

**RADIOLOGICAL SURVEILLANCE OF
REMEDIAL ACTION ACTIVITIES
AT THE PROCESSING SITE
AMBROSIA LAKE, NEW MEXICO**

SURVEILLANCE DATE: APRIL 12-16, 1993

Final

April 1993

**Prepared by
Jacobs Engineering Group Inc.
UMTRA Project Office
Albuquerque, New Mexico**

MASTER

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1.0 SUMMARY

The Uranium Mill Tailings Remedial Action (UMTRA) Project's Technical Assistance Contractor (TAC) performed a radiological surveillance of the Remedial Action Contractor (RAC), MK-Ferguson and CWM Federal Environmental Services, Inc., at the processing site in Ambrosia Lake, New Mexico. This was the first radiological surveillance conducted by the TAC at this site, and was performed by Jim Hylko and J. B. Baird, Jr. of the TAC, April 12-16, 1993. The U.S. Department of Energy (DOE) was represented by Bob Cornish.

The requirements and attributes examined during the audit were developed from reviewing working-level procedures developed by the RAC. Objective evidence, comments, and observations were verified based on investigating procedures, documentation, records located at the site, personal interviews, and tours of the site. No findings were identified during this audit. Ten site-specific observations, three good practice observations, and five programmatic observations are presented in this report.

The overall conclusion from the surveillance is that the radiological aspects of the Ambrosia Lake, New Mexico, remedial action program are performed adequately. The results of the good practice observations indicate that the site health physics (HP) staff is taking the initiative to address and resolve potential issues, and implement suggestions useful to the UMTRA Project. However, potential exists for improving designated storage areas for general items, and the RAC Project Office should consider resolving site-specific and procedural inconsistencies.

Site-specific observations are identified below:

- Observation AMB-S01-001:** Miscellaneous items were stored on shelves located in a radiologically controlled area.
- Observation ABM-S01-002:** The training records were reviewed and determined to be in compliance with procedural requirements. Typographical errors and minor inconsistencies were identified, and resolved by site HP staff.
- Observation AMB-S01-003:** The Bioassay Program was reviewed and determined to be in compliance with procedural requirements. Minor inconsistencies were identified and resolved by site HP staff.
- Observation AMB-S01-004:** The Opposed Crystal (detector) System (OCS), and soil verification sampling was reviewed and determined to be in compliance with procedural requirements.

- Observation AMB-S01-005:** Records and worksheets related to personnel monitoring were reviewed and determined to be in compliance with existing requirements.
- Observation AMB-S01-006:** The daily performance logs of alpha smear counters, beta/gamma smear counters, and friskers located at access control were reviewed for consistency and completeness, and they were determined to be in compliance with existing requirements.
- Observation AMB-S01-007:** External dose rate monitoring, contamination control related to heavy equipment, and radiation detection equipment calibrations were reviewed for consistency and completeness, and they were determined to be in compliance with existing requirements.
- Observation AMB-S01-008:** The capital/operating equipment list was reviewed and determined to be in compliance with procedural requirements.
- Observation AMB-S01-009:** Site contamination control requirements were reviewed and determined to be in compliance with procedural requirements.
- Observation AMB-S01-010:** The radiological postings around the perimeter of the Ambrosia Lake UMTRA site were reviewed and determined to be in compliance with procedural requirements.

Good Practice observations are as follows:

- Observation AMB-S01-011:** A memo to D. Carlson dated February 24, 1993 provides traceability of HP personnel to their corresponding initials and signatures.
- Observation AMB-S01-012:** The equipment monitoring and release criteria information was reviewed and determined to be in compliance with procedural requirements. Furthermore, site HP personnel should be recognized for using pictures of the vehicle in performing surveys instead of relying on drawings that do not provide adequate detail, and may result in bypassing areas of the vehicle that may accumulate contamination. Other programs such as Industrial Hygiene/Health and Safety may also find these pictures useful in performing applicable surveys (e.g., noise).

Observation AMB-S01-O13: Workplace monitoring and exposure control requirements were reviewed and determined to be in compliance with procedural requirements. Furthermore, a fraction rule form worksheet was developed that summarizes input data for performing the fraction rule calculation. The development of this worksheet provides ease of transferring data from other worksheets, and allows a review of all input data for performing calculations thereby reducing the chance of error.

