

**Department of Energy**  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
July 18, 2008

Mr. Jonathan D. Edwards, Acting Director  
Radiation Protection Division  
Office of Radiation and Indoor Air  
U. S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Mail Code 6608J  
Washington, DC 20460

**MAIL ROOM COPY**

Re: Response to the Environmental Protection Agency Letter Dated July 14, 2008,  
Related to the Shipment of Los Alamos National Laboratory Drum LAS817174

Dear Mr. Edwards:

This letter transmits the Carlsbad Field Office (CBFO) response to your letter dated July 14, 2008. Specific responses to the questions and concerns of Enclosure A to that letter are contained herein as Attachment 1.

With regard to the suspension of shipments from the Los Alamos National Laboratory (LANL), the CBFO Office of Quality Assurance (QA) has approved the corrective action plan (CAP) for CBFO Corrective Action Report (CAR) 08-025, which was issued to the Central Characterization Project (CCP) in response to the shipment of drum LAS817174 from LANL. The implementation and effectiveness of CCP's remedial actions identified in the CAP have been verified by CBFO QA. Corrective actions are also being implemented and tracked to closure under CCP CAR 0008-08.

The EPA should note that the draft root cause analysis report that was provided to your staff at the time of the inspection was for information only, and was not intended to be considered as a finished analysis or as the entire CAP for CAR 08-025. Root cause analysis is only one action out of several that is required by the CBFO QA Program for a condition adverse to quality that meets the criteria for significance, as this CAR did. A full suite of CAP elements was determined to be necessary to assure that the full extent of the condition be identified, evaluated and corrected, as you can see from the copy of CAR 08-025 included here as Attachment 2. These CAP elements include performance of immediate remedial actions to mitigate consequences; investigation of extent of impact to evaluate whether there are other LANL containers with a similar issue and whether the condition has occurred at other CCP sites; root cause analysis to determine contributing causes, direct causes, and root causes of the condition; and identification of actions needed to preclude recurrence, which includes actions to be taken for all CCP sites.

CBFO QA has evaluated the CAP prepared by CCP, and, as always, has ensured that each required element of the CAP is present and complete; the information

contained in each element reflects a rational, balanced, compliant, and sound approach; and that there are sufficient actions planned to address and correct each adverse condition and recommendation identified in the CAP elements. In addition, for this CAR, CBFO QA required additional actions in areas that the CBFO Quality Assurance Manager and her staff determined had not been sufficiently addressed. The effectiveness of the corrective actions put in place at all CCP sites will be verified through performance of a CBFO QA surveillance prior to final closure of CBFO CAR 08-025.

At the conclusion of our June 25<sup>th</sup> meeting, Juan Reyes requested that we not seek EPA concurrence until we have approved the root cause analysis (RCA) report and the standard waste box (SWB) containing drum LAS817174 has been opened and inspected for the presence of an NCR HOLD tag. Both of these actions are now complete.

The CBFO and CCP quality assurance programs that are being used to correct the condition adverse to quality related to the shipment of drum LAS817174 have both been approved by EPA. The CCP program was approved under the provisions of 40 CFR 194.8(a) and the CBFO program under the provisions of 40 CFR 194.22. The condition adverse to quality has been subjected to the full rigor of the CBFO corrective action process. The CBFO has determined that the corrective actions that are in place provide sufficient assurance that waste shipments from sites to which CCP is deployed will not cause the total amount of each waste component that will be emplaced in the disposal system to exceed the upper limiting value or fall below the lower limiting value as required by 40 CFR 194.24(c)(4) and (e).

Based on our evaluation of the corrective actions completed and planned, CBFO is lifting our restrictions on shipments from LANL on July 21, 2008. Per our agreement, we are requesting your concurrence on resumption of shipments.

Please contact me at (575) 234-7300 should you have any questions concerning this matter.

Sincerely,



David C. Moody  
Manager

Enclosure

cc: w/o enclosure

A. Holland, CBFO	*ED
D. Miehl, CBFO	ED
M. Navarrete, CBFO	ED
V. Daub, CBFO	ED
D. Gadbury, CBFO	ED
R. Patterson, CBFO	ED
J. Plum, CBFO	ED
F. Marcinowski, DOE-EM	ED
A. Harris, DOE-EM	ED
S. Stiger, LANL	ED
G. Rael, LASO	ED
J. O'Leary, LANL	ED
J. Reyes, EPA	ED
N. Stone, EPA	ED
R. Joglekar, EPA	ED
E. Feltcom, EPA	ED
C. Byrum, EPA	ED
M. Eagle, EPA	ED
S. Ghose, EPA	ED
S. Zappe, NMED	ED
J. Bearzi, NMED	ED
F. Sharif, WTS	ED
D. Haar, WTS	ED
J. Hoff, WTS	ED
M. Hendrickson, WTS	ED

cc: w/enclosure

CBFO QA File

CBFO M&RC

\*ED denotes electronic distribution



## ATTACHMENT 1

Response to EPA questions and concerns in Environmental Protection Agency  
Letter Dated July 14, 2008, Related to the Shipment of Los Alamos National  
Laboratory Drum LAS817174, Enclosure A

### LANL-Specific Container HOLD Tag Issues

- **EPA Comment:** During the July 2nd inspection; EPA staff observed that the nonconforming drum from LANL had no HOLD tag attached. The plastic tie and the brass ring of the HOLD tag were still affixed to the drum, while the HOLD tag itself had detached from its brass ring. This evidence indicates that the initial RCA was premature and the resulting corrective actions may not be appropriate.

**CBFO Response:** *The draft RCA provided to the EPA at the time of the July 2<sup>nd</sup> inspection was preliminary in nature and was intended for EPA's information only. The draft report was not to be considered as complete, final, or approved; nor had it been evaluated for adequacy as an element of the CAP by CBFO QA. Due to the fact that the condition adverse to quality under investigation was determined to be a RCRA-related condition that occurred in a process certified in accordance with the WIPP Hazardous Waste Facility Permit (HWFP), there was a mandatory deadline of 30 days for CAP submittal and completion of the planned corrective actions.*

*The drum was contained in a standard waste box (SWB), and the schedule for opening that SWB was not in the full control of CCP. In order to meet the corrective action deadline and further comply with QA program requirements for timeliness of corrective action, the RCA team was assembled and the analysis begun. When the SWB was opened on June 25, 2008 the drum was examined and no NCR HOLD tag was found. The final RCA report included statements that required the subject drum to be checked for tags once it was removed from the SWB.*

*Your statement implies that because a plastic tie was left in place on the container, the root cause conclusions were premature. This is inaccurate. As discussed at our June 25<sup>th</sup> meeting in Los Alamos, there are many ways in which a tag could become separated from the container, and there was more than one NCR tag affixed to this container at various points in the processing. There is no way to tell which NCR tag remnant was left. The important point here is that no tag was found attached. As a consequence, CBFO considers the root cause conclusions valid and appropriate. The RCA was formulated on information that was available at the time. Had the status of that information changed, CCP would have revised the RCA to take the new information into consideration. CBFO QA performed a detailed review of the submitted CAP, including requests for additional information and a CAP revision, and did not approve the CAP containing the final RCA report until July 18, 2008, after verification of the lack of any NCR HOLD tags. The absence of any NCR HOLD tag confirmed the assumptions made by the RCA team in their report.*

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Letter Dated July 14, 2008, Related to the Shipment of Los Alamos National  
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*A root cause analysis and the corrective actions identified within it do not constitute, by themselves, an adequate CAP under the CBFO corrective action process for this type of CAR. The CAP for this condition adverse to quality was required to address remedial actions, investigation of extent, and actions to preclude recurrence in addition to the RCA. If an NCR HOLD tag had been found during the drum examination, then the final RCA report would clearly have been inadequate, and the corrective actions would have been rejected by CBFO QA on that basis.*

**EPA Comment cont'd.:** The RCA also focuses on the quality assurance (QA) aspects of the incident instead of the root cause, which lies with the operational staff and decision-making errors. While useful in understanding the event chronology and potentially improving future procedures, the actions of the QA staff could not have been the root cause of the problem. It appears that it may have been a QA staff member who eventually identified the problem drum, albeit too late to prevent emplacement.

**CBFO Response:** *The condition adverse to quality identified in CBFO CAR 08-025 is a failure in the quality assurance controls defined and implemented under the CCP quality assurance program, namely identification and control of items; instructions, procedures, and drawings; and nonconformance control (NQA-1-1989 criteria 8, 5, and 15, respectively). CBFO and CCP management and staff have full understanding of and support for the concept that quality is achieved by those who perform the work and verified by those independent of the work. Performance of verification activities is also a quality-affecting work activity, and quality must also be achieved by the individuals responsible for performing verification work.*

*In the final RCA report, the root cause was identified as failure to evaluate the most recent Nondestructive Examination (NDE) characterization data, and the direct cause was identified as failure to recognize the significance of the unresolved NCR. Multiple individuals, primarily operations staff but also including QA staff, erred. As a result, it is recognized by CBFO and CCP that no one individual is to be "blamed" but that there are process and procedure flaws that must be addressed in order to prevent recurrence. The CAP for CAR 08-025 does not focus on punishing individuals. It focuses on the appropriate corrective actions to fix the process and procedures and to train all CCP personnel, both operations and QA, in those revisions.*

- **EPA Comment:** Based on EPA's observations, the initial RCA and corrective actions are no longer valid. CBFO/CCP must develop a new RCA and corrective action plan. The Agency understands that a new RCA is being developed now and EPA looks forward to receiving it.

**CBFO Response:** *See CBFO's response to the first EPA comment.*

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- **EPA Comment:** During the June 25th EPA inspection, EPA was informed that CCP has decided to attach new HOLD tags of a different design (made of plastic instead of paper, and attached using a metal clip instead of a plastic loop) to all TRU waste containers with open/unresolved NCRs at all CCP sites . This action was initiated due to CBFO/CCP's assumption that the plastic loop may have fallen off of the container due to the environmental conditions (e.g., HOLD tag breaking due to UV exposure) at LANL. However, this assumption was proven incorrect due to the presence of an intact plastic loop with remnant paper on the subject container.

**CBFO Response:** *The final RCA report identifies the lack of a NCR HOLD tag as a contributing cause. It was not an assumption. CCP explained at the June 25<sup>th</sup> meeting that tags have been found with broken plastic ties before. No assumptions are stated regarding the reasons for the absence of the NCR HOLD tag. The report recommends that CCP "Continue/refine use of wire clips for NCR HOLD tags by ensuring a permanent attachment and durable tag." This recommendation is a reasonable one. CBFO QA staff agreed with it based on practical experience with and knowledge of behavior of paper hold tags hung on plastic loops in unprotected environments, and during evaluation of the CAP for CAR 08-025 required that CCP include actions to implement the recommendation.*

*The EPA should note that drum LAS817174 had several hold tags applied to it during the course of characterization. It is not known if the cable tie and grommet on the drum were from the hold tag that should have been on the drum, or from a tag that was previously removed.*

- **EPA Comment:** DOE needs to provide EPA with information on physical durability of the new HOLD tags and any other relevant information. Assurance must also be given that all paper tags have been replaced with the new design at all CCP sites. In addition, please provide both old and new HOLD tag configurations and characteristics so that we may compare the two.

**CBFO Response:** *CCP has purchased hold tags that are made of polyethylene as opposed to the previous tag which was composed of plastic over paper. The new tag is 0.035 thick, approximately twice as thick as the previous tag, and is UV resistant to help preclude damage to markings from the elements. The grommet installed in the new tags is considerably larger and stronger than the type used in the old tag. The tags will now be attached with a galvanized steel aircraft cable approximately 1.5 mm thick instead of a plastic tie. The cable is threaded through a red metal locking device that is stamped "CCP NCR." Once it passes through the device, it cannot be removed without wire cutters. This device will serve as a status indicator in the unlikely event that the tag becomes dislodged. The first shipment of the new tags and locking devices has been received and will soon be in use at all CCP sites.*

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*As part of their approved remedial actions, CCP is verifying that all existing tags are in place at this time. This action will take several months to complete. Remedial action # 5 in the CCP response to CBFO CAR 08-025 adds an in-depth field verification that all NCRs are resolved.*

- **EPA Comment:** DOE should also provide information that 1) discusses the CCP-implemented processes associated with placement and removal of HOLD tags on TRU waste containers with NCRs and 2) identifies the personnel (e.g., transportation certifying official) responsible for making decisions and taking relevant actions. For example, is the paper tag cut, or ripped off?

**CBFO Response:** *CCP-QP-005, CCP TRU Nonconforming Item Reporting and Control, describes the responsibilities and procedure for applying and removing HOLD tags.*

*The “Responsibilities” section of CCP-QP-005 lists the following responsibilities.*

- *The NCR Originator is responsible for, or ensuring, application of a CCP HOLD TAG. Note that segregation is procedurally allowed as an alternative, but in practice, HOLD TAGs are applied to all CH containers.*
- *CCP QA is responsible for applying and removing (or ensuring application/removal) CCP HOLD TAGS.*
- *CCP QA Designees are responsible for applying and removing (or ensuring application/removal) CCP HOLD TAGS for NCRs documenting prohibited items.*

*Section 4.7 of CCP-QP-005 requires the CCP QA Engineer to review NCRs proposed for closure, verify the NCR is ready for closure, and either personally remove the CCP HOLD TAG or coordinate with the Vendor Project Manager (VPM) to ensure its removal. In the event the VPM assists in Hold Tag removal, the Hold Tags are forwarded to the NCR Coordinator as evidence that they were properly removed. CCP-QP-005 is undergoing revision as a result of the CBFO QA evaluation of the CAP for CAR 08-025 in order to clarify certain procedure steps.*

*CCP-TP-033, CCP Shipping of CH TRU Waste, section 4.3.10 currently states that the Transportation Certifying Official (TCO) ensures that each waste container is checked to see that there are no Hold Tags attached. It also states that if a Hold Tag is found, then the disposition of the NCR is checked to ensure the container is acceptable for shipping. Previously, Hold Tags were removed by cutting the plastic tie that secured it to the drum; however, investigation showed that numerous tags were removed by pulling and tearing them away from the grommet, leaving the plastic strap and*



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*grommet affixed. The new tags being employed by CCP cannot be torn away by hand. The thickness of the tag and the extra heavy grommet will require the person removing the tag to cut the steel cable. All personnel qualified to remove tags will be trained to only cut the cable.*

- **EPA Comment:** At the June 25 inspection, EPA staff observed new HOLD tags on TRU waste containers stored in Dome 49 at LANL. EPA-requested photos from this inspection have yet to be submitted by DOE. These need to be provided promptly.

**CBFO Response:** *The photographs requested by EPA are undergoing authorized derivative classification review at LANL, and will be made available to EPA as soon as the review is complete.*

### Management of TRU Waste Containers with NCRs at CCP Sites

- **EPA Comment:** Based on the information available about the aforementioned LANL HOLD tag issue, EPA believes that this problem may not be unique to LANL. EPA is concerned about CCP's TRU waste container tagging process and its ability to differentiate between containers with unresolved/open NCRs, as well as those with closed/resolved NCRs.

