



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

September 24, 2004

Mr. John Vaselein, Radiation Safety Officer
and Manager
Environmental and Regulatory Services
COGEMA Mining, Inc.
P. O. Box 730
Mills, Wyoming 82644-0730

SUBJECT: NRC INSPECTION REPORT 40-08502/04-001

Dear Mr. Vaselein:

This refers to the inspection conducted on August 26, 2004, at the Irigaray and Christensen Ranch facilities. The inspection consisted of a routine review of site operations, with an emphasis on your radiation protection, groundwater operations, and environmental monitoring programs. A final exit briefing was held with you and members of your staff at the conclusion of the inspection on August 26, 2004. The enclosed report presents the results of that inspection. Overall, the inspection determined that you have continued to operate the uranium production facility in a safe and effective manner.

Based on the results of this inspection, no violations or deviations were identified; therefore, no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Ms. Judith Walker at 817-860-8229 or the undersigned at 817-860-8197.

Sincerely,

/RA/

Jack E. Whitten, Chief
Nuclear Materials Licensing Branch

Docket No.: 40-08502
License No.: SUA-1341

Enclosure:
NRC Inspection Report
040-08502/04-001
cc w/enclosure:

COGEMA Mining Corporation

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Mr. David Finley
Wyoming Department of Environmental Quality
Solid and Hazardous Waste Division
122 West 25th Street
Cheyenne, Wyoming 82002

Bob Giurgevich, District III Supervisor
Wyoming Department of Environmental Quality
Land Quality Division
1043 Coffeen Ave., Suite D
Sheridan, Wyoming 82801

Mr. Pat Mackin, Assistant Director
Systems Engineering & Integration
Center for Nuclear Waste Regulatory Analyses
6220 Culebra Road
San Antonio, Texas 78238-5166

Wyoming Radiation Control Program Director

bcc w/enclosure (via ADAMS distrib):

DM Gillen

EBrummett

MASatorius

JEWhitten

CLCain

JLWalker

NMLB

KEGardin

MIS System

RIV Nuclear Materials File - 5th Floor

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No. 40-08502
License No. SUA-1341
Report No. 40-08502/04-001
Licensee: COGEMA Mining Corporation
Facilities: Irigaray/Christensen Ranch In-Situ Leach Facilities
Location: Johnson and Campbell Counties, Wyoming
Dates: August 26, 2004
Inspector: Judith Walker, Health Physicist
Nuclear Materials Licensing Branch
Approved By: Jack E. Whitten, Chief
Nuclear Materials Licensing Branch
Attachment: Supplementary Information

EXECUTIVE SUMMARY

Irigaray and Christensen Ranch In-Situ Leach Facilities NRC Inspection Report 40-08502/04-001

This inspection included a review of site status, management organization and controls, in-situ leach (ISL) operations, radioactive waste management, radiation protection, environmental protection, and followup of event reports on excursions and spills. Overall, the licensee was operating the facility in a safe and effective manner.

Management Organization and Controls

- The inspector determined that the licensee had both organization and procedures in place to adequately implement the performance-based license (PBL) and staffing levels were acceptable for the work in progress at the facility (Section 2).

In-Situ Leach Operations and Radioactive Waste Management

- Site activities appeared to have been conducted in accordance with applicable license conditions and regulatory requirements. No significant health or safety concern was identified by the inspector during the tours of the Irigaray and Christensen Ranch sites (Section 3).

Radiation Protection

- The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the conditions of the license. Occupational exposures were determined by the inspector to be well below the NRC allowed annual total effective dose equivalent exposure limit (Section 4).

Environmental Protection

- The licensee's groundwater monitoring program was determined to be in compliance with license requirements. Decommissioning activities continued at the Irigaray facility and the Christensen Ranch evaporation ponds. The evaporation ponds were determined by the inspector to be in good condition during the inspection (Section 5).
- The licensee continued to progress towards completing restoration activities at the Irigaray and Christensen Ranch wellfields. The water treatment units and surface impoundment capacity appeared adequate to handle continuing restoration activities (Section 5).