Programmatic observations are as follows:

Observation AMB-S01-O14: Occupational worker and visitor orientation was reviewed and determined to be in compliance with procedural requirements. Minor discrepancies were identified and reported to site HP personnel.

Observation AMB-S01-O15: Site-specific and procedural inconsistencies were identified in Procedure RP-002-1, Long-Lived Gross Alpha and Th-230 Monitoring, Rev. 2, and Procedure RAC-RP-002, Work Place Monitoring and Exposure Control, Rev. 1. These inconsistencies were reported to site HP personnel.

Observation AMB-S01-O16: Site-specific and procedural inconsistencies were identified in Procedure RAC-IN-001, UMTRA HP Instrumentation Program, Rev. 0, ICN-01. These inconsistencies were reported to site HP personnel.

Observation AMB-S01-O17: Site-specific and procedural inconsistencies were noted in Procedure RAC-IN-001, UMTRA HP Instrumentation Program, Rev. 0, ICN-01, and Procedure RP-002-1, Long-Lived Gross Alpha and Th-230 Monitoring, Rev. 2, regarding the collection and display of data from computer programs, including the use of computer printouts in lieu of procedural attachments. This information was reported to site HP personnel.

Observation AMB-S01-O18: Minor inconsistencies in the proper identification of units were identified in the soil verification data printout. These inconsistencies were reported to site HP personnel.

2.0 INTRODUCTION

Radiological surveillances are conducted by the TAC for the UMTRA Project Office to provide an independent assessment that the quality of remedial action work is sufficient to ensure that specified EPA standards are met. Different but related purposes are served by radiological surveillance and quality assurance (QA) programs and audits. QA programs and audits provide a high degree of assurance that procedures are followed; radiological surveillance addresses whether the remedial action work actually results in a site that meets EPA standards. The purpose of a radiological surveillance is not only to determine if the proper procedures are followed, but also to determine if the procedures are effective. Specific attention is given to the contractor's radiological survey techniques and procedures, sampling and measurement techniques, and data management capabilities.

In general, a radiological surveillance report provides two levels of conclusions: findings and observations. The findings conform to DOE Order 5482.1B, where a surveillance is classified as a Functional Appraisal (Paragraph 6.h). Findings (Paragraph 6.g) presented in a radiological surveillance of remedial action activities based on any of the following criteria (Paragraph 6.a):

- Noncompliance with published requirements of the remedial action plan (RAP), vicinity properties management and implementation manual, engineering design, or UMTRA Project Office directives applicable to the site.
- Evidence that the existing radiological measurement methods may result in residual contamination levels in excess of established limits (under-excavation).
- Evidence that the existing radiological measurement methods may result in the removal of materials not contaminated in excess of the limits (over-excavation).
- Evidence that some aspects of the contractor's radiological survey plans and procedures, measurement techniques, or data management capabilities are insufficient to allow eventual certification of the site.
- Evidence that activities are not in compliance with applicable DOE Orders.

Observations are additional comments by the auditors to acknowledge good practices, to document issues of concern, and to note areas where improvements in techniques or procedures could be made. Although observations are not of an immediately critical nature, they are important points that the auditors judge to merit documentation and ultimate resolution.

A radiological surveillance of the Ambrosia Lake, New Mexico, processing site was conducted April 12-16, 1993. Reviews were made of the RAC's radiological procedures regarding radiologically controlled storage areas, training records, bioassay, the OCS detector system, soil verification, personnel monitoring, daily performance logs of smear counters and friskers, capital/operating, site contamination control requirements, signature

traceability, radiological postings and surveys, workplace monitoring and exposure control, occupational worker and visitor orientation, site-specific and programmatic requirements, and the UMTRA Instrumentation Program.

On-site RAC personnel interviewed during the surveillance included Bill Gallagher, Belinda Icenhower, and Ryan Holyoak. An exit interview was conducted at the processing site upon completion of the surveillance. At that meeting, all observations were discussed, and a preliminary list of observations was presented.

3.0 OBSERVATIONS

3.1 SITE-SPECIFIC

AMB-S01-001

Observation: Miscellaneous items were stored on shelves located in a radiologically controlled area.