**CBFO Response:** *The remedial actions approved by CBFO are applicable to all sites where CCP is deployed. CBFO has always recognized the potential for a CCP condition adverse to quality to affect all of these sites. This is why CBFO routinely requests an investigation of extent of condition for conditions adverse to quality.*

- **EPA Comment:** Based on EPA observations from the two LANL inspections, EPA notes deficiencies in coordination and communication between CCP Carlsbad staff and CCP personnel at different CCP sites. EPA is concerned about the processes implemented at CCP sites for selection, certification, verification, and loading of TRU waste containers for WIPP disposal.

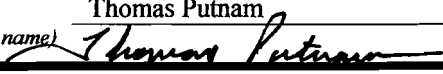
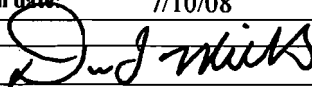
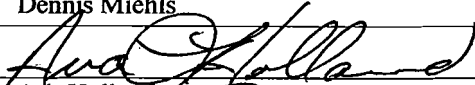
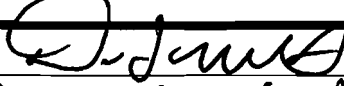
**CBFO Response:** *Coordination and communication are always a concern with operations ongoing at several remote locations simultaneously. CCP has taken steps to minimize miscommunications. These steps include daily phone calls between the project office and each remote CCP site. These calls discuss all aspects of CCP operations, including logistics, lessons learned, drum status, safety, and any issues that may arise. Over the past several months, visits to all remote sites by CCP project office personnel have increased in order to foster enhanced communications.*



Attachment 2

QA Records for CBFO CAR 08-025

# CORRECTIVE ACTION REPORT

1. CAR No.: 08-025	2. Activity Report No.: N/A	3. Page 1 of 1
4. Controlling document: CCP-PO-001; QAPD	5. CBFO Assessment Team Leader: Dennis Miehl	
6. Responsible organization: LANL/CCP	7. CAQ was discussed with: Val Cannon	
8. Requirement that was violated: CCP-PO-001, CCP TRU Waste Characterization Quality Assurance Project Plan, Section B3-13, Nonconformances: "The CCP reconciles and corrects nonconformance items, as appropriate, in accordance with DOE-CBFO QAPD (DOE). Quality Assurance Program Description (QAPD) Section 1.3.2.4.A – "Further processing, delivery, installation, or use of nonconforming items shall be controlled pending the evaluation and approval of the disposition.		
9. Condition Adverse to Quality (CAQ): Drum LAS817174, contained in standard waste box (SWB) LASB00411, was shipped to the Waste Isolation Pilot Plant (WIPP) from Los Alamos National Laboratory (LANL) and emplaced, even though there was an open CCP nonconformance report (NCR) – LANL- 0902-05 – against it for residual liquids >1% of the container volume.		
10. Suggested actions (Optional):		
11a. Significant CAQ? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	12. Type of actions required:  Remedial? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Investigative? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Root Cause Analysis? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Actions to Preclude Recurrence? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
11b. Work Suspension recommended? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
11c. RCRA related? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
11d. Accelerated corrective action required? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
11e. Does this CAQ affect waste streams BNINW216 or BNIN218? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
13a. Trend Code: CA 05	13b. CAR Initiator: Thomas Putnam <i>(printed name)</i> 	Date: 6/9/08
14a. Response due date: 6/24/08		
14b. Required corrective action completion date: 7/10/08		
15. Concurrence:		
a. Assessment Team Leader:  <i>(printed name)</i> Dennis Miehl	Date: 6-9-08	
b. CBFO Quality Assurance Manager (if applicable):  <i>(printed name)</i> Ava Holland	Date: 6/9/08	
16. Acceptance of Proposed Corrective Actions:  <i>(printed name)</i> Dennis S. Miehl	Date: 7-16-08	
17. Acceptance of Corrective Action Completion: * <i>(printed name)</i>	Date:	
18. Closure: <i>(printed name)</i>	Date:	

Block 17 \* The remedial actions only have been verified and approved on 7-18-08 by Dennis S. Miehl  
DSM 7-18-08

**CCP Corrective Action Plan Dated June 23, 2008**

COPY

**Washington**

TRU Solutions LLC

CP:08:00320  
UFC:2300.00

June 23, 2008

Mr. D. S. Miehls  
Senior Quality Assurance Specialist  
Carlsbad Field Office  
U.S. Department of Energy  
P.O. Box 3090  
Carlsbad, NM 88221-3090

**Subject: CORRECTIVE ACTION PLAN FOR CBFO CORRECTIVE ACTION REPORT 08-025, RESULTING FROM EMPLACEMENT OF DRUM WITH OPEN NONCONFORMANCE REPORT**

- Reference 1: CBFO Memorandum CBFO:QA:DSM:KBS:08:0338:UFC:2300.00 from Mr. D. S. Miehls to Mr. David H. Haar, dated June 9, 2008, subject: Issuance of Corrective Action Report 08-025 Not Associated with an Audit
- Reference 2: CBFO Memorandum CBFO:QA:DSM:KBS:08-0348:UFC:2300.00 from Mr. D. S. Miehls to Mr. David H. Haar, dated June 16, 2008, subject: Advance Notice of Corrective Action Report 08-025 Due Date for Corrective Action Plan Submittal
- Reference 3: CBFO Memorandum CBFO:NTP:DCG:GS:08-0788:UFC:2300.00 from Mr. D. C. Gadbury to Mr. D. C. Moody, dated June 20, 2008, subject: Impact Evaluation of Accelerated Corrective Action Report 08-025

Dear Mr. Miehls:

Enclosed is the Corrective Action Plan (CAP) for Corrective Action Report (CAR) 08-025. This CAR was issued as a result of the emplacement of drum LAS817174 in standard waste box LASB00411 with open Nonconformance (NCR) LANL-0902-05.

Should you have any questions or need additional information, please contact me at Extension 7125.

Sincerely,

D. K. Ploetz, Manager  
Central Characterization Project  
Retrieval, Characterization and Transportation

DKP:jmc

Enclosure

- cc: N. I. Castaneda, CBFO ED
- C. G. Fesmire, CBFO ED
- C. D. Gadbury, CBFO ED
- A. L. Holland, CBFO ED
- T. Putnam, CTAC ED

UNCLAS #	DOE UFC	DATE REC'D	ADDRESSEES
9001484	270000	JUN 23 2008	D. Miehls N. Castaneda C. Fesmire C. Gadbury A. Pangle A. L. Holland

**Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

**Corrective Action Plan:**

CAR 08-025 identified one (1) condition adverse to quality, the identification of drum LAS817174 contained in Standard Waste Box (SWB) LASB00411, which was shipped by Central Characterization Project (CCP) and emplaced at the Waste Isolation Pilot Plant (WIPP), even though there was an open CCP Nonconformance Report (NCR)-LANL-0902-05 against the drum for liquids greater than 1% of the drum volume.

**Condition Adverse to Quality:**

*Drum LAS817174, contained in SWB LASB00411, was shipped to the WIPP and emplaced, even though there as an open CCP NCR LANL-0902-05 against it for liquids greater than 1% of the container volume.*

**A. Remedial Actions:**

1. Suspended all shipments to WIPP on June 6, 2008 until immediate Corrective Actions were completed.

Action Manager: D. Haar  
Due Date/Status: Completed 6/16/08

2. Performed a 100% verification of the four shipments that were enroute to WIPP on June 6, 2008, or received at WIPP but not yet emplaced, to confirm that all containers certified in WWIS did not have unresolved NCRs affecting their certification.

Action Manager: M. Pearcy  
Due Date/Status: Completed 6/11/08

3. Performed a 100% verification of the containers currently certified in the WWIS, but not yet shipped to confirm that all containers did not have unresolved NCRs affecting their certification.

Action Manager: M. Pearcy  
Due Date/Status: Completed 6/11/08 for CCP/LANL, 6/14/08 for CCP/SRS and 6/16/08 for CCP/INL

4. Completed briefings, including briefing Retrieval, Characterization and Transportation personnel on this event. As part of this briefing, it was emphasized that all reviews must be performed to the required rigor. This general briefing was followed by detailed briefings of affected personnel to review their roles and responsibilities, and management's expectations for performing reviews.

Action Manager: M. Pearcy  
Due Date: Completed 6/12/08

5. In order to capture the content of the above briefings and clarify SPM and WCO responsibilities contained in CCP's procedures, the following Standing Orders (SO) were issued:

**Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

- S.O.32 Clarification for Selection of Data at Project Office Lot Evaluation
- S.O.33 Clarification of WCO Responsibility in Certification of Containers for Shipment to WIPP
- S.O.34 NCR/CAR Resolution Check prior to CH Payload Assembly to WIPP

Action Manager: M. Percy  
Due Date: Completed 6/13/08

6. Suspended manual searches of the CCP Data Center for the purpose of generating Lot Candidate Lists until controls are developed and implemented.

Action Manager: DK Ploetz  
Due Date/Status: Completed 6/16/08

7. Placed all unresolved NCR'd containers at LANL into a hold lot preventing their certification in WWIS as an interim control measure until each NCR'd container can be checked to verify that it is still tagged with a CCP Hold Tag. If the tag is damaged or missing, it will be replaced and affixed with a wire tie.

Action Manager: M. Percy  
Due Date/Status: Completed 6/11/08

8. Adopted the use of a wire tie to attach CCP Hold Tags to containers.

Action Manager: DK Ploetz  
Due Date: Completed 6/12/08

**B. Investigation Actions:**

Based on the investigation conducted by CCP, the impact and extent of the CAR condition are as follows:

**Impact**

The unresolved NCR (NCR-LANL-0902-05) on drum LAS817174 was self-identified by CCP during a routine QA surveillance on June 5, 2008. NCR-LANL-0902-05 was evaluated and determined that it could be closed on June 6, 2008 on the following basis:

Even though the SWB payload container containing drum LAS817174 was determined to be compliant with the Permit, WTS voluntarily decided to retrieve SWB LASB00411 from the WIPP and return it to the generator site for remediation.

The SWB containing drum LAS817174 was safely retrieved and returned to the generator site on June 13, 2008. Therefore, there is no impact to the public health and safety.

CCP issued CAR-CCP-0008-08 on June 9, 2008, to document shipment of drum with an open NCR.



## **Corrective Action Plan for CBFO CAR-08-025: Resulting From Emplacement Of Drum With Open Nonconformance Report**

### **Extent**

On April 21, 2004, drum number LAS817174 was processed through Real Time Radiography (RTR) and no prohibited items were identified. However, Visual Examination (VE) was performed as a Quality Control (QC) check of the RTR process for this container [a permit requirement at the time] on 4/9/05 and greater than 1% by volume liquid was identified on top of the waste. This condition was documented in NCR-LANL-0902-05 with a reject disposition to return the drum to the generator site for remediation. In April 2008, failure of a primary and secondary check resulted in this drum being overpacked into Standard Waste Box (SWB) LASB00411 which was emplaced at WIPP May 28, 2008. The unresolved nonconformance documentation NCR-LANL-0902-05 was discovered June 5, 2008, during a routine Quality Assurance (QA) surveillance. CAR-CCP-0008-08 was issued June 6, 2008, documenting this condition. The SWB containing drum LAS817174 was retrieved and returned to the generator site June 13, 2008.

As noted in CBFO's formal notification to EPA (CBFO Memorandum CBFO:NTP:CG:KJB:08-0783:UFC5900 dated June 13, 2008, to Mr. Juan Reyes from Mr. David C. Moody) the documentation trail associated with a waste container successfully completing RTR, and then being rejected for a prohibited condition during visual examination (VE) is extremely uncommon. This condition can only arise in waste containers that were selected for VE as a quality control check on RTR, and the resulting VE identified an issue. Of the nearly 50,000 containers processed by the CCP, this total population amounts to eight (8) containers. Of the eight containers, only two are associated with solid homogeneous waste, both at LANL. Therefore, this is viewed as being an isolated condition.

CCP verified that all 2,500 drums currently certified for shipment were free of any unresolved nonconformances.

### **C. Root Cause Determination:**

Based on the significance of the event, a Root Cause Analysis Team (RCAT) was assembled by Washington TRU Solutions Senior Management, and a root cause analysis was completed with the following results:

The root cause was identified as failure to use the most recent nondestructive examination characterization data.

#### **Analysis**

#### **Description of the Process for Obtaining Drum Candidate Lists for Lot Evaluation**

In order for a drum to be a candidate for Lot Evaluation, it must have been successfully characterized through each method (e.g., NDE, NDA) applicable to the drum.

CCP makes use of a database called the CCP Data Center to keep track of the status of drums through characterization. The CCP Data Center has the capability to associate an individual drum with all of the BDRs and NCRs for that drum. Standard queries, or searches, have been developed to provide users with information that is routinely required from the Data Center; manual searches can also be performed for a specific purpose.

The standard queries available in the Data Center are based on the characterization methods applicable to virtually all the drums in the database: NDE (RTR or VE), NDA, and either HSG or FGA. The standard queries will not produce drums as candidates for lot evaluation until the most recent BDRs for each of these methods are acceptable, and there are no unresolved (reject) NCRs against the drums for these latest results. The

**Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

critical factor for drum selection by the Data Center is the use of the most recent characterization information to develop the lists of candidate drums for lot evaluation.

For reasons discussed in the Root Cause Analysis Report, the selection of the drum subsequently shipped to WIPP was based on a manual search that focused on the previously acceptable RTR and NDA, and not on a standard search for candidate drums. This is important because the standard search would have recognized the importance of the more recent rejection of the drum during VE and would not have included the drum as a candidate for lot evaluation.

**D. Actions to Preclude Recurrence**

**1. Issue a Lessons Learned to communicate management expectations as follows:**

- Tie NCRs to previous acceptable characterization data in the same process (i.e., NDE, NDA, and HSG/FGA)
- Prior to certification of a container for disposal, close out applicable NCRs. NCRs that cannot be formally closed because they apply to more than one container shall be evaluated to ensure that they do not affect the acceptability of the drum for certification.
- The lot evaluation process includes reviewing relevant information, including all available characterization data.
- In the Data Center Search No. 7, a "Yes" in the "NCR data" column should only indicate "Open" NCRs.

Action Manager: D. K. Ploetz  
Due Date: June 30, 2008

**2. Revise CCP-TP-002 and CCP-TP-030 to incorporate Standing Orders CCP-S0-32 and CCP-S0-33, respectively.**

Action Manager: M. Pearcy  
Due Date: August 27, 2008

**3. Evaluate the following potential refinements to the wire tie:**

- Use of a flexible wire tie which is crimped in place
- Use of a more durable (e.g., thicker) plastic tag

Action Manager: D. K. Ploetz  
Due Date: July 31, 2008

**4. Unload drum LAS817174 from SWB and visually inspect to verify the absence of a CCP Hold Tag.**

Action Manager: S. Peterman  
Due Date: July 15, 2008

**5. Issue the final Root Cause Analysis Report.**

Action Manager: D. K. Ploetz  
Due Date: July 15, 2008

**Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

6. Based on the results of the EPA inspection, release shipment of drums from LANL.

Action Manager: D. Haar  
Due Date: July 11, 2008

**CBFO Evaluation and Rejection  
of CCP CAP Dated July 1, 2008**



**Department of Energy**  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221

July 1, 2008

Mr. David Haar  
Washington TRU Solutions  
P.O. Box 2078  
Carlsbad, NM 88220

Re: Corrective Action Plan for CBFO Corrective Action Report 08-025 Identified in Washington TRU Solutions Letter Dated June 23, 2008 (CP:08:00320:UFC 2300.00)

Dear Mr. Haar:

The Carlsbad Field Office (CBFO) reviewed the proposed Corrective Action Plan (CAP) issued by the Central Characterization Project (CCP) for Corrective Action Report (CAR) 08-025, and found the proposed CAP to be unacceptable. Please provide a revised response addressing the issues documented on the attached CAR Continuation Sheet on or before July 9, 2008.

