

United States Government

Department of Energy

memorandum

Carlsbad Area Office
Carlsbad, New Mexico 88221

DATE: August 25, 1997

REPLY TO
ATTN OF: CAO:NTP:MRB 97-1833 UFC 2300

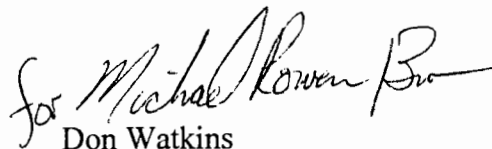
SUBJECT: CAO Audit Report A-97-03

TO: Keith Klein, RFFO

The Carlsbad Area Office (CAO) conducted an audit of your Quality Assurance (QA) Program for TRU Waste Characterization, Transportation, and Certification at Rocky Flats Environmental Technology Site (RFETS) on July 14-18, 1997. The audit team concluded that the adequacy of the RFETS Technical and QA Programs were indeterminate in accordance with the QAPD, QAPP, WAC, and the TRAMPAC. The audit team also concluded that the defined QA Program was being marginally implemented (bordering on unsatisfactory) and for the technical areas evaluated, the RFETS program was effective (bordering marginal). The audit team also concluded that corrective actions for open, previously issued CAO Corrective Action Reports (CARs) had not been fully completed. These CARs were identified in 1995.

As a result of this audit, 18 new CARs were issued, 14 observations and 4 recommendations were identified. Observations 1, 2, 3, 11, 12, 13, and 14 require a written response. The CARs were transmitted to RFETS under separate letter.

If you have any questions or comments concerning this report, please contact Butch Stroud at (505) 234-7483.



Don Watkins
Manager
National TRU Program

Attachment



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Keith Klein

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August 25, 1997

cc w/attachment:

K. Hunter, CAO

D. Brown, CAO

B. Stroud, CAO

J. Legare, RFFO

L. Xuam, RFFO

M. Horseman, CTAC

D. Winters, DNFSB

B. Walker, EEG

M. Eagle, EPA

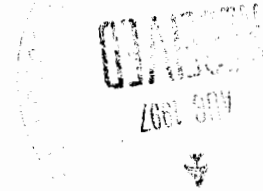
✓ S. Zappe, NMED

C. Wentz, NMEM&NR

R. Lahoud, RFETS/KH

A. Flewelling, RFFO/RMRS

G. O'Leary, RFFO/RMRS



U.S DEPARTMENT OF ENERGY
CARLSBAD AREA OFFICE

AUDIT REPORT

OF THE

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

AUDIT NUMBER A-97-03

JULY 14-18, 1997

TRU WASTE CHARACTERIZATION, CERTIFICATION, AND
TRANSPORTATION PROGRAM



Prepared By: *for Marc Staleno*
R. Dennis Brown
Audit Team Leader

Date: 8/20/97

Approved By: *for Marc Staleno*
R. Dennis Brown
CAO QA Manager

Date: 8/20/97

Approved By: *for Michael R. Brown*
Robert A. Stroud
CAO NTP Certification Manager

Date: 8/21/97

1.0 EXECUTIVE SUMMARY

Carlsbad Area Office (CAO) Audit A-97-03 was conducted to evaluate the adequacy, implementation, and effectiveness of the Rocky Flats Environmental Technology Site (RFETS) Transuranic (TRU) Waste Characterization, Transportation, and Certification Program. The audit scope also included verification of the completion and effective implementation of previously identified corrective actions for conditions adverse to quality.

The audit was conducted at the RFETS facility July 14 through 18, 1997. The audit team concluded that the adequacy of the RFETS technical and Quality Assurance (QA) Programs was indeterminate in accordance with the CAO Quality Assurance Program Description (QAPD); Quality Assurance Program Plan (QAPP); Waste Acceptance Criteria (WAC); and TRUPACT-II Authorized Methods for Payload Control (TRAMPAC). The audit team also concluded that the defined QA Program was being marginally implemented (bordering on unsatisfactory) in accordance with RFETS implementing procedures and that, for the technical areas evaluated, the RFETS program was marginally effective (bordering on marginal). The audit team also concluded that the corrective actions for open, previously issued CAO Corrective Action Reports (CARs) had not been fully completed.

The audit team identified 18 CARs that require corrective action in the areas of management assessment, training, document review and control, QA records, procurement, audits, corrective action, the Performance Demonstration Program (PDP), Acceptable Knowledge (AK), headspace gas analysis, non-destructive assay (NDA), real-time radiography (RTR), data review, and software control. Twenty-five deficiencies, isolated in nature and requiring only remedial corrective actions, were corrected during the audit (CDAs). Fourteen observations and four recommendations are being offered for management action and consideration. The audit team noted six exemplary practices being performed by RFETS personnel. CARs, CDAs, observations, recommendations, and exemplary practices are described in Section 6.0.

2.0 SCOPE

The audit team evaluated the adequacy, implementation, and effectiveness of technical and quality assurance activities related to the RFETS TRU Waste Characterization, Transportation, and Certification Program.

The following CAO QAPD elements were evaluated:

- Organization
- QA Program Implementation

Personnel Qualification and Training
Quality Improvement
Documents and Records
Work Processes
Procurement
Inspection and Testing
Measuring and Test Equipment
Assessments
Sample Control
Data Documentation, Control, and Validation
Software Requirements

The following CAO characterization (QAPP) technical elements were evaluated:

Acceptable Knowledge
Sampling Analysis Plan
Sampling - Headspace Gas
Testing - Nondestructive Assay (NDA),
Testing - Real Time Radiography (RTR)
Analysis - Headspace Gas
Data Validation, Usability, and Reporting
Performance Demonstration Program (PDP)

The following CAO transportation (TRAMPAC) technical elements were evaluated:

Inspection of Packaging
Preparation and Loading
Shipping
Packaging Maintenance
Documentation and Records

The following CAO certification (WAC) technical elements were evaluated:

Waste Stream Profile Data
Software (WIPP Waste Information System [WWIS], Analysis Software, and
Others)

Evaluation of RFETS TRU Waste Characterization Program (TWCP) documents was based on current revisions of the following documents:

CAO Quality Assurance Program Document, CAO-94-1012

Transuranic Waste Characterization Quality Assurance Program Plan,
CAO-94-1010

Safety Analysis Report (SARP) for TRUPACT-II Shipping Package, Appendix
1.3.7, TRAMPAC and the TRUPACT-II Certificate of Compliance, NRC 71-
9281, Revision 7

