Procedures are not consistently reviewed to determine if there is an interference or inconsistency with another procedure. Management shall implement a rigorous impact review program to ensure procedural inconsistencies

do

not create continuing errors and conditions adverse to quality at the site.

Root Cause: Human Performance Difficulty (1H)

Procedures (3P)

Followed Incorrectly (4FI)

Details NI (5DE)

Corrective Action: 14

Date Due:

Responsible Dept.:

Date Complete:

Responsible Person:

See CA 13

Root Cause: Human Performance Difficulty (1H)

Procedures (3P)

Followed Incorrectly (4FI)

Ambiguous instructions (5AI)

TapRooT® Incident Report

Corrective Action: 15

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**

This root cause appears to be a continuation of practices detailed in the 480V near miss. A review of corrective actions being implemented as a result of that root cause shall be reviewed for effectiveness. Perform periodic self-assessments to ensure corrective actions continue to be effective.

Root Cause: Human Performance Difficulty (1H)
Quality Control (3Q)
QC NI (4QL)
Inspection techniques NI (5QZ)

Corrective Action: 16

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**

Develop a method to implement a QC practice and review of procedures to ensure they are consistent & cohesive.

Root Cause: Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls NI (4SL)
Not strict enough (5NS)

Corrective Action: 17

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**

Management is responsible and accountable for enforcing strict procedural compliance. Measures are currently under way to deal with issues as a result of MII initiatives for R2A2. This event shall be reviewed with those strategies in mind.

Root Cause: Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls Not Used (4SN)
Enforcement NI (5EL)

Corrective Action: 18

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**
See CA 17

Root Cause: Human Performance Difficulty (1H)
Management System (3M)
Standards, Policies, or Admin. Controls Not Used (4SN)
Accountability NI (5AL)

Corrective Action: 19

Date Due: **Responsible Dept.:**
Date Complete: **Responsible Person:**
See CA 17

Root Cause: Human Performance Difficulty (1H)
Management System (3M)
Oversight / Employee Relations (4OE)
A & E lack depth (5LD)

Corrective Action: 20

TapRoot® Incident Report

Date Due:
Date Complete:
See CA 16

Responsible Dept.:
Responsible Person:

Investigator / Investigation Team:

Tommy Wall- Taproot Process Lead
Alan Mitchell-Test Coordination Office
Bill Distel- Safety Assurance Department
Rudy Johnson-Project Field Engineering



Gerald Boldt
01/07/2003 12:19 PM

To: Edward Fitch/YM/RWDOE@CRWMS, Leonard Savastio/YM/RWDOE@CRWMS
cc: Leon Fossum/YM/RWDOE@CRWMS, Ann Koplow/YM/RWDOE@CRWMS, Charles
Buckey/YM/RWDOE@CRWMS, Robert Freeman/YM/RWDOE@CRWMS
Subject: CAR 90 - TFM Reporting Deficiency Root Cause

User Filed as: Excl/AdminMgmt-14-4/QA N/A

Attached is the first part of our closure activity for **Causal Factor 5 - Procedural Inconsistency** which reads:

"There are numerous inconsistencies among the various procedures associated with TFM. These include but are not limited to LP-OM-040Q, AP-2.17Q, AP-2.23Q."

The attached is a detailed review of the three named procedures for inconsistencies. None were found. Please contact Ann koplow or myself for any further information.

This closes schedule item FCCAR90L20. Our remaining activity to verify that the impact review was completed and documented is on schedule.



TFM Causal Factor 5.doc

TFM Reporting Deficiency Root Cause

Causal Factor 5 - Analysis of Potential Inconsistencies among LP-OM-040Q, AP-2.17Q, and AP-2.23Q

LP-OM-040Q References:

LP-OM-040Q References to AP-2.17Q

1.0 PURPOSE

This procedure establishes the responsibilities and process for ensuring that applicable tracers, fluids, and materials (TFM) requirements of the Yucca Mountain Site Characterization Project (YMP) are implemented during Exploratory Studies Facility (ESF) construction, operations, and site characterization construction activities, such as drilling and testing support. The use of TFM within the test and waste isolation evaluation zone (TWIEZ) and in proximity to site characterization testing activities must be controlled in accordance with prescribed requirements contained in AP-2.17Q, Tracers, Fluids, and Materials Data Reporting and Management.