Report Details

1 Site Status

The Irigaray project started commercial ISL extraction operations during November 1978. The central processing facility is located at the Irigaray site, while the Christensen Ranch site is a satellite facility for the Irigaray plant. The licensee had submitted a decommissioning plan for NRC approval in May 2000. The licensees' ISL production operations had ceased at the Christensen facility in June 2000, and all ISL extraction operations had ceased at the Irigaray site.

The licensee has continued to recover uranium through groundwater restoration operations, since the last inspection. No uranium was dried or shipped during calendar year (CY) 2003 and to the date of this inspection in CY 2004. At the time of the inspection, the licensee had approximately 100,000 pounds of yellowcake slurry stored in the thickner tanks.

The licensee indicated that Mine Unit (MU) 2 was near the stabilization phase of restoration, MU 3 was undergoing hydrogen sulfide gas (H₂) treatment to enhance selenium and uranium reduction, and MU4 and MU 5 were in the stabilization phase of restoration. The inspector also determined that MU 6 was undergoing active reverse osmosis and that the licensee had constructed MU7, but the unit had never been operational. Consequently, the licensee had not planned groundwater restoration for this wellfield.

2 Management Organization and Controls (88005)

2.1 Inspection Scope

The organizational structure was reviewed to ensure that the licensee had established an effective organization with defined responsibilities and functions. Also, the utilization and implementation of the licensee's performance-based license (PBL) was reviewed.

2.2 Findings and Observations

a. Management Organization

Staffing requirements for the licensee are provided in License Condition 9.3. This license condition in turn refers to the license renewal application which included an organization chart dated October 30, 1995.

At the time of this inspection, the licensee had an onsite staff of 18 employees. The licensee's onsite radiation protection and environmental monitoring staff positions remained filled with qualified individuals, and the onsite organizational structure agreed with the conditions of the license.

b. Performance-Based License Review

License Condition 9.4 states, in part, that the licensee may, under certain conditions and without prior NRC approval, make changes in the facility or processes, make changes to procedures, or conduct tests and experiments not presented in the license application.

The licensee's assessments for changes to items included in the application and under the provisions of License Condition 9.4 were made by the SERP. For CY 2002 through the date of this inspection in CY 2004, the licensee had not held any SERP meetings nor made any changes to its license. The licensee's implementation of the PBL had correctly ensured that changes made under the provisions of License Condition 9.4 did not negatively impact the licensing basis of the site.

c. Site Procedures

In accordance with License Condition 9.6, standard operating procedures (SOPs) are required to be established and followed for all operational process activities involving radioactive materials that are handled, processed, or stored. Additionally, all written procedures will be approved in writing and reviewed annually by the radiation safety officer (RSO).

The inspector verified that all SOPs had been reviewed and revised to incorporate the provisions of the PBL. All activities observed during the inspection were in compliance with established procedures. The RSO had conducted the annual review of SOPs for CY 2003 and to the date of this inspection in CY 2004.

2.3 Conclusions

The inspector determined that the licensee had both organization and procedures in place to adequately implement the PBL and staffing levels were acceptable for the type and scope of work in progress at the facility.

3 Operations Review (88020); In-Situ Leach Facilities (89001)

3.1 Inspection Scope

A site tour was conducted by the inspector. The inspector's tour verified that site activities were being conducted in accordance with applicable regulations, conditions of the license, and to ensure that operational controls were adequate to protect the health and safety of the workers and members of the general public.

3.2 Findings and Observations

a. Site Tour

During the plant tour, site buildings, equipment, fences, and gates were observed. Site perimeter postings required by License Condition 9.11 were noted by the inspector to be in place at all entrances to the site. No significant health or safety concern was identified during the tour.

b. Process Plant Operations

Licensee Condition 10.1 restricts the licensee from injecting lixiviant into production wells for producing yellowcake. License Condition 10.5 authorizes the licensee to produce 50,000 pounds of yellowcake per year. During CY 2000 and CY 2003, the licensee's production of yellowcake was below the limit specified in the license. The licensee plans to conduct drying operations in the last quarter of CY 2004 or the first quarter of CY 2005. At the time of this inspection, the licensee had approximately 100,000 pounds of wet yellowcake in storage in the thickener tank.