Waste Acceptance Criteria for the Waste Isolation Pilot Plant, DOE/WIPP-069

Programmatic and technical checklists were developed from the applicable revision of
the following documents:

RFETS Quality Assurance Project Plan (QAPjP) for the Transuranic Waste
Characterization Program, 95-QAPjP-0050

RFETS Transuranic Waste Management Manual, 3-MAN-008-WM-001

Related RFETS technical and quality assurance implementing procedures

CAO Corrective Action Reports and observations from Audit A-95-06

3.0 AUDIT TEAM AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

R. Dennis Brown	CAO QA Manager, Audit Team Leader
Robert A. Stroud	CAO Certification Manager, Technical Specialist
Marlin Horseman	Auditor, Audit Coordinator/CTAC
Sam Vega	Auditor/CAO
Beth Bennington	Auditor/CAO
Amy Arceo	Auditor/CTAC
Ava Holland	Auditor/CTAC
Pete Rodriguez	Auditor/CTAC
Amber Clay	Technical Specialist/CAO
Cindy Zvonar	Technical Specialist/CAO
Sid Ailes	Auditor/Technical Specialist/CTAC
Ken Coop	Technical Specialist/CTAC
Mark Doherty	Technical Specialist/CTAC
Vann Bynum	Technical Specialist/SAIC
Clint Kelley	Technical Specialist/WID

OBSERVERS

S. J. Chern	EPA
Jean Lillich	EPA Region 8
Patrick Kelly	EPA/SC&A
Julie Shanahan	EPA/ATK
Connie Walker	EPA/ATK
Daniel Shain	EPA/ICF Kaiser
Steve Zappe	NMED
Timothy Michael	NMED
Bob Warther	DNFSB
Matthew Silva	EEG
Kem Hainebach	LLNL
Michael Mason	BNFL-SRS
Kent Hunter	DOE/CAO
Bruce Lilly	DOE/CAO

4.0 AUDIT PARTICIPANTS

Individuals involved in the audit are listed in Attachment 1. A preaudit meeting was held at the RFETS Building 111 Auditorium on July 14, 1997. A daily meeting was held with RFETS management and staff to discuss issues and potential deficiencies. The audit was concluded with a postaudit meeting held at the RFETS Building 111 Auditorium on July 18, 1997.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

The audit team concluded that the adequacy of the RFETS QA Program was indeterminate in meeting the CAO Quality Assurance Program Document (QAPD), Revision 1; the Quality Assurance Program Plan (QAPP), Revision 0/Interim Change 11/96; the Waste Acceptance Criteria (WAC), Revision 5/Change Notice 1; and the TRAMPAC, Revision 15. The audit team concluded that the QA program was being marginally implemented (bordering on unsatisfactory). For the technical areas evaluated, the RFETS program was determined to be effective (bordering on marginal). Data evaluation was determined to be ineffective and Acceptable Knowledge, sampling design, RTR, and transportation were determined to be marginally effective. The audit team also evaluated the status and implementation of corrective actions completed for previous CAO Corrective Action Reports. Four previous CARs, issued in 1995, remain open (96-006, 009, 012, and 013).

5.2 QA Program Audit Activities

A summary table of audit results is provided as Attachment 2. Details of audit activities, including specific objective evidence reviewed, are contained within the audit checklists. The checklists are maintained as QA Records.

5.3 Technical Activities

5.3.1 Performance Demonstration Program (PDP)

The activities performed by RFETS in support of the PDP were evaluated for compliance with the PDP Plans for Nondestructive Assay and Analysis of Simulated Headspace Gases.

Nondestructive Assay

The RFETS processes for implementation of the PDP Plan for Nondestructive Assay (DOE/CAO-94-1045, Revision 0) were reviewed. The evaluation included examination of the PDP drum/sample storage facility, observation of PDP drum assays on the Canberra mobile systems, and interviews with the PDP standards custodian and assay coordinator. Implementation of the NDA PDP on the Building 371 Passive/Active Drum Counter (PADC) was complicated by the re-calibration of the instrument, which was currently underway. The first two PDP cycles were performed using the old calibration and software (which will not be used to certify drums for shipment to WIPP), while the third PDP cycle drums were assayed using new software and "hand corrections" based on the anticipated new calibration. Results for the third cycle should be reviewed for validity when the new calibration is completed and the resulting algorithms have been incorporated into the system software.

A deviation from the chain-of-custody requirements of the PDP instructions was discovered during the audit (see CAR 97-094 in Section 6.1). This involved the PDP chain-of-custody forms for the transfer of the drums from the Rocky Mountain Remediation Services (RMRS) PDP standards custodian to Canberra Industries (the operators of the mobile assay systems). However, examination by the audit team of the site-specific transfer forms and the Tampering Indicating Devices on the PDP drums, verified that the drums had been transferred properly and had not been subject to tampering. This area was determined to be satisfactorily implemented and processes were determined to be effective.

Analysis of Simulated Headspace Gases

The headspace gas activities in support of the PDP were evaluated. The audit team verified that gas samples were maintained by cognizant groups in a secure area or cabinet under their direct control. Analytical records include required information and were in compliance with the PDP Plan for Analysis of Simulated Headspace Gases (DOE/CAO-95-1076, Revision 0). This area was determined to be satisfactorily implemented and processes were determined to be effective.

5.3.2 Data Validation

RFETS had not assembled any data summary packages at the time of the audit. A full evaluation of project level (Level II) data validation will be performed prior to site certification. Data packages do exist for individual components of the data summary packages and were reviewed by the audit team. Five packages were scanned and two packages were evaluated in detail for the review and use of the checklist by the Project Quality Assurance Officer (PQAO). The packages were found to be acceptable with the exception of one package that contained an open Nonconformance Report (NCR). This deficiency was corrected and verified by the audit team during the audit by the removal of the NCR (see CDA 2 in Section 6.2). The QA Record Review checklist used for data packages was different from the one specified in the procedure. This deficiency was corrected by revising the procedure (see CDA 3 in Section 6.2). It was noted that the PQAO checklists include details of objective evidence that the PQAO used to verify the checklist items. This practice greatly facilitated review of the package (see Exemplary Practice 1 in Section 6.5). Due to the noted deficiencies, this area was determined to be ineffective.

