



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION IV  
URANIUM RECOVERY FIELD OFFICE  
BOX 25325  
DENVER, COLORADO 80225

JUN 08 1992

Docket No. 40-8905 ;

Quivira Mining Company  
ATTN: Bill Ferdinand  
6305 Waterford Blvd., Suite 325  
Oklahoma City, Oklahoma 73118

Dear Mr. Ferdinand:

SUBJECT: NRC INSPECTION REPORT 40-8905/92-01 (NOTICE OF VIOLATION)

This refers to the routine unannounced radiation safety inspection conducted by Mr. P. Garcia of this office on May 18-19, 1992, of the activities authorized by NRC Source Material License SUA-1473, and to the discussion of the findings held by the inspectors with members of your staff at the conclusion of the inspection. The enclosed NRC Inspection Report 40-8905/92-01 documents this inspection.

The inspection was an examination of the activities conducted under the license as they relate to radiation safety, and to compliance with the Commission's rules and regulations and the conditions of the license. The inspection consisted of selective examinations of procedures and representative records, interviews of personnel, and observations by the inspector.

During this inspection, certain of your activities were found not to be conducted in full compliance with NRC requirements. Consequently, you are required to respond to this matter in writing in accordance with the provisions of Section 2.201 of the NRC "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Your response should be based on the specifics contained in the Notice of Violation enclosed with this letter.

As a result of this inspection, the inspector concluded that the radiation safety program at the facility is functioning adequately with the exception of the deficiency identified concerning the respiratory protection program. The inspector also noted that interim stabilization of the tailings piles is proceeding in an efficient and thorough manner.

The response directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

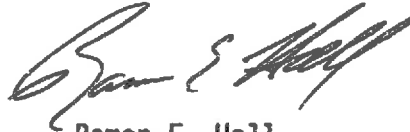
In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and enclosed inspection report will be placed in the NRC's Public Document Room.

OFFICIAL DOCKET COPY

JUN 08 1992

Should you have any questions concerning this letter, we will be please to discuss them with you.

Sincerely,



Ramon E. Hall  
Director

Enclosures:

1. Appendix A - Notice of Violation
2. Appendix B - NRC Inspection Report 40-8905/92-01

cc:

- A. Gebeau, Quivira
- B. Garcia, RCPD, NM
- E. Montoya, NMED

Quivira Mining Company

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JUN 08 1992

Cases Closed: 04008905630E  
04008905670E

bcc:

LFMB

PDR

Suspense File

Licensing Assistant, URFO

URFO r/f

LJCallan, RIV

GSanborn, RIV

RITS Operator

RSTS Operator

NMIS

JJaudon

RDMartin

RWise

MRodriguez, OC/LFDCB (4503)

DMB (IE-07)

LLUR Branch, LLWM

PGarcia

8905/92-01/PJG/92/05/22/INSP

PM:URFO  
PGarcia/lv  
06/5/92

DD:URFO  
EHawkins  
05/8/92

D:URFO:RIV  
REHall  
05/8/92

APPENDIX A

NOTICE OF VIOLATION

Quivira Mining Company  
Ambrosia Lake Mill

Docket No. 40-8905  
License No. SUA-1473

During an NRC inspection conducted on May 18-19, 1992, one violation of NRC requirements was identified. The violation involved the failure of the licensee to obtain a determination by a physician at least every 12 months that an individual user is physically able to use respiratory protective equipment. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1992)(Enforcement Policy), the violation is listed below:

10 CFR 20.103(c)(2) states, in part, that a licensee may make allowance for the use of respiratory protective equipment in estimating exposures of individuals to airborne radioactive material provided that the licensee maintains and implements a respiratory protection program that includes a determination by a physician at least every 12 months that the individual user is physically able to use the respiratory protective equipment.

Contrary to this requirement, the licensee took credit for the use of respiratory protective equipment numerous times in calculating exposures for four individuals between May and December 1991, although medical certification of their ability to use the equipment was last obtained on March 20, 1990.