If you have any questions or comments, please contact me at (575) 234-7483.

A handwritten signature in black ink that reads "Martin P. Navarrete".

Martin P. Navarrete  
Senior Quality Assurance Specialist

Enclosure

CAR CONTINUATION SHEET

1. CAR No: 08-025

2. Activity No: N/A

3. Page 1 of 1.

**Block # 16 Acceptance of Proposed Corrective Actions**

The following is an evaluation of the proposed corrective action plan (CAP) for CBFO CAR 08-025 submitted via Washington TRU Solutions letter dated June 24, 2008 (CP:08:00325:UFC:2300.00), from D. K. Ploetz to D. S. Miehl.

**Condition Adverse to Quality (CAQ):** Drum LAS817174, contained in standard waste box (SWB) LASB00411, was shipped to the Waste Isolation Pilot Plant (WIPP) from the Los Alamos National Laboratory (LANL) and emplaced, even though there was an open CCP nonconformance report (NCR) – LANL-0905-05 – against it for residual liquids >1% of the container volume.

**Root Cause Analysis Report**

Page 4: "The direct cause was identified as the failure to recognize the significance of the unresolved NCR." The CAP does not appear to address the direct cause, namely the failure to recognize the significance of the unresolved NCR identified during the Quality Assurance review and Independent Verification review shown in 4.1.1, first bullet. The CAP should identify what actions CCP will take to make it clear to personnel performing open NCR checks, how to identify whether an NCR issued is "resolved" for a particular container. CCP should evaluate whether CCP-QP-005 need to be revised. The personnel who failed to identify an open NCR needs to be retrained prior to resuming this task and the retraining documented.

Ensure all contributing causes (e.g., *WCO SME was unaware of the WCO training manual; therefore, guidance regarding NCR checks was not implemented.... Expectations communicated to the lot evaluator were inconsistent with CCP-TP-002, step 4.4.8...*) identified in section 4.1.1 are addressed in the CAP.

The CAP does not appear to accept all of the recommendations in section 7.0 of the Root Cause Analysis Report (e.g., *Management should routinely review the records of drums that are certified in WWIS and are subsequently removed from WWIS.... Clarify the intent of step 4.4.8 in CCP-TP-002 not to exclude the consideration of available characterization data.*). The CAP should be revised to address all the recommendations in the Root Cause Analysis Report.

**Corrective Action Plan**

Page 3 of 5: CCP states that only 8 containers in CCP's history have failed VE as a QC check. Because CCP identified this as a factor in the errant drum coming to WIPP, there is a need to identify what happened to the other 7 drums that failed VE as a QC check.

Any changes made as a result of this CAP that have an effect on other sites need to be addressed.

Accordingly, it is recommended that the CAP be disapproved and resubmitted to address the noted deficiency.

Response Evaluation by: Thomas Putnam  
Thomas Putnam

07-01-08  
Date

CCP Revised CAP Dated July 9, 2008

COPY

July 9, 2008

Mr. D. S. Miehl  
Senior Quality Assurance Specialist  
Carlsbad Field Office  
U.S. Department of Energy  
P.O. Box 3090  
Carlsbad, NM 88221-3090

Subject: REVISED CORRECTIVE ACTION PLAN FOR CBFO CORRECTIVE ACTION REPORT 08-025, RESULTING FROM SHIPMENT OF A DRUM FROM THE LOS ALAMOS NATIONAL LABORATORY WITH AN UNRESOLVED NONCONFORMANCE REPORT

Reference: CBFO Memorandum CBFO:QA:MPN:KBS:08-0374:UFC:2300 from Mr. M. P. Navarrete to Mr. David Haar, dated July 1, 2008, Subject: CAP for CBFO CAR 08-025

Dear Mr. Miehl:

The subject Corrective Action Report (CAR) 08-025 documented the shipment and emplacement of a drum from Los Alamos National Laboratory (LANL) with an unresolved nonconformance report. The Corrective Action Plan (CAP) for this CAR was originally submitted to CBFO on June 23, 2008.

The reference CBFO memorandum rejected the original Central Characterization Project (CCP) CAP as incomplete, since it was not apparent how it addressed all of the elements (direct cause, contributing causes, and recommendations) contained in the CCP Root Cause Analysis Report issued on June 26, 2008. The reference memorandum also requested current status information for seven drums mentioned in the original CAP, and the effect on other sites from any changes made as a result of the CAP.

Enclosed is a supplement to the CAP for CAR 08-025, that is responsive to each of the areas identified in the reference CBFO memorandum. The original CAP is also being resubmitted; it has been updated to reflect the current status of completed actions and add actions 6-9 completion dates and actionees for the additional actions in the supplement.

On June 24, 2008, CCP requested an extension until August 27, 2008, for completion of all actions identified in the CAP. By this correspondence, CCP reaffirms August 27, 2008, as the date for completion of the last action in the CAP, and requests that CBFO extend the due date until August 27, 2008.

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0801784	2300.00	JUL 09 2008	<i>all 7-9-08 gpb</i> D. Michaels K. Squires D. Castaneda C. Feamire C. Gadbury



Should you have any questions or need additional information, please contact me at Extension 7125.

Sincerely,



D. K. Ploetz, Manager  
Central Characterization Project  
Retrieval, Characterization and Transportation

AJF:jmc

Enclosure

cc: N.I. Castaneda, CBFO  
C. G. Fesmire, CBFO  
D. C. Gadbury, CBFO  
M. P. Navarrete, CBFO  
A. Holland, CBFO  
P. M. Martinez, CTAC  
A. Pangle, CTAC  
T. Putnam, CTAC

## **Supplement to CCP Corrective Action Plan for CBFO CAR 08-025: Emplacement of Drum with Unresolved Nonconformance Report**

### **References:**

- a) CCP Root Cause Analysis Report: Shipment of Drum with Unresolved Nonconformance Report in Standard Waste Box, dated June 26, 2008
- b) CBFO Memorandum CBFO:QA:MPN:KBS:08-0374:UFC:2300 from Mr. M. P. Navarrete to Mr. David Haar, dated July 1, 2008, Subject: CAP for CBFO CAR 08-025

### **Background**

CAR 08-025 identified one (1) condition adverse to quality, the identification of drum LAS817174 contained in Standard Waste Box (SWB) LASB00411, which was shipped by Central Characterization Project (CCP) and emplaced at the Waste Isolation Pilot Plant (WIPP), even though there was an open unresolved CCP Nonconformance Report (NCR)-LANL-0902-05 against the drum for liquids greater than 1% of the drum volume.

In accordance with the CBFO direction for this CAR, CCP developed a Corrective Action Plan (CAP) addressing Remedial Actions, Investigative Actions, Root Cause, and Actions to Prevent Recurrence. This CAP was submitted to CBFO on June 23, 2008.

Based on the significance of the event, a Root Cause Analysis Team was assembled by Washington TRU Solutions Senior Management, and the referenced Root Cause Analysis was completed on June 26, 2008.

On July 1, 2008, CBFO rejected the CCP CAP because it was not apparent how the CAP addressed the following elements of the CCP Root Cause Analysis report for the shipped drum: the Direct Cause, the Contributing Causes, and the Recommendations of the root cause team. CBFO also requested that the CAP be expanded to: 1) document the current status of each of the other seven drums that have failed VE as a QC check on RTR since the inception of the CCP program, and 2) address the effect on sites (other than LANL) of changes made as a result of the CAP.

In response to CBFO, CCP has prepared this supplement to the original CAP. The supplement is divided into five sections, corresponding to each of the five areas where CBFO identified the need for more information. Beneath each section heading, the actual text from the referenced CBFO memorandum appears, boxed and in italics.

The additional actions resulting from this supplement have been added to the original CAP, which is also enclosed.

1. Direct Cause from the Root Cause Report and Actions in Response

*The direct cause was identified as “the failure to recognize the significance of the unresolved NCR.” The CAP does not appear to address the direct cause, namely the failure to recognize the significance of the unresolved NCR identified during the Quality Assurance review and Independent Verification review shown in 4.1.1, first bullet [of the CCP Root Cause Analysis report]. The CAP should identify what actions CCP will take to make it clear to personnel performing open NCR checks, how to identify whether an NCR is “resolved” for a particular container. CCP should evaluate whether CCP-QP-005 needs to be revised. The personnel who failed to identify an open NCR need to be retrained prior to resuming this task and the retraining documented.*

The Lot Evaluator, QA personnel, Independent Verifiers, and the WCO involved in the reviews for the shipped drum have been re-instructed in the requirements for performing NCR checks for lot evaluation and certification. The process for performing NCR checks, the reasons for failing to recognize the significance of the unresolved NCR for the shipped drum, and the actions to prevent recurrence have been broadly distributed to CCP personnel in CCP Lessons Learned LL 2008-13. See also Recommendations 3.d) and 3.e), which address revisions to CCP procedures CCP-TP-002 and CCP-TP-030 in response to the event. These procedure changes are part of the overall corrective action plan, which CCP considers adequate to prevent recurrence of the CAR condition. CCP has evaluated CCP-QP-005 in light of the event and has determined that no changes are needed to this procedure.

2. Contributing Causes from the Root Cause Report and Actions in Response

*Ensure all contributing causes (e.g., WCO SME was unaware of the WCD training manual; therefore, guidance regarding NCR checks was not implemented.... Expectations communicated to the lot evaluator were inconsistent with CCP-TP-002, step 4.4.8...) identified in section 4.1.1 [of the Root Cause Analysis report] are addressed in the CAP*

The contributing causes identified in the CCP Root Cause Analysis Report are listed below, along with actions in response. Actions have also been added to the original CAP, in the section devoted to Actions to Prevent Recurrence, along with the responsible manager and due date for completion.

- a) The failure to identify the unresolved NCR during the QA review and the during the IV review

This contributing cause is tied to the Direct Cause and the same actions described above are applicable to resolution.

- b) WCO SME was unaware of the WCO training manual; therefore, guidance regarding NCR checks was not implemented

This cause is being addressed in Recommendation 3.e). CCP Training sent the WCO training manual to the WCO SME with directions for implementation.

- c) No NCR tag was present on the drum

The CCP program provided the protection of an NCR tag on the drum. However, the tag became detached from the drum sometime after one was applied in April 2005. When the SWB was opened on July 2, 2008, after it was retrieved from WIPP and returned to LANL, it was verified that there was no NCR tag on the drum. However, there was evidence that an NCR tag had been attached to the drum at one time (a plastic tie-wrap and grommet were found hanging from the locking ring). This cause is being addressed in Recommendation 3.f). CCP will select a wire clip design from among several types under evaluation, and has ordered NCR tags made of more durable material.

- d) Expectations communicated to the lot evaluator did not result in full compliance with CCP-TP-002, step 4.4.8

This cause is being addressed in Recommendation 3.d). CCP-TP-002 is being revised to ensure that the most recent information is used during lot evaluations.

- e) Influence of Compliance Order HWB 07-43 on the importance of RTR compared to VE on the subject waste stream

This cause is addressed by CCP Lessons Learned 2008-13, which states that "Discussions about applicability of a characterization method are never to be interpreted to mean that existing reject information can be discounted or ignored."

- f) Unrecognized additional risk resulting from the use of a manual query instead of the standard lot candidate list query

The immediate action was Remedial Action 6 in the original CAP, which was to suspend manual searches of the Data Center for the

purpose of generating Lot Candidate Lists until controls are developed and implemented. The overall CAP, including the supplemental information provided herein, will ensure that the most recent characterization data is used to determine the suitability of any list of candidate drums for lot evaluation, regardless of the source of the list.

### 3. Root Cause Report Recommendations and Actions in Response

*The CAP does not appear to accept all of the recommendations in section 7.0 of the Root Cause Analysis Report (e.g., Management should routinely review the records of drums that are certified in WWIS and are subsequently removed from WWIS.... Clarify the intent of step 4.4.8 in CCP-TP-002 not to exclude the consideration of available characterization data.). The CAP should be revised to address all the recommendations in the Root Cause Analysis Report.*

The recommendations identified in the CCP Root Cause Analysis Report are listed below, along with actions as appropriate. Actions have also been added to the original CAP, in the section devoted to Actions to Prevent Recurrence, along with the responsible manager and due date for completion. These additional actions are numbered 6-9 in the original CAP.

- a) Tie NCRs to any previous BDR data in the same process (NDE, NDA, etc).

CCP has evaluated this recommendation from the Root Cause Analysis report and believes that the overall CAP, including the supplemental information provided herein, is adequate to prevent recurrence of the CAR condition. The identified actions will ensure that the most recent characterization data is used to determine the suitability of any list of candidate drums for lot evaluation, thus superseding any prior results. For this reason, the recommended action is not needed, and CCP has decided not to implement it.

- b) Prior to certification of a drum for shipment, all applicable NCRs should be formally closed. Those NCRs that cannot be formally closed because they apply to more than one drum should be evaluated to ensure that they do not affect the acceptability of the drum for certification.

This is, and has been, the practice of CCP with regard to lot evaluation and certification. Close-out of applicable NCRs prior to certification is re-emphasized in CCP Lessons Learned 2008-13. In addition, this activity is strengthened by Recommendation 3.h), which will give the

WCOs a more useful search tool for identifying open NCRs against drums being evaluated for certification. [CAP Actions D.1 and D.6]

- c) Management should routinely review the record of drums that are certified in WWIS and are subsequently removed from WWIS to identify any weaknesses in the certification process.

CCP management has documented the process to be used for periodic review of drums removed from WWIS for the purpose of identifying any observable trends. [CAP Action D.7]

CCP will revise CCP-QP-019, *CCP Quality Assurance Reporting to Management*, to include a section for reporting any adverse trends related to removal of drums from WWIS. [CAP Action D.8]

- d) Incorporate Standing Order CCP-SO-32 into CCP-TP-002 (To ensure review of most recent data)

Standing Order CCP-SO-32 will be incorporated into CCP-TP-002. [CAP Action D.2]

- e) Incorporate Standing Order CCP-SO-33 into CCP-TP-030 (Adding WCO NCR/CAR review). Additionally, CCP Training formally transmit appropriate training materials (including WCO-01, *WCO Training Manual*) to the WCO SME. The WCO SME should review the training manual with currently qualified and any new WCOs.

Standing Order CCP-SO-33 will be incorporated into CCP-TP-030. CCP Training has completed the second action. [CAP Actions D.2 and D.9]

- f) Continue/refine use of wire clips for NCR tags by ensuring a permanent attachment and durable tag.