3.3 Conclusions

Site activities appeared to have been conducted by the licensee in accordance with applicable license conditions and regulatory requirements. No significant health or safety concern was identified during tours of the Irigaray and Christensen Ranch sites.

4 Radiation Protection (83822)

4.1 Inspection Scope

The purpose of this portion of the inspection effort was to determine if the licensee's radiation protection program was in compliance with requirements established in the license and 10 CFR Part 20 regulations.

4.2 Findings and Observations

a. Audit Program Review and Personnel Exposures

In accordance with License Condition 12.6, an annual as low as is reasonably achievable (ALARA) audit of the radiation safety program is required to be performed in accordance with Regulatory Guide 8.31. The licensee performed ALARA audits for CY 2002 and CY 2003 both audits were found to be thorough and comprehensive.

The inspector reviewed personnel exposure data for CY 2002 and CY 2003 to determine the licensee's compliance with License Condition 11.7. License Condition 11.7 requires the licensee to assess personnel exposures in accordance with the provisions of 10 CFR 20.1502 and Section 5.7 of the license application. Eight workers that wore dosimeters during CY 2002, had measured doses. The highest total effective dose equivalent to an individual was 63 millirem for CY 2002. In CY 2003, 19 workers were badged and the highest total effective dose equivalent was 26 millirem.

Additionally, the inspector reviewed CY 2002 and CY 2003 airborne particulate and radon progeny air sampling data. The inspector determined that the licensee had conducted air sampling as required by License Condition 10.10. The licensee had collected and analyzed the air samples on a monthly basis as required by the license.

Overall, the inspector determined that personnel exposures for CY 2002 and CY 2003 were a small percentage of the allowable limit of 5,000 millirem per year specified in 10 CFR Part 20.

b. Decommissioning Recordkeeping

In accordance with 10 CFR Part 40.36(f)(1), decommissioning records are required to be permanently maintained, including a description of the restricted area, spills, and any unusual events. The licensee was noted by the inspector as having maintained these records in onsite files.

c. Personal and Equipment Contamination Monitoring

License Condition 10.11 states, in part, that employees shall monitor themselves with an alpha survey instrument prior to exiting the site restricted areas. The inspector observed that workers routinely conducted personnel contamination surveys before leaving the process areas. The inspector observed workers functionally checking the contamination survey instruments prior to each use.

License Condition 9.8 stipulates, in part, that the release of equipment or packages from the restricted area shall be in accordance with the attachment to the license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials." The licensee's equipment release records were reviewed for CY 2002 through the date of this inspection in CY 2004. The licensee had maintained extensive records of equipment that had been released from the site. No item was identified by the licensee as having been inappropriately released from the site.

d. Bioassay Program Review

The bioassay program requirements are listed in License Condition 10.12 states, in part, that the licensee shall implement the bioassay program discussed in Regulatory Guide 8.22, Bioassay at Uranium Mills, and in Section 5.7.5, "Bioassay Program," of the approved license application. The licensee's bioassay program consisted of urine sampling for uranium content, comparison with baseline sampling data of all site workers, and conducting monthly sampling of process workers assigned to areas where the possibility of yellowcake inhalation existed. In addition, urine samples were obtained as stipulated by the conditions outlined in the licensees' radiation work permits. The licensee also obtained blank and spiked samples for quality control purposes. The bioassay samples were analyzed by an third-party laboratory located offsite..

The licensee's CY 2004 bioassay records indicated that one individual exceeded the first action level of 15 micrograms per liter ($\mu\text{g/l}$) uranium in urine. The individual's bioassay measured 24 $\mu\text{g/l}$ uranium. The licensee investigated the bioassay result and determined that the SOP for performing eluant precipitation (SOP IR-19) needed to be revised to require the use of a respirator.