Discussion: Items such as styrofoam cups enclosed and sealed in plastic, xerox paper, toner, empty or flattened cardboard boxes, extension cords, plastic bottles, full-face respirator, first-aid kit, and hard hats were stored on shelves located in a radiologically controlled area. The shelves were also used for the temporary storage of soil samples. The shelves are to be used for the temporary storage of excavation and verification soil samples collected at the UMTRA site. After notifying the HP site manager, the styrofoam cups were removed from the shelves, and relocated to a non-radiologically controlled storage area.

Recommendation 1: As a good radiological practice to prevent the cross-contamination and potential spread of contamination to non-radiologically controlled areas, items not related to the preparation and/or storage of soil samples should be resurveyed, then relocated to a non-radiologically controlled storage area. The RAC should consider revising the appropriate contamination control procedures (e.g., RAC-RP-003, Site Contamination Control) to address the segregation of materials, thereby preventing the storage of non-radioactive and radioactive materials in the same area.

Recommendation 2: The full-face respirator should be stored in accordance with Procedure RP-003-5, Respirator Issue and Maintenance, Rev. 0, ICN-01, or stored under controlled conditions to prevent the distortion of rubber or other elastomeric parts, and prevent the inadvertent use by site personnel.

AMB-S01-002

Observation: The training records were reviewed and determined to be in compliance with procedural requirements. Typographical errors and minor inconsistencies were identified, and resolved by site HP staff.

Discussion: The Respirator Issue Log was reviewed in accordance with Procedure RP-003-5, Respirator Issue and Maintenance, Rev. 0, ICN-01, and compared to the Current Employee Roster—Respirator Training records located at access control. A typographical error indicating

the respirator training of an employee expired on March 29, 1993 was identified in the Current Employee Roster—Respirator Training records. Further investigation revealed the respirator-qualified expiration date for this employee was actually March 29, 1994. Personnel at access control had already recognized this inconsistency, and later corrected the computer data base to reflect correct respirator training expiration date of March 29, 1994.

Recommendations: Prior to updating a computer data base, personnel should initial, date, and make pen-and-ink corrections, as appropriate, when resolving typographical inconsistencies.

Discussion: Training records for nine HP technicians, two HP monitors, and seven HP monitor trainees were reviewed for completeness. A PAP E260 form (HP technician) appeared to be dated 1983 by the physician performing the medical exam, and another PAP E260 form (HP technician) date line following the signature was blank.

The training transcripts of two HP technicians and one HP monitor were blank, and the practical factors forms of two HP technicians were blank. Recently, HP technicians from the Grand Junction UMTRA site have transferred to the Ambrosia Lake UMTRA site; however, their training records remained in Grand Junction.

After notifying the HP site manager, immediate action was taken to resolve these inconsistencies. The physician was contacted regarding the appearance of the incorrect and blank dates of examination. Furthermore, the RAC Project Office and Grand Junction UMTRA sites were contacted and requested to forward the completed training transcripts and practical factor forms.

Recommendations: None.

AMB-S01-003

Observation: The Bioassay Program was reviewed and determined to be in compliance with procedural requirements. Minor inconsistencies were identified and resolved by site HP staff.

Discussion: Step 5.9.3 of Procedure RP-004-1, Bioassay Program, Rev. 2 states that "The HPP Manager or designee shall sign and date these (bioassay) reports." Contrary to this step, the Health Physics Project (HPP) Manager was only initializing the reports. After notifying the HP site manager, all forms were signed and dated correctly.

Recommendation: None.

Discussion: Attachment 3—Bioassay Services Authorization Form (dated March 8, 1993) of Procedure RP-004-1, Bioassay Program, Rev. 2 did not identify the "Type of Analysis" to be performed for bioassay samples submitted for analysis. After notifying the HP site manager, the HP technician responsible for the Bioassay Program contacted the laboratory by telephone to ensure that the bioassay samples were being analyzed appropriately, as indicated in previous Attachments.

Recommendation: None.

AMB-S01-004

Observation: The OCS detector system and soil verification sampling were reviewed and determined to be in compliance with procedural requirements.

Discussion: Eleven blind/spiked Ra-226 samples were given to the HP staff for analysis using the OCS detector system. Each sample was counted repeatedly ten times. The results of the OCS bias was -1.8 percent, which meets the TAC target precision standard of ± 10 percent for group data. The range of the individual results were -11 percent to +4 percent of the reference value, which meets the UMTRA Project standard of ± 30 percent. All eleven sample cans passed leak testing requirements, performed by site HP personnel.