3.2 Exempted TFMs—TFMs not required to be reported in accordance with this procedure.

The following TFMs are exempted from reporting, per AP-2.17Q, if they are recovered from the site prior to repository closure:

3.3 Fluids—In the context of the YMP TFM definition (per AP-2.17Q), fluids include gases and liquids, certain plastic solids, and mixtures of solids and liquids (excluding concrete) other than tracers, which are capable of flow.

3.6 Reportable TFM—All TFM used/removed/committed within the TWIEZ and in other areas where site characterization field activities are conducted for the YMP, unless exempted by either DIES or in accordance with AP-2.17Q.

Retroactive to 02/07/1997, quality assurance (QA) records shall be made and provided for all TFM that are permanently emplaced/committed (i.e., to remain after closure of the potential repository) to the Topopah Spring Loop and associated operation and test support areas, including water, wood, hydraulic fluids, fuels, oils, etc., and unrecovered spills, except incidental losses of chlorinated, potable water/ice used for drinking and hand-washing purposes, and the tracer gas sulfur hexafluoride.

It may be necessary to track TFM use/removal for those items that are not committed and thus not reportable to the TFM database per AP-2.17Q.

3.7 TFM—TFMs to be controlled, limited, and documented in accordance with AP-2.17Q to ensure that data gathered during site characterization are not compromised and that testing activities do not adversely impact the ability of Yucca Mountain to isolate high-level radioactive waste. AP-2.17Q sets forth upper-tier procedure requirements for the YMP TFM program.

Quality assurance controls associated with TFM reporting are included in *Temporary Surface Construction Facilities*, BAB000000-01717-6300-01500; *Subsurface General Construction*, BAB000000-01717-6300-01501; *Materials and Equipment*, BAB000000-01717-6300-01600; *Constructor Quality Control/Quality Assurance*, BA000000-01717-6300-01400; *Cross Drift Subsurface General Construction*, BABEAF000-01717-6300-01502; and *Maintenance and Operation of Surface Facilities*, BAB000000-01717-6300-01800.

3.9 TWIEZ—An area that encompasses the Conceptual Controlled Area Boundary and extends to the northern side of Yucca Wash and to the western side of Windy Wash. This zone, which includes the conceptual controlled area and an area upgradient of the conceptual controlled area, is expected to bound the area from where the surface-water infiltration could affect a potential repository. Use of TFM within the TWIEZ is strictly controlled. The Potential Repository Outline is the area with the highest degree of control from a TFM standpoint. See Attachment 1, Test and Waste Isolation Evaluation Zone, in AP-2.17Q for a diagram of these boundaries.

5.1.2 TFM Designee:

- a) Compile a TFM estimate for each assigned design package, work package, work instruction, or other discrete element using the report form (AP-2.17Q.1, Tracers, Fluids, and Materials Report) included as Attachment 5 in AP-2.17Q, or a comparable report that includes all of the same information. Contact the Safety Assurance (SA) Department to determine if TFM estimates must be submitted for on-going or continuing work for which TFM estimates have previously been submitted. Also provide additional information required per Subsection 5.1 of AP-2.17Q. Request input from the following, as needed:
- b) Submit TFM estimate to the BSC SA Department in accordance with AP-2.17Q.

5.2.1 TFM Designee:

- a) Ensure that TFM use is authorized based on the results of DIES in accordance with the process described in AP-2.17Q that documents specific tracer approval. Do not allow use of TFM until approval is received from the BSC SA Department.
- b) Prepare and maintain lists of TFM approved for reference use by Field Engineering and construction that is compiled from Attachment II of the surface and subsurface DIES, and from the TFM qualifying as exempt by Subsection 3.4 of AP-2.17Q.