This is a Severity Level IV Violation (Supplement IV)(49-8905/9201-01)

Pursuant to the provisions of 10 CFR 2.201, Quivira Mining Company is hereby required to submit a reply to this office, with a copy to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation if admitted; (2) the corrective steps which have been taken and the results achieved; (3) the corrective steps which will be taken to avoid further violations; and (4) the date when full compliance will be achieved. If an adequate reply is not received within the time specified in this Notice, an Order may be issued to show cause why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Dated at Denver, Colorado,  
this \_\_\_\_ day of \_\_\_\_ 1992

APPENDIX B

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

NRC Inspection Report: 40-8905/92-01  
Docket: 40-8905

License: SUA-1473

Licensee: Quivira Mining Company  
P.O. Box 218  
Grants, New Mexico 87020

Facility: Ambrosia Lake Mill

Inspection At: McKinley County, New Mexico

Inspection Conducted: May 18-19, 1992

Inspector: Pete J. Garcia Jr.  
Pete J. Garcia, Jr.  
Senior Project Manager

6/5/92  
Date

Approved: Ramon E. Hall  
Ramon E. Hall, Director  
Region IV, URFO

6/8/92  
Date

Inspection Summary:

Inspection conducted May 18-19, 1992, Report 40-8905/92-01.

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

Results: Within the nine areas inspected, one violation was identified as follows:

- ° The failure to obtain annual medical certification of the ability of individuals to safely use respiratory protective equipment in numerous instances where credit was taken for the use of the equipment in estimating exposures.

The inspector concluded that the radiation safety and environmental protection programs currently in effect are functioning adequately with the exception of the deficiency discussed above. In addition, the inspector noted that interim stabilization of the tailings piles is proceeding in an efficient and thorough manner. No major areas of concern were noted.

## DETAILS

1. Persons Contacted

A. Gebeau, General Manager  
\*P. Luthiger, Environmental Engineer/Radiation Safety Officer  
G. Trujillo, Environmental Technician  
A. Delgado, Senior Chemist  
G. Ross, Reclamation Engineer  
T. Fletcher, Superintendent-Maintenance and Reclamation

\*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Violation (40-8905/9102-01). The failure to maintain proper documentation of quality control tests for construction activities on the tailings pile and to use specified procedures for the tests pending NRC approval of correlation data for alternate test procedures. The inspector determined that adequate documentation has been maintained and the specified tests procedures have been utilized in meeting required test frequencies.

(Closed) Open Item (40-8905/9001-02). Lack of documentation to show that employees working in yellowcake areas had showered prior to leaving the site if they did not self-monitor. The inspector's interview of the individual primarily responsible for yellowcake drying and packaging activities indicated that showers were conscientiously taken by yellowcake workers prior to leaving the site. The inspector also reviewed site policies which stress that showers should be taken by all individuals who work with yellowcake.

(Open) Open Item (40-8905/9101-01). Inadequate documentation of the review of Standard Operating Procedures (SOPs). The inspector noted that adequate documentation was available for review of SOPs concerning operational activities, but only generic sign-off sheets were available for nonoperational activities. This item will therefore remain open.

3. Management, Organization, and Controls/Operations Review

Conventional ore processing sections of the Ambrosia Lake Mill remain on standby. The licensee has continued to extract uranium from mine water. In addition, Quivira performed processing of alternate feed materials received from Sequoyah Fuels Corporation (SFC) from March 22 to December 17, 1991. The processing included drying of the yellowcake using a radiant heating system and packaging the product in 55-gallon drums in enclosed packaging stations. The drying and packaging were performed in accordance with License Condition No. 38 of Source Material License SUA-1473.

The licensee continued to receive shipments of alternate feed materials from SFC. A review of records revealed that approximately 145 shipments of the feed materials had been received since May 1991. The material is stored onsite in thickener tanks. In addition, Quivira received nine shipments of uranium-bearing solution from the ion exchange circuit at the Homestake Uranium Mill.

