



QA: QA

WM 11

Mark T. Peters, Manager  
Science & Engineering Testing  
Bechtel SAIC Company, LLC  
1180 Town Center Drive  
Las Vegas, NV 89144

VERIFICATION OF CORRECTIVE ACTION AND CLOSURE OF DEFICIENCY REPORTS (DRs) BSC(V)-02-D-048, -049, -050, AND -051 RESULTING FROM THE BECHTEL SAIC COMPANY, LLC (BSC) QUALITY ASSURANCE AUDIT BSC-SA-02-007 OF THE UNIVERSITY OF WESTERN ONTARIO (UWO)

BSC Quality Assurance has verified implementation of corrective action for DRs BSC(V)-02-D-048, -049, -050, and -051 and determined the results to be satisfactory. As a result, the DRs have been closed.

If you have any questions, please contact either Richard L. Maudlin at (702) 295-2961 or Daniel A. Klimas at (702) 295-2665.

A handwritten signature in cursive script that reads 'D. T. Krisha'.

Donald T. Krisha, Manager  
Quality Assurance

4/30/02  
Date Signed

RLM:bw-0429022444

Enclosure:  
DR BSC(V)-02-D-048, -049, -050, and -051

NM55 07

April 30, 2002

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cc w/encl:

L. H. Barrett, DOE/HQ (RW-2) FORS  
L. W. Bradshaw, Nye County, Pahrump, NV  
Margaret Chu, DOE/HQ (RW-1) FORS  
J. R. Dyer, DOE/YMSCO, Las Vegas, NV  
W. J. Glasser, NQS, Las Vegas, NV  
Birdie Hamilton-Ray, DOE/YMSCO, Las Vegas, NV  
C. E. Hampton, DOE/YMSCO, Las Vegas, NV  
R. W. Henderson, BSC, Las Vegas, NV  
D. G. Horton, DOE/YMSCO, Las Vegas, NV  
D. A. Klimas, BSC, Las Vegas, NV  
D. T. Krisha, BSC, Las Vegas, NV  
Robert Latta, NRC, Las Vegas, NV  
S. W. Lynch, State of Nevada, Carson City, NV  
S. P. Mellington, DOE/YMSCO, Las Vegas, NV  
Ram Murthy, DOE/OQA, Las Vegas, NV  
D. G. Opielowski, NQS, Las Vegas, NV  
R. E. Powe, BSC, Las Vegas, NV  
J. M. Replogle, DOE/YMSCO, Las Vegas, NV  
N. K. Stablein, NRC, Rockville, MD  
D. D. vonderLinden, BSC, Las Vegas, NV  
Engelbrecht von Tiesenhausen, Clark County, Las Vegas, NV  
T. J. Wall, BSC, Las Vegas, NV  
B. L. Wilson, BSC, Las Vegas, NV

cc w/encl:

R. W. Andrews, BSC, Las Vegas, NV  
R. D. Habbe, BSC, Las Vegas, NV  
R. L. Maudlin, BSC, Las Vegas, NV  
Venkataraman Pasupathi, BSC, Las Vegas, NV  
Sridhar Ramamurthy, UWO, London, Ontario, Canada  
R. E. Rucinski, BSC, Las Vegas, NV  
Roxanna VanDillen, BSC, Las Vegas, NV

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

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8.  DEFICIENCY REPORT  
 CORRECTIVE ACTION  
REPORT

NO. BSC(V)-02-D-048

PAGE 1 OF 5  
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT

1. Controlling Document:  
University of Western Ontario (UWO) Quality Assurance Plan,  
Version 1, Revision 3

2. Related Report No.:  
BSC-SA-02-007

3. Responsible Organization:  
BSC/ UWO

4. Discussed With:  
M. Peters, BSC; S. Ramamurthy, UWO

5. Requirement:

UWO QA Plan, Section 4.11 states: All samples are clearly numbered or identified according to the procedure entitled "Specimen Control". The numbering process ensures that sample numbers remain clearly visible on the specimen or traceability is maintained in an appropriate manner.

6. Description of Condition:

Contrary to the above, UWO sent several rods of different material to their machine shop for saw cutting into multiple samples and there was no procedure to ensure that the samples cut were traceable to the individual rod. Additionally, UWO sent several samples to Laboratory Testing, Inc. (LTI) for chemical analysis and the LTI test reports do not identify the unique specimen number that was analyzed.

