

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION  
URANIUM RECOVERY FIELD OFFICE  
REGION IV

Inspection Report: 40-8681/93-01

License: SUA-1358

Licensee: Umetco Minerals Corporation  
P.O. Box 669  
Blanding, Utah 84511

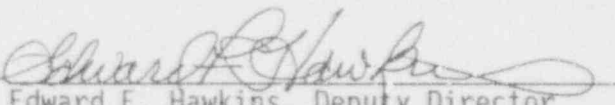
Facility Name: White Mesa Mill

Inspection At: San Juan County, Utah

Inspection Conducted: March 11, 1993

Inspectors: Pete J. Garcia, Jr., Project Manager  
Dana C. Ward, Project Manager

Approved:

  
Edward F. Hawkins, Deputy Director  
Uranium Recovery Field Office  
Region IV

4/2/93  
Date

Inspection Summary

Areas Inspected: Announced inspection of the uranium mill operations and radiation safety program including Management Organization and Controls/Operations Review, Operator Training and Retraining, Maintenance/Surveillance Testing, Radiation Protection, Radioactive Waste Management, Transportation of Radioactive Materials, Environmental Protection, and Emergency Preparedness.

Results:

- Occupational exposure calculations were not routinely performed and documented within one week of the end of the regulatory compliance period. This was identified as a violation (Section 5).
- Equipment was released from the restricted area prior to completion of a radiological contamination survey. This was identified as a violation (Section 5).
- The licensee had spent considerable time in improving the housekeeping in the mill building and support facilities. One significant improvement was made by installing translucent panels on the mill building and yellow cake enclosure to upgrade visibility (Section 1).

Summary of Inspection Findings:

- Violation 40-8681/9301-01 was opened (Section 5).
- Violation 40-8681/9302-02 was opened (Section 5).
- Violation 40-8681/9101-01 was closed (Section 10).

Attachments:

Attachment - Personnel Contacted and Exit Meeting

## DETAILS

### 1 PLANT STATUS

The Umetco White Mesa Mill was on standby during the inspection period. The licensee has conducted extensive housekeeping tasks in preparation for future operations at the facility. New siding was placed on sections of the mill building along with translucent panels to increase ambient light levels. Translucent panels along with new siding were also placed on the yellowcake dryer enclosure to increase light levels and to maintain negative air pressure. Sandblasting was also done on much of the mill building interior in preparation for painting. Painting of the many of the cleaned surfaces had already been completed at the time of the inspection. New concrete work had been completed around outdoor storage tanks to contain any spills. Regrading of the areas adjacent to the mill was done for proper drainage and in preparation for asphaltting. Old process tanks were dismantled in preparation for the placement of new tanks. Some process plumbing was also upgraded. The overall appearance of the mill facility was excellent.

### 2 MANAGEMENT ORGANIZATION AND CONTROLS/OPERATIONS REVIEW (88005)(88020)

The licensee described the organizational structure in effect at the site. The Maintenance Superintendent and Production Supervisor are the two highest ranked officials at the facility, and have equal authority. The Maintenance Superintendent is responsible for the maintenance of the facility and environmental services, while the Production Supervisor is responsible for purchasing, laboratory, and office functions. Both officials report to the Director of Operations who is located in Grand Junction, Colorado.

There were a total of 23 employees on site at the time of the inspection. Most employees were involved in routine standby operations and maintenance activities. There were also four security personnel working on site that maintained around the clock, seven day a week coverage of the facility. The regular staff work four 10 hour days with supervisory personnel providing rotating coverage over the weekends. There was no union representation at the mill.

The Department Head for Health, Safety and Environmental Affairs/Radiation Protection Officer (RPO) was responsible for the day to day operation of the radiation protection program, and reported directly to the Maintenance Superintendent. The RPO was assisted by a staff of two technicians. While both technicians performed a wide variety of radiation protection tasks, one technician was primarily responsible for safety operations, and the other technician was primarily responsible for environmental monitoring duties.

The inspectors reviewed records of inspections and audits performed by the radiation protection staff. The inspectors noted that the RPO and the radiation protection technicians performed the daily inspections of the facility. Weekly inspections were performed primarily by the RPO. During the previous inspection Umetco was cited for a violation of License Condition No. 32, which requires that the RPO perform the weekly inspections when he is

on site. Umetco requested and was granted an amendment to allow weekly inspections to be conducted by a qualified designee when the RPO is on site. The audit program in effect at the site included the monthly preparation by the RPO of reports which summarized radiation safety data for the month. These reports were distributed to site and corporate personnel and provided a good summary of data collected during the month. In addition, an annual ALARA audit was conducted by an audit committee. The ALARA audit addressed the topics recommended in Regulatory Guide 8.31.