5.5 REPORTING OF ACTUAL USE AND AS-CONSTRUCTED INFORMATION
TFM Designee:

- a) Collect actual use information as follows:
 - 1) ... obtain TFM usage and installation information from records generated as a result of implementing Subsection 5.4.
(Note this includes Forms LP-OM-040Q-BSC.1 & .2, LP-OM-041Q-BSC.1 & .2 and LP-OM-027Q-BSC.2)
 - 2) Determine the actual quantities used and removed; compile the results on Form AP-2.17Q.1, Tracers, Fluids, and Materials Report,; and process the form in accordance with AP-2.17Q by signing and transmitting the report to the BSC SA Department for completion no later than three months after the completion of an activity.
For activities lasting longer than three months, reasonable efforts should be made to transmit the TFM Actual Use Reports within six months of TFM use, emplacement, or recovery.
Cross Drift Subsurface General Construction requires that water use be reported no later than 9 days after application, in accordance with AP-2.17Q.
 - 3) Use the following as available sources of TFM use and removal documentation:

b) Report actual use and as-constructed information by transmitting the TFM Actual Use Report to the BSC SA Department in accordance with AP-2.17Q.
LP-OM-040Q References to AP-2.23Q
5.4.1 TFM Designee: b) Ensure ESF construction, maintenance, and operations are initiated and performed under the direction of a work order (AP-2.23Q, <i>Work Request/Work Order Process</i>) or for support of scientific testing, a field work package (AP-5.2Q, <i>Testing Work Packages</i>) ...
5.4.2 Responsible Individual: a) Account for permanent materials use as follows: 1) Record quantities of installed or removed quality affecting materials recorded in accordance with applicable procedures either in the Work Order Package (AP-2.23Q) or on Attachment 2, Quality Affecting Materials Installation Log.
5.5 REPORTING OF ACTUAL USE AND AS-CONSTRUCTED INFORMATION TFM Designee: a) Collect actual use information as follows: 1) Upon completion of a work order (AP-2.23Q) or field work package (AP-5.2Q), or at an interim interval for long duration work packages as defined in the work order or work package, obtain TFM usage and installation information from the records generated as a result of implementing Subsection 5.4. 3) Use the following as available sources of TFM use and removal documentation: • For permanent materials accounting, use: - Work package installation reports prepared in accordance with AP-2.23Q

AP-2.23Q References:

AP-2.23Q References to AP-2.17Q
none
AP-2.23Q References to LP-OM-040Q
none

AP-2.17Q References:

AP-2.17Q References to AP-2.23Q
none
AP-2.17Q References to LP-OM-040Q
none

Submittal Page 1 of X2
160
4/21/03

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

☒ DR/CAR/QO
☐ SWO

NO. BSC-02-C-090

PAGE OF

QA: QA

CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

Verification of Corrective Actions to Corrective Action Report BSC-02-C-090

Initial Response dtd. 12/23/03 Committed Actions:

Block 4. Immediate Actions Necessary to Bring the Process Under Control:

Verified initiation of site stand-down . See Field Operations Log (Attachment 3) and statement in DIR 02-18 signed off by Site QA Manager.

Block 5. Immediate Remedial Actions Completed:

Verified e-mail release for the Technical Coordination Office for work E. Fitch cc. to James Hollins dtd. 10/03/02. (See Attachment 4) Conversation with Site Engineering reveals a typo in the date the TCO was released, the actual date was 9/30/02, as evidenced in the Field Operations log dated same. (See Attachment 5)

Verified lifting of stand down on 10/03/02 (See Attachment 4) and committed briefings to underground supervisory personnel on the responsibilities of para. 5.4.2 by review of Training Attendance Record dtd. 10/03/02. This attendance record will be submitted as objective evidence reviewed during this verification in the final records package for this deficiency document.. Also verified the Safety Assurance briefing from the Safety Assurance Manager to site personnel during the weekly safety meeting on 10/07/2002. (See Attachment 6).

Block 6. Plan for Determining the Extent of Condition:

See Complete Response dtd. 1/21/03 with Root Cause Determination and Committed Corrective Actions

Verification of Committed Corrective Actions of Complete Response dtd 1/21/03

Block 4. Extent of Condition:

See Complete Response

Block 5. Impact:

See Complete Response

Block 6. Remedial Actions:

Conditions 1 and 2:

Verified that walk downs of areas of the ESF have been performed and documented for Work Orders (WOs) #'s 13309 and 12464. In addition, all WO's identified in the extent of condition were also evaluated with their results. Also verified that resulting walk down supplemental information resulting has been reflected on the appropriate TFM reports (See Attachment 7 for all). Note: Attachment 7 is an Activity Summary Matrix with the corrected TFM Records cross linked to the appropriate Records Center Accession Numbers, copies of this documentation are also contained in a three ring binder of objective evidence related to this CAR and will be submitted with the final records package.