CCP will select a wire clip design from among several types under evaluation, and has ordered NCR tags made of more durable material. [CAP Action D.3]

- g) Clarify the intent of step 4.4.8 in CCP-TP-002 not to exclude the consideration of available characterization data.

In addition to the action in Recommendation 3.d), above, to ensure review of the most recent data, clarification was provided in CCP Lessons Learned LL 2008-13. [CAP Action D.1]

- h) In the Data Center Search 7, a "Yes" in the "NCRdata" column should **ONLY** indicate "Open" NCRs.

The appropriate changes to the Search 7 query in the Data Center will be implemented. [CAP Number D.6]

4. Status of Seven Other Drums that Failed VE as a QC Check on RTR

*CCP states that only 8 containers in CCP's history have failed VE as a QC check. Because CCP identified this as a factor in the errant drum coming to WIPP, there is a need to identify what happened to the other 7 drums that failed VE as a QC check.*

The other seven drums were all properly managed and controlled under the CCP program, as follows:

LANL

S58362: Liquid found in the drum was remediated during VE, and the drum was then accepted for certification.

S850287: The drum was rejected back to LANL for remediation, for the presence of a prohibited amount of liquid. The drum is still rejected on two open NCRs (one for VE and one for RTR) and has not been put into a lot or certified. CCP has confirmed that the two NCR tags are still on the drum and that it is in reject status in the CCP Data Center.

SRS

SR226871: During VE, a lead-lined rubber glove was found in a waste stream where AK did not identify the presence of lead. The AK was re-evaluated and lead was added to the AK. The drum was then accepted for certification

SR542539: Liquid found in the drum was remediated during VE, and the drum was then accepted for certification.

SR588310: A large sealed container found in the drum was remediated during VE, and the drum was then accepted for certification.

SR236859: During VE, the drum was determined to be homogeneous solids waste, not debris waste, and therefore did not meet AK. The drum was rejected and removed from the list of drums on the AK.

INL

10015325: Liquid found in the drum was remediated during VE, and the drum was then accepted for certification.

5. Effect of CAP Changes at Other CCP Host Locations

*Any changes made as a result of this CAP that have an effect on other sites need to be addressed.*

- a) Programmatic changes made as the result of this CAP will affect CCP activities in the Project Office. For example, the changes to CCP-TP-002 (to ensure review of the most data during lot evaluation) and CCP-TP-030 (to add WCO NCR/CAR checks) will apply to drums from all locations. Other actions, such as the use of more durable NCR tags with permanent attachments, will apply to all CCP locations.
- b) CCP performed a review of the approximately 2,500 containers in certified in WWIS but not yet shipped. The purpose of the review was to determine whether there were any containers in WWIS with unresolved NCRs against them. The review showed that all of the 2,500 containers certified for shipment were free of unresolved NCRs. These containers were from all host locations where CCP is currently authorized to ship TRU waste to WIPP. The lack of problems with this large number of containers strongly supports the conclusion that this was an isolated event without adverse effect at any other host locations.

This conclusion is further supported by the fact that the CAR condition can only arise in waste containers that were selected for VE as a quality control check on RTR, and the resulting VE identified an issue. Of the nearly 50,000 containers processed by the CCP, this total population amounts to eight (8) containers. As noted above, the other seven containers were properly managed and controlled under the CCP program.



**Updated Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

**Corrective Action Plan:**

CAR 08-025 identified one (1) condition adverse to quality, the identification of drum LAS817174 contained in Standard Waste Box (SWB) LASB00411, which was shipped by Central Characterization Project (CCP) and emplaced at the Waste Isolation Pilot Plant (WIPP), even though there was an open CCP Nonconformance Report (NCR)-LANL-0902-05 against the drum for liquids greater than 1% of the drum volume.

**Condition Adverse to Quality:**

*Drum LAS817174, contained in SWB LASB00411, was shipped to the WIPP and emplaced, even though there as an open CCP NCR LANL-0902-05 against it for liquids greater than 1% of the container volume.*

**A. Remedial Actions:**

1. Suspended all shipments to WIPP on June 6, 2008 until immediate Corrective Actions were completed.

Action Manager: D. Haar  
Due Date/Status: Completed 6/16/08

2. Performed a 100% verification of the four shipments that were enroute to WIPP on June 6, 2008, or received at WIPP but not yet emplaced, to confirm that all containers certified in WWIS did not have unresolved NCRs affecting their certification.

Action Manager: M. Pearcy  
Due Date/Status: Completed 6/11/08

3. Performed a 100% verification of the containers currently certified in the WWIS, but not yet shipped to confirm that all containers did not have unresolved NCRs affecting their certification.

Action Manager: M. Pearcy  
Due Date/Status: Completed 6/11/08 for CCP/LANL, 6/14/08 for CCP/SRS and 6/16/08 for CCP/INL

4. Completed briefings, including briefing Retrieval, Characterization and Transportation personnel on this event. As part of this briefing, it was emphasized that all reviews must be performed to the required rigor. This general briefing was followed by detailed briefings of affected personnel to review their roles and responsibilities, and management's expectations for performing reviews.

Action Manager: M. Pearcy  
Due Date: Completed 6/12/08

5. In order to capture the content of the above briefings and clarify SPM and WCO responsibilities contained in CCP's procedures, the following Standing Orders (SO) were issued:

**Updated Corrective Action Plan for CBFO CAR-06-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

- S.O.32 Clarification for Selection of Data at Project Office Lot Evaluation
- S.O.33 Clarification of WCO Responsibility in Certification of Containers for Shipment to WIPP
- S.O.34 NCR/CAR Resolution Check prior to CH Payload Assembly to WIPP

Action Manager: M. Pearcy  
Due Date: Completed 6/13/08

6. Suspended manual searches of the CCP Data Center for the purpose of generating Lot Candidate Lists until controls are developed and implemented.

Action Manager: DK Ploetz  
Due Date/Status: Completed 6/16/08

7. Placed all unresolved NCR'd containers at LANL into a hold lot preventing their certification in WWIS as an interim control measure until each NCR'd container can be checked to verify that it is still tagged with a CCP Hold Tag. If the tag is damaged or missing, it will be replaced and affixed with a wire tie.

Action Manager: M. Pearcy  
Due Date/Status: Completed 6/11/08

8. Adopted the use of a wire tie to attach CCP Hold Tags to containers.

Action Manager: DK Ploetz  
Due Date: Completed 6/12/08

**B. Investigation Actions:**

Based on the investigation conducted by CCP, the impact and extent of the CAR condition are as follows:

**Impact**

The unresolved NCR (NCR-LANL-0902-05) on drum LAS817174 was self-identified by CCP during a routine QA surveillance on June 5, 2008. NCR-LANL-0902-05 was evaluated and determined that it could be closed on June 6, 2008 on the following basis:

Even though the SWB payload container containing drum LAS817174 was determined to be compliant with the Permit, WTS voluntarily decided to retrieve SWB LASB00411 from the WIPP and return it to the generator site for remediation.

The SWB containing drum LAS817174 was safely retrieved and returned to the generator site on June 13, 2008. Therefore, there is no impact to the public health and safety.

CCP issued CAR-CCP-0008-08 on June 9, 2008, to document shipment of drum with an open NCR.

## Updated Corrective Action Plan for CBFO CAR-08-025: Resulting From Emplacement Of Drum With Open Nonconformance Report

### Extent

On April 21, 2004, drum number LAS817174 was processed through Real Time Radiography (RTR) and no prohibited items were identified. However, Visual Examination (VE) was performed as a Quality Control (QC) check of the RTR process for this container [a permit requirement at the time] on 4/9/05 and greater than 1% by volume liquid was identified on top of the waste. This condition was documented in NCR-LANL-0902-05 with a reject disposition to return the drum to the generator site for remediation. In April 2008, failure of a primary and secondary check resulted in this drum being overpacked into Standard Waste Box (SWB) LASB00411 which was emplaced at WIPP May 28, 2008. The unresolved nonconformance documentation NCR-LANL-0902-05 was discovered June 5, 2008, during a routine Quality Assurance (QA) surveillance. CAR-CCP-0008-08 was issued June 6, 2008, documenting this condition. The SWB containing drum LAS817174 was retrieved and returned to the generator site June 13, 2008.

As noted in CBFO's formal notification to EPA (CBFO Memorandum CBFO:NTP:CG:KJB:08-0783:UFC5900 dated June 13, 2008, to Mr. Juan Reyes from Mr. David C. Moody) the documentation trail associated with a waste container successfully completing RTR, and then being rejected for a prohibited condition during visual examination (VE) is extremely uncommon. This condition can only arise in waste containers that were selected for VE as a quality control check on RTR, and the resulting VE identified an issue. Of the nearly 50,000 containers processed by the CCP, this total population amounts to eight (8) containers. Of the eight containers, only two are associated with solid homogeneous waste, both at LANL. Therefore, this is viewed as being an isolated condition.

CCP verified that all 2,500 drums currently certified for shipment were free of any unresolved nonconformances.

See also the additional discussion of Extent of Condition in the supplement to this Corrective Action Plan.

### C. Root Cause Determination:

Based on the significance of the event, a Root Cause Analysis Team (RCAT) was assembled by Washington TRU Solutions Senior Management, and a root cause analysis was completed with the following results:

The root cause was identified as failure to use the most recent nondestructive examination characterization data.

### Analysis

#### Description of the Process for Obtaining Drum Candidate Lists for Lot Evaluation

In order for a drum to be a candidate for Lot Evaluation, it must have been successfully characterized through each method (e.g., NDE, NDA) applicable to the drum.

CCP makes use of a database called the CCP Data Center to keep track of the status of drums through characterization. The CCP Data Center has the capability to associate an individual drum with all of the BDRs and NCRs for that drum. Standard queries, or searches, have been developed to provide users with information that is routinely required from the Data Center; manual searches can also be performed for a specific purpose.

The standard queries available in the Data Center are based on the characterization methods applicable to virtually all the drums in the database: NDE (RTR or VE), NDA,

## Updated Corrective Action Plan for CBFO CAR-08-025: Resulting From Emplacement Of Drum With Open Nonconformance Report

and either HSG or FGA. The standard queries will not produce drums as candidates for lot evaluation until the most recent BDRs for each of these methods are acceptable, and there are no unresolved (reject) NCRs against the drums for these latest results. The critical factor for drum selection by the Data Center is the use of the most recent characterization information to develop the lists of candidate drums for lot evaluation.

For reasons discussed in the Root Cause Analysis Report, the selection of the drum subsequently shipped to WIPP was based on a manual search that focused on the previously acceptable RTR and NDA, and not on a standard search for candidate drums. This is important because the standard search would have recognized the importance of the more recent rejection of the drum during VE and would not have included the drum as a candidate for lot evaluation.

### D. Actions to Preclude Recurrence

#### 1. Issue a Lessons Learned to communicate management expectations as follows:

- Tie NCRs to previous acceptable characterization data in the same process (i.e., NDE, NDA, and HSG/FGA)
- Prior to certification of a container for disposal, close out applicable NCRs. NCRs that cannot be formally closed because they apply to more than one container shall be evaluated to ensure that they do not affect the acceptability of the drum for certification.
- The lot evaluation process includes reviewing relevant information, including all available characterization data.
- In the Data Center Search No. 7, a "Yes" in the "NCR data" column should only indicate "Open" NCRs.

Action Manager: D. K. Ploetz  
Due Date: Completed 6/30/08

#### 2. Revise CCP-TP-002 and CCP-TP-030 to incorporate Standing Orders CCP-S0-32 and CCP-S0-33, respectively.

Action Manager: M. Pearcy  
Due Date: August 27, 2008

#### 3. Evaluate the following potential refinements to the wire tie:

- Use of a flexible wire tie which is crimped in place
- Use of a more durable (e.g., thicker) plastic tag

Action Manager: D. K. Ploetz  
Due Date: July 31, 2008

#### 4. Unload drum LAS817174 from SWB and visually inspect to verify the absence of a CCP Hold Tag.

Action Manager: S. Peterman  
Due Date: Completed 7/02/08

#### 5. Issue the final Root Cause Analysis Report.

Action Manager: D. K. Ploetz  
Due Date: Completed 6/26/08

**Updated Corrective Action Plan for CBFO CAR-08-025:  
Resulting From Emplacement Of Drum With Open Nonconformance Report**

6. Reconfigure the Search 7 capability in the Data Center so that a "Yes" in the NCR Data column means that there is at least one open NCR against the drum.

Action Manager: M. Pearcy  
Due Date: 8/27/08

7. Document the process to be used for management review of drums removed from WWIS, for the purpose of identifying any observable adverse trends.

Action Manager: D.K. Ploetz  
Due Date: Complete 7/09/08

8. Revise CCP-QP-019, *CCP Quality Assurance Reporting to Management*, to include a section for reporting any adverse trends related to the removal of drums from WWIS.

Action Manager: V.K. Cannon  
Due Date: 8/27/08

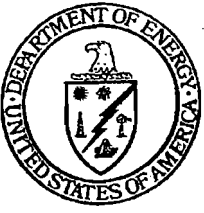
9. Formally transmit appropriate training materials (including WCO-01, *WCO Training Manual*) to the WCO SME for review with WCOs.

Action Manager: A.J. Fisher (transmittal)  
Due Date: Complete 7/02/08

Action Manager: M. Sensibaugh (review with WCOs)  
Due Date: 7/18/08

NOTE: The action in the original CAP to release shipment of drums from LANL based on the results of the EPA inspection has been deleted, since this a CBFO decision outside of CCP's control.

**CBFO Acceptance of Revised CCP  
CAP Dated July 16, 2008**



**Department of Energy**  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
July 16, 2008

Mr. David H. Haar  
Washington TRU Solutions  
P. O. Box 2078  
Carlsbad, NM 88220

**Subject: Corrective Action Plan for Correction Action Report 08-025, Not Associated with an Audit**

Dear Mr. Haar:

The Carlsbad Field Office (CBFO) has reviewed the correction action plan (CAP) and supplemental CAP for Corrective Action Report (CAR) 08-025. The corrective actions identified in the CAP and supplement are acceptable. The enclosed CAR continuation sheet provides additional information regarding the basis for approval.

Please provide documentation for closure of this CAR by August 27, 2008.

Should you have any questions, please contact me at (575) 234-7491.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Miehls".

Dennis S. Miehls  
Senior Quality Assurance Specialist

Enclosure

CAR CONTINUATION SHEET

1. CAR No: 08-025

2. Activity No: N/A

3. Page 1 of 1.

**Block # 17 Acceptance of Proposed Corrective Actions:**

**SUBJECT:** REVISED CORRECTIVE ACTION PLAN FOR CBFO CORRECTIVE ACTION REPORT 08-025, RESULTING FROM SHIPMENT OF A DRUM FROM THE LOS ALAMOS NATIONAL LABORATORY WITH AN UNRESOLVED NONCONFORMANCE REPORT

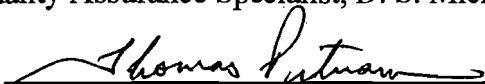
**REFERENCE:** WTS letter (CP:08:00346 UFC 2300.00) from D.K. Ploetz to D.S. Miehl dated July 9, 2008

The identified actions (remedial, investigative, root cause analysis, and actions to preclude recurrence) for the updated CAP and the supplemental CAP described in the referenced WTS letter are acceptable, but not complete.