Standard Operating Procedures (SOPs) were reviewed by the inspectors. The SOPs appeared to be in order, and provided the necessary information to complete the job task without confusion. All procedures had been reviewed annually by the RPO as required by License Condition No. 29. SOPs were available from the RPO, and the Production and Maintenance Supervisors.

The inspectors reviewed Radiation Work Permits (RWPs) issued for nonroutine jobs since the last inspection. The RWPs were used to describe the work being performed, and precautions to be followed to minimize exposure. The inspectors found no areas of concern regarding RWP issuance, other than the methodology used for exposure calculations which will be addressed in Section 5.

The Maintenance Superintendent reviewed a plan with the inspectors concerning the pumping of all solutions from Cell 11 to Cell 3 over the next several months. This operation would be followed by pumping of solutions from Cell 4A to Cell 3. Interim cover will be placed on accessible areas of Cell 3 in places above the solution level. Any beach areas not covered by solutions or interim cover will have stabilizers applied to prevent blowing. This action is being taken by Umetco to reduce costs during standby, and to meet current Environmental Protection Agency standards.

The inspectors concluded that the site programs were in accordance with license requirements.

### 3 OPERATOR TRAINING AND RETRAINING (88010)

The inspectors reviewed records of training during the inspection. Radiation safety training was provided by the RPO. The inspectors noted that all site personnel had received annual training as required by the license. The last annual training had been completed March 3, 1993. The content of the radiation safety training course was reviewed, and found to be equivalent to that recommended in Regulatory Guide 8.31. A written test was required of all workers with a 70 percent correct score needed to pass. The licensee also provided prenatal radiation training as recommended by Regulatory Guide 8.13 to all female workers. Visitors and contractors to the restricted area were given hazard recognition training, but were not given a written test. All visitors were escorted while in the restricted area.

The RPO and two technicians attended a five day course on radiation protection presented at the site by a contractor. This course was conducted in December 1991 and will be presented at the White Mesa Mill again in April 1993. The

inspectors found no concerns with the RPO retraining, and were pleased to see that the technicians had also received this retraining.

Safety meetings were conducted weekly throughout the year since the last inspection. The inspectors reviewed the topics covered and found them to be appropriate for maintaining a safe working environment. The licensee uses a rotating instructor system where all supervisors gave training on topics that they felt competent in presenting. The RPO coordinated the training from week to week and presented topics as needed.

The inspectors concluded that the licensee's training programs were conducted in accordance with license requirements.

#### 4 MAINTENANCE/SURVEILLANCE TESTING (88025)

The inspectors toured the mill and restricted area during the inspection. All structures were in excellent condition with maintenance work in progress as described in Section 1. All entrances to the mill were posted in accordance with License Condition No. 27. Portions of the restricted area fence observed by the inspectors were in good order and properly posted. Employee postings required by 10 CFR 19.11 were noted to be in good order.

The inspectors also toured the yellowcake storage area on the east side of the restricted area. Some yellowcake storage barrels were observed to be in poor condition due to rusting, but none were noted to be compromised. The inspectors suggested that the licensee consider placing the barrels inside to prevent any further degradation. Umetco representatives stated that they have been considering this action and hoped to accomplish the task in the near future. The inspectors conducted a gamma survey next to the restricted area fence adjacent to the yellowcake storage area. All survey results were less than two mR/hr.

The inspectors identified no areas of concern with the exception of the barrel storage facility.

#### 5 RADIATION PROTECTION (83822)

##### 5.1 Internal Exposure Determination

The inspectors reviewed the licensee's program for determination of internal exposures. The licensee collected air particulate samples quarterly from 26 locations within the processing facilities. These samples were collected at a rate of 40 liters per minute (lpm) for 60 minutes. Breathing zone samples were collected during RWP jobs using lapel samplers calibrated to draw about 2 lpm. The higher volume pumps were calibrated prior to use using a Kurz meter, which was itself calibrated annually using a bubble tube. The lapel samplers were calibrated prior to use using a bubble tube. The samples were analyzed fluorometrically onsite.