The licensee described the organization of the radiation safety staff. The General Manager is the highest ranking corporate official onsite. The Environmental Engineer, who also serves as Radiation Safety Officer (RSO), reports directly to the General Manager. The RSO is assisted by a staff of two technicians.

The inspector reviewed the records of audits and inspections performed since the last NRC inspection. The inspection program at the mill consisted of daily inspections by a member of the radiation safety staff and weekly inspections by the RSO. All walkthrough inspections were properly documented. The inspector noted that the RSO produced a monthly summary report for the General Manager which summarized exposure records, environmental data, and inspection results. An annual ALARA audit was performed by the licensee that conformed to the requirements of Regulatory Guide 8.31.

The inspector reviewed the Standard Operating Procedures (SOPs) established for routine site activities and the Radiation Work Permits (RWPs) generated for nonroutine activities. The SOPs were observed to contain adequate detail regarding the job to be performed and covered all site activities. The SOPs had been reviewed by the RSO at least annually, although a weakness in review documentation identified during the previous inspection had not been completely remedied as discussed in Section 2 of this report.

RWPs were found to contain adequate information regarding the job to be performed and the precautions to be taken to minimize exposures. The RWPs were issued by the RSO or a radiation safety technician, although all RWPs were reviewed by the RSO prior to issuance. The inspector recommended that the RSO initial the RWPs issued by a technician to document his review. The inspector also noted that several RWPs had been issued for drumming yellowcake which had spilled onto the floor of the yellowcake dryer. The inspector recommended that an SOP be established for the job since it must be repeated periodically.

No violations or deviations were identified by the inspector.

#### 4. Operator Training/Retraining

Employees were required to attend introductory and annual refresher radiation protection training. Initial training consists of 40 hours of safety inspection with 8 hours of annual review thereafter. Radiation safety training was conducted for about 1.5 hours of the refresher training. Written tests were given to all employees following completion



of the training. All visitors and any contractors were given training appropriate to their stay or work onsite.

Prenatal training was included in the refresher training provided to all employees. However, specific prenatal training for female employees was not performed. The inspector recommended that copies of Regulatory Guide 8.13 be provided to female employees and the contents discussed with them, and that documentation of this training be maintained.

The inspector noted that the RSO had recently attended a training course covering the new 10 CFR 20. The attendance at the course should aid in the transition to the new requirements.

No violations or deviations were identified by the inspector.

#### 5. Maintenance/Surveillance Testing

Access to the restricted area was controlled by a four-strand barbed wire fence. The inspector noted that the fence was in good repair and was appropriately posted. The inspector also observed that notices as required by 10 CFR 19.11 were posted on employee bulletin boards.

The inspector performed an extensive tour of the yellowcake drying and packaging area. The original steam drying system was replaced by a radiant heat system to provide more economical drying of the relatively small amount of product generated during the current state of reduced operations. The three yellowcake packaging stations have also been enclosed to provide containment of any airborne yellowcake generated during the packaging process. No items of concern were observed.

The yellowcake drying and packaging area is serviced by three separate ventilation and effluent control systems. General ventilation in the area is provided by a Microdyne scrubber. A wet scrubber services the dryer enclosure, while a baghouse dust collector collects emissions from the packaging stations. The inspector noted that the vents for the baghouse are located immediately above the packaging stations within the enclosure and therefore provide good control of airborne emissions from the packaging operation.

The inspector reviewed records concerning the maintenance and operation of the effluent control systems. The records showed that the systems had been inspected and serviced prior to the start of drying operations. Further, hourly checks of operational parameters for the systems had been performed to assure proper operation. No items of concern were noted.

No violations or deviations were identified by the inspector.

## 6. Radiation Protection

### a. Internal Exposure Control

The inspector reviewed the in-plant air sampling program implemented by the licensee. Weekly samples for airborne uranium were collected from six locations within the yellowcake area. The samples were collected for 5 minutes using a sampler calibrated to draw about 21 cubic feet per minute. Breathing zone samples were collected during RWP jobs and yellowcake packaging operations using lapel samplers calibrated to draw 1.7 liters of air per minute (lpm). Air sample filters were counted using an alpha scintillation counter.