7. Initiator:

*R. Maudlin*  
FOR

Richard L. Maudlin Date 12/17/01

9. Does a stop work condition exist? (Not required for a DR)

Yes  No

If Yes, Check One:  A  B  C  D

10. Recommended Actions:

Provide a method to determine if samples can be traced to their original material heat/lot or scrap the material.

Prepare a procedure to describe the process for maintaining traceability of YMP samples during saw cutting and submittal to subcontractors for analysis or any other quality affecting activities.

Determine if condition had any affect on the experiments performed on YMP samples.

11. QA Review:

*R. Maudlin*  
FOR

QAR Richard L. Maudlin Date 12/17/01

12. Response Due Date:

20 Working Days From Issuance

13. DOQA Issuance Approval:

Printed Name Donald T. Krishna

Signature *Donald T. Krishna*

Date 12/11/01

22. Corrective Actions Verified:

QAR *Maell*

Date 01/18/02

23. Closure Approved by:

*D. T. Krishna*

Date 4/30/02

TYPE RESPONSE:

- Initial
- Complete
- Amended

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

DR/CAR NO. BSC(V)-02-D-048  
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QA: QA

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**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

CAR-SSW-2001-01 was issued on 12/5/01 by the Program Manager (Sridhar Ramamurthy) stating that all specimens that had already been cut would be labeled 'not to be used for quality affecting work' and scrapped. All quality-affecting testing supporting the Yucca Mountain Project was temporarily suspended until deficiencies are resolved.

Compliance Date: 12/05/01

14. Remedial Actions:

The following remedial actions address the lack of traceability of samples at UWO, and will be completed by 2/28/02:

- Uncut samples will be labeled with their heat number along with their material name.
- A procedure will be written that outlines the process for maintaining traceability during sectioning and machining process.
- Mr. Bruce Campbell, the supervisor at the University of Western Ontario Dept. of Physics and Astronomy Instrument Shop, will be trained and qualified according to the Quality Assurance Plan for the investigation of Long-term Passivity of Alloy-22 and Titanium Grade-7 Under Yucca Mountain Conditions. He will be responsible for the machining and traceability of samples as per the written procedure.
- CAR-SSW-2001-01 will be resolved.

The remedial actions identified above discuss the actions required to maintain sample traceability at UWO. The issues regarding the lack of sample traceability at LTI will be resolved in the following manner:

- Since it was determined that the lack of traceability at LTI was due, in part, to a lack of necessary requirements in the purchase orders, such as the need for sample identification, the procurement procedure will be revised to require more detailed information in the purchase orders. This issue is identified and addressed in deficiency report BSC(V)-02-D-051. Detailed corrective actions regarding this issues are provided there.
- The lack of traceability of the LTI samples was also due, in part, to the fact that they were not properly labeled when they went to LTI from UWO. This issue will be resolved by implementing the remedial actions listed above for maintaining sample traceability at UWO.

*UWO 2-5-02 submitted to LTI RR 2-5-02*

15. Extent of Condition:

As a result of the failure to maintain sample traceability, the samples and associated data will not be used for quality-affecting work. There were two LTI purchase orders involved in this deficiency. They are identified as follows: Q115469 and Q115474. Data associated with these purchase orders will not be used for quality-affecting work, and cut material samples will be discarded. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.

*UWO 2-5-02*

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:

- Review of the UWO QA plan (with emphasis placed on traceability)
- Review of the procedure for writing a procedure
- Review of the qualification and training procedure
- Training to the corrective action procedure

*RR 02-20-02 2/20/02*

Deficiency report BSC(V)-02-D-051 discusses those actions to preclude recurrence associated with LTI purchase orders.

18. Due Date: 2/28/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible ind.)

*Mark Peters for RP*  
Date: 01/25/02 Phone: 702-295-3644 *RR BSC QA*

20. Evaluation:  Accept  Partially Accept  Reject

QAR *Manelli* Date *01/29/02*

21. Concurrence:

DOQA *W.T. Kisha* Date *2/20/02*

TYPE RESPONSE: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Complete <input checked="" type="checkbox"/> Amended	<b>OFFICE OF CIVILIAN          RADIOACTIVE WASTE MANAGEMENT          U.S. DEPARTMENT OF ENERGY          WASHINGTON, D.C.</b>	DR/CAR NO. BSC(V)-02-D-048 PAGE <u>1</u> OF <u>5</u> <u>3</u> <u>5</u> Add 3-11-02 QA: QA
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**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

**14a. Immediate Actions:**

When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This ~~became~~ a permanent termination of YMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. <sup>^will become</sup>

*RR  
2-28-02*

Compliance Date: 2/15/02

**14. Remedial Actions:**

All YMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:

- C-2000 Specimen Prep. - 1
- C276 Sample Preparation - 1
- C-22 Electrochemical Exps. - 1
- C-22 Specimen Preparation - 1
- Ti2 Surface Analysis - 1
- Ti2 Specimen Preparation - 1
- Solution Preparation - 1

**15. Extent of Condition:**

All YMP-related data collected at UWO was affected. See list of notebooks in Block 14.