Recommendation: The RAC should consider using this information to determine why other UMTRA sites (e.g., Grand Junction, Falls City) are reporting an approximate overall bias of -10 percent.

Discussion: Traced five soil verification samples in accordance with Step 5.7, Sample Retention of Procedure OP-003-1, Verification Soil Sampling, Rev. 0, ICN-02. The five soil verification samples were traced to their corresponding location on the Soil Verification Map-AMB-Area C1, dated April 1, 1993, and located in the sample storage room.

Recommendation: None.

AMB-S01-005

Observation: Records and worksheets related to personnel monitoring were reviewed and determined to be in compliance with existing requirements.

Discussion: Step 4.4, Acceptance Criteria; Step 5.3, Counting System; Step 5.4, Sample Counting and Calculations; and Attachment 1—Working Level Data Sheet (Form F1-RP-002-2) of Procedure RP-002-2,

Working Level Monitoring, Rev. 0 and Step 5.1, Background Survey; Step 5.2, Controlled Area Surveys; and Attachment 1—Dose Rate Log (Form F1-RP-002-3) of Procedure RP-002-3, Rev. 0, ICN-01, were reviewed for compliance. The data acquired from the steps listed above were used for completing Attachment 1—Fraction Rule Form (Form F1-RAC-RP-002) and Attachment 2—Workplace Exposure Control Form (Form F2-RAC-RP-002) of Procedure RAC-RP-002, Workplace Monitoring and Exposure Control, Rev. 1. All forms were complete and in compliance with procedural requirements.

Recommendations: None.

AMB-S01-006

Observation: The daily performance logs of alpha smear counters, beta/gamma smear counters, and friskers located at access control were reviewed for consistency, completeness, and determined to be in compliance with existing requirements.

Discussion: All records indicated the daily performance results were within acceptable count ranges, with consistent efficiency and background values.

Recommendations: None.

AMB-S01-007

Observation: External dose rate monitoring, contamination control related to heavy equipment, and radiation detection equipment calibrations were reviewed for consistency, completeness, and determined to be in compliance with existing requirements.

Discussion: Routine external dose rate monitoring in work areas was observed to be performed adequately using the Bicron Micro Rem survey meter, and sodium-iodide crystal detector. All radiation detection instruments were observed to be operational and in calibration to perform monitoring of radiological conditions. Furthermore, contamination control for heavy machinery (e.g., vehicle air and oil filters) was discussed with the HP site manager.

Recommendations: None.

AMB-S01-008

Observation: The capital/operating equipment list was reviewed and determined to be in compliance with procedural requirements.

Discussion: Step 4.1.5 of Procedure RAC-IN-001, UMTRA HP Instrumentation Program, Rev. 0, ICN-01, states "The HP site manager or designee is responsible for ensuring that the site inventory is correct." The capital/operating equipment list was reviewed to ensure accountability of site HP instrument inventory. The capital/operating equipment list was complete and in compliance with procedural requirements.

Recommendations: None.

AMB-S01-009

Observation: Site contamination control requirements were reviewed and determined to be in compliance with procedural requirements.

Discussion: The site contamination control requirements of Procedure RP-003, Site Contamination Control, Rev. 0, ICN-01, was reviewed for compliance. Step 4, Requirements, Prerequisites, Requirements (Tools, Materials, Precautions, limits); Step 5, Access Control, Personnel Monitoring, Equipment Monitoring and Release Criteria, Contamination Monitoring in Uncontrolled Areas, Respiratory Protection, and Protective Clothing; were complete and in compliance with procedural requirements.

Recommendations: None.

Discussion: Step 5.1 of Procedure RP-003-4, Contamination Monitoring in Uncontrolled Areas, Rev. 1, ICN-01 "Survey Locations and Frequency of Alpha Contamination Monitoring," was reviewed for compliance. The daily records of performing routine smears in uncontrolled areas and their results were complete and in compliance with procedural requirements.

Recommendations: None.

AMB-S01-010

Observation: The radiological postings around the perimeter of the Ambrosia Lake UMTRA site were reviewed and determined to be in compliance with procedural requirements.