On July 10, 2008 WTS/CCP, CBFO, and CTAC personnel met in the CBFO/QA conference room and discussed further clarification of the proposed corrective actions submitted, in addition to expectations from CBFO during verification of corrective actions associated with CAR 08-025.

WTS/CCP agreed that procedure CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, would be revised to include language describing the process that CCP personnel use when performing open NCR checks and whether the NCR is "resolved" for a particular container in conjunction with software changes to the PTS (NCR status) portion of the CCP Datacenter. The CCP-QP-005 revision will also include additional language with respect to reconciliation of hold tags once the NCR's are cleared for containers.

Upon completion of the corrective actions please submit documentation supporting closure to CBFO Senior Quality Assurance Specialist, D. S. Miehl by the date indicated in the CAP.



Response Evaluated by

7-16-08

Date



**CBFO Evaluation of CCP  
Remedial Actions Dated July 18, 2008**



**Department of Energy**  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
July 18, 2008

Mr. David H. Haar  
Washington TRU Solutions  
P.O. Box 2078  
Carlsbad, NM 88220

**Subject: Evaluation of the Remedial Actions for Corrective Action Report 08-025,  
Los Alamos National Laboratory Central Characterization Project**

Dear Mr. Haar:

The Carlsbad Field Office has reviewed the remedial actions for Corrective Action Report (CAR) 08-025. This CAR resulted from shipment of a drum with an unresolved Nonconformance Report from Los Alamos National Laboratory Central Characterization Project.

The remedial actions have been verified as complete and determined to be adequate. The results of the evaluation are included on the enclosed CAR continuation sheet.

If you have any questions or comments, please contact me at (575) 234-7491.

Sincerely,

A handwritten signature in black ink, appearing to read "D. S. Miehl".

Dennis S. Miehl  
Senior Quality Assurance Specialist

Enclosure

Mr. David H. Haar

-2-

July 18, 2008

cc: w/ enclosure

A. Holland, CBFO	*ED
M. Navarrete, CBFO	ED
D. Gadbury, CBFO	ED
N. Castaneda, CBFO	ED
C. Fesmire, CBFO	ED
D. Ploetz, WTS/CCP	ED
A. J. Fisher, WTS/CCP	ED
V. Cannon, WTS/CCP	ED
M. Walker, WTS/CCP	ED
G. Rael, LASO	ED
M. Eagle, EPA	ED
E. Feltcorn, EPA	ED
R. Joglekar, EPA	ED
S. Zappe, NMED	ED
S. Holmes, NMED	ED
T. Kesterson, DOE OB WIPP NMED	ED
D. Winters, DNFSB	ED
V. Waldram, LANL-CO	ED
P. Gilbert, LANL-CO	ED
A. Pangle, CTAC	ED
P. Y. Martinez, CTAC	ED
CBFO QA File	
CBFO M&RC	

\*ED denotes electronic distribution

## CAR CONTINUATION SHEET

1. CAR No: 08-025

2. Activity No: N/A

3. Page 1 of 3.

### Block # 17 Acceptance of Corrective Action Completion (Remedial Actions Only):

SUBJECT: VERIFICATION OF REMEDIAL ACTIONS FOR CORRECTIVE ACTION PLAN FOR CBFO CORRECTIVE ACTION REPORT 08-025, RESULTING FROM SHIPMENT OF A DRUM FROM THE LOS ALAMOS NATIONAL LABORATORY WITH AN UNRESOLVED NONCONFORMANCE REPORT

An evaluation has been performed of the completion of the remedial actions associated with CBFO CAR 08-025, which resulted from shipment of a drum from the Los Alamos National Laboratory (LANL) with an unresolved nonconformance report (NCR). Documentation supporting the completion of the remedial actions was submitted to CBFO via WTS letter (CP:08:00346 UFC 2300.00) from D.K. Ploetz to D.S. Miehl, dated July 9, 2008.

#### A. Remedial Actions:

1. Suspended all shipments to WIPP on June 6, 2008, until immediate corrective actions were completed.
  - The following documentation was reviewed and verified; a copy of WTS e-mail from Kyle Darrah to Retrieval, Characterization, and Transportation (RCT) personnel for notification that all waste shipments to WIPP, both CH and RH, are immediately suspended until further notice; a copy of the ORPS Operating Experience Report EM-CAFO-WTS-WIPP-2008-0005, dated 6/9/08, and a copy of CCP Corrective Action Report CAR-CCP-00008-08.
2. Performed a 100% verification of the four shipments that were en route to WIPP on June 6, 2008, or received at WIPP but not yet emplaced, to confirm that all containers certified in WWIS did not have unresolved NCRs affecting their certification.
  - The process used on the CCP Datacenter to search for drums pertaining to this action was verified by interview with the Project Compliance Manager of CCP and review of the database. Also, a review was performed of the container number list against the submitted search results. Traceability from the container numbers to the search results to any NCRs associated with these containers was also verified. A review was performed of copies of the CCP Datacenter search result printouts for verification of shipments that were en route to WIPP or received at WIPP but not yet emplaced. The shipments were SRS, INL, and INL RH shipments. The fourth shipment was an AMWTP shipment containing no CCP drums.
3. Performed a 100% verification of the containers currently certified in the WWIS, but not yet shipped, to confirm that all containers did not have unresolved NCRs affecting their certification.
  - The process used on the CCP Datacenter to search for drums pertaining to this action was verified by interview with the Project Compliance Manager of CCP and review of the database. Also, a review of the container number list against the submitted search results was performed. Traceability from the container numbers to the search results to any NCRs associated with these containers was verified. A review was performed of copies of the CCP Datacenter search result printouts for verification of containers that were currently certified in the WWIS, but not yet been shipped.

## CAR CONTINUATION SHEET

1. CAR No: 08-025

2. Activity No: N/A

3. Page 2 of 3.

4. Briefings on this event were completed, including Retrieval, Characterization, and Transportation personnel. As part of these briefings, it was emphasized that all reviews must be performed to the required rigor. The general briefing was followed by detailed briefings of affected personnel to review their roles and responsibilities, and management's expectations for performing reviews.
  - Documentation was reviewed for verification of the briefing held for RCT personnel on the LANL drum given by D. K. Ploetz, CCP Manager of RCT. Detailed briefings were performed with the SPMs and WCOs on the reviews and their roles and responsibilities, and management's expectations for performing reviews. Copies of the CCP attendance sheets were reviewed and verified against the List of Qualified Individuals for the WCOs and SPM Lot Evaluators.
  
5. In order to capture the content of the briefings and clarify SPM and WCO responsibilities contained in CCP procedures, the following Standing Orders (SO) were issued:
  - S.O.32 Clarification for Selection of Data at Project Office Lot Evaluation
  - S.O.33 Clarification of WCO Responsibility in Certification of Containers for Shipment to WIPP
  - S.O.34 NCR/CAR Resolution Check prior to CH Payload Assembly to WIPP
  - A review was done of CCP S.O.32, *Clarification for Selection of Data at Project Office Lot Evaluation*; S.O.33, *Clarification of WCO Responsibility in Certification of Containers for Shipment to WIPP*; and S.O.34, *NCR/CAR Resolution Check Prior to CH Payload Assembly to WIPP*. The SOs provide supplemental direction in order to capture the content of the above briefings and clarify SPM and WCO responsibilities contained in the CCP procedures.
  
6. Suspended manual searches of the CCP Data Center for the purpose of generating Lot Candidate Lists until controls are developed and implemented.
  - Verification that an e-mail from Mark Percy to staff on suspended manual searches for the purpose of generating Lot Candidate List was distributed. This e-mail was for LANL waste streams LA-MIN03-NC.001 and LA-CIN02.001. These are the only two waste streams subject to manual searches.
  
7. Placed all containers at LANL with unresolved NCRs into a hold lot preventing their certification in WWIS as an interim control measure until each container with an unresolved NCR can be checked to verify that it is still tagged with a CCP Hold Tag. If the tag is damaged or missing, it will be replaced and affixed with a wire tie.
  - Verified the process used in the CCP Datacenter to search for unresolved NCRs. Drums are placed in Lot ID when an open NCR is present. These drums will not be allowed to populate to a candidate list for shipment. This keeps the drums from being certifiable. Random container numbers were put into the CCP Datacenter to verify this process. Copies of the CCP Datacenter search printouts for all LANL containers with unresolved NCRs placed in a hold lot, preventing their certification in WWIS. This is an interim control measure until each container with an unresolved NCR can be checked to verify that it is still tagged with a CCP Hold Tag.

## CAR CONTINUATION SHEET

1. CAR No: 08-025

2. Activity No: N/A

3. Page 3 of 3

8. Adopted the use of a wire tie to attach CCP Hold Tags to containers.

- Verified an example of the wire tie used to attach the CCP Hold Tags to the containers. A copy of CCP Lessons Learned 2008-12 was submitted for properly tagging nonconforming drums. Use of wire ties at LANL was verified by Wayne Ledford on June 25, 2008.

Based on the detail review, it has been determined that the remedial actions of the CAR have been implemented. It is recommended that the remedial actions only of CBFO CAR 08-025 be approved.

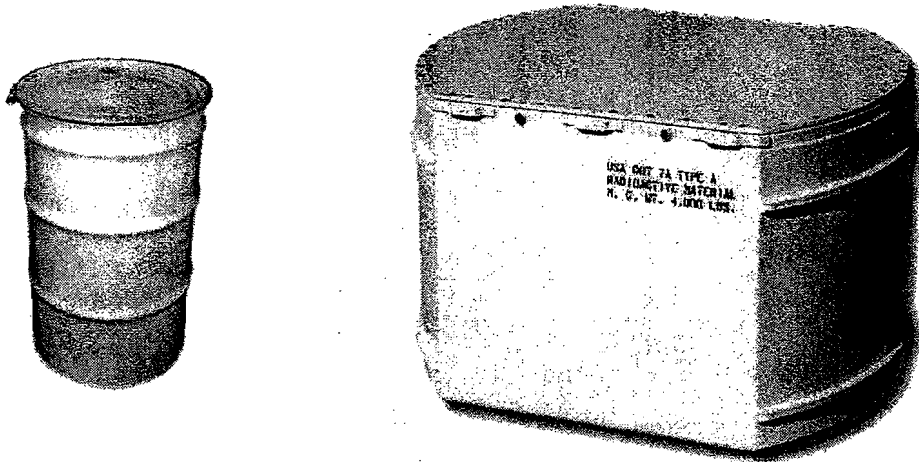
Priscilla Y. Mantz / Ward                      7-17-08  
Response Evaluated by    Date

**CCP Final Root Cause  
Analysis Report Dated June 26, 2008**

# Central Characterization Project

## Shipment of Drum with Unresolved Nonconformance Report in Standard Waste Box

### Root Cause Analysis Report



June 26, 2008



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## LIST OF ACRONYMS AND ABBREVIATIONS

AMWTP	Advanced Mixed Waste Treatment Project
BDR	Batch Data Report
CAR	Corrective Action Report
CBFO	Carlsbad Field Office
CCP	Central Characterization Project
CIS	Characterization Information Summary
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FGA	Flammable Gas Analysis
HENC2	High Efficiency Neutron Counter 2
HSG	Head Space Gas
ID	Item Identification
IV	Independent Verification
LANL	Los Alamos National Laboratory
NCR	Nonconformance Report
NDA	Nondestructive Assay
NDE	Nondestructive Examination
NMED	New Mexico Environment Department
OPTCD	Overpack Payload Transportation Certification Documents
PATCD	Payload Assembly Transportation Certification Documents
PO	Project Office
ppm	parts per million
QA	Quality Assurance
RCA	Root Cause Analysis
RCAT	Root Cause Analysis Team
RCT	Retrieval, Characterization and Transportation
RTR	Real Time Radiography
SME	Subject-Matter Expert
SPM	Site Project Manager
SRS	Savannah River Site
SWB	Standard Waste Box
TCO	Transportation Certification Official
TRU	Transuranic (waste)
VE	Visual Examination
VOC	Volatile Organic Compound
VPM	Vendor Project Manager
WCA	Waste Certification Assistant
WCO	Waste Certification Official
WIPP	Waste Isolation Pilot Plant
WAP	Waste Analysis Plan
WTS	Washington TRU Solutions
WWIS	WIPP Waste Information System

## 1.0 Executive Summary

On May 20, 2008, the Washington TRU Solutions (WTS) Central Characterization Project (CCP) shipped a Standard Waste Box (SWB) containing drums of transuranic mixed waste from Los Alamos National Laboratory (LANL) to the Waste Isolation Pilot Plant (WIPP) for disposal. The SWB was received at the WIPP on May 21, 2008, and subsequently emplaced on May 28, 2008.

The SWB contained four 55-gallon drums, one of which had an unresolved Nonconformance Report (NCR) for the presence of a prohibited amount of liquid in a 55-gallon drum. The four drums had been placed into an SWB because they had drum integrity issues.

WTS became aware of the NCR problem on June 5, 2008, when a routine check of unresolved NCRs identified the subject drum as emplaced within the WIPP repository. The U.S. Department of Energy (DOE) - Carlsbad Field Office (CBFO) was immediately notified, and the decision was made to retrieve the SWB from the repository and return it to LANL. Although the amount of liquid in the 55-gallon drum did not exceed the amount of liquid allowed in an SWB, as a conservative measure, a decision was made to retrieve the SWB.

Based on the significance of the event, a Root Cause Analysis Team (RCAT) was assembled by WTS senior management, and a Root Cause Analysis (RCA) was completed with the following results.

**The root cause was identified as failure to evaluate the most recent Nondestructive Examination (NDE) characterization data.**

**The direct cause was identified as the failure to recognize the significance of the unresolved NCR.**

Contributing causes are listed and discussed in Section 4.1.1 of this report.

This event occurred because several administrative checks built into the CCP process failed for reasons related to the root cause. In addition, the physical barrier, consisting of the NCR HOLD tag, was missing at the time the drum was inspected prior to being placed in the SWB (based on the interview with the Transportation Certification Official (TCO) and will be verified when the SWB is opened).

The RCAT has examined the Immediate/Compensatory Corrective Actions taken by management, listed in Section 6.0, and concluded that they are sufficient.

The RCAT recommendations, as a result of examining this incident and other similar conditions, are listed in Section 7.0.

## 1.1 Introduction

On May 20, 2008, the WTS CCP at LANL shipped a SWB containing a 55-gallon drum of transuranic (TRU) waste (drum number LAS817174) to the WIPP in Carlsbad, New Mexico where it was emplaced underground on May 28, 2008. During a routine review of open NCRs on June 5, 2008 it was determined that the subject drum had been shipped with an unresolved NCR (CCP-LANL-0902-05). The discovery of the unresolved NCR resulted in the immediate initiation of an investigation to determine if the condition was the result of an administrative failure to process closure of the document or if some other condition existed.