**16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)**

Lack of understanding of the requirements of implementing a quality assurance program.

**17. Action to Preclude Recurrence:**

UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.

UWO will be removed from Qualified Supplier List (QSL). *RR  
2-28-02*

**18. Due Date:** 3/31/02

For submittal of complete response

For completion of corrective action

**19. Response by:** Mark Peters (Shellie Rucinski-responsible ind.)

*wow* *Mark J Peters* *2/27/02* *MS* *2/27/02* *RR* *RR* *RR*

Date: 02/27/02 Phone: 702-295-3644 *MS* *QSCQA*

**20. Evaluation:**  Accept  Partially Accept  Reject

QAR *R.L. MAUDLIN* *RR* *for* Date *3-11-02*

**21. Concurrence:**

DOQA *W.T. Krishna* Date *3/15/02*

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8.  DR/CAR  
 Stop Work Order

NO. BSC(V)-02-D-048

PAGE 4 OF 5  
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

*At 3/14/02*

*in Block 19 of the Initial & Complete response*

For clarification purposes only:

Actions identified on response dated 01/25/02 are superseded by actions committed to in this response.

Continued from block 14:

Notification will be provided to UWO that BSC purchase order P.O.24540-160-PA-00469 will be terminated.

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

DR/CAR/QO  
 SWO

NO. BSC(V)-02-D-048

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QA: QA

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**CONDITION ADVERSE TO QUALITY CONTINUATION PAGE**

Verification of corrective action and closure of DR BSC(V)-02-D-048.

This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Western Ontario (UWO).

Verification of Immediate Actions:

The QAR verified that Pasu Pasupathi, BSC, verbally notified UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.

Verification of Remedial Actions:

The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration page 1; Optical Microscope Calibration Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.

The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.

Extent of Condition:

Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.

Verification of Action to Preclude Recurrence

The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.

A review of the extent of condition did not indicate that this DR is a significant condition.

The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions for this DR. Based on the above this DR is considered closed.

Richard L. Maudlin, 4/17/02



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8.  DEFICIENCY REPORT  
 CORRECTIVE ACTION REPORT

NO. BSC(V)-02-D-049

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**DEFICIENCY/CORRECTIVE ACTION REPORT**

1. Controlling Document: University of Western Ontario (UWO) Quality Assurance Plan, Version 1, Revision 3; BSC PO 24540-160-PA-00469, Technical Services Statement of Work, Rev 00, Section III.B.6.0, and QARD, Section 12.2.7.	2. Related Report No.: BSC-SA-02-007
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3. Responsible Organization: BSC/ UWO	4. Discussed With: M. Peters, BSC; S. Ramamurthy, UWO
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5. Requirement:

A-UWO QA Plan, Section 4.6, states: Instruments will be calibrated by a supplier on the OCRWM QSL, or otherwise approved by OCRWM. BSC PO 24540-160-PA-00469, Technical Services Statement of Work, Rev 00, Section III.B.6.0 states: The method used to assure that M&TE...is adjusted... against reference standards have traceability to nationally recognized standards.

B- UWO QA Plan, Section 4.6, states: Calibration status of the equipment is noted on the respective instruments or on appropriate records.

C- QARD, Section 12.2.7 states: Measuring and test equipment calibration documentation shall include the following information: A. Identification of the M&TE calibrated; B. Traceability to the calibration standard used for calibration; C. Calibration Data; and D. Identification of the individual performing the calibration.

6. Description of Condition:  
Contrary to the above:

A. - The following UWO M&TE was not calibrated by a supplier on the OCRWM QSL or calibrated to standards traceable to nationally recognized standards: Thermometer (100 DegC); Thermometer (400 DegC); Balance (ID 37030044); Weight Set 1g-1kg, (No ID); Ag/AgCl electrode (No ID); and Saturated Calomel Electrode (No ID).