Radon daughter samples were collected monthly at 20 locations. The samples were collected for 5 minutes using samplers calibrated to draw 2 lpm. The samples were analyzed using the Modified Kusnetz method.

A review of air sampling data revealed that all area sample results were generally small percentages of the respective maximum permissible concentration (MPC). However, uranium concentrations measured during several RWP jobs were significantly higher, with results ranging up to 300 percent of MPC. These RWP jobs involved work in the yellowcake drying and packaging areas, and required the use of respiratory protective equipment. In addition, radon daughter concentrations in the solvent extraction (SX) building occasionally exceeded 25 percent of MPC. Fans in the SX building were activated to lower the concentrations when the 25 percent level was reached.

The licensee calculated internal exposures for workers by using the results of area or breathing zone air sampling data to determine the concentrations of radioactive materials in air to which workers were exposed. Exposure times were determined by using time cards or RWPs. A review of exposure data indicated that all exposures were small fractions of the exposure limits.

License Condition No. 37 requires that occupational exposure calculations be performed and documented within one week of the end of the weekly compliance periods specified in 10 CFR 20.103(a)(2) and 20.103(b)(2). A review of exposure calculation documentation revealed that the calculations were often not performed for periods of two or three weeks. This was identified as a violation of License Condition No. 37 (40-8681/9301-01).

The inspectors' review of the methodology used to determine the airborne concentrations under RWPs indicated a significant weakness in the methodology. Air sampling pumps were often placed on the worker for a significantly longer period of time than the actual work performed under the RWP while using a respirator. As a result, the concentrations determined for the RWP job, against which the respiratory protection factors are applied, are diluted and non-conservative. The inspectors recommended that the actual times listed on the RWPs be used to determine the concentrations to which the workers were exposed while working under the RWP, instead of the total amount of time the pump was running. This would not necessitate a change in the licensee's air sampling program, but only in the methodology used to calculate the concentrations, and would result in conservative estimates of the airborne concentrations to which workers were exposed.

## 5.2 Respiratory Protection and Bioassay

The licensee maintains a respiratory protection program which includes the use of full-face and half-mask respirators. Full-face respirators were required for all RWP jobs with a potential for significant exposure to radioactive materials. Respiratory protection credit was taken for the use of full-face respirators in calculating employee exposures. Issuance records for required respirator use were maintained.

Employee training on respirator use was reviewed and found to be adequate. Fit testing was performed and documented annually by the RPO. Medical certification of the ability of workers to wear respirators had been obtained for all employees, although the inspectors noted that the annual certification for several workers was due to be renewed during March 1993. The RPO stated that the certifications were in the process of being scheduled.

All employees who work within the restricted area were required to provide urine samples on a quarterly basis. In addition, workers involved in RWP work provided additional samples as required by the RWP. Samples were provided onsite prior to beginning a shift.

Urine samples were analyzed in-house fluorometrically. Spikes, blanks, and duplicates were analyzed for quality assurance purposes along with each batch of specimen samples. Samples collected under RWPs were analyzed within two days, while routine samples were analyzed within four days. A review of urinalysis data showed all results to be below the initial action level of 15 ug/l uranium.

#### 5.4 External Exposure and Contamination Control

All site employees were provided with thermoluminescent dosimeters (TLDs) which were exchanged and analyzed quarterly. A review of data for 1992 showed that the highest quarterly result was 201 mRem, or 16 percent of the regulatory limit. Area TLDs were also placed at 35 locations within the mill. These TLDs were also exchanged quarterly. The highest area TLD result was 28 mRem per week near the settler tanks in the SX building.

External radiation surveys were also performed on a quarterly basis. The surveys were performed as part of a general walk through of all mill facilities. The average reading was 0.35 mR per hour, while the highest value measured was 10 mR per hour near the settler tanks. The south end of the SX building near the settler tanks and the yellowcake storage area were noted to be appropriately posted as "Radiation Areas" in accordance with 10 CFR 20.203.

Surveys for alpha surface contamination were performed weekly in eating areas, change rooms, and the administration building. Surveys for total and removable contamination were performed. All survey results were well below action levels specified in the license. Control of personnel contamination was achieved by requiring the use of protective clothing for all jobs with a significant potential for contamination. Further, all employees who work within the restricted area were required to shower or monitor with an alpha meter prior to leaving the site.