Discussion: Step 5.5.2.1 of Procedure RP-003-1, Access Control, Rev. 0, ICN-05, states that "The perimeter fence of each controlled area shall be posted at approximately 150-ft (45.7 m) intervals with 'CAUTION CONTROLLED AREA' signs." The postings around the perimeter of the site still read "CAUTION—RADIOACTIVE MATERIAL." After notifying the HP site manager, a telephone call was placed to the RAC Project Office to determine the status of the RADCON Manual, which is still pending implementation. Site personnel should remain aware of pending implementation status of the RADCON manual in conjunction with revised posting requirements.

Recommendations: None.

3.2 GOOD PRACTICES

AMB-S01-011

Observation: A memo to D. Carlson dated February 24, 1993 provides traceability of HP personnel to their corresponding initials and signatures.

Discussion: This type of traceability eliminates the confusion of trying to decipher initials and signatures associated with the review of documents, reports, and the like.

Recommendations: The RAC should consider implementing this policy of traceability of names, initials, and signatures at all UMTRA sites.

AMB-S01-012

Observation: The equipment monitoring and release criteria information was reviewed and determined to be in compliance with procedural requirements.

Discussion: Step 5.3.4 of Procedure RP-003-3, Equipment Monitoring and Release Criteria, Rev. 1, ICN-04, states in part that "The swipes shall be numbered with the corresponding number from the equipment survey map. (See example presented in Attachment 4—Example Survey Points)." Heavy-equipment (e.g., dozer, water truck, and the like) survey maps displayed a picture of each vehicle, including specific locations for performing routine swipe surveys. A picture of the vehicle provides easy recognition for performing swipes instead of relying on a drawing that does not provide adequate detail, which may result in bypassing areas of the vehicle that may accumulate

contamination. Other programs such as Industrial Hygiene/Health and Safety may also find these pictures useful in performing applicable surveys (e.g., noise).

Recommendations: Instead of using a drawing to identify example survey points, as identified in Attachment 4, the RAC should consider using pictures at all UMTRA sites to identify survey and swipe areas for heavy equipment.

AMB-S01-O13

Observation: Workplace monitoring and exposure control requirements were reviewed and determined to be in compliance with procedural requirements.

Discussion: Step 5.4 of Procedure RAC-RP-002, Workplace Monitoring and Exposure Control, Rev. 1, provides guidance on performing the "Fraction Rule Calculation." A fraction rule form worksheet was developed that summarizes input data for performing the fraction rule calculation. The development of this worksheet provides ease of transferring data from other worksheets, and allows a review of all input data for performing calculations thereby reducing the chance of error.

Recommendations: The RAC should consider implementing the fraction rule form worksheet as part of Procedure RAC-RP-002, Workplace Monitoring and Exposure Control.

3.3 PROGRAMMATIC

AMB-S01-O14

Observation: Occupational worker and visitor orientation was reviewed and determined to be in compliance with procedural requirements. Minor discrepancies were identified and reported to site HP personnel.

Discussion: To prevent the spread of contamination, frisking is required by all personnel exiting the controlled area. Furthermore, an HP technician is present at the frisking station to observe and ensure the proper frisking of all personnel exiting the controlled area. In contrast to the showing of a general safety video for an UMTRA Project site and provided the handout "Construction Environment, Safety, and Health—Initial Indoctrination and Training," the members of the audit team were given a verbal introduction and general demonstration on the proper technique of frisking.

Recommendation: To ensure consistency with the dissemination of proper radiological control information (e.g., frisking), the RAC should consider showing visitors, not planning to attend the detailed site HP indoctrination program, a video and/or provide visitors with a handout that reviews the proper technique of frisking. This video and/or handout would be similar in concept to the video covering general safety indoctrination program. Furthermore, the frisking demonstration handout should be included as part of Attachment 1—"Occupational Worker/Visitor Orientation," of Procedure AD-003-1 Occupational Worker/Visitor Orientation, Rev. 0.

Discussion: Attachment 1—"Occupational Worker/Visitor Orientation" of Procedure AD-003-1, Occupational Worker/Visitor Orientation, Rev. 0, includes a discussion from USNRC Regulatory Guide 8.13, "Pregnant Worker's Guide—Possible Health Risks to Children of Women who are Exposed to Radiation during Pregnancy." USNRC Regulatory Guide 8.13 includes references to 10 CFR 20 and uses terminology related to the commercial nuclear power industry (e.g., NRC license).