The inspector reviewed the revised SOP for this procedure and determined that the licensee had adequately investigated the exceedance.

e. Radiation Surveys

Licensee procedures require that all radiation survey instruments shall be operationally checked before each use. The radiation protection equipment in service at the plant sites were inspected by the inspector for operability. All radiation detection equipment used for personnel scanning and frisking were found to be properly calibrated and appeared to be fully functional. Each instrument responded accordingly when tested with a check source. Radiation survey records and instrument calibration records reviewed by the inspector were found to be acceptable.

Routine ambient gamma exposure rate surveys are required by License Condition 10.1. Specifically, Section 5.7.2.1 of the Christensen Ranch license application specifies that the gamma surveys be performed semiannually or more frequently when an action level is exceeded. All site gamma exposure rates measured by the licensee were less than 5 millirem/hour at Christensen Ranch and at Irigaray. The inspector observed the licensee perform radiation surveys using a microRoentgen survey meter. No radiation areas in excess of 5 millirem/hour were identified by the inspector during the site tour at either the Irigaray or Christensen Ranch sites.

f. Radiation Work Permits

License Condition 10.9 requires the licensee to use radiation work permits (RWPs) for all non-routine work where the potential for significant exposure to radioactive material exist and no applicable SOP exists. The inspector reviewed RWPs that were written in CY 2003 (33 RWPs) and to the date of the inspection in CY 2004 (5 RWPs). The inspector determined that the licensee had implemented an adequate RWP program .

4.3 Conclusions

The licensee had implemented a radiation protection program that met the requirements established in 10 CFR Part 20 and the conditions of the license. Occupational exposures were determined by the inspector to be well below the NRC's allowed annual total effective dose equivalent exposure limit.

**5 Environmental Protection (88045)
Radioactive Waste Management (88045)**

5.1 Inspection Scope

License Condition 12.1 requires the licensee to implement the effluent and environmental monitoring program. At the time of the inspection, the licensee's environmental monitoring program consisted of sampling airborne particulates (during dryer operations), surface water, and groundwater. Portions of the environmental monitoring program were reviewed to assess the effectiveness of the licensee's program and to evaluate the effects, if any, of site activities on the local environment.

5.2 Observations and Findings

a. Groundwater Monitoring Program

License Condition 11.2 states, in part, that all designated monitor wells shall be sampled and tested for upper control limits (UCLs) established in accordance with License Condition 10.4 and if routine sampling results indicate an exceedance of at least two UCLs, a second sample shall be collected. Confirmed exceedances of the UCLs in monitoring well samples shall be reported to the NRC. A review of selected licensee monitoring well data since the previous inspection did not identify any wells in excursion status that had not been previously reported to the NRC. The inspector also reviewed records of spills and excursions reported to NRC project management. The licensee's groundwater monitoring program was determined to be in compliance with the license requirements.

b. Evaporation Impoundment Tour

The physical condition of all lined impoundments at both the Irigaray and Christensen Ranch sites was evaluated. Ponds at the Irigaray facility included Pond A, C, RA, and E. In CY 2003 the licensee began decommissioning Pond A and RA, by removing the liner, the leak detection system, and sludge. All decommissioned items were transported off-site for disposal. The inspector toured Pond A and observed the licensee performing surveys using a microRoentgen (μR) survey meter. Survey readings ranged from 20-35 $\mu\text{R}/\text{hour}$. The inspector noted that background radiation readings at the site the ranged from 15-20 $\mu\text{R}/\text{hour}$.