Items which were being released for unrestricted use were surveyed for gamma and alpha contamination. A review of survey documentation revealed that all results were well below release limits specified in the license. However, the review also revealed that surveys for alpha contamination had not been performed on a backhoe, a construction trailer, and various contractor materials released from the site on November 13, 1992. The failure to perform alpha surveys was identified as a violation of License Condition No. 14, which requires by reference that alpha surveys be performed prior to the release of items from the site (40-8681/9301-02).

### 5.5 Conclusion

The inspectors concluded that the licensee's radiation safety program was being conducted in accordance with license requirements, with the exception of the deficiencies identified above, and was adequate for a facility in a shut down status.

## 6 RADIOACTIVE WASTE MANAGEMENT (88035)

The inspectors toured the east embankment of tailings Cell 11. The licensee stated that precipitation amounts well above normal had filled Cell 11 with an addition foot of water since last fall. Runoff from the mill area had also contributed to this increase in water volume. The liner above the freeboard limit on Cell 11 was torn by vehicle traffic early in the year as a result of erosion of the protective soil cover by runoff from the mill area. The licensee had made temporary repairs to the liner and had channeled drainage water from the mill area through a temporary sluice over the damaged area to prevent further degradation. Additional work was planned for the liner as soon as the weather cooperated, and the tailings embankment area dried out. The licensee also expects to complete additional contouring of the area to reduce the potential for erosion. The inspectors reviewed the work conducted by the licensee and determined that all previous actions taken were appropriate.

The inspectors reviewed the documentation made during tailings dam inspections. The licensee conducts daily, weekly, monthly, quarterly, and annual inspections of the dams. Each inspection documents among other things blowing of tailings, exposed beach size, ground moisture, and solution elevation. Inspectors who conduct the daily, weekly and monthly embankment inspections were qualified by reviewing the tailings dam inspection procedure and signing off that they understood the procedure. The RPO conducts the quarterly inspection while a Registered Professional Engineer conducts and documents the annual inspection. No concerns were noted by the inspectors.

The licensee has installed a battery of automatic cannons around the tailings impoundment area to scare off water fowl. This operation was necessary to prevent water fowl from landing on the ponds and incurring injury from contacting acid solutions. These cannons fire automatically from dawn to dusk on random schedules, and appear to be quite effective.

The licensee's waste management program was in accordance with license requirements, although additional repair work on the Cell 11 liner and area contouring will be necessary.

## 7 TRANSPORTATION OF RADIOACTIVE MATERIALS (86740)

The licensee maintains a considerable inventory of barreled yellowcake within the restricted area for future sale. The inspectors noted that Umetco had not transported any yellowcake or other radioactive materials off site since the last inspection.

## 8 ENVIRONMENTAL PROTECTION (88045)

The licensee maintains five environmental monitoring stations. Each location has a high volume air particulate sampler, passive radon monitor, and environmental TLD. One location also supported a small weather station that recorded wind speed and wind direction. Filters from the particulate sampler were collected weekly and composited quarterly for off site analysis. Environmental TLDs and passive radon monitors were exchanged quarterly.

Soil samples were collected each August at five separate locations and sent off site for analysis. Vegetation samples were collected three times a year at three locations, and were also sent off site for analysis.

Surface-water samples were collected at two locations, Cottonwood Creek and West Water Canyon. Cottonwood Creek's flow was more consistent than West Water Canyon, and therefore Cottonwood was sampled quarterly while West Water was sampled annually. Sample analysis was conducted partly on site and partly off site by a vendor. The off site analysis was conducted for radiological parameters.

Ground-water samples were collected quarterly from eleven wells situated near the tailings impoundments. Sample analysis was also conducted on site and off site as with the surface waters. The licensee uses an air driven pump to retrieve the samples and prefilters all specimens. The sample hose was washed prior to each sampling day, and sampling was conducted from the wells with the least amount of contamination to the wells with the greatest amount of contamination.

The inspectors concluded that the licensee's environmental protection program met all license requirements.

## 9 EMERGENCY PREPAREDNESS (88050)

The inspectors reviewed the licensee's emergency procedures and found them to be acceptable. An annual review of all procedures was performed by the RPO as required. The inspectors also toured the mill and examined safety equipment to determine its status. No concerns were noted during the mill walk-through.

Umetco maintains an ambulance on site and has three qualified Emergency Medical Technicians on the staff. A medical clinic in Blanding, Utah is approximately eight minutes away. Monticello, Utah, approximately 30 minutes away by ambulance, has a hospital.