Prior to November 2006, the WIPP permit required that periodic quality checks of the Real Time Radiography (RTR) process be performed by randomly selecting a drum that was found acceptable by RTR, opening it and performing Visual Examination (VE) of the content to confirm the results of radiography. The drum in question was evaluated by RTR on April 21, 2004 and was found to be acceptable. It was selected for quality check and VE was performed on April 9, 2005, during which an unacceptable amount of liquid (> 1%) was found on top of the waste. The liquid was contained to the inside of the bag ruling out the possibility that it entered the drum through a leak such as around the filter. The amount of liquid identified was determined to be between 4 and 6 liters. The NCR generated to document this condition was dispositioned "reject and return to host site."

Review of the video record of the VE and associated data bases determined that liquid was present during the quality check in 2005 and the drum had not been remediated; consequently, the NCR was still valid. Notifications were made to the New Mexico Environment Department (NMED), the Environmental Protection Agency (EPA), DOE, and the affected shipping sites. All shipments to the WIPP other than those already in transit were suspended.

CCP Management and WTS Permit Personnel reviewed the noncompliance in detail and determined at the time that the NCR was generated the condition was correctly stated; however, prior to shipping the drum, integrity issues required it to be overpacked in a SWB with three other drums. The amount of liquid in consideration (approximately 5 to 7 liters) was now well below that allowed for the SWB which was approximately 18 liters. As the condition was no longer nonconforming, the NCR was closed. WTS Senior Management considered the option to leave the compliant container in the underground but chose to remove it and return it to Los Alamos.

CCP has several layers of overchecks built into its drum evaluation process to create defense in depth; however, in this scenario at least three administrative barriers and one physical barrier failed.

On June 12, 2008, senior management commissioned a formal RCAT comprised of representation from Configuration Management, Training, Project Management, Transportation/Characterization, Quality Assurance (QA), and the WIPP Site Operations. The team has been tasked with analyzing this issue, identifying the root cause and contributing causes, and recommending corrective actions to senior management. The team has chosen the Phoenix Root Cause method which was conducted in compliance with WTS WP 13-QA3016, *Root Cause Analysis*, Rev. 3, Barrier Analysis.

## 2.0 Similarity with Other Events or Incidents

A review was made of other issues/events that have been documented within the WIPP program. There are two similar events within WTS/CCP, and one similar event from the Advanced Mixed Waste Treatment Project (AMWTP) program which impacted the WIPP program. The events are as follows:

- Event 1: 06/08/2004 - CCP/Savannah River Site (SRS) Container shipped with an unresolved NCR, documented on CCP CAR-SRS-0002-04
- Event 2: 08/24/2006 - CCP/LANL Containers shipped using data from uncertified equipment, documented on CBFO CAR 06-037
- Event 3: 07/16/2007 - AMWTP shipment of uncharacterized container, documented on AMWTP Corrective Action Report (CAR)-28920

Each case indicated inadequate program controls and/or human error in the implementation of existing controls for TRU waste containers.

Event 1 is closest in similarity to the current issue. In this event, a SRS container with an unresolved NCR on a prohibited item (sealed inner container >4L) was processed through the CCP Project Office (PO) and offered for shipment. The error was recognized while the shipment was in route and subsequently the shipment/container was returned to SRS. CCP CAR-SRS-002-04 was issued; a RCA and a WTS Senior Management Review were performed on this event.

The investigation prompted by CCP CAR-SRS-0002-04 revealed there were inadequate controls for CCP PO review/certification and physical marking of containers with non-conformance conditions. The resulting actions from this event prompted strengthening the tools used in the CCP Data Center database to assist in project level reviews and certification, and a revision of CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*, to require "tagging" containers identified with nonconforming issues when they are returned to the generator site for remediation.

In Event 2, CCP at LANL certified and shipped two containers to the WIPP from the High Efficiency Neutron Counter 2 (HENC2) assay system which

had been formally audited, but had not yet been certified for the WIPP acceptance by DOE. Batch Data Reports (BDRs) produced by the HENC2 were sent to the PO for review while awaiting completion of the formal certification process for a new piece of equipment. At the time, CCP did not have a method for controlling drums/data processed on equipment pending certification. As a consequence, the review tools in the PO allowed these containers to be processed as if the equipment was certified.

This event revealed inadequate controls to prevent the container assay data from being processed through the PO, and the container from being routed in the field to shipment. DOE/CBFO issued CBFO CAR 06-037 documenting the actions to preclude recurrence, which included: a revision to CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*, that requires a PO Site Project Manager (SPM) to verify equipment certification status for container data provided for certification, and a revision to each CCP site Container Management procedure that requires a physical control, the application of a Vendor Project Manager (VPM) HOLD tag to all containers run through uncertified systems.

In Event 3, Waste Handlers at AMWTP mistakenly selected an uncharacterized container for overpack assembly and shipment. In this event, the container had been through a RTR pre-screening process which identified an inner container with liquid > 1 inch, since the pre-screening process was before formal acceptance in the certified program an NCR was not produced, the generator site was provided a RTR pre-screening log identifying the issue requiring remediation. This container was selected due to an operator's transcription error of a Container ID number. Container ID 10161094 was entered into the inventory database for location instead of Container ID 10106194, and this initiated the sequence of events that led to the improper shipment.

AMWTP CAR-28920 and subsequent RCA-05-007 identified inadequate procedural controls in INST-OI-21, *Payload Assembly*, which allowed human intervention/error. Resulting actions included: (1) Revision of INST-OI-21, *Payload Assembly* to disallow manual transcription of container numbers; (2) Institution of independent peer verification to the WIPP Waste Information System (WWIS) produced Overpack Payload Transportation Certification Documents (OPTCDs) and/or Payload Assembly Transportation Certification Documents (PATCDs) of containers loaded for shipment to the WIPP; and, (3) Imposing a requirement for AMWTP to initiate an NCR and "tag" any container that failed pre-screening for a prohibited condition.

The events described above and the resulting actions were known and in place at the time of this CCP/LANL event. Supporting evidence collected shows that the PO review tools were in place and were working to clearly identify the NCRs

associated with LANL container LAS817174, and NCR documentation is marked such that LAS817174 was properly "tagged" at the time of issuance of the nonconformance.

### 3.0 Facts (Comparative Time Line)

When	What did happen	What should have happened	Immediate result (Consequence)	Significance (Impact on Final Consequences)
04/21/2004	RTR was performed on the subject drum, which passed.	OK.	None.	None.
04/09/2005	VE (as a QC check on RTR) was performed on the subject drum, and a prohibited amount of liquid was found in the drum. NCR-LANL-0902-05 was issued and an NCR hold tag was applied to the drum.	OK. The process for control of nonconforming items was followed correctly. An NCR was written and an NCR HOLD tag was applied to the drum.	None.	None.
02/28/2008	The CCP Characterization Manager requested the LANL SPM to do a manual search in the CCP Data Center for LANL drums with acceptable RTR and NDA characterization results. The only time this manual query was ever needed within CCP was for two LANL waste streams that did not require Head Space Gas (HSG) or Flammable Gas Analysis (FGA) for shipment.	Ordinarily, standard queries built into CCP Data Center database would have been used to produce the list of acceptable drums. The standard query would have detected VE as the most recent NDE performed on the drum. The standard query would not have shown this drum as a candidate for Lot Evaluation, because there was an unresolved NCR against it.	The manual search introduced a drum for evaluation that would have been excluded if the standard query had been used.	The manual search relied on human intervention to eliminate drums for which the most recent characterizations were unacceptable. If the person doing the manual search had recognized VE as the most recent NDE of the drum, the drum would have been removed from the list and the event would not have occurred.
02/28/2008	LANL SPM e-mailed a spreadsheet list of 165 LANL drums to the PO Lot Evaluator.	The list of drums showed an unresolved NCR against one of the drums. The LANL SPM should have removed this drum from the list.	A drum with an unresolved NCR against the most recent NDE BDR was introduced into the lot evaluation process.	Although this action added to the risk, the administrative controls, document reviews, and physical tagging required by the CCP program should have been sufficient to prevent the event from occurring.



When	What did happen	What should have happened	Immediate result (Consequence)	Significance (Impact on Final Consequences)
03/17/2008 through 03/20/2008	The Lot Evaluator performed the evaluation and set the lot. He did not review all the columns in the spreadsheet; therefore, failed to identify an unresolved NCR against the drum for VE that was after the RTR that passed.	A thorough review of the entire spreadsheet would have shown that there were unresolved NCRs against the subject drum.  Further, CCP-TP-002 requires that the Lot Evaluator sign a form that becomes part of the Characterization Information Summary (CIS), documenting that there are no prohibited items in the waste stream lot. The limited review performed by the Lot Evaluator (NCRs related to the BDRs being used to certify the drums) was not adequate.	An opportunity to identify the problem was missed.	A thorough review of the documentation associated with the subject drum, to the degree necessary to ensure compliance, would have resulted in the determination that there was an unresolved NCR against the most recent NDE of the drum. The drum would have been removed from the lot and the event would not have occurred.
03/17/2008	QA initiated the informal NCR/CAR check, but did not complete it due to concerns. QA sent an e-mail asking the Lot Evaluator to "Please start over," due to concerns (i.e. three drums had been included in the lot that had been overpacked into 85-gallon containers and were not available for shipping) unrelated to the NCRs against the subject drum.	The Lot Evaluator should have re-reviewed the drum list and returned it for another QA check. The Lot Evaluator did not think this was being asked of him and proceeded with lot evaluation.	An opportunity to identify the problem was missed, because the informal NCR/CAR check was never completed.	The subject drum should have been excluded from the Lot Evaluation, but was not.
03/20/2008	The Lot Evaluator finishes the evaluation and signs the CIS.	OK.	None.	None.

When	What did happen	What should have happened	Immediate result (Consequence)	Significance (Impact on Final Consequences)
03/24/2008	Waste Certification Assistant (WCA) requested formal QA check and independent verification (IV) in an e-mail to potential actionees.	OK.	None.	None.
03/24/2008	QA check and independent review completed. Subject drum accepted by both individuals because NCRs were not against the BDRs used for certification, even though all NCRs were shown on the spreadsheet.	A close reading of the results would have shown that the VE NCR was written the year after the RTR was performed.	An opportunity to identify the problem was missed. (This was a real opportunity because the work was performed by two people who had not done any prior reviews of the documentation for the subject drum.)	The subject drum should have been excluded from consideration for certification. The drum would have been removed and the event would not have occurred.
04/07/2008	A second QA check and independent review was performed due to a seven day lapse from the time of the previous QA check.	A close reading of the results would have shown that the VE NCR was written the year after the RTR was performed.	An opportunity to identify the problem was missed.	The subject drum should have been excluded from consideration for certification. The drum would have been removed and the event would not have occurred.
04/07/2008	Waste Certification Official (WCO) runs Drum Tracker, an Excel review tool, and does a Search 7 from the Data Center. The WCO followed the training he had been given, which did not include direction to review any NCRs associated with the drums being certified.	The WCO should have been trained from the WCO Training Manual to review for NCR's, but the WCO Manual was not provided during his qualification. If he had been trained to the WCO Training Manual the WCO would have reviewed each NCR against the subject drum for potential impact on certification.	An opportunity to identify the problem was missed. Once again, the review would have been done by someone with a fresh set of eyes, who had not done any prior reviews of the documentation.	The subject drum should have been excluded from consideration for certification. The drum would have been removed and the event would not have occurred.
04/07/2008	WCA enters the subject drum into WWIS.	OK.	None.	None.

When	What did happen	What should have happened	Immediate result (Consequence)	Significance (Impact on Final Consequences)
4/23/2008	The subject drum is examined prior to loading, for drum integrity and for the presence of any NCR HOLD tags. The TCO stated that he inspected the subject drum and found no NCR HOLD tags.	OK. (There should have been a CCP Hold Tag affixed to the drum.)	None.	None, insofar as the examination of the drum is concerned. However, had the TCO found an NCR HOLD tag affixed to the drum, the event would not have occurred.
04/23/2008	The subject drum is overpacked into an SWB, due to previously-identified drum integrity issues (unrelated to the examination performed just prior to loading).	OK.	None.	None.
05/20/2008	The SWB containing the subject drum is shipped to the WIPP.	OK.	None.	None.
05/28/2008	The SWB containing the subject drum is emplaced in the WIPP.	OK.	None.	None.
06/05/2008	During routine QA checks, the unresolved NCR on the subject drum was discovered.	OK.	None.	None.

## 4.0 Analysis

### Description of the Process for Obtaining Drum Candidate Lists for Lot Evaluation

In order for a drum to be a candidate for Lot Evaluation, it must have been successfully characterized through each method (e.g., NDE, Nondestructive Assay [NDA]) applicable to the drum. It is a routine occurrence for a drum to be processed through a characterization method more than one time.

#### Example

*A common example is when the presence of a prohibited item is detected during RTR. The drum is rejected on an NCR, a red NCR HOLD tag is hung on the drum, and the drum is returned for remediation of the prohibited item (remediation could consist of puncturing a large sealed container inside the drum, or the addition of an absorbent to soak up prohibited amounts of liquid).*

*Following remediation, the drum is returned for a second RTR to confirm there are no longer any prohibited items in the drum. As soon as this has been confirmed by the second RTR, the NCR is to be closed and the red NCR HOLD tag is to be removed. For this drum, there will be two separate RTR BDRs. The first BDR will show the drum as rejected for a prohibited item, and will list the NCR number rejecting the drum. The second and more recent BDR will show that the drum passed RTR; no NCR will be associated with the drum in the second RTR BDR.*

CCP makes use of a database called the CCP Data Center to keep track of the status of drums through characterization. The CCP Data Center has the capability to associate an individual drum with all of the BDRs and NCRs for that drum. Standard queries, or searches, have been developed to provide users with information that is routinely required from the Data Center; manual searches can also be performed for a specific purpose.

One standard search is for drums from a CCP host location that have good characterization results, and which have no unresolved NCRs against the most recent (good) characterization results. Using the example above for the drum that went through RTR twice, if all other criteria were met, the standard Data Center search for LANL drums would include this drum as a candidate. The Data Center would recognize that the original RTR (with the reject NCR) had been superseded by another, more recent, RTR where the drum passed.

The critical factor for drum selection by the Data Center is the use of the most recent characterization information to develop the lists of candidate drums for lot evaluation.

The standard queries available in the Data Center are based on the characterization methods applicable to virtually all the drums in the database: NDE (RTR or VE), NDA, and either HSG or FGA. The standard queries will not produce drums as candidates for

lot evaluation until the most recent BDRs for each of these methods are acceptable, and there are no unresolved NCRs against the drums for these latest results.

For reasons discussed elsewhere in this analysis, the selection of the drum subsequently shipped to LANL was based on a manual search that focused on RTR and NDA, and not on a standard search for LANL candidate drums. This is important because the standard search would have recognized the most recent rejection of the drum during VE and would not have included the drum as a candidate for lot evaluation.

### **Description of Lot Evaluation Process**

The purpose of the Lot Evaluation is to evaluate each candidate drum to reconcile the data in accordance with the requirements of the CCP-PO-001, *CCP Transuranic Quality Assurance Project Plan*. This includes determining that all drums are from the same waste stream, that there are no NCRs against the drums that would affect certification, and ensuring that the drums (even though otherwise acceptable) should not be excluded from lot evaluation for some reason. For example, a drum may have been overpacked into an 85-gallon drum, or it may have been selected for random HSG sampling.