5.3.3 Acceptable Knowledge

Acceptable Knowledge (AK) relevant to WIPP at RFETS includes the Waste Stream and Residue Identification and Characterization (WSRIC) book, Non-Routine Waste Origination Logs (NRWOLs), the Backlog Waste Reassessment Baseline Book (BWRBB), the Waste and Environmental Management System (WEMS), and a Supplemental Information Document (SID). During the audit the WSRIC system and the SID were evaluated. The SID was determined to be acceptable but must still undergo a confirmation of the traceability of the information. The WSRIC process was determined to be inconsistent with the requirements of the QAPP (see CAR 97-095 in Section 6.1 for specific details) with respect to the assignment of EPA hazardous codes. Additionally, the WSRIC process procedures require extensive updating to be consistent with current practice (see CAR 97-096 in Section 6.1, Observations 1, 2, and 3 in Section 6.3, and Recommendation 4 in Section 6.4 for specific details). The audit team concluded that RFETS does not have a fully effective process for establishing

and implementing AK activities. This area was considered to be indeterminate until the traceability activity is performed, the NRWOLs, WBRBB, and WEMC, are evaluated, and CARs have been addressed.

5.3.4 Sampling Design

The Sampling Plan and associated Resource Conservation and Recovery Act (RCRA) characterization procedures were reviewed and found to be inadequate. They lack the level of detail required to understand the process RFETS will use to demonstrate random selection of containers, data reduction, and the determination of EPA Hazardous Waste Numbers. This will be followed as an adequacy issue (also see Recommendation 3 in Section 6.4). Because the procedures lack sufficient detail, the audit team could not evaluate the implementation and effectiveness of the process; therefore, this area was considered to be indeterminate.

5.3.5 Chain-Of-Custody

Chain-of-Custody (C of C) and sample administration practices were reviewed and found to be acceptable. The Volatile Organic Compounds (VOC) laboratory is not recording canister pressure, ambient pressure, and ambient temperature within 24 hours as directed by Section 6.2 of the QAPP. This will be addressed as a procedural adequacy issue because it does not affect the quality of data provided by the laboratory. The process was determined to be effective.

5.3.6 Headspace Gas

The processes for headspace gas sampling; SUMMA canister cleaning; sample preparation; and calibration were reviewed and determined to be effective. An exemplary practice was the efficiency of the sample team and their ability to coordinate the activities of a large number of people under difficult circumstances (see Exemplary Practice 2 in Section 6.5). One bottle of field reference gas could not be traced to a manufacturer's certification (see CAR 97-097 in Section 6.1). While the procedure used to clean SUMMA canisters is not verbatim from the Methods Manual, RFETS has ample evidence (i.e., acceptable gas certification samples) to demonstrate that the procedure is equivalent to that contained in the Methods Manual. This area was determined to be effective.

5.3.7 Nondestructive Assay (NDA)

Nondestructive assay (NDA) activities for calibration and assay of TRU waste drums were evaluated for satisfactory implementation of procedures and the effectiveness of the processes. The evaluation included observations of measurements on both PDP

and TRU waste drums and an examination of data sheets. Both Canberra instruments (IQ-3 gamma and passive neutron) were fully operational and were determined to be providing acceptable data.

Because Canberra documents did not clearly address the range of waste types to which they will be applied, it was not possible to determine whether the documents meet the Quality Assurance Objectives (QAOs) requirements in the CAO QAPP. Calibration sources could not be definitively traced to NIST. The results indicate that Canberra needs to expand and clarify their system documentation and obtain traceable certification from the calibration source supplier (LANL). See CARs 97-098 and 97-099 in Section 6.1. Data currently obtained with the Canberra instruments appear to be valid and, when the CARs are addressed, the processes are expected to provide suitable waste characterization data. Until these issues are properly resolved, this area is determined to be ineffective.

5.3.8 Real-Time Radiography (RTR)

Real-time radiography (RTR) operations in Building 664 were observed. Procedures and records for RTR operations were reviewed. The Building 569 RTR unit was down for maintenance and could not be operated during the audit. Problems noted and not corrected during the audit include the need for testing batch data reports, standard volume-to-weight conversion tables for the RTR procedures, and some adequacy issues with the RTR procedures (see CAR 97-100 in Section 6.1 and CDAs 4 and 5 in Section 6.2). An exemplary practice was noted; the use of reference liquid bottles during drum scanning enhances the operator's ability to estimate volumes and identify resolution limitations (see Exemplary Practice 3 in Section 6.5). The effectiveness of the RTR activities was considered to be indeterminate because visual examination was not part of the audit scope.

5.3.9 Hydrogen And Methane Analysis

Hydrogen and methane analysis, instrument maintenance, and data reporting activities were reviewed. There were no data generation level (Level 1) review checklists available during the audit that were ready for signature release of the data package to the project level. An adequacy issue was identified regarding the designation of field sampling batch numbers and the method used to trace a particular sample to the Field Quality Control samples that apply to that batch. This will be handled as a separate adequacy issue. The processes reviewed in this area were determined to be effective, however, some activities had not yet been implemented and they are, therefore, indeterminate.

5.3.10 Gas VOCs Analysis

The processes for Analysis of gas VOCs, instrument maintenance, and data reporting activities were reviewed. There were no data generation Level I review checklists available during the audit that were ready for the signature release of the data package to the project level. An adequacy issue was identified regarding the designation of field sampling batch numbers and the method used to trace a particular sample to the field Quality Control samples that apply to that batch. This will be handled as a separate adequacy issue. The processes reviewed in this area were determined to be effective, however, some activities had not yet been implemented and they are indeterminate.

5.3.11 Transportation

Transportation activities at Building 664 and the preparations necessary for certifying waste for transport in the TRUPACT-II were evaluated. The audit team observed a TRUPACT-II payload (14 pack) being assembled; loaded into the TRUPACT-II; and the TRUPACT-II being closed. The team also observed drum handling operations in Building 664. Selected drum travelers were reviewed for accuracy and were determined to be acceptable. The overall conclusion of the audit team was that, for the areas evaluated, RFETS was able to meet the conditions of the TRUPACT-II Certificate of Compliance (C of C) and the Safety Analysis Report for Packaging (SARP). Two deficiencies and an observation were identified and corrected during the audit (see CDAs 6 and 7 and Observation 5). Two processes were not assessed during the audit; the Helium Leak Check and the final payload certification, therefore, this area was considered to be indeterminate.