B. - The following UWO M&TE was not uniquely identified or contained calibration status indicators: Thermometer (100 DegC, No ID); Thermometer (400 DegC, No ID); Weight Set 1g-1kg, (No ID); Ag/AgCl electrode (No ID).

C- The UWO calibration records did not include: the unique instrument ID, the standard used in the calibration, the calibration results, or the individual who performed the calibration for the following UWO M&TE: Thermometer (100 DegC); Thermometer (400 DegC); Balance (ID 37030044); Weight Set 1g-1kg, (No ID); Ag/AgCl electrode (No ID); and Saturated Calomel Electrode (No ID).

7. Initiator: <i>Richard L. Maudlin</i> Richard L. Maudlin Date 12/17/01	9. Does a stop work condition exist? (Not required for a DR) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
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10. Recommended Actions:

A. Take the necessary action to have all M&TE calibrated by a supplier on the OCRWM QSL or calibrated to standards traceable to a nationally recognized standard.

B. Label or assign a unique identification to each piece of M&TE and attach a calibration status indicator or document calibration status in the calibration records.

C. Modify the calibration record forms to include all required information.

11. QA Review: <i>Richard L. Maudlin</i> QAR Richard L. Maudlin Date 12/17/01	12. Response Due Date: 20 Working Days From Issuance
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13. DOQA Issuance Approval:

Printed Name Donald T. Krishna  
Signature *Donald T. Krishna*  
Date 12/18/01

22. Corrective Actions Verified: QAR <i>Richard L. Maudlin</i> Date 04/18/02	23. Closure Approved by: <i>Donald T. Krishna</i> Date 4/30/02
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TYPE RESPONSE:

- Initial
- Complete
- Amended

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DR/CAR NO. BSC(V)-02-D-049

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QA: QA

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**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

All quality-affecting testing supporting OCRWM was temporarily suspended until deficiencies are resolved.

Compliance Date: 12/05/01

14. Remedial Actions:

The following remedial actions refer only to M&TE being used to produce quality-affecting data for OCRWM. These actions will be completed by 3/31/02:

- The thermometers and weight set will be calibrated by a supplier on the OCRWM QSL.
- A balance calibration procedure will be written describing how to calibrate balances against a properly calibrated weight set. The balance will then be calibrated using such procedure.
- UWO M&TE will be uniquely identified and contain a calibration due date (if applicable). The requirement to identify "calibration due date" will replace "calibration status" in the revised QA Plan.
- The calibration records for quality affecting items will be written to include; the unique identifier/model# and/or serial# of the instrument being calibrated, the standard used in the calibration, the calibration results, the signature of the individual who performed the calibration and the date of calibration. This requirement will be added to the UWO QA Plan and relevant procedures.
- The Saturated Calomel Electrode will either be calibrated (internally or externally) or a new one will be procured from a supplier on the OCRWM QSL. This process will insure traceability to nationally recognized standards. The Ag/AgCl electrode will then be calibrated against the properly calibrated Saturated Calomel Electrode.

15. Extent of Condition:

It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:

- Review of the UWO QA plan (with emphasis placed on calibration) RR 02-20-02 01/20/02
- Review of the procedure for writing a procedure
- Review of the qualification and training procedure
- Training to the corrective action procedure

18. Due Date: 3/31/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible inc.)

*Dem Oliver for UWO #13 BSC QA RE*  
Date: 01/25/02 Phone: 702-295-3644 *KS 01/25/02*

20. Evaluation:  Accept  Partially Accept  Reject

QAR *Shellie* Date 01/29/02

21. Concurrence:

DOQA *AT Kisha* Date 2/20/02

TYPE RESPONSE:

- Initial
- Complete
- Amended

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DR/CAR NO. BSC(V)-02-D-049

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QA: QA

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**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This ~~became~~ a permanent termination of YMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. <sup>^ will become PR</sup>

*PR  
2-28-02*

Compliance Date: 2/15/02

14. Remedial Actions:

All YMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:

- C-2000 Specimen Prep. - 1
- C276 Sample Preparation - 1
- C-22 Electrochemical Exps. - 1
- C-22 Specimen Preparation - 1
- Ti2 Surface Analysis - 1
- Ti2 Specimen Preparation - 1
- Solution Preparation - 1

15. Extent of Condition:

All YMP-related data collected at UWO was affected. See list of notebooks in Block 14.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.