The licensee indicated to the inspector that COGEMA will continue reclamation activities at Pond A and RA until radiation levels are closer to background. Ponds at the Christensen Facility included RB, B, and D. Ponds RB and B at the time of this inspection were being used to store water and Pond D was used to store salt. Ponds 1, 2, 3, and 4 at the Christensen Ranch site were in good physical condition, with no visible tears or holes in the liner material.

c. Environmental Monitoring Program Review

License Condition 11.3 states, in part, that the licensee shall implement the effluent and environmental monitoring program specified in Section 5.8 of the license application. The semiannual effluent reports for the year CY 2002 and CY 2003 were reviewed. The reports were submitted to the NRC on February 27 2003, and February 24, 2004. The CY 2002 sample results were comparable to those sample results taken to date of this inspection in CY 2004. During CY 2002 and CY 2003, and to the date of this inspection in CY 2004, the licensee had collected and evaluated all environmental monitoring samples as required by the license.

d. Groundwater Restoration Program

The groundwater restoration program was reviewed by the inspector to assess the status of wellfield restoration activities at the Irigaray and Christensen Ranch facilities. The licensee states that COGEMA has initiated restoration in all of its wellfields at the Irigaray and Christensen Ranch facilities.

The licensee provided a guided tour of the satellite facility at Christensen Ranch and the processing facility at Irigaray. The inspector noted several reverse osmosis water treatment units in operation.

The licensee indicated that Mine Unit (MU) 2 was near the stabilization phase of restoration. MU 3 was undergoing hydrogen sulfide gas (H₂) treatment to enhance selenium and uranium reduction. Also, MU4 and MU 5 were in the stabilization phase of restoration. The inspector noted that MU 6 was undergoing active reverse osmosis. The licensee indicated that MU7 was constructed, but never considered operational, consequently, no groundwater restoration was planned for this wellfield.

e. Effluent Releases to Surface Waters

The Willow Creek surface water discharge outfalls at the Irigaray and Christensen Ranch facilities were examined to evaluate if the licensee was in compliance with 10 CFR Part 20. Willow Creek intermittently flows through parts of the licensee's site. The inspector reviewed the surface water sample results for CY 2002 and CY 2003 and determined that all samples were less than the 10 CFR Part 20, Appendix B, Table 2, Effluent Concentration Limit for all radionuclides analyzed.

f. Radioactive Waste Shipments

During CY 2003 and to the date of this inspection in CY 2004, the licensee continued to decommission Evaporation Pond A and RA. During CY 2003 and to the date of this inspection in CY 2004, the licensee had completed a total of 92 and 95 waste shipments, respectively. The inspector reviewed the licensee's shipment records. Shipping records and manifest reviewed by the inspector indicated that the licensee

had conducted contamination surveys on each container before it was released from the controlled area and transported from the facility. The inspector concluded that the licensee had released radioactive shipments in accordance with applicable license conditions and NRC regulations.

5.3. Conclusions

The licensee's groundwater monitoring program was determined to be in compliance with license requirements. Decommissioning activities undertaken by the licensee at the Irigaray facility and the Christensen Ranch were noted by the inspector to be in good condition during this inspection.

The licensee continued to progress towards completing ground water restoration activities at the Irigaray and Christensen Ranch wellfields. The water treatment units and surface impoundment capacity appeared adequate to handle continuing restoration activities.

6 Exit Meeting Summary

The inspector presented the preliminary inspection results to the representatives of the licensee at the conclusion of the inspection on August 26, 2004. Licensee representatives acknowledged the findings as presented. The licensee did not identify any information reviewed by the inspector as proprietary information.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

W. Heili, Manager, Operations
J. Vasein, Radiation Safety Officer
D. Wichers, General Manager, ISL & Reclamation Operations

INSPECTION PROCEDURES USED

83822	Radiation Protection
88005	Management Organization and Controls
88020	Operations Review
88035	Radioactive Waste Management
88045	Environmental Monitoring
89001	In-Situ Leach Facilities

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ALARA	annual as low as is reasonably achievable
ECL	Effluent Concentration Limit
ISL	in-situ leach
µg/l	microgram per liter
µR	microRoentgen
MU	mine unit
PBL	Performance-Based License
RSO	radiation safety officer
RWP	radiation work permit
SERP	Safety and Environmental Review Panel
SOP	standard operating procedure
UCL	Upper Control Limits