Once the Lot Evaluator has determined that a particular population has met all the criteria, the evaluator "sets the lot." This simply means that the lot evaluation process is now based on a specific list of drums and BDRs that will eventually comprise the CIS, unless new information comes to light.

One way that new information could come to light would be during an informal NCR/CAR check performed by CCP QA. The check is informal in the sense that there is no procedural requirement to conduct it at this point in the Lot Evaluation process; the formal check occurs later. However, it has been the practice for the Lot Evaluator to send the list of candidate drums to CCP QA for an upfront, informal check. This practice had been established to increase efficiency of the lot evaluation and certification process. Although the formal check was placed late in the process to maximize the opportunity for detecting an unresolved NCR prior to shipment, the earlier check was implemented for efficiency.

The CIS identifies the specific BDRs for each required characterization process that is being used to certify each drum in the lot. As discussed elsewhere, there may be more than one RTR of a drum or more than one NDA of a drum. The Data Center identifies the most recent BDR for each required certification method. If they are good, the Data Center standard query will identify the drum as a candidate for lot evaluation. The Lot Evaluator lists these BDRs in the CIS, drum by drum, as the basis for certification.

A couple of years ago, if a drum had undergone both RTR and VE, the practice was to list both BDRs on the CIS form. The most common reason for having both an RTR and a VE of a drum was the requirement (deleted in the 311 Permit Modification in November 2006) for VE-as-a-QC-check-on-RTR, which is discussed elsewhere in this analysis.

The practice of listing both NDE BDRs in the CIS was discontinued as a result of the 311 Permit Modifications, because the practice was causing confusion when characterization data was being entered into WWIS. Data entry personnel did not always know which NDE BDR (RTR or VE) was being used to certify the drum. The decision was made to limit the information on the CIS to those BDRs actually being used for certification. There was the further consideration that, since VE-as-a-QC-check-on-RTR was no longer required, there would be little reason to have both NDE methods on a single drum.

#### **Previous Waste Analysis Plan (WAP) Requirements for VE as a QC Check on RTR**

Prior to the effective date of the 311 Permit Modifications on November 16, 2006, there was a requirement for CCP to perform VE on an initial 50 drums which had passed RTR. The relevance of VE-as-a-QC-check-on-RTR to the event comes about in the following ways:

1. The subject drum was one of those selected at LANL for initial VE as a QC check in 2005; the VE reject was of a drum that had previously passed RTR, and was therefore counted at the time as a miscertification (where RTR said the drum was good but VE rejected the drum). The unresolved NCR for the subject drum was issued for the rejection that occurred during VE after the good RTR was complete.
2. VE-as-a-QC-check-on-RTR has not been a requirement since November 16, 2006, and most drums affected by it have since been processed and shipped. The possibility that a VE BDR for a drum being evaluated today might have resulted from VE-as-a-QC-check-on-RTR is not uppermost in people's minds anymore.

#### **CCP Nonconformance Control Program**

In April 2005, when the subject drum was rejected in VE, the CCP NCR program required that all nonconforming items be tagged, unless it was impractical to do so. Nonconforming drums were also tracked administratively in the CCP Data Center. The CCP nonconformance control program had been revised extensively, following a June 2004 event when an SRS drum with a potential prohibited item was shipped, but returned before receipt at the WIPP. The SRS event is discussed in Section 2.

As a consequence of the June 2004 event at SRS and the subsequent strengthening of the CCP NCR program, the importance of tagging drums had been emphasized to all CCP personnel and NCR HOLD tags were being consistently applied whenever practical at LANL and at other CCP host locations.

## Background Specific to the Drum Shipped to LANL

### Exceptions for LANL Waste Stream LA-MIN03-NC.001

The subject drum is in one of only two waste streams in all of CCP that can be entered into WWIS without either HSG or FGA results. The HSG requirement for solids waste in general was removed by the 311 Permit Modifications on November 16, 2006. The need for FGA is determined by the following criteria in Section 3.9.1 of the CH TRAMPAC CH-TRU Payload Appendices (Revision 1):

“If a concentration of flammable volatile organic compounds (VOCs) in the payload container headspace is less than or equal to 500 parts per million (ppm) cannot be established based on waste generation procedures or records of process knowledge, headspace gas sampling for flammable VOCs is required.”

For waste stream LA-MIN03-NC.001, CCP had test results supporting the conclusion that the concentration of flammable VOCs would be less than or equal to 500 ppm. CCP-AK-LANL-004 (Revision 7) states in Section 5.4.3:

“The estimated waste weight percentages for inorganic waste materials (sludge, flocculants, and absorbents) and organic waste materials (miscellaneous plastics) for this waste stream are 99.50 percent and 0.50 percent, respectively. In addition, the results of available headspace gas testing and analysis of 166 drums in this waste stream indicated that flammable VOCs are not present in significant amounts. The total flammable VOCs measured for each of the drums is less than 500 ppm. Based on the final waste form and sample data, containers in waste stream LA-MIN03-NC.001 are not expected to exceed a total FVOC concentration of greater than or equal to 500 ppm.”

The effect of the above section is to document through process knowledge that FGA is not required for drums in waste stream LA-MIN03-NC.001, unless individual container decay heat limits are exceeded.

One important consequence of this difference in criteria is that the standard query in the Data Center **will never produce any of these drums as candidates for lot evaluation**. The reason is simple: the standard query is designed to look for drums that have acceptable HSG or FGA results. Since none of the drums in waste stream LA-MIN03-NC.001 are required to have either HSG or FGA performed on them, they cannot meet the criteria used by the standard search.

When this difference in criteria was recognized by CCP early this year, the Characterization Manager requested that the LANL SPM begin conducting manual searches in the Data Center, to bring these drums forward for lot evaluation. Otherwise, they would never become candidates for lot evaluation. The request was for drums in the LA-MIN03-NC.001 waste stream with acceptable RTR and NDA results.

For obvious reasons, the request did not include HSG or FGA as part of the manual search criteria. The reasons for excluding VE are less apparent, and require further explanation in this analysis.

#### Relevance and Impact of the NMED Compliance Order HWB 07-43 for Solids Waste at LANL

There are two types of NDE: RTR and VE. Under normal circumstances, either NDE method is acceptable for purposes of certifying a drum. If both NDE methods have been applied to a drum, the usual rules of the standard Data Center search query apply: the more recent of the two NDE results would be used to determine whether the drum was a candidate for lot evaluation.

In November 2007, the NMED issued Compliance Order HWB 07-43, specific to LANL homogeneous solids (S3000) waste. The compliance order addressed 121 LANL drums from waste stream LA-MIN03-NC.001 that had been characterized by CCP using VE. The NMED did not believe VE was appropriate for this solids waste stream, and that RTR should have been used instead.

The technical basis for using VE, and the NMED objections to it, are beyond the scope of this analysis. The relevance of the Compliance Order to the subject drum is that a briefing was given to CCP personnel in November 2007. The briefing clearly described NMED's objection to VE in-lieu-of RTR for homogeneous solids. However, it appears that over a period of time some of the people involved with the subject drum came to believe that VE was not applicable for certification of solids waste at LANL. In particular, VE was not considered applicable to the drums in waste stream LA-MIN03-NC.001. Although specific recollections varied from person to person, two common statements made to the team were either "VE was not allowed for LANL solids drums" or "VE did not apply to LANL solids drums," because of the NMED Compliance Order.

What is known is that, as a consequence of the NMED Compliance Order, there was a common understanding among the interviewed personnel involved in the subject LANL lot evaluation that RTR was of greater relevance than VE. This understanding resulted in two incorrect views of the way VE related to the subject drum. One view was that RTR verified that any deficiencies from VE had been remediated. The other view was that VE was not applicable to this waste stream; and therefore, it was not considered.

#### **Analysis of the Event and the Actions Leading Up to It**

The chronology is detailed in the Comparative Timeline provided in Section 3.0 of this root cause report. The following analysis draws heavily from the information in the timeline, which should be referred to in conjunction with the analysis. The information comes from interviews with the principals and from review of relevant documentation obtained by the team. The interviewees and the documentation reviewed by the team are identified elsewhere in this root cause report. Any information in the analysis that does not come from one or the other of these two sources will be identified by exception, with an explanation.



Since the actions leading up to the event, and the event itself, involve a number of individuals, the analysis is divided into sections.

#### VE of the Subject Drum by the Operator

VE of the subject drum occurred on April 9, 2005, in the LANL Permicon. The drum was rejected on CCP NCR-LANL-0902-05 for the presence of liquid in an amount greater than 1% of the volume of the drum. The NCR was written the same day and the NCR HOLD tag was hung shortly (within a few minutes) after the drum was surveyed (radiologically) out of the VE area, and became available to be tagged. The tagging was done by the same operator who did the VE.

#### LANL SPM

The LANL SPM performed a manual search of the Data Center, using the criteria provided by the Characterization Manager. She did not notice that there were two open NCRs flagged against one of the 165 drums in the list. One of the NCRs was the VE reject, and the other was for a problem with the HSG BDR (recall that the requirement for HSG of solids waste was subsequently removed from the Permit). If she had noticed the NCRs, she would have removed the drum.

#### Lot Evaluator (initial review)

The Lot Evaluator received the drum list from the LANL SPM and processed it in the same way as he would process any list of candidate drums. He did not know it resulted from a manual search of the Data Center rather than a standard query, and would not have treated it any differently if he had known.

The spreadsheet from the LANL SPM is "wide," meaning that it cannot be viewed in its entirety on the Lot Evaluator's computer monitor. In order to see the two reject NCRs, he would have had to scroll to the right of the default information displayed when he opened the spreadsheet. The Lot Evaluator did not notice that there were two NCRs against the subject drum. The Lot Evaluator told the team that even if he had noticed the two NCRs, he would not have removed the subject drum from the lot because one of the NCRs was against VE (and certification was based on the RTR BDR) and the other was against HSG (which was not required for solids waste drums).

Section 4.4.8 of CCP-TP-002 (Revision 19) contains a requirement for the Lot Evaluator to complete a form that becomes a part of the CIS, documenting that prohibited items are not present in the waste stream lot:

"Complete the CCP RTR/VE Summary of Prohibited Items to document that prohibited items are NOT present in the waste stream or waste stream lot."

The purpose of the Lot Evaluation is to consider all relevant data associated with the candidate drums. Due to expectations communicated to him, the Lot Evaluator limited his review to the BDRs selected for Lot Evaluation. The RCAT considers that the

limited review performed by the Lot Evaluator was not adequate to provide assurance that the criteria established in CCP-TP-002 have been met.

The Lot Evaluator sent the list of drums to CCP QA for the informal (i.e., non-proceduralized) NCR/CAR check that has been the practice within CCP.

#### QA NCR/CAR Check (informal)

The QA Engineer initiated the informal NCR/CAR check, but did not complete it because several drums had flags indicating that they were to be excluded from Lot Evaluation. She replied to the Lot Evaluator in an e-mail to "Please start over," and listed three drums that should have been excluded because the 55-gallon drums had been overpacked into 85-gallon drums by the host site and were not available for shipping. The subject drum was not included as one of the three examples. She believed that her request would cause the Lot Evaluator to re-review the list of drums to ensure that there were no other administrative holds, and then to re-submit the drums for her to complete the informal NCR/CAR check.

In fact, the Lot Evaluator interpreted the e-mail to mean that QA was done with the informal check, and all he had to do was remove the three excluded drums from the lot. After removing the three drums, he proceeded with the lot evaluation. There was no evidence provided to indicate that the Lot Evaluator resubmitted the request for the informal NCR/CAR check.

#### Lot Evaluator (CIS)

The Lot Evaluator completed the CIS on March 20, 2008, triggering the WCAs to begin preparing WWIS data entry spreadsheets for review. This is a preliminary action and no drums are actually entered into WWIS until reviews by the WCO and the formal QA NCR/CAR checks required by CCP-TP-030, *CH TRU Waste Certification and WWIS Data Entry*, have been completed.

#### WCO (who did the review that included the subject drum)

The WCO uses Drum Tracker, which is an Excel review tool, to call up all of the documentation needed for review of drums in the lot. The documentation includes BDRs and other pertinent information needed for certification of each drum.

He also makes use of the Search 7 standard query in the Data Center. This search is used exclusively by WCOs and the data fields can be tailored to suit host-location specific purposes (for example, the Search 7 for SRS has a column for beryllium drums that Search 7's for other locations do not).

The Search 7 for LANL contains an NCR data field intended to notify (by "Yes" or "No") whether there are any NCRs applicable to each drum listed in the search. The WCO's training did not include taking any action on the basis of the Yes/No information in this column. He believed that NCR checks were done by the Lot Evaluator and by CCP QA,

and it made sense to him that he would not be required to duplicate work being performed by others.

#### WCO Subject-Matter Expert (SME)

The WCO SME is responsible for, among other things, training of new WCOs. He was unaware of the issuance of a WCO Training Manual that was produced by his predecessor in January 2007. The WCO Training Manual contains a step for WCOs to perform a Data Center Search 7 and "Verify the NCR column has no open NCRs for the container(s)."

When WCOs were trained by the SMEs predecessor, they were taught to evaluate all NCRs applicable to each drum being certified. The trigger for this evaluation was the presence of "Yes" in the NCR data column in the Search 7 results. About a year ago, the current SME decided that this evaluation was redundant with checks being done before the WCO review (the informal NCR/CAR check by QA for the Lot Evaluator) and after the WCO review (the formal NCR/CAR check requested by the WCAs in accordance with CCP-TP-030). The SME saw this as a way to reduce the time needed by the WCOs to process drums for certification, by eliminating what he saw as a redundant check. Another reason given for eliminating the NCR check was that the NCR data column did not distinguish between open and closed NCRs.

With two exceptions, the WCOs are new and were all trained by the current SME. As a consequence, they were not told to perform NCR checks on the basis of the information in the Search 7 NCR data column, and were not doing any.

#### QA NCR/CAR Check (formal)

Per CCP-TP-030, the formal NCR/CAR check is requested by the WCAs and performed by QA. As a result of CAR-CCP-0003-06, an IV of formal NCR/CAR checks is required by CCP-TP-030.

The first formal NCR/CAR check was performed 3/24/08. The QA Engineer had reviewed the NCR and concluded that the RTR BDR satisfied the requirement for NDE. Because of this conclusion, the QA Engineer failed to compare the dates of the RTR and VE BDRs. He received an IV, concluding the same results through the logic that RTR BDR satisfied the requirement for NDE.

The WCAs have been trained to request a re-review of the NCR/CAR check if the containers have not been submitted into WWIS within seven days from the previous NCR/CAR check. In this case, the check and corresponding IV were both done twice. The second NCR/CAR check was performed 4/07/08. There was no overlap of personnel between the two reviews. QA-1 and IV-1 were both different from QA-2 and IV-2: four people were involved.