Evacuation drills were conducted twice a year since the last inspection with the last drill conducted in October 1992. Umetco maintains four emergency crews for fires and chemical releases. The licensee does not maintain a fire truck on site, but does maintain fire fighting cabinets and fire hydrants at eight locations. Umetco maintains 300,000 gallons of reserve capacity in its water tower for fire fighting purposes.

Umetco maintains an emergency generator as a source of electrical power. This generator can run the facilities lights, fans and critical processing equipment if need be, to prevent freeze up. The emergency generator was started on a monthly frequency to test operability.

No areas of concern were identified regarding the site emergency preparedness program.

#### 10 FOLLOWUP ON CORRECTIVE ACTIONS FOR VIOLATIONS (92702)

(Closed) Violation 40-8681/9101-01: Failure of the RPO to perform weekly inspections of the mill while on site.

The inspectors determined that the RPO had performed and documented weekly inspections while on site following the previous inspection. A subsequent amendment to the license allowed the RPO or his designee to perform the inspections.

## ATTACHMENT

### 1 PERSONS CONTACTED

#### 1.1 Licensee Personnel

- \*Wallace W. Brice, Maintenance Superintendent
- \*Gerald G. Ray, Production Supervisor
- \*Scott Schierman, Radiation Protection Officer
- \*Gerald F. Richards, Energy Fuels Nuclear, Inc. Representative
- Shannon Clark, Environmental Technician
- John Wilson, Safety Technician

#### 1.2 Accompanying Personnel

- \*Maxine Dunkelman, Health Physicist, Washington State Dept. of Health
- \*Identifies those present at the exit meeting.

### 2 EXIT MEETING

An exit meeting was conducted on March 11, 1993. During this meeting, the inspectors reviewed the scope and findings of the inspection. The licensee did not identify as proprietary any information provided to or reviewed by the inspectors.

## IFS Data Entry Form

Reviewed By: WJADate: 4/5/93Site/Name: Umetco White MesaReport Transmittal Date: 4/5/93Lead Inspector: PBGResponsible Org. Code: 4302Report End Date: 1/1Region: 4

Reactor/Vendor Inspection (IFS Option 1)

Docket Related/P21 Items (IFS Option 4)

Items Opened (Y/N):

Enter Log Number:

☒ Material Inspection (IFS Option 2)

LER Items (IFS Option 5)

SER (Y/N): N

Enter LER Number:

Letter (Y/N): YClear (Y/N): N

Non-Docket Related Items (IFS Option 6)

Report NBR

Docket NBR

A 93-0140-86A1

Materials Only

License NBR

SUA-1358

\*Docket Name

B

C

Update? (Y/N):

Opened IRLER/P21 LOG/IFS Number:

\*\*\*Sequence NBR: 01Item Type: VIO\*\*Severity: 4\*\*Supplement: 6

Status

\*UPD I/R

\*Proj. Closeout

\*Actual Closeout

10 CFR

Materials Only

License Cond.

Tie Down

A

1/11/1

B

1/11/1

C

1/11/1Title: Occupational Exposure Calculations

(55 character width)

\*Closeout Org:

\*Closeout EMP:

\*Contact EMP:

\*Procedure: 83822

\*Functl Area:

\*Cause CD:

\*\*EA Number:

\*\*NOV/NNC Issue Date: 1/1Text: Failure to perform Occupational Exposure calculations within one week of the end of the regulatory compliance period.

Update? (Y/N):

Opened IRLER/P21 LOG/IFS Number:

\*\*\*Sequence NBR: 02Item Type: VIO\*\*Severity: 4\*\*Supplement: 6

Status

\*UPD I/R

\*Proj. Closeout

\*Actual Closeout

10 CFR

Materials Only

License Cond.

Tie Down

A

1/11/1

B

1/11/1

C

1/11/1Title: Release of Equipment from the Restricted Area

(55 character width)

\*Closeout Org:

\*Closeout EMP:

\*Contact EMP:

\*Procedure: 83822

\*Functl Area:

\*Cause CD:

\*\*EA Number:

\*\*NOV/NNC Issue Date: 1/1Text: Failure to perform alpha surveys on equipment removed from the restricted area.

\* Optional Fields.

\*\* Severity, Supplement, and NOV/NCC only applicable to Violations; EA Number only applicable for Apparent Violations.

\*\*\* Sequence NBR is not applicable for docket related/P21, LER, or non-docket related items.

ITEMS CONTINUED? (Y/N): N