UWO will be removed from Qualified Supplier List (QSL). *RR*

*2-28-02*

18. Due Date: 3/31/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible ind *RR*

*will* *Mark J Peters* *2/27/02* *2/27/02* *RR*  
Date: 02/27/02 Phone: 702-295-3644 *BSC QA RR RR*

20. Evaluation:  Accept  Partially Accept  Reject

*RR*  
QAR *R. D. L. MAUDLIN* Date *3-11-02*

21. Concurrence:

DOQA *G.T. Krishna* Date *3/15/02*

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8.  DR/CAR  
 Stop Work Order

NO. BSC(V)-02-D-049

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DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

For clarification purposes only:

Actions identified on response dated 01/25/02 <sup>in Block 19 of the initial & complete response</sup> are superseded by actions committed to in this response. *RLH 3/11/02*

Continued from block 14:

Notification will be provided to UWO that BSC purchase order P.O.24540-160-PA-00469 will be terminated.

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RADIOACTIVE WASTE MANAGEMENT  
U.S. DEPARTMENT OF ENERGY  
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DR/CAR/QO  
 SWO

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QA: QA

**CONDITION ADVERSE TO QUALITY CONTINUATION PAGE**

Verification of corrective action and closure of DR BSC(V)-02-D-049.

This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Western Ontario (UWO).

Verification of Immediate Actions:

The QAR verified that Pasu Pasupathi, BSC, verbally notified UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.

Verification of Remedial Actions:

The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration page 1; Optical Microscope Calibration Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.

The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.

Extent of Condition:

Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.

Verification of Action to Preclude Recurrence

The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.

A review of the extent of condition did not indicate that this DR is a significant condition.

The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions for this DR. Based on the above this DR is considered closed.

Richard L. Maudlin, 4/17/02



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8.  DEFICIENCY REPORT  
 CORRECTIVE ACTION REPORT

NO. BSC(V)-02-D-050

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DEFICIENCY/CORRECTIVE ACTION REPORT

1. Controlling Document:  
University of Western Ontario (UWO) Quality Assurance Plan,  
Version 1, Revision 3

2. Related Report No.:  
BSC-SA-02-007

3. Responsible Organization:  
BSC/ UWO

4. Discussed With:  
M. Peters, BSC; S. Ramamurthy, UWO

5. Requirement:

UWO QA Plan, Section 4.10 states: Software verification records for each software version will be maintained per procedure requirements.

6. Description of Condition:

Contrary to the above, no objective evidence could be provided to reflect that the Coreware Version 2.2 software used in the C22 electrochemical experiments for BSC was tested/verified to determine if the software produced the desired results.

7. Initiator:

Richard L. Maudlin

*R. Maudlin FOR*

Date 12/17/01

9. Does a stop work condition exist? (Not required for a DR)

Yes  No

If Yes, Check One:  A  B  C  D

10. Recommended Actions:

Take the necessary action to verify that the software is producing the desired results.

Prepare a procedure to describe the process for testing or verifying software programs used for YMP work.

Determine if condition had any affect on the experiments performed on YMP samples.

11. QA Review:

QAR Richard L. Maudlin

*R. Maudlin FOR*

Date 12/17/01

12. Response Due Date:

20 Working Days From Issuance

13. DOQA Issuance Approval:

Printed Name Donald T. Krishna

Signature

*Donald T. Krishna*

Date

*12/21/01*

22. Corrective Actions Verified:

QAR R. L. MAUDLIN

*R. Maudlin FOR*

Date 4-18-02

23. Closure Approved by:

*D. T. Krishna*

Date

*4/30/02*

TYPE RESPONSE:

- Initial
- Complete
- Amended

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

DR/CAR NO. BSC(V)-02-D-050  
PAGE 2 OF 5

QA: QA

ORIGINAL  
red

**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

All quality-affecting testing supporting the Yucca Mountain Project was temporarily suspended until deficiencies are resolved.

Compliance Date: 12/05/01

14. Remedial Actions:

The performance of the Corware software is verified as part of the Solartron 1287 monthly performance verification. To insure control over this M&TE-related software, the Solartron 1287 performance verification procedure, SSW-CALP, will be modified to require that the current version of the Corware software be documented during the monthly performance verification checks. The instrument will undergo a performance verification with the appropriate standards, which will verify the acceptability of the software. These actions will be completed by 3/15/02.