Condition 3.

Verified ECN corrections and record supplements to LP-OM-040Q-BSC ECN (accession number SIT 20030317.0002) and correction to same dtd 03/31/03

Submittal Page 12 of 12 ⁰⁶⁰
4/2/03

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

☒ DR/CAR/QO
☐ SWO

NO BSC-02-C-090

PAGE OF

QA: QA

CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

Verification of Corrective Actions to Corrective Action Report BSC-02-C-090 (Continued)

Block 7 Root Cause:

See Attachment 1 to the Complete Response.

Block 8. Action to Preclude Recurrence:

Verified by review of LP-OM-040Q-BSC Revision 0, ICN 2 for the following:

1. Verified paras. 3.3, 3.7, and 4.2 of LP-OM-040Q that clarifies and adds the responsibilities for the Assigned Field Engineer, Responsible Field Engineer and Operations Data Collector.
2. Verified para. 5.6 d) of the above procedure to require a semi-annual self assessments by the Project Engineer to ensure procedural requirements of this procedure are met.
3. Verified Site Personnel briefings on TFM monitoring, recording and reporting via review of Training Attendance Records for Briefings 1 through 4 dated 2/25/03, 2/27/03, 3/04/03 and 3/12/03 by R. Johnson
4. Verified para. 5.5 a) 3) of LP-OM-040Q-BSC that Work Order Numbers are included/referenced during the final TFM reporting

NOTE: Objective evidence related to the above corrective actions not as linked as attachments this CAR is in binder form and will be included in the final records package to this CAR.

The Above Committed Corrective Actions are considered complete.

This CAR is considered closed.

QAR: John R. Doyle Date: 4/01/03.

John R. Doyle

ATTACHMENT 3

FLAME FIELD OPERATIONS

CARBON-02C-090

plot 0700

26 Sept. '02 (Thursday)

Assume position duties R. Olson / (Anderson)

0732 No. Portal attendant on-duty, water valve open, granting tunnel access (Bartolillo)

0741 No. Ramp airflow (340k cfm) and air quality acceptable for tunnel entry (Taylor)

0742 Mercury dispatch called & will be taking down RMAID power this weekend - no YMP impact (Terque)

0743 So. Portal attendant on-duty, granting so. side access, mine phone comm check OK (Reid)

0752 Potable water use for 9/25/02 = 740 gallons

0801 So. Ramp radon levels low (1150 Bq/m³) - no respirators required (Jesse)

0822 NPW-45-MV-001 open (Jacobson)

0823 De-railers set up on North pad near mech. shops for rail maintenance (Jarin)

0833 Turn on 2 strings of lights past CD 17+63 from MPC 16 (Hinton)

0850 ECRB airflow (63.4k cfm) and quality acceptable for work activities. Air behind blh 22+01 OK. Radon (663 Bq/m³) low - no respirators req'd. Dry bulb temps 0+30 = 83.4 ; 5+00 = 90.8 ; 21+75 = 94.2 (Taylor)

0855 Stop work issued on TFM documentation: (1) stop all TFM work UG (2) stop any TFM from going UG (LP-OM-040) (Lee). Unable to contact UG Supt. or Field Supt. - in safety training class

0905 No. and So. Portal attendants contacted & will hold/stop TFM shipments to UG. No. Portal will contact shifters to stop TFM work (Bartolillo & Reid)

0912 Survey crew at 74+50 to curve on So. Ramp

0917 A-8 open blh doors (Otto - USGS)

0930 IH reports WBGT = 68.9 no Notification needed.

0945 Yellow trouble light and audible alarm at 5008 fire alarm panel - suspect paper jam (Maier)

ATTACHMENT 4

PCAR BSC-02-C-090

pl. of 1

► Nelson O'Connor
10/03/2002 10:06 AM

.....