5.3.12 Software

The audit team evaluated the maintenance, configuration control, verification and validation, computer security, and access controls for the Waste and Environmental Management Systems (WEMS) software. The review of information system practices determined that computer security and access control, configuration management, data backup, and archival practices were exemplary (see Exemplary Practice 4 in Section 6.5) and demonstrated a high level of standardization. The WEMS Administration Group also continues to improve configuration control and unit testing practices. For example, extensive use of checklists have been added to help standardize the documentation of the testing process. Current verification (review) practices are not, however, effective in ensuring that the Software Change Record (SCR) packages are 1) complete, 2) provide a complete record of software testing, and 3) able to trace how test exceptions were satisfactorily resolved. In addition, the level of testing performed to date on the off-site shipping module has been limited to the verification of each individual form and report to assure that they meet specified requirements. No system

integration or validation test plans have been prepared to define the process for validating that the overall WEMS software meets WIPP requirements. This level of testing is needed to ensure that changes in individual forms and modules have not compromised the performance of previously completed modules.

SCR 1130, dated 5/10/97, and SCR 1142, dated 6/10/97, were installed on the production environment without completing required evaluations. Both SCR forms were corrected and subsequently verified by the audit team (see CDA 17, Section 6.2).

The audit team evaluated maintenance, configuration control, verification and validation activities, computer security, and access controls for software used in headspace analysis in the Analytical Laboratory. The review of change control, access control, data and software backup systems, and computer security indicated continued improvement in the effectiveness of controls for identifying software applications, limiting access, and documenting modifications to the software. However, the methods for planning and performing verification and validation activities are not effective in ensuring that test results demonstrate acceptable performance. Test results must demonstrate that specified acceptance criteria were achieved and provide sufficient information such that an independent reviewer could replicate the test.

Interviews with staff indicated that verification and validation of several software programs were based on comparison of results with previous software versions. Unless the previous versions used in the comparison were qualified in accordance with QAPD requirements, comparison results would not be acceptable. The Analytical Laboratory needs to carefully evaluate existing test data from previous testing to ensure that results are complete and correct, and perform new tests where objective test data is not available for review (also see CARs 97-090 and 97-091 in Section 6.1, Observation 10 in Section 6.3, and Recommendation 1 in Section 6.4)

The WWIS status was not available for review during the audit; therefore, the evaluation of this software was concluded to be indeterminate.

Overall, activities in this area were determined to be marginally implemented, but processes were effective.

5.3.13 Subcontractor NDA Integration

Implementation of QAPjP and QAPP requirements by the subcontractor, Canberra, was indeterminate because of vague requirements identified in the statement of work (SOW). See CARs 97-084, 97-089, and 97-099 in Section 6.1.

Because of the unclear requirements being passed to the subcontractor, procedural implementation was determined to be unsatisfactory and the overall integration process of Canberra activities into the RFETS program was determined to be ineffective.

6.0 CORRECTIVE ACTIONS/OBSERVATIONS & RECOMMENDATIONS

The audit team identified 43 deficiencies during the audit, requiring the issuance of 18 Corrective Action Reports; 25 deficiencies, isolated in nature and requiring only remedial action, were corrected and then verified by the audit team prior to the post-audit conference.

6.1 Corrective Action Reports

A brief description of each Corrective Action Report is detailed below. CARs were transmitted to RFETS under separate letter.

CAO CAR 97-083

RFETS Management Assessments do not address the level of effectiveness of their QA program.

CAO CAR 97-084

The Canberra Nuclear Implementation Plan for RFETS Transuranic Waste Characterization Program (SQM-011) was revised and issued without RFETS approval.

CAO CAR 97-085

TWCP personnel have not received all required training.

CAO CAR 97-086

Required training has not been documented for all TWCP personnel. In addition, the education, experience, training, qualification, and certification requirements have not been established for many TWCP related job positions.

CAO CAR 97-087

RFETS Records Inventory and Disposition Schedule (RIDS) has been deleted from RFETS procedure 1-V41-RM-001. It is required by the WIPP QAPP and RFETS procedure 1-V41-RM-001.

CAO CAR 97-088

RFETS QA records are not being reasonably protected from damage or loss prior to being placed in storage. Records are not being properly submitted to the records system, stored in dual facilities, placed in fire-rated cabinets, nor protected to preclude damage from moisture and temperature.

CAO CAR 97-089

Procurement documents for the NDA subcontractor (Canberra) did not contain adequate QA and technical requirements and responsibilities. The subcontractor program did not meet the requirements of the CAO QAPD and QAPP.

CAO CAR 97-090

The Software Change Record (SCR) tracking system is not being maintained current with the implemented changes.

CAO CAR 97-091

Software Change Record packages are missing information and documentation and have improper QA record changes.

CAO CAR 97-092

Site-wide and company audit procedures implementation activities and controls do not meet the requirements of the CAO QAPD and the RFETS implementing procedures.

CAO CAR 97-093

Nonconformances (tracking and trending) are not being properly controlled within the RFETS TWCP Analytical Laboratory and the Waste Certification and Oversight (WCO) group.

CAO CAR 97-094

The transfer of the NDA PDP Drum from RFETS to the NDA subcontractor did not meet the requirements of the chain-of-custody process.

CAO CAR 97-095

Use of the "Underlying Hazardous Constituents Worksheet" does not meet requirements relative to the assignment of EPA codes. Necessary analytical data does not support the exclusion of certain hazardous constituents.

CAO CAR 97-096

Procedure 4-H19-WSRIC-001 for creating and updating the WSRIC Building Books is not being properly implemented; does not reflect current practices; contains missing steps, forms, and references; and does not indicate approval of the results.

CAO CAR 97-097

A field reference gas cylinder could not be traced to the manufacturer's certification records.

CAO CAR 97-098

The range of waste types the passive neutron and IQ-3 gamma systems were intended to measure was not clearly documented.

CAO CAR 97-099

Calibration traceability was not available for plutonium sources fabricated by LANL and used by the RFETS NDA subcontractor.

CAO CAR 97-100

Required checklists for Level 1 data validation and verification have not been prepared. Additionally, the VOC analysis form does not contain sufficient information; RTR testing batch reports have not been completed; and the applicable procedure requires revision.

6.2 Deficiencies Corrected During the Audit (CDA)

Those deficiencies that are considered isolated in nature and only require remedial action may be corrected and verified during the audit. The following 25 deficiencies were corrected and verified by the audit team during the audit:

1. The cover letter for the analyses report sent to NFT International regarding Hydrogen and Methane analyses was not signed and the date had been scratched-out

and written-in by hand. The audit team questioned if the letter had ever been sent. It was confirmed during the audit that it had indeed been sent thereby resolving the issue.