15. Extent of Condition:

It is unknown how this deficiency affected the data collected. To date (12/5/01) only one experiment has been performed and completed. Data generated during this experiment will not be used for quality-affecting work.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:

- Review of the UWO QA plan (with emphasis placed on software)
- Review of the procedure for writing a procedure
- Review of the qualification and training procedure
- Training to the corrective action procedure

*RR 02-20-02 OK 01/25/02*

18. Due Date: 3/15/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible ind)

*Run above for WWO BSC QA R*  
Date: 01/25/02 Phone: 702-295-3644 *KD 01/25/02*

20. Evaluation:  Accept  Partially Accept  Reject

QAR *[Signature]* Date *01/29/02*

21. Concurrence:

DOQA *[Signature]* Date *2/20/02*

TYPE RESPONSE: <input type="checkbox"/> Initial <input checked="" type="checkbox"/> Complete <input checked="" type="checkbox"/> Amended	<b>OFFICE OF CIVILIAN          RADIOACTIVE WASTE MANAGEMENT          U.S. DEPARTMENT OF ENERGY          WASHINGTON, D.C.</b>	DR/CAR NO. BSC(V)-02-D-050 PAGE <b>3</b> OF <b>5</b> QA: QA
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ORIGINAL  
red

**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

**14a. Immediate Actions:**

When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This became a permanent termination of YMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. *^ will become RR 2-28-02*

Compliance Date: 2/15/02

**14. Remedial Actions:**

All YMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:  
 C-2000 Specimen Prep. - 1  
 C276 Sample Preparation - 1  
 C-22 Electrochemical Exps. - 1  
 C-22 Specimen Preparation - 1  
 T12 Surface Analysis - 1  
 T12 Specimen Preparation - 1  
 Solution Preparation - 1

**15. Extent of Condition:**

All YMP-related data collected at UWO was affected. See list of notebooks in Block 14.

**16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)**

Lack of understanding of the requirements of implementing a quality assurance program.

**17. Action to Preclude Recurrence:**

UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.  
 UWO will be removed from the Qualified Supplier List (QSL). *RR 2-28-02*

**18. Due Date: 3/31/02**

For submittal of complete response  
 For completion of corrective action

**19. Response by: Mark Peters (Shellie Rucinski-responsible ind)**

*WOW Mark J. Peters 2/27/02 RR 02/27/02 RK*  
 Date: 02/27/02 Phone: 702-295-3644 *BSEB*

**20. Evaluation:  Accept  Partially Accept  Reject**

QAR *R.L. MAUDLIN* *for* Date *3-11-02*

**21. Concurrence:**

DOQA *[Signature]* Date *3/15/02*

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

ORIGINAL  
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8.  DR/CAR  
 Stop Work Order

NO. BSC(V)-02-D-050

PAGE 4 OF 5  
QA: QA

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

For clarification purposes only:

Actions identified on response dated 01/25/02 are superceded by actions committed to in this response.

*in BLOCK 19 OF THE INITIAL & COMPLETE RESPONSE  
RZH 5/14/02*

Continued from block 14:

Notification will be provided to UWO that BSC purchase order P.O.24540-160-PA-00469 will be terminated.



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WASHINGTON, D.C.

DR/CAR/QO  
 SWO

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PAGE 5 OF 5  
QA: QA

ORIGINAL  
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CONDITION ADVERSE TO QUALITY CONTINUATION PAGE

Verification of corrective action and closure of DR BSC(V)-02-D-050.

This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Western Ontario (UWO).

Verification of Immediate Actions:

The QAR verified that Pasu Pasupathi, BSC, verbally notified UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.

Verification of Remedial Actions:

The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration page 1; Optical Microscope Calibration Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.

The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.

Extent of Condition:

Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.

Verification of Action to Preclude Recurrence

The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.

A review of the extent of condition did not indicate that this DR is a significant condition.

The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions for this DR. Based on the above this DR is considered closed.

Richard L. Maudlin, 4/17/02



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WASHINGTON, D.C.**

8.  DEFICIENCY REPORT  
 CORRECTIVE ACTION REPORT

NO. BSC(V)-02-D-051

PAGE 1 OF 5  
QA: QA

ORIGINAL  
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**DEFICIENCY/CORRECTIVE ACTION REPORT**

1. Controlling Document: University of Western Ontario (UWO) Quality Assurance Plan, Version 1, Revision 3	2. Related Report No.: BSC-SA-02-007
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3. Responsible Organization: BSC/ UWO	4. Discussed With: M. Peters, BSC; S. Ramamurthy, UWO
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5. Requirement:

UWO QA Plan, Section 4.3 states: All purchase orders for quality affecting items or services should be reviewed and approved by Dr. Ramamurthy and Professor Shoemsmith. This review will ensure that all technical and quality requirements have been adequately addressed.