To: Edward Fitch/YM/RWDOE@CRWMS
cc:
Subject: Re: TFM Stand-Down

User Filed as: Excl/AdminMgmt-14-4/QA:N/A

We need to make sure that the Electrical Supervisors get briefed on this also. They need to set anchors for Fan 1 and other electrical components.
Edward Fitch



Edward Fitch
10/03/2002 08:44 AM

To: Site Operations@CRWMS
cc: Nelson O'Connor/YM/RWDOE@CRWMS, Leon Fossum/YM/RWDOE@CRWMS, James
Hayes/YM/RWDOE@CRWMS, James Hollins/YM/RWDOE@CRWMS, John
Martin/YM/RWDOE@CRWMS
Subject: TFM Stand-Down

User Filed as: Excl/AdminMgmt-14-4/QA:N/A

The TFM Stand-Down regarding the materials identified previously has been lifted following briefing of Underground Supervisory Personnel on the requirements of LP-OM-040Q-BSC. These materials are ground support materials and support or anchor bolts. Ground support materials consist of Swellex, Split-Set, and Williams rockbolts and related materials such as welded wire fabric, rock bolt plates and grout for the Williams bolts. Also, any Hilti or similar anchor bolts used to anchor support fixtures etc. to the rock surface in the tunnel. Survey spads and monuments are also recorded as permanent committed materials.

0645 Assume die Duties - B. Smith

0730 Back up Compr. on line

0750 Cut Tank Reading - 557950

0758 N.P. Access open, water on

FBS OK. - Henry.

0759 Taylor Reports Air Flow, quantity
 OK. Reading is 840 x 400.

0803 S.P. Access open, main phone
 check OK - Wally

0840 Smoke Reports ECRB Running
 Normal - will be vacuuming at
 A-8 Area.

0841 Tim m. Reports S.P. cleared for
 Entry - Low RADON ~~840~~ 726.

0845 Lenevon Reports main water valve
 to A-5 open.

0905 Don Hinton Reports opening
 Breaker on MPC 16. This will
 turn lighting back on Behind
 Bulk Head.

0920 Taylor Reports ECRB cleared -
 Readings are 0+30 418 - 79.6°
 5+00 369 58.5° 21+75
 93.8. AIR OK AT AND

Behind Bulk Head.
 0940 Lee F. has lifted the hold
 on TFM for TCO.

0955 Rail maint. Inspect. AT S.P.
 PCU Knows - Wally

0958 Pete has stopped work.

AT slot cut 3, will contact
 us when things are OK.

1005 Survey has De-Railers AT
 53+00 Going out to south.

Per. DAVIN? Wally - Henry Becu
 contacted

ATTACHMENT 6

TO CAR BSC-02-C-090.

pl. f 1



James Hollins

03/31/2003 02:05 PM

To: John Doyle/YD/RWDOE@CRWMS
cc: Edward Fitch/YM/RWDOE@CRWMS, Bill Distel/YM/RWDOE@CRWMS
Subject: Presentation on TFMs

User Filed as: Excl/AdminMgmt-14-4/QA N/A

The Safety Assurance group (James Hollins and Bill Distel) briefed manual and non-manual personnel on TFMs at the Weekly Safety Meeting on 10/07/02. This briefing on were presented to Site personnel after meeting with Field Engineering to discuss the condition and a path forward on BSC-02-C-090.

Revised Weekly Safety Minutes o F - Same.
JHO 3/31/03

**BSC-02-C-090 REMEDIAL ACTION
ACTIVITY SUMMARY MATRIX**

ATTACHMENT 7
FO
CAR BSC-02-C-090

Page 1 of 2

SUMMARY

As stated in Block 6, remedial Actions, for Conditions 1 & 2 identified in this CAR would require "walk-downs" as a means to supplement/replace affected Tracers, Fluids and Materials (TFM) reports to correct the TFM record. However, subsequent records search (RISWeb) based on information associated with the work order found documentation associated with the work substantiating the type and amount of TFM (ground support items) that were installed. This documentation consists primarily of Quality Control (QC) Reports; QC Inspection Reports (BSC IR) and Test Checklist for Specifications (Issue #). In some cases the original Quality/Non-Quality Affecting Materials Installation Log (QMIL/NQMIL) was found. Based on these findings, and to ensure correct TFM reporting approximately 50 % of the work orders were walked down out of those needed and it was determined that a high level of confidence could be placed on the NQMILs or QMILs generated based on this documentation.