2. During an evaluation of the Project Level Data Review, a data package was found to contain an open NCR. The NCR was closed.
3. The QA Record Review Checklist used for data package HVOC-DP-00093 was different than the one specified in Procedure 4-X06-WP-4714, Revision 0. A Document Modification Request (DMR) was processed on 7/16/96 to revise the QA Record Review Checklist of procedure 4-X06-WP-4714 to match QAPjP requirements.
4. Supervisory reviews were recorded in the RTR sample log but the log was not signed nor initialed. The log was corrected.
5. Form RF-47001 has been revised without indicating the new revision number on the form nor incorporating the new form into procedures 4-I19-NDT-00569 and 4-W30-NDT-00664. DMRs 97-DMR-000871 and 97-DMR-00872 were issued to correct the deficiencies.
6. TRUPACT-II operating procedures did not reference DOE/WIPP 93-1001. A procedure change was initiated to reference DOE/WIPP 93-1001 whenever performing maintenance or replacing parts on the TRUPACT-II.
7. A TRUPACT-II maintenance log had not been established. A log was prepared to track maintenance work on the TRUPACT-II.
8. The Master Control Copy of procedure 4-X06-WP-4714 had incorrectly numbered pages 11, 48, and 48a. These pages indicated 4-X06-WO-4714 instead of 4-X06-WP-4714. This was corrected by replacing the pages with the correct ones.
9. The Document History file for procedure 1-77000-RM-001, Revision 0, was not submitted to Records Management as required by 1-MAN-0001-SDRM, Revision 0. The procedure was superseded by 1-V41-RM-001, Revision 0 on 7/2/96. This was corrected by submitting the Document History File to Records Management.
10. "Headspace Gas Sampling of Waste Containers," L-4146-D, Interim Change Notification (ICN), effective date 5/22/97, was not listed on the Master Copy Custodian Index nor was it distributed. This ICN was added to the Master Copy Custodian Index and distributed.

11. The QA plan for transportation referenced two documents that had been canceled and replaced by new documents. A procedure change was initiated to correct the references.
12. Review Comment Sheets were not available for all reviewers of the AK procedures; WIPP-003, Revision 0, "Collection, Review, and Confirmation of Acceptable Knowledge Documentation," WIPP-004, Revision 0, "Evaluation and Use of Acceptable Knowledge Information," and RF/RMRS-97-018, Revision 0, "RFETS TRU Waste Acceptable Knowledge Supplemental Information." The Comment Sheets were located and the audit team was then able to determine that all review comments were retrievable and incorporated into the Document History File for each procedure.
13. Documentation of reading assignment completion for some Analytical Laboratory personnel was not dated. The laboratory uses generic RFETS training forms that do not provide for the dating of each employee's entry. The form was revised to confirm that reading was completed by the date indicated.
14. The Project Data Control Officer (PDCO) did not complete the QA Record Review Checklist for all records received as required by procedure 4-Q31-WP-4710, Revision 1, Paragraph 5.2. DMR No. 97-DMR-00879, effective date 7/18/97, clarified that the QA Record Review Checklist is to be completed and added to each records package requiring document validation by the PQAQ. Records not included in the package that require document validation by the PQAQ will be reviewed using the criteria on the QA Record Review Checklist, however, the checklist will not be added to the record.
15. NCRs used by the WCO do not provide for documentation of all procedure requirements. Specifically, there is no space for time of issuance, time of receipt of the NCR, nor date of disposition, as the procedure requires. This was corrected by Document Modification Request 97-DMR-000881.
16. Document History Files of Traffic Department procedures were not stored in a fire-rated cabinet nor submitted to Records Management. This was corrected during the audit by moving the files into a fire-rated cabinet. This item has also been included in CAR 97-088 (see CAR 97-088 in Section 6.1).
17. 4-F72-WEM-WP1205, Section 6.3.2, step 18, requires that, when validation testing is complete, an independent reviewer evaluate results prior to approving the SCR production change. Section 6.3.3, step 4 of the procedure requires that WEMS Administration group verify the new production version prior to releasing the software for use. A review of six requested change packages indicated that two changes were made to the WEMS software, the testing was completed, and the software change was released to users without completing the required evaluations. SCR 1130 was installed

on the production computer without the required validation review and SCR 1142 was installed on the production computer without the required production verification. Both evaluations were completed and the SCR forms were corrected. Based on these results, a larger sample was selected to determine the effectiveness of the change control system. No additional discrepancies in this process were identified for SCRs 1143 through 1155.

18. A review of NCRs for the WCO group revealed that not all forms were completely filled out. WCO management issued a Waste Certification Instruction dated 7/17/97 to emphasize the need for personnel to complete all information and to clarify when Waste Program approval of NCRs is necessary.

19. A completed nonconformance report had not been signed by the Laboratory Manager as required. This signature was obtained.

20. The WIPP Record of Variance Logbook was not up-to-date. Procedure L-4032-A-6 requires that variance requests be entered in the logbook. Three variances were identified that had been initiated but not logged. The logbook was updated.

21. Real-Time Radiography (RTR) procedures for Buildings 569 and 664, (4-I19-NDT-00569 and 4-W30-NDT-00664) do not clearly identify the use of NCRs for addressing rejects and discrepancies. DMR numbers 97-DMR-00871 and 97-DMR-00872 were issued to clearly address the use of NCRs for activities related to these procedures.

22. NCR Status tag 26229, dated 11/12/96, pertaining to drum 86857 was written to document that the Waste Packing Verifier's qualification was out of date. The corrective action indicated on the NCR was documented as "use as is." This corrective action was not approved by the Waste Programs Office. Additionally, a comment on the Waste/Residue traveler dated 1/8/97 referenced the NCR and stated that the drum would have to be repacked. The NCR record did not reflect this action nor was there any documentation that the drum had in fact been repacked. After researching the actions taken on this drum, cognizant personnel determined that the drum did not require repacking and that the original "use as is" disposition was correct. The proper approval signature was obtained, and the actions taken were documented on the Waste/Residue traveler. No other similar instances were found.

23. Disposition codes for NCRs describe two categories that are not identified in the CAO QAPP, QAPD, or RFETS upper tier documents (the QAPjP and 3-MAN-008-WM-001). These codes are "supercompactor" and "deferred". There is no identified process to use the supercompactor category. There is a significant number of TWCP NCRs that have been categorized as "deferred". During the audit, a Document

Modification Request (DMR) 97-DMR-000881 for procedure 2-U76-WC-4030, Rev. 0, Control of Waste Nonconformances, was developed to delete these codes.