The QA Engineer who performed the NCR/CAR check noticed the two NCRs and, using the Search 1 standard query tool in the Data Center, looked at them in some detail. She determined that, even though the two NCRs were both open against the same

drum, neither of them affected certification. She determined that the VE NCR had no effect since the certification was based on an acceptable RTR BDR and the HSG NCR had no effect since HSG was not required for the waste stream.

The RCAT believes that a close reading of the Search 1 screen would have revealed that the RTR BDR carried an "04" suffix, meaning that it was performed in 2004, while the VE NCR carried an "05" suffix. If the QA Engineer had made the connection, she would have investigated further, and in all likelihood would have realized that the drum was unacceptable for lot evaluation.

Both sets of reviews reached the same conclusion that the subject drum was acceptable, and the drum was subsequently entered into WWIS.

#### Mobile Loading Crew (loading of the drum into the SWB)

Prior to being loaded, the drum was staged in Dome 49 and inspected to ensure container integrity, proper labeling, and the absence of NCR/HOLD tags. Mobile loading personnel are very aware of the prohibition against loading a drum with an NCR HOLD tag. The TCO stated that he inspected the subject drum and found no NCR/HOLD tags. The VPM and SPM were also interviewed and they stated that they would have been notified, as required, if an NCR/HOLD tag was found on the subject drum.

#### 4.1 Summary of Causes and Recommendations

The RCAT identified the causes for the condition as summarized below:

##### 4.1.1 Contributing Causes

- The failure to identify the unresolved NCR during the QA review and the during the IV review
- WCO SME was unaware of the WCO training manual; therefore, guidance regarding NCR checks was not implemented
- No NCR HOLD tag was present on the drum (to be verified when the SWB is opened)
- Expectations communicated to the lot evaluator were inconsistent with CCP-TP-002, step 4.4.8
- Influence of Compliance Order HWB 07-43 on the importance of RTR compared to VE on the subject waste stream
- Unrecognized additional risk resulting from the use of a manual query instead of the standard lot candidate list query

#### 4.1.2 Direct Cause

The direct cause was identified as the failure to recognize the significance of the unresolved NCR.

#### 4.1.3 Root Cause

The root cause was identified as failure to use the most recent NDE characterization data.

### 5.0 Conclusions

The RCAT has examined the basic structure used for Lot Evaluation and Waste Certification and considers it sound. However, actual implementation of the process did not ensure that the most recent NDE characterization data was used. Acceptance of the recommendations discussed in this report, coupled with the Immediate/Compensatory Corrective Actions initiated by management, will prevent recurrence.

### 6.0 Corrective Actions

Immediate/Compensatory Actions taken by Management as documented in CAR-CCP-0008-08:

- Suspended shipments to the WIPP on June 6, 2008, except those already in transit.
- Performed a 100% verification of the four shipments that were enroute to the WIPP on June 6, 2008, or received at the WIPP, but not yet emplaced.
- Performed a 100% verification of the containers currently certified in the WWIS, but not yet shipped.
- Completed briefings, including briefing Retrieval, Characterization and Transportation (RCT) personnel on this event. This general briefing was followed by detailed briefings of affected personnel to review their roles and responsibilities, and management's expectations for performing reviews.
- In order to capture the content of the above briefings and clarify SPM and WCO responsibilities contained in CCP's procedures, the following Standing Orders (SO) were issued:
  - S.O.32 Clarification for Selection of Data at PO Lot Evaluation
  - S.O.33 Clarification of WCO Responsibility in Certification of Containers for Shipment to the WIPP
  - S.O.34 NCR/CAR Resolution check prior to CH Payload Assembly to the WIPP

- Suspended manual searches of CCP Data Center for the purpose of generating Lot Candidate Lists until controls are developed and implemented.
- Placed all unresolved NCR'd containers at LANL into a hold lot preventing their certification in WWIS as an interim control measure until each NCR'd container can be checked to verify that it is still tagged with a CCP Hold Tag.
- Adopted the use of a wire tie to attach CCP Hold Tags to containers.

The team did not identify any additional interim compensatory measures necessary as a result of the RCAT's review of the event.

## 7.0 Recommendations

- Tie NCRs to previous BDR data in the same process (NDE, NDA, etc.), as applicable.
- Prior to certification of a container for disposal, all applicable NCRs should be formally closed. Those NCRs that cannot be formally closed because they apply to more than one container shall be evaluated to ensure that they do not affect the acceptability of the container for certification.
- Management should routinely review the record of drums that are certified in WWIS and are subsequently removed from WWIS to identify any weaknesses in the certification process.
- Incorporate Standing Order CCP-SO-32 into CCP-TP-002 (To ensure review of most recent data)
- Incorporate Standing Order CCP-SO-33 into CCP-TP-030 (Adding WCO NCR/CAR review). Additionally, CCP Training formally transmit appropriate training materials (including WCO-01, *WCO Training Manual*) to the WCO SME. The WCO SME should review the training manual with currently qualified and any new WCOs.
- Continue/refine use of wire clips for NCR HOLD tags by ensuring a permanent attachment and durable tag
- Clarify the intent of step 4.4.8 in CCP-TP-002 not to exclude the consideration of available characterization data.
- In the Data Center Search 7, a "Yes" in the "NCRdata" column should **ONLY** indicate "Open" NCRs.

Attachment 1 – Root Cause Analysis Team Charter

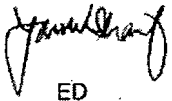
**Washington**

TRU Solutions LLC

AA:08:00781  
UFC:2300.00

**INTER-OFFICE CORRESPONDENCE**

DATE: June 20, 2008

FROM: M. F. Sharif  LOCATION: General Manager's Office

TO: S. B. Rose ED LOCATION: Retrieval, Characterization and Transportation

SUBJECT: CHARTER FOR INVESTIGATION OF THE WIPP OCCURRENCE REPORT EM-CAFO-WTS-WIPP-2008-0005 DATED JUNE 9, 2008

This letter serves to document my June 12 verbal direction to perform a root cause investigation of the WIPP Occurrence Report EM-CAFO-WTS-WIPP-2008-0005. A draft report is to be submitted directly to me by June 20, 2008.

The objective of this effort is to produce a report, as described below, to be used for corrective action and organizational learning. I am particularly interested in an assessment of the causal factors and their resulting consequences. I also request that you conduct an assessment to determine if previous experiences did or should have mitigated the current situation.

If, in the conduct of your investigation, your team discovers significant issues adverse to quality or safety that could contribute to the initiation or exacerbation of a similar situation, you are to recommend immediate interim compensatory measures while permanent corrective action is being formulated and deployed.

Your team is requested to produce a report with the following content:

- Executive summary that includes the most important conclusions and findings, recommended actions to be taken and any brief details and elaboration that you believe to be vital to our understanding of the conclusions.
- A description of the event, including, for every condition and action that was not right, proper, or expected, what in your team's view would have been the appropriate action or condition.
- The factors that controlled the consequences of the event, including 1) the preexisting causal factors that set the stage for the problem and made the situation vulnerable to the event, 2) the initiating/triggering events or conditions, and, 3) the factors that contributed to the significance of the consequences.

This section should discuss the underlying causal factors, including all missed opportunities to have detected, corrected, or avoided the factors contributing to vulnerability, initiation or exacerbation.

## Attachment 1 – Root Cause Analysis Team Charter (Continued)

S. B. Rose

-2-

AA:08.00781

- Previous similar events and conditions; those items from experience and records that indicate similarities in consequences or causation that might reflect on performance in problem analysis or corrective action effectiveness.
- Lines of questioning that the team could not resolve, if any.
- Proposed corrective actions that address the causal factors of the event including:
  - Interim compensatory measures
  - Corrective actions for root and contributing causes
- Principal lessons to be learned from the event you are investigating.

Please include this charter as an attachment to your report.

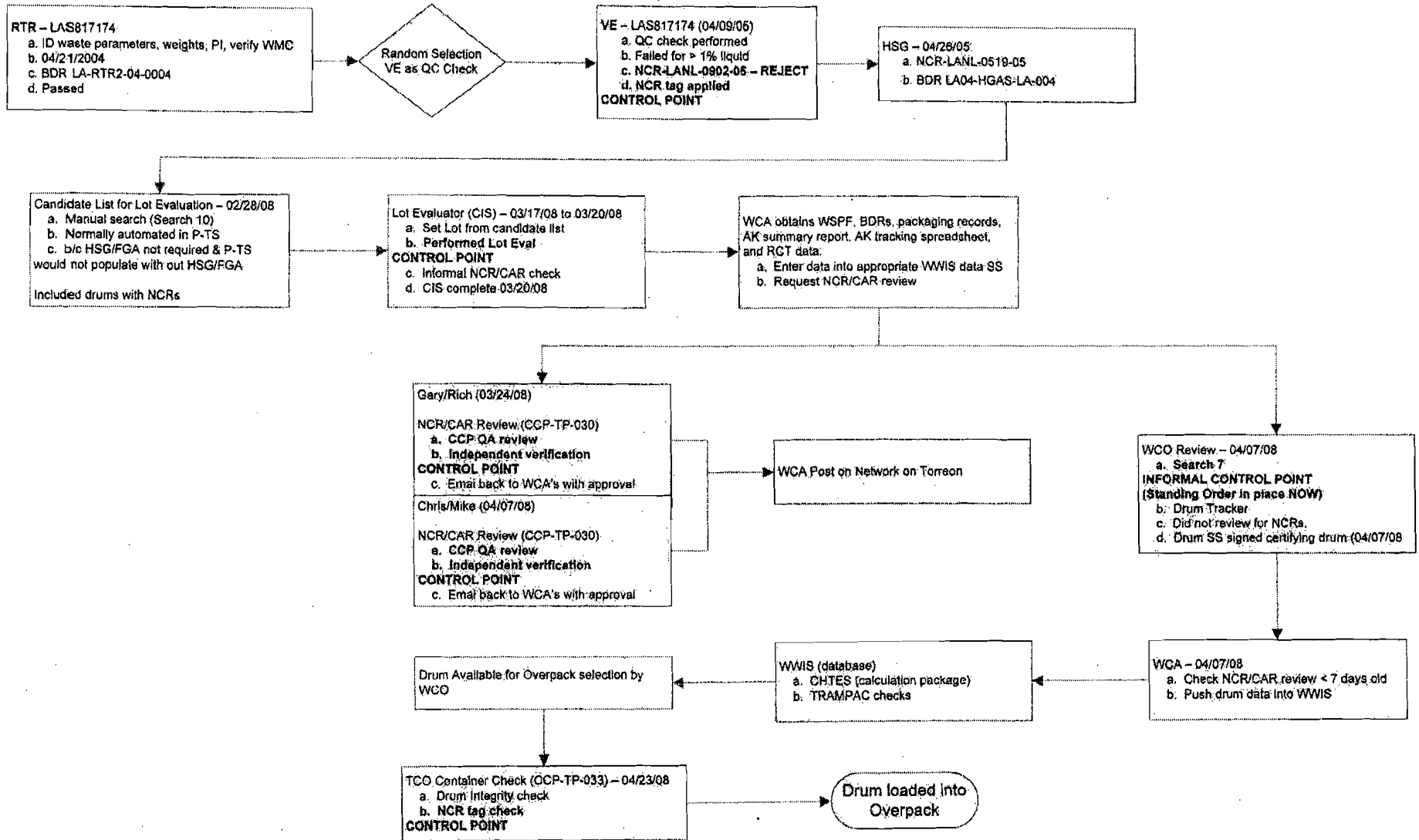
DKP:jmc/yhc

cc: D. H. Haar           ED  
   J. E. Hoff           ED  
   D. K. Ploetz         ED



# Attachment 2 – Flow Chart

RCA – Flow Chart      **Control Points in BOLD**



Attachment 3 – Interviews

Position	Relevance
SPM/IV	Lot Evaluator NCR/CAR Reviewer (Independent Verifier)
VPM, Container Management (LANL)	Container Management
IV/SPM	NCR/CAR Reviewer (Independent Verifier)
QA	NCR/CAR Reviewer
WCO	Drum Certification
WCO SME	Trained WCOs
QA	NCR/CAR Reviewer
LANL SPM	Performed the manual search for drums to be considered for Lot Evaluation
VE Expert	Applied NCR/HOLD tag to subject drum
TCO	Final Container Inspection
VPM	VPM at the time of VE NCR HOLD tag application
Characterization Manager	Trained Lot Evaluator

Attachment 4 – Documents Reviewed and Other Evidence

CCP-SO-007

WCO Training Manual, WCO-01 Guide, Rev0

WP 13-QA3016

CCP-TP-002, *CCP Reconciliation of DQOs and Reporting Characterization Data*

CCP-TP-030, *CH TRU Waste Certification and WWIS Data Entry*

CCP-TP-033, *CCP Shipping of CH TRU Waste*

CCP-TP-086, *CCP CH Packaging Payload Assembly*

CCP-QP-005, *CCP TRU Nonconforming Item Reporting and Control*

CCP-TP-120, *CCP Container Management*

CCP-TP-005, *CCP Acceptable Knowledge Documentation*

CCP-AK-LANL-004, *CCP for Los Alamos National Laboratory TA-50 Radioactive Liquid Waste Treatment Facility Homogeneous Inorganic Solids*

CH TRAMPAC CH-TRU Payload Appendices

CAR-CCP-0008-08

CBFO-CAR-08-025

NCR-LANL-0902-05

NCR-LANL-0519-05

CIS WSPF# LA-MIN03-NC.001, Lot 42

Timeline Package

ORP Report

Draft Retrieval Plan

Basic Flow For Container Through CCP

RCT Briefing 6-9-08

DK's Immediate Action List

DK's Tag Investigation

RCA Supertemplate

HWB 07-43

SPM email and spreadsheet to CCP Characterization Manager

Emails from CCP QA and CCP SPM

Training Qualification Cards for QE, SPM, and WCO

Standing Order CCP-SO-32

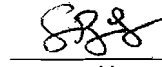
Standing Order CCP-SO-33

### RCAT Signatures/Titles

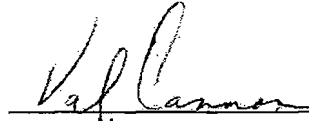
Steve Rose, Team Leader  
Manager, RCT Finance

  
Name Date  
6/26/08

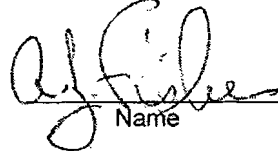
Scott Burns  
CCP Configuration Management,  
Lead Engineer

  
Name Date  
06/26/08

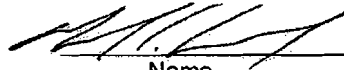
Val Cannon  
Manager, CCP QA

  
Name Date  
6/26/08

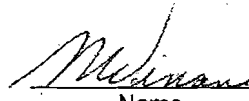
AJ Fisher  
CCP Training

  
Name Date  
6/26/08

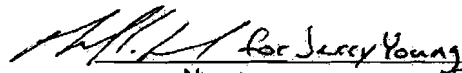
Mike Sensibaugh  
Manager, CCP Waste Certification

  
Name Date  
6-26-08

Tex Winans  
WIPP Facility Shift Manager

  
Name Date  
06/26/08

Jerry Young  
CCP WCO/WCA

  
Name Date  
6-26-08