6. Description of Condition:

Contrary to the above, no objective evidence could be provided to reflect that Dr. Ramamurthy or Professor Shoemsmith had reviewed quality affecting purchase orders' Q115469 and Q115474 to Laboratory Testing, Inc. Additionally, the purchase orders did not contain quality or technical requirements (i.e. the statement of work was not referenced on the PO).

7. Initiator: <i>R. D. Habbe</i> Robert D. Habbe Date 12/17/01	9. Does a stop work condition exist? (Not required for a DR) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Check One: <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
--	---

10. Recommended Actions:

Revise the procurement procedure to ensure that Dr. Ramamurthy and Professor Shoemsmith review the issued purchase order for quality affecting items/services to determine that quality and technical requirements have been addressed.

Determine if conditions had any affect on the experiments performed on YMP samples.

11. QA Review: <i>R. D. Habbe</i> QAR Robert D. Habbe Date 12/17/01	12. Response Due Date: 20 Working Days From Issuance
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13. DOQA Issuance Approval:

Printed Name Donald T. Krishna Signature *Donald T. Krishna* Date *12/21/01*

22. Corrective Actions Verified: <i>R. D. Habbe</i> QAR <b>R. D. HABBE</b> Date <b>4-17-02</b>	23. Closure Approved by: <i>Donald T. Krishna</i> Date <i>4/30/02</i>
--	---

TYPE RESPONSE:

- Initial
- Complete
- Amended

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U.S. DEPARTMENT OF ENERGY  
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DR/CAR NO. BSC(V)-02-D-051

PAGE **2** OF **5**

QA: QA

ORIGINAL  
red

**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

All quality-affecting testing supporting the Yucca Mountain Project was temporarily suspended until deficiencies are resolved.

Compliance Date: 12/05/01

14. Remedial Actions:

All past purchase orders related to quality affecting items/services will be reviewed for deficiencies and dispositioned by 2/28/02.

The procurement procedure, SSW-PROC, will be revised by 2/28/02, to require that:

- Dr. Ramamurthy and Professor Shoesmith review the issued purchase order for quality affecting items/services to determine that quality and technical requirements have been addressed. They will document their review of the purchase order.
- The statement of work be referenced on the purchase order.
- The statement of work be enclosed with the purchase order.

15. Extent of Condition:

The data collected up to 12/05/01 date will not be used for OCRWM quality-affecting work.

The specific disposition of each of the quality-affecting items and services procured to support OCRWM work will be provided in the complete response.

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

On December 11, 2001, individuals at UWO doing work in support of OCRWM were trained and/or retrained to the UWO QA plan. The following areas were covered:

- Review of the UWO QA plan
- Review of the procedure for writing a procedure
- Review of the qualification and training procedure
- Training to the corrective action procedure

After the procurement procedure is revised, the appropriate personnel will be trained to the revised procedure. This will be done by 2/28/02.

The next three UWO quality-affecting statements of work and associated purchase orders issued to support OCRWM activities will be reviewed by BSC S&ET for completeness prior to issuance to subcontractors. If those three are acceptable, no further reviews of purchase orders will be required by BSC S&ET.

18. Due Date: 2/28/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible ind.)

*Mark Peters*  
Date: 01/25/02 Phone: 702-295-3644  
*WWW KB 01/25/02 RP*

20. Evaluation:  Accept  Partially Accept  Reject

QAR *R.D. HASBE* *ASB* Date *27-02*

21. Concurrence:

DOQA *G.T. Krishna* Date *2/8/02*

TYPE RESPONSE:

- Initial
- Complete
- Amended

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DR/CAR NO. BSC(V)-02-D-051

PAGE 1 OF 15  
3 *Part 3-4-02*  
QA: QA

ORIGINAL  
red

**DEFICIENCY/CORRECTIVE ACTION REPORT (RESPONSE)**

14a. Immediate Actions:

When the deficiencies were initially found, during the audit, it was determined that all quality-affecting testing at UWO supporting the Yucca Mountain Project would be temporarily suspended until deficiencies were resolved. This became a permanent termination of YMP-related quality-affecting work, based on an email from Cindy Palmer, on 2/15/02. *will become RR 2-28-02*

Compliance Date: 12/05/01 *2/15/02* *Part 3-4-02*

14. Remedial Actions:

All YMP-related data collected at UWO will be marked non-Q and will not be used for quality-affecting work. This involves data in the following seven notebooks:

- C-2000 Specimen Prep. - 1
- C276 Sample Preparation - 1
- C-22 Electrochemical Exps. - 1
- C-22 Specimen Preparation - 1
- Ti2 Surface Analysis - 1
- Ti2 Specimen Preparation - 1
- Solution Preparation - 1

*UWO will be notified that BSC PO 24540-160-PA-00469*

15. Extent of Condition:

All YMP-related data collected at UWO was affected. See list of notebooks in Block 14.