24. Four Waste/Residue traveler files out of 20 reviewed had discrepancies pertaining to reporting; 1) all four discrepant files were lacking documentation of NCR corrective action or resolution and 2) were missing the NCR number on the Waste/Residue traveler.

The files reviewed were active files and documentation of the disposition and resolution of these nonconformances had not yet been placed in the files. Cognizant personnel were able to locate and file the proper documentation. No other similar instances were found.

25. RFETS Procedure L-5017-G-8, Sections 6.1.1 and 6.1.2, requires the circumstances and any other information that may describe the impact on the quality of the data pertaining to a NCR to be included in the Case Narrative. The description of an NCR in the Case Narrative for Data Package HVOC-DP-00094 (page 7) did not include an evaluation of the impact on quality. RFETS corrected this condition during the audit by including an assessment of the quality impact of the NCR in the Case Narrative.

6.3 Observations

The following 14 observations are presented to RFETS management for consideration.

Written responses by RFETS are requested for observations 1, 2, 3, 11, 12, 13, and 14.

1. The WSRIC Building Book program requires that appropriate building operations and environmental personnel thoroughly review each Building Book annually. These individuals are required to receive appropriate training. Presently, Operations Managers are documenting the annual verifications as the "WID Group". Unless a DMR is written to revise the Book(s), there is no documented reference of which RFETS staff members performed the environmental review. Therefore, there is no way to verify that a staff member is appropriately trained. A written response to this observation is requested.

2. During the review of Acceptable Knowledge, RFETS was asked to provide various records which support information stated in the WSRIC Building Books. Some of the records are being stored at the Denver Federal Records Center. RFETS personnel indicated that it would take five weeks to retrieve them. WIPP records should be more readily retrievable. A written response to this observation is requested.

3. The process description section of the Process Output Detail form used in WSRIC does not include sufficient information to support the stated conclusions. For example, one form had hazardous metals listed on the form with no reasons provided as to why they had been included. The form should describe the process that generated the waste to support the waste determination. A written response to this observation is requested.
4. A standard table converting volume estimates to weight for each parameter is not used. An inventory of waste items should be sorted by waste material parameter and combined with a standard "look up table" to provide an estimate of the weight of waste material parameters. DMR Numbers 97-DMR-000871 and 97-DMR-000872 were issued to procedures 4-I19-NDT-00569 and 4-W30-NDT-00664 to include the standard tables. RFETS must use this table to make weight estimates.
5. During observation of the TRUPACT-II loading exercise in Building 664, waste handlers were seen working under a load suspended by the overhead crane. This occurred during the removal of the long lifting legs from the lifting fixture. This was discussed with cognizant personnel. A lift fixture support stand has been designed that will negate the risk of personnel standing or working under the suspended fixture. Until this stand is built, individuals performing work activities with the lifting fixture are at risk.
6. The Document History File for "WIPP Bin Case Data Review by Project Quality Assurance Officer" document number 5-23100-BST-WP-4714, effective date 6/8/92 was not available at the Document Control Center nor was this inactive file sent to Records Management. This procedure was superseded by 4-Q31-WP-4714, "WIPP TRU Waste Characterization Project Level Data Review and Reporting." The history file was found and transmitted (Document Receipt Transmittal Form, Document Identifier: PADC-92-00493) to Document Control on 7/17/97 by the record source. The file has not gone through Document Acceptance and Verification by Document Control and therefore had not been transferred to Records Management. Inactive files should be promptly dispositioned.
7. "TRU Waste Management Manual" 3-MAN-008-WM-001, was issued as Revision 3 instead of Revision 0. The title page stated "This document supersedes Revision 2 of the Transuranic (TRU) Waste Management Plan, 1-10000-EQWA-1.2." Identifying this document as Revision 3 instead of Revision 0, indicates that this is the fourth instead of the first issue of the document under this document number and title.
8. No RFETS personnel have attended a TRUPACT-II users school since 1991. With the numerous changes that have taken place to the TRUPACT-II SARP it is recommended that key personnel attend the school as a refresher.

9. The "Process Activity Determination" for DMR 97-DMR-00669 (4-X06-WP-4714, Revision 0 - PADC 96-00625) and DMR 97-DMR-00153 (3-MAN-008-WM-001, Revision 3 - PADC 97-00176) were not properly completed, (missing date and missing DMR and document numbers). The Categorical Exclusion From SES Review Process form was missing the DMR number and the Document Receipt and Transmittal form had corrections that were not initialed nor dated (4-X06-WP-4714, Revision 0 - PADC 96-00625). This was corrected during the audit. The "Process Activity Determination" form is Appendix 2 of 1-MAN-001-SDRM. This form did not provide for a space to indicate the date the form was signed. This information should be added to the form.
10. The WEMS data conversion procedure has not been prepared as required by 4-F72-WEM-WP1205, Section 6.4.2. No data conversion has been implemented since the new procedures were approved for use. However, the adequacy of the data conversion process could be adversely affected if data is converted from other data bases to WEMS prior to establishing the required procedure.
11. The NCR reporting system in use by the TWCP Analytical Laboratory does not correspond with or address all aspects of RFETS Site Procedure 15.01. A written response to this observation is requested.
12. Procedure L-4032-A-6 controls the use of variances for the Radiological Laboratories. In some cases, instead of NCRs variances are being used to identify nonconforming conditions. A written response to this observation is requested.
13. The site procedure for metrology (1-I97-ADM-12.01, Revision 0) requires user organizations to obtain a review of purchase requisitions involving measuring and test equipment (M&TE) prior to the requisition being sent to procurement. No requisitions have been reviewed in two years. In the sample of nine pieces of equipment used on TWCP activities, no new acquisitions were noted. RFETS should investigate the current practices and implement the requirements or revise the procedure. A written response to this observation is requested.
14. The site procedure for metrology (1-I97-ADM-12.01, Revision 0) requires the Metrology Laboratories to oversee other on-site calibrating organizations (indicated as being accomplished by surveillance). No surveillances or other overview activities have been performed in the last two years. Since there was no evidence that other calibrating organizations were performing calibrations of M&TE used on WIPP activities (based on a sample of 9), this situation is being documented as an observation. RFETS should perform an in-depth investigation of how this process and other metrology activity interfaces will be performed. A written response to this observation is requested.