Recommendations: The RAC should consider revising Procedure AD-003-1, Occupational Worker/Visitor Orientation, Rev. 0, to replace NRC Regulatory Guide 8.13 with DOE Order 5480.11/RADCON manual sections, as appropriate, that discuss the health risks to children of women who are exposed to radiation during pregnancy. Site personnel should also remain aware of pending implementation status of the RADCON manual.

AMB-S01-O15

Observation: Site-specific and procedural inconsistencies were identified in Procedure RP-002-1, Long-Lived Gross Alpha and Th-230 Monitoring, Rev. 2, and Procedure RAC-RP-002, Work Place Monitoring and Exposure Control, Rev. 1, and reported to site HP personnel.

Discussion: Attachment 2—Air Density Correction Factors of RP-002-1, Rev. 2 identifies an Atmospheric Density Correction Factor (ADCF) of 1.19 for the Ambrosia site. Contrary to this value, the actual ADCF of 1.17 is being used for all site-related calculations. The HP site supervisor informed the audit team of this inconsistency, and is using an ADCF of 1.17 for all site-related calculations.

Recommendation: The RAC should comply with the ADCF procedural value of 1.19 or revise Attachment 2 of RP-002-1, Rev. 2, to reflect the ADCF of 1.17 currently being used for all site-related calculations.

Discussion: Step 3.4—Minimum Detectable Concentration of RP-002-1, Rev. 2 defines the constant K as follows: "K=temperature correction factor (refer to Step 5.3.4)." Step 5.3.4 states "The air density correction factor shall be determined from Attachment 2." The definition of K is inconsistent with Steps 3.4 and 5.3.4.

Recommendations: The RAC should revise Step 3.4 of RP-002-1, Rev. 2 as follows: "K=atmospheric density correction factor (refer to Step 5.3.4)."

Discussion: A memo from D. Carlson to B. Gallagher dated October 29, 1992 (Subject: Use of a Soluble Th-230 Limit) states in part, "...you are directed to use of the soluble Th-230 limit (3×10^{-12} $\mu\text{Ci/mL}$) during implementation of workplace monitoring and exposure control procedures," which allows the use of a site-specific "soluble" DAC for the Ambrosia lake UMTRA site. Contrary to this memo, the following steps do not indicate the allowance of using a site-specific "soluble" DAC. Step 4.4.1 (Acceptance Criteria) of RP-002-1, Rev. 2 states in part "The HP site manager or designee shall ensure the occupational air monitoring system(s) can achieve an MDC of 10 percent of the DAC for insoluble Th-230 or 7×10^{-13} $\mu\text{Ci/mL}$." Furthermore, Step 3.13—Internal Percentage of RAC-RP-002, Rev. 1, defines DAC as follows: $\text{DAC} = \text{DAC for Th-230}$ ($7\text{E-}12$ $\mu\text{Ci/mL}$), and Step 5.4.2 (Fraction Rule Calculation) defines DAC as follows: $\text{DAC}_{\text{Th230}} = \text{DAC for Th-230}$ (7×10^{-12} $\mu\text{Ci/mL}$). However, the RAC should be commended for recognizing the need to implement a lower DAC applicable to the Ambrosia UMTRA site.

Recommendations: The RAC should consider revising the procedures to reflect the allowance of using site-specific, soluble/insoluble DACs, as appropriate, and provide methodology and documentation related to the derivation of site-specific DACs used at the various UMTRA sites.

Discussion: Step 5.4.2 of Procedure Rac-RP-002, Rev. 1, identifies a "Note:" as follows: "The DAC for Th-230 is multiplied by 0.5 because Th-230 causes approximately 50 percent of the dose from a chronic inhalation intake of tailings dust (Reference 2.2—R.H. Reif et al.). This value of 0.5 is also found in the internal percentage formula listed on Attachment 1—Fraction Rule Form.

Recommendations: The RAC should justify if the 0.5 multiplier is still applicable for the site-specific soluble DAC used at the Ambrosia Lake UMTRA site.

AMB-S01-016

Observation: Site-specific and procedural inconsistencies were identified in Procedure RAC-IN-001, UMTRA HP Instrumentation Program, Rev. 0, ICN-01, and reported to site HP personnel.