Radon daughter sampling was performed weekly at about 16 locations throughout the mill and the ion exchange facility. The samples were collected using air sampling pumps calibrated to draw 1.7 lpm. Samples were analyzed using an instant working level meter.

A review of data showed that all areas sampled were routinely below 25 percent of the maximum permissible concentration (MPC). Values for the drum filter and packaging stations were occasionally above 25 percent of MPC.

### b. Exposure Determination

The determination of internal exposures to airborne radioactivity was conducted by utilizing air sample concentration data, time cards for hours worked in airborne areas, and respiratory protection factors. The radiation safety staff performed time studies once a year on yellowcake workers for the purpose of determining occupancy times within areas. Time studies performed consisted of tracking the operators 8 hours a day, for 5 days a year. The most recent time studies were conducted in June 1991.

Breathing zone samples were used to calculate exposures for RWP jobs and yellowcake packaging activities. The inspector's review of the sampling methodology used revealed that the licensee uses a cyclone to separate the respirable and nonrespirable particles based on particle size. Respirable particles were considered to be those smaller than 10 microns in size. The inspector's review of information concerning the operation of the cyclone indicated that it is a passive system which provides the required size separation for an air flow of 1.7 lpm, which coincides with the calibrated flows on the lapel sampling pumps. No items of concern were noted.

The inspector's review of data showed that all calculated exposures were small fractions of the regulatory limit. The inspector concluded that this was due, in part, to the small amount of time spent by operators in the yellowcake area and the enclosures and ventilation provided for the yellowcake packaging stations.

c. Respiratory Protection

The licensee implemented a respiratory protection program which included the use of negative pressure half-mask, powered air purifying, and supplied air respirators. Credit for the use of respirators in estimating employee exposures was taken for certain RWP jobs and some yellowcake packaging activities. The inspector determined that annual training and fit testing was provided to all personnel required to wear respirators. Issuance records for respirators were maintained in a logbook.

A check of medical certifications for four individuals for whom respiratory protection credit was taken in estimating exposures in numerous instances between May and December 1991, revealed several inadequacies. In two instances, no records of recent medical evaluations could be located; in the third, a record of a pulmonary function test did not reveal the results of the test; and in the fourth, the pulmonary function test indicated minor negative results but no conclusion by the physician regarding the individual's ability to safely use respiratory protective equipment. Adequate medical certifications were last obtained on March 20, 1990. The failure to provide medical certification at least every 12 months while taking credit for the use of respiratory protective equipment was identified as a violation of 10 CFR 20.103(c)(2) [40-8905/9201-01].

d. Bioassay

The inspector reviewed the bioassay program in effect at the site. Urine samples were collected from yellowcake area workers at least quarterly, with the frequency increasing to monthly during drying operations. The inspector noted that the samples were collected and submitted at the required frequencies, and that quality assurance samples were submitted with specimen samples as required by the license. The inspector also noted that the licensee had recently begun using a sign-off sheet to provide assurance that required samples are provided in a timely manner.

A review of the bioassay data indicated that all results but four were less than the lower limit of detection of 5 ug/l uranium, and only one result exceeded the initial action level of 15 ug/l. A confirmatory sample showed a result less than 5 ug/l.

e. External Exposure

Thermoluminescent dosimeter (TLD) badges were issued to all site employees. Men exchange dosimeters on a quarterly basis and women exchange dosimeters monthly. A review of TLD data showed that the highest annual exposure incurred during 1991 was 620 mRem, while the highest exposure for the first quarter of 1992 was 135 mRem.

The licensee also performed semiannual surveys for external radiation. All results were less than 2.5 mR/hr, although the yellowcake storage area was posted as a "Radiation Area" due to the relatively higher values measured in the area. Survey instruments were calibrated semiannually.

f. Contamination Control

The licensee performed routine weekly surface contamination surveys, taking smears in 10 locations which include eating areas and change rooms. Nonroutine samples were collected quarterly in areas less prone to contamination such as business offices. All survey results were less than the licensee's internal action level of 250 dpm/100 cm<sup>2</sup>.