6.4 Recommendations

The following four recommendations are presented for RFETS management consideration:

1. It was discovered during the audit that over 75 software improvements have been identified that have not been formally documented in an SCR package. Twenty-eight of these improvements involved the Repack and Reporting modules. Many of the requested improvements were for changes to existing reports or forms. It is recommended that RFETS management carefully distinguish between required changes and changes that may improve the user interface, but are not necessary to achieve mission objectives. The desire to be "user friendly" and meet customer requests for new or different reports could adversely impact the timely completion of functional and performance requirements.

Because the WEMS software is critical to the preparation and documentation of waste shipments, RFETS management should carefully plan the effort required to implement requested software changes. Without careful planning and evaluation of user requests, changes important to the interface of WEMS with the WWIS software and certification of waste shipment practices could be adversely impacted by a last minute flood of "improvements". The audit team recommends that all software improvements be formally documented in a Software Change Request Package.

2. Procedure WC 4014 is outdated. The WRR Waste Rejection Report is a legacy from 1992. The identified nonconforming conditions and waste packages still exist. There is no plan to bring them into current practices, although WCO has attempted to catalog them. The audit team recommends that a plan be developed and implemented to address this condition.

3. The Sample Canister Information Document (SCID) is a multi-purpose form used to record information for various analytical procedures. The form has blank spaces for analyses not completed that are not "N/A". The audit team recommends that the form or instructions be revised to clearly indicate which blanks are required and which should be filled with an "N/A".

4. The audit team recommends that the content designation assigned on the Residue and Radioactive Waste Determination form be clarified to reflect that it is an anticipated designation (with respect to low level waste as opposed to TRU waste). This designation can only be made via assay.

6.5 Exemplary Practices

The following six items are examples of exemplary practices observed by the audit team:

1. The Project Quality Assurance Officer (PQAO) Validation Checklists include a description of the evidence that the PQAO used to validate the completion of the item. This contributed to an easily traceable document and made it clear that the PQAO had actually looked at the documentation instead of merely filling out a checklist.
2. Gas Sampling of drum headspace was extremely efficient considering the activities that must be coordinated during sample collection. The team was well prepared, knowledgeable, and proficient. The organizations involved are recognized for this effort.
3. RTR operations are performed using four bottles of water with 10, 20, 40, & 80 ml inside. This practice enhances the operator's ability to discover wave motion and estimate volumes. This practice is above and beyond required methods.
4. The Configuration Management System in Building 881 provided excellent oversight of physical security and access controls, backups, configuration control, and retrieval of archival software records for the WEMS software.
5. RFETS has developed a Records Management System specific to WIPP records. The system was implemented on April 1, 1997 and 1,955 records have been included to date. The records in this system are easily retrievable.
6. RFETS Analytical Laboratories have developed a three page document that identified the status of all "L-Procedures" used in the performance of WIPP activities.

7.0 LIST OF ATTACHMENTS

- Attachment 1: Personnel Contacted During the Audit
- Attachment 2: Summary Table of Audit Results

PERSONNEL CONTACTED DURING THE AUDIT

RFETS PERSONNEL CONTACTED				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Alhamoodah, Victoria	RMRS/ATA, WIPP Records Specialist	X		X
Amont, Vic	Transportation Specialist/DCI Traffic Management		X	
Anderson, Brian	SSOC		X	
Angucano, Joe L.	Tech. Lead/RMRS	X	X	
April, Bob	DOE/RFFO/EC, Environmental Compliance	X		X
Archuleta, Larry	Sr. Specialist/RMRS/SWO		X	
Auchampaugh, George	Staff Support/Pajarito Scientific		X	
BeHanna, Jim	System Analyst/RMRS		X	
Bennett, John	Sr. Team Lead/RMRS QA		X	
Brown, M. B.	Home Engineering Waste Certification Oversight	X		
Caplyn, Berry	Dyncorp		X	
Castagneri, Mark	Consultant/NFT	X	X	
Chestnut, S. D.	Contract Tech. Rep./K-H Quality Audits		X	
Collins, Miller	DCI QA Manager/DCI		X	
Crone, Steve	K-H, Division Mgr., CPE&I	X		X
D'Amico, Eric	RMRS, Env. Scientist	X	X	X
Davidson, Dorothy	Ind. Div./Canberra		X	X
Dreith, Gary W.	DOE/EH Resident/DOE/EH-24			X
Durcholz, Mary E.	Compliance Specialist/RMRS		X	
Edrich, Pam	Lead-Waste Systems/RMRS		X	X
Elishans, Carl	QA Director/Canberra		X	

RFETS PERSONNEL CONTACTED				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Eschenbaum, Bobby	Safe Sites		X	
Ferrera, C. L.	Horne Eng., Alternate Waste Certification Official	X	X	X
Fischer, Sherrie	Lab Tech. Spec./SSOC ROL		X	
Flewelling, Art	RFETS/RMRS, QA Officer	X	X	X
Fox, Mary	RRT/K-H		X	
Franco, Johnna	NDA Tech. Support/RMRS		X	
Franks, Dwan	Administration Specialist WEMS		X	
Gason, Ernest C.	Project Manager RMRS/REOS		X	
Gates, Corliss T.	RMRS/ATA, Records Spec.	X		
Gillespie, Bruce	NDA/Canberra		X	X
Goade, Dan	RMRS/SEG, Sr. Project Eng.	X	X	X
Grady, Frank	RMRS, TRU Waste Environmental Engineer	X	X	X
Guerrieri, Leroy R.	Rec. Manager/Source One Management		X	
Gwyn, Terry	QA Engineer/PQA/E-2		X	
Hadden, Blaine	Subcontractor/Pajarito Scientific		X	
Hahn, J. F.	Manager & Anti-C Lead STDs-MET System/DCI Metrology		X	X
Hains, Peggy	Training Records Manager TFE		X	
Harlan, Ronald	Staff Support/ATA RMRS		X	
Hemmer, Ralph	ATA/RMRS, TRU Waste Project Engineer	X	X	
Hernandez, Juan M.	QA Manager/RMRS			X
Jennings, John	Chemist/SSOC/ROL		X	