Discussion: Step 5.3.3 of Procedure RAC-IN-001, Rev. 0, ICN-01, states "Calibration information shall be indicated, as appropriate, on instruments by the use of a calibration label containing the following information: a) Instrument serial number, b) Date of calibration, c) Calibration due date, and d) Initials of calibrator." Contrary to this requirement, two Ludlum 2000 scalers provided by the RAC Project Office, one located in access control and the other located in the counting laboratory, possessed calibration labels that did not provide room for an instrument serial number.

Recommendations: During the next series of instrument calibrations performed by the RAC Project Office, the RAC should consider replacing, as necessary, the calibration labels containing information, as required by Step 5.3.3.

Discussion: Step 5.3.8 of Procedure RAC-IN-001, Rev. 0, ICN-01, states in part to include the "...calibrator's signature" on the instrument calibration sheets, which lists all instruments used to calibrate the instrument. Contrary to the above requirement, only the typed name and signed initials of the calibrator appeared on the calibration sheets, and one calibration sheet was not signed or initialed by the calibrator.

Recommendations: The calibrator should comply with the procedure, or revise the procedure to allow the use of initials instead of a full signature.

AMB-S01-017

Observation: Site-specific and procedural inconsistencies were noted in Procedure RAC-IN-001 UMTRA HP Instrumentation Program, Rev. 0, ICN-01, and Procedure RP-002-1 Long-Lived Gross Alpha and Th-230 Monitoring, Rev. 2, regarding the collection and display of data from computer programs, including the use of computer printouts in lieu of procedural attachments. This information was reported to site HP personnel.

Discussion: Step 5.5.5.4 of Procedure RAC-IN-001, Rev. 0, ICN-01 states "Determine this high-voltage setting, and adjust the high voltage to the next lowest 25 volt increment." Step 5.5.5.6 states in part, "Increase the voltage 25 volts, take and record another source and background count at this voltage." Step 5.5.5.7 states, "Graph the

source and background counts data with counts on the "y" axis and high-voltage on the "x" axis." Contrary to these requirements, the software used to generate the high-voltage plateau information is unable to collect source counts in 25 volt increments, and is unable to collect background counts. Furthermore, the software is unable to graph high-voltage values below 400 volts.

Recommendations: The RAC should consider revising the procedure and software to allow the collection of source and background counts in 25-volt or 50-volt increments, and display high-voltage values of less than 400 volts. For operating voltages less than 400 volts, the RAC should consider graphing the high voltage plateaus manually utilizing Attachment 7—High Voltage Plateau Data Sheet, as necessary.

Discussion: Step 5.5.4.a of Procedure RAC-IN-001, Rev. 0, ICN-01, states "Complete the top portions of the Precision Test Report (Attachment 6)." Furthermore, Step 5.5.5.5 states "Take a source count and background count reading and record them on the High Voltage Plateau Data Sheet (Attachment 7). Contrary to these requirements, the results are not recorded in the attachments, but are provided in a computer printout. Furthermore, the headings on the attachments do not coincide with the headings on the computer printouts.

Step 5.2.4 of Procedure RP-002-1, Rev. 2, states in part "The following data shall be recorded on the Air Particulate Log (Attachment 1) or on the filter envelope during or immediately after each grab sample..." Contrary to recording sample time (m) and volume sampled (mL) on the Air Particulate Log, the computer program calculates this information and provides the results to the user, e.g., Attachment 3—UMTRA Particulate Air Sampling, RAC Project Office Data Report.

Recommendations: The RAC should consider revising the procedures to allow the option of completing the attachments manually, or allow the use of computer printouts in lieu of attachments. Examples of these printouts should be included in the procedure, as appropriate. Furthermore, the computer printouts should contain the same heading and body information included in the attachment.

AMB-S01-O18

Observation: Minor inconsistencies in the proper identification of units were identified in the soil verification data printout, and reported to site HP personnel.

Discussion: The units (pCi/g) of the soil verification data printout dated April 12, 1993 lists initial and 20-day Ra-226 values for Area C-1 (AMB-SV-C1-##-##), were not listed properly.

Recommendations: The RAC should consider revising the computer program to include proper identification of units (pCi/g).

4.0 LIST OF CONTRIBUTORS

The following individuals contributed to the preparation of this audit report.

Name	Contribution
Jim Gibb	Document review
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