The licensee has a contamination control program that requires employees working in the yellowcake area to wear smocks, boots, and gloves. Coveralls were worn for daily operations and were laundered onsite. All personnel had to monitor themselves prior to exiting at the guard office or they had to shower. Records for employee's frisking were reviewed and no concerns noted. Weekly random surveys of the employees were conducted by the radiation safety staff. All survey instruments were calibrated quarterly and checked daily for proper operation.

The inspector reviewed records of items released from the site for unrestricted use. The records showed that surveys for alpha and gamma radiation were conducted on all items leaving the site. All survey results were well below the limits specified in the license.

One violation was identified by the inspector.

7. Radioactive Waste Management

The inspector toured the tailings retention system and observed that natural vegetation has started to establish itself on the top and sides of Pond No. 1, which has been covered with an interim soil cover. Approximately two-thirds of Pond No. 2 has been covered with 6 inches of cover, and the licensee expects to complete the placement of cover within about 30 days. Soil placement operations were ongoing at the time of the inspection.

The licensee is performing compaction of the upper layer of tailings and the soil in accordance with license requirements. Tailings are compacted to 90 percent of the standard proctor maximum density, while the soil layer is compacted to 95 percent of standard proctor. Laboratory density tests were being performed at a frequency of one test per 10,000 cubic yards, while field density tests were performed at a frequency of one test per 1000 cubic yards. The sand cone method was used for verifying adequate compaction, although nuclear density tests were used as a quick

means of identifying areas requiring additional compaction. A review of representative compaction records revealed no items of concern.

The inspector determined that the licensee had received shipments of crushed yellowcake drums from SFC for disposal. The drums were transported in plywood crates and buried in trenches excavated in Pond No. 2. The inspector visited an open burial trench and observed no items of concern.

A shipment of waste was also received from an in situ leach facility for disposal in May 1991. Documentation maintained by the licensee indicated that drums were checked to verify fullness, and three drums determined to not be completely full were buried without lids to eliminate void space. Barrels containing contaminated scrap were emptied prior to burial.

No violations or deviations were identified by the inspector.

#### 8. Transportation of Radioactive Waste

A review of transportation records indicated that records were kept for incoming and outgoing shipments. Byproduct material was generally shipped as slurry although two shipments of dried yellowcake were made. The shipping papers for representative shipments were reviewed. No deficiencies were noted during the review.

The licensee performed alpha and gamma surveys of each yellowcake barrel and the trucks. A spill list and emergency instructions were included with each shipment.

No violations or deviations were identified by the inspector.

#### 9. Environmental Protection

The inspector reviewed the environmental monitoring program in effect at the site. The licensee performed air particulate sampling, radon sampling, external radiation monitoring, and soil and vegetation sampling at five locations in accordance with the license. In addition, ground and surface water sampling was performed as required.

Data were submitted to the NRC in accordance with 10 CFR 40.65 and the license by letters dated August 30, 1991, and February 28, 1992. The inspector reviewed the data and determined that all values were well below the respective MPC with the exception of several radon values. The mill is located in an area heavily impacted by previous mining activities and includes several mine ventilation shafts near the site. Based on the fact that the licensee has almost completed covering all exposed tailings, the inspector concluded that the elevated concentrations were due primarily to contributions from mining and not NRC-licensed activities. In addition, no anomalous trends were noted during the inspector's review of the data.

No violations or deviations were identified by the inspectors.

10. Emergency Preparedness

The site RSO and two environmental engineers were the emergency crew and were trained for emergency response. All employees received emergency first aid training, and emergency drills were conducted semiannually.

The licensee maintains an ambulance and a fire truck onsite. The fire truck could utilize one of eight fire hydrants or a tanker truck kept onsite for its water supply. The fire fighting water is supplied by a reservoir. There is no emergency power available onsite.

No violations or deviations were identified by the inspectors.

11. Exit Interview

The inspector met with a licensee representative at the conclusion of the inspection and discussed the scope and findings of the inspection.