*will be terminated. RR 3-4-02*

16. Cause: (Attach results of root cause determination prepared in accordance with AP-16.4Q for a significant deficiency.)

Lack of understanding of the requirements of implementing a quality assurance program.

17. Action to Preclude Recurrence:

UWO will no longer be used for the collection of quality-affecting data, based on email from Cindy Palmer, dated 2/15/02.

*UWO will be removed from the Qualified Supplier List (QSL).*

*RR 2-28-02*

18. Due Date: 3/31/02

- For submittal of complete response
- For completion of corrective action

19. Response by: Mark Peters (Shellie Rucinski-responsible ind)

*Mark J Peters* *2/27/02* *RR*  
Date: 02/27/02 Phone: 702-295-3644 *2/27/02*

20. Evaluation:  Accept  Partially Accept  Reject

QAR *R.D. HARBE* *Palmer* Date *3-11-02*

21. Concurrence:

DOQA *W. T. Kisha* Date *3/15/02*

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8.  DR/CAR  
 Stop Work Order

NO. BSC(V)-02-D-051

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QA: QA

ORIGINAL

red

DEFICIENCY/CORRECTIVE ACTION REPORT/STOP WORK ORDER CONTINUATION PAGE

For clarification purposes only:

Actions identified on response dated 01/25/02 are superceded by actions committed to in this response.

*in block 19 of the initial & complete response*

*SA 3/5/02*

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DR/CAR/QO  
 SWO

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PAGE 5 OF 5  
QA: QA

ORIGINAL  
red

**CONDITION ADVERSE TO QUALITY CONTINUATION PAGE**

Verification of corrective action and closure of DR BSC(V)-02-D-051.

This verification was based on a review of documentation provided by Science Engineering and Testing (SE&T) and University of Western Ontario (UWO).

Verification of Immediate Actions:

The QAR verified that Pasu Pasupathi, BSC, verbally notified UWO on 12/05/01 to stop testing work on Yucca Mountain Project activities during the BSC-SA-02-007 audit exit meeting. The QAR verified that Cynthia Palmer issued an email on 2/15/02 requesting that no further testing activities be performed at UWO.

Verification of Remedial Actions:

The QAR performed a review of the following notebooks and verified that the pages in the notebooks have been marked as NON-Q data. The notebooks reviewed were: C-2000 Specimen Prep. pages 1-2; C276 Sample Preparation pages 1-4; C-22 Electrochemical Exps. pages 1-6; C-22 Specimen Preparation pages 1-6; Ti2 Surface Analysis pages 1-18; Ti2 Specimen Preparation pages 1-12; and Solution Preparation pages 1-16. Additionally, UWO has marked the following records as NON-Q: Ti2A Surface Analysis pages 1-6; C22 Electrochemistry pages 1-5; Ti7 Specimen Preparation pages 1-2; AFM Calibration pages 1-2; Tencor Calibration page 1; Optical Microscope Calibration Pages 1-2; Top Loading Optical Microscope Calibration pages 1-3; ToF-Sims Calibration pages 1-17; SEM/EDX Calibration pages 1-5; Laboratory Aged Ti2a6 pages 1-6; and XPS Calibration page 1.

The QAR performed a review of an email from John Giannini, BSC Buyer dated 3/15/02 stating that UWO was contacted and notified that the BSC contract with UWO will be terminated.

Extent of Condition:

Based on discussions with R. Rucinski, BSC the above mentioned records are the only documents generated by UWO for the BSC testing activities.

Verification of Action to Preclude Recurrence

The QAR verified that the OCRWM Qualified Supplier List (QSL) was updated on 3/15/02 to remove UWO from the QSL.

A review of the extent of condition did not indicate that this DR is a significant condition.

The documentation provided and the corrective actions taken provide satisfactory implementation of correction actions for this DR. Based on the above this DR is considered closed.

Robert D. Habbe, 4/17/02