WORK ORDER #	QMIL/NQMIL CREATED	ASSOCIATED RECORD MOL #	REMARKS
13309	YES	SIT.20030313.0008 (QMIL) MOL.20020530 0081 (WO)	Walked-down and verified TFM installation. Associated QC Reports: Issue #'s 0948,0947, 0942, 0945, 0964.
12646	YES	SIT.20030313.0008 (NQMIL) MOL 20020731.0123 (WO)	Walked-down and verified TFM installation: Associated QC Report: IR# BSC-0074
13760	YES	SIT.20030313.0008 (QMIL)	Work required for YMSCO-02-0002, Associated QC Report: IR# BSC-0191
13680	NO	MOL.20020812.0345 (WO)	Bulkhead door removal/re-install no reportable TFMs
13381	YES	SIT.20030313.0006 (NQMIL) MOL.20021025.0529 (WO)	AP-2.23Q Materials Tracking Record
12459	N/A	N/A	Monthly Filter PM (MAXMO WO tracking)
12248	YES	SIT.20030313.0004 (QMIL)	NCRs: YMSCO-01-0018, YMSCO-01-0025. Associated QC Inspection Reports: Issue#'s 0621, 0735, 0806, 0892, 0893, 0924, 0929, 0898, 0899, 0923, 0932, 0809, 0897, 0904, 0929, 0927, IR# BSC-0152, 0165, & 0167.
11792	NO	MOL.20010913.0381 (NQMIL)	Previously reported, walked-down/verified. Associated QC Inspection

40 of 41

BSC-02-C-090 REMEDIAL ACTION
ACTIVITY SUMMARY MATRIX

Page 2 of 2

		MOL.20020627.0242 (WO)	Report: IR # BSC-0020
11706	NO	MOL.20010920.0172 (NQMIL) MOL.20020627.0260 (WO)	Previously reported, walked-down/verified. Associated QC Inspection Report: IR# BSC-0034
11002	NO	MOL.20020603.0294 (WO)	Welding on steel set, TFM report not required. Associated QC Reports: Issue # 0831
11001	NO	MOL.20020603.0293 (WO) MOL.20010920.0170 (MQMIL)	Previously reported, Associated QC Reports: Issue # 0577
10751	YES	SIT.20030313.0008 (QMIL)	Ground support NCR work. NCR's: YMSCO-97-0013, YMSCO-00-0059, YMSCO-00-0053, YMSCO-08---44, YMSCO-01-0029, YMSCO-99-025, YMSCO-99-0081. Associated QC Reports: QC Issue #'s 0253, 0920, 0921, 0430, 0907, 0908, 0909, 0885, 0883, 0884, 0877, 0872, 0437, 0865, 0869, 0874, 0873, 0857, 0856, 0855, 0854, 0853, 0852, 0836, 0846, 0823, 0850, 0811, 0438, 0483, 0496, 0494, 0799, 0495, 0810, 0499, 0563, 0729, 0732, 0804, 0732, 0721, 0720, 0717, 0714, 0712, 0707, 0692, 0693, 0690, 0718, 0748, 0719, 0731, 07833, 0701, 0620, 0619, 0615, 0614, 0611, 0609, 0610, 0608, 0606, 0607, 0599, 0624, 0625, 0605, 0583, 0582, 0581, 0567, 0596, 0562, 0598, 0589, 0590, 0565, 0773, 0798, 0637, 0649, 0651, 0656, 0666, 0668, 0670, 0636, 0565, 0574, 0584, 0526, 0543.
10057	NO	MOL.20010718.0148 (WO)	Temporary installation, TFM reporting not required.
9207	NO	MOL.20010627.0200 (WO) MOL.20010605.0616 (NQMIL)	Multiple daughter WO's, only required TFM previously reported for 9207-002-01
9390	YES	SIT.20030318.0027 (NQMIL) MOL.20011010.0309 (WO)	Multiple daughter WO's, TFM record supplemented after walk-down/verification to correct rock bolt type quantities.
9308	NO	N/A	Tracking WI to collect equipment hours/and or fluids use.