RFETS PERSONNEL CONTACTED				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Kercher, Ann	RMRS, TRU/TRM Waste Prj.	X	X	X
Klaburner, Clayton	Systems Engineer/WEMS		X	
Kline, Keith	DOE/RFFO Deputy Manager			X
Knudtsen, Karen	Environmental Chemist Benchmark Env.	X	X	X
Krauker, Scott	Lead/NDA		X	
Kray, Edd	CDPHE Representative			X
Lahoud, Russ	K-H, TRU/TRM Projects	X		X
Latz, Carlin J.	WIPP Records /RMRS			X
Legare, Joe	DOE RFFO, Assistant Manager Environmental Compliance	X		X
Lenarcil, Kenneth F.	Traffic Manager/DCI		X	X
Lewis, Leslie	RMRS, TRU Waste Projects	X	X	X
Lillich, Jean	EPA Region 8, Project Mgr.	X		
LoSasso, Dave	Supervisor		X	
Luoma, Chris	Programmist/Dyncorp		X	
Manzanares, Kathy	Document Control Coordinator/RMRS		X	
Massie, Jack R.	Auditor/RMRS/QA		X	
Mattson, Marty	Tech. Support/DCI Metrology		X	
Maxwell, Dave	Phys. Scien./DOE/RFFO			X
Meyer, Leslie	Tech. Support/DynCorp		X	
Michael, Lee	Records Liaison RFETS/Source One Records Management		X	X
Myers, Carla	Tech. Admin/Rad Labs/SSOC		X	
O'Connor/Brian G.	Lab QA Officer/CDI/SSOC		X	X

RFETS PERSONNEL CONTACTED				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
O'Leary, Jerry	RMRS, TRU/TRM Project Manager	X		X
Parker, Alan	K-H, Vice President	X		
Parker, Doug	Specialist/Dyncorp		X	
Peters, Kevin	RMRS Support/WASTREN			X
Peterson, Ruth	Records Liaison/RFETS/Source One Records Management		X	X
Prochnow, David	Records Manager/Source One		X	X
Reinhart, Doug	Training/RMRS ESH&Q		X	
Remington, Daniel	Operations Technical Support/RMRS		X	
Richardson, E.	NDT Tech.		X	
Robledo, Ron	ATA/RMRS, TRU Waste Prj.	X	X	X
Rodrick, Peter	DOE/EA Resident/DOE/EH-24			X
Romano, Steve	Manager - IA & PO/KH			X
Rose, Steve	Deputy Facility Manager/RMRS		X	
Schoen, Jim	WSRIC Project Manager/Waste Certification		X	
Shainholtz, J. W.	Project Specialist/RMRS/SEG		X	
Sheply, Todd	Customer Service Engineer Canberra		X	
Simmons, Bill	Principal Chemist/SSOC/ROC		X	
Smart, Kim	R-H/IRM/Kaiser-Hill		X	X
Smith, Steve	Team Lead/K-H Engineering		X	
Stoddard, Ann	Document Control Lead/Source One		X	

RFETS PERSONNEL CONTACTED				
NAME	ORG/TITLE	PRE-AUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
	Management			
Strong, Mary Jo	RFFO/OOM/DOE			X
Tallman, S. L.	NDT Manager/NDT		X	X
Teagarden, Jim	Standards Lab		X	
Torczon, Dave	PQA Lead/K-H PQA		X	
Tower, Steve	DOE/RFFO, AIG	X		
Transue, Martin	Lab QA Officer/SSOC/LATA		X	X
Trohkimoinen, Gary	RMRS, Waste Disposal Project Manager	X		X
Tulk, C. R.	Team Leader/RMRS		X	
Turner, Charles A.	Lab Manager/SSOC		X	X
Tyler, Laura	RMRS, Records Manager	X		
Tyler, Reg	RFFO/AMEC			X
Valdez, Joe "Larry"	Tech. Support/DCI/Gamma		X	
Valenzuela, F. J.	K-H, Chief Waste Cert. Off.	X	X	X
Vetack, Thomas	Sr. Adman Team Lead/RMRS Procurement		X	
Ward, Greg	RMRS, QA Engineer	X	X	
Watkins, Jeanett	DCI, Traffic Management	X	X	
Williams, Linda	WIPP Records Lead/RMRS	X	X	X
Williamson, Brandon	General Engineer/DOE/RFFO			X
Wolfe, Gary	Asst. Rec. Manager/Source One Management		X	
Xuan, Lam	DOE/RFFO/EC WIPP Liaison	X		X

CAO Audit A-97-03 Detail Summary

Requirements Documents		No. of Pages	Concern Classification				QA Evaluation		Technical	
			CARs	CDAs	Obs	Rec	Adequacy	Implementation	Effectiveness	
QAPJP										
2.1	Organization/ Management Assessment	23	97-083				I	S	E	
2.2	Document Control	26	97-084	8,9,10,11,12	6,7		I	S	E	
2.3	Training	27	97-085 97-086	13	8		I	U	NE	
2.4	Records	32	97-087 97-088	14,15,16	9	3	I	M	E	
2.5	Procurement	18	97-089				I	S	E	
2.7	Software	61	97-090 97-091	17	10	1	I	M	E	
2.8.1	Audits	18	97-092				I	U	NE	
2.9	Corrective Action	25	97-093	18, 19, 20, 21 22, 23, 24, 25	11, 12,	2	I	M	E	
2.1	Calibration/M&TE	9			13, 14		I	M	E	
2.8.3	PDP	15	97-094	1			I	S	E	
3.0	Data Validation	13		2, 3			I	U	NE	
4.0	Acceptable Knowledge	7	97-095 97-096		1, 2, 3	4	I	I	I	
5.0	Sampling Design	2					I	I	I	
6.0	C of C	10					I	S	E	
7.0	Headspace Gas	106	97-097				I	S	E	
8.0	Solid Sampling			NOT AUDITED						
9.0	NDA	7	97-097 97-098				I	I	NE	
10.0	RTR	13	97-100	4, 5	4		I	M	I	
11.0	H ₂ and Methane	5					I	S	E	
12.0	VOCs	4					I	S	E	
13.0	Total VOCs			NOT AUDITED						
14.0	Total Semi VOC Analysis			NOT AUDITED						
15.0	Metals Analysis			NOT AUDITED						
	NDA Contractor Intregation	9	97-089				I	I	NE	
	Transportation	55		6, 7	5		I	I	I	
TOTALS		485	18	25	14	4	I	M	E	

Definitions

E = Effective
S = Satisfactory
I = Indeterminate

M = Marginal
N/A = Not Applicable
U = Unsatisfactor

CAR = Corrective Action Report
CDA = Corrected During Audit
NE = Not Effective

Obs = Observation
Rec = Recommendation