UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

January 8, 2004

Docket No. 04008980 License No. SMB-1541

Edele Hovnanian
President
Heritage Minerals Inc.
One Hovchild Plaza
4000 Route 66
Tinton Falls, NJ 07753

SUBJECT: INSPECTION 04008980/2003001, HERITAGE MINERALS INC., LAKEHURST, NEW JERSEY SITE

Dear Ms. Hovnanian:

On February 7- December 11, 2003, Craig Gordon of this office conducted a safety inspection at the Lakehurst, New Jersey site of activities authorized by the above listed NRC license. The inspection was an examination of your licensed activities as they relate to radiation safety and to compliance with the Commission's regulations and the license conditions. The inspection consisted of observations by the inspector, interviews with personnel, and a selected examination of representative records. The findings of the inspection were discussed with you at the conclusion of the inspection.

Within the scope of this inspection, no violations were identified.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at http://www.nrc.gov/reading-rm.html. No reply to this letter is required.

Your cooperation with us is appreciated.

Sincerely,

Original signed by Ronald R. Bellamy

Ronald R. Bellamy, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure: NRC Inspection Report No. 04008980/2003001 w/Attachments

cc w/encl:
Anthony J. Thompson, Esquire
State of New Jersey

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	04008980/2003001
Docket No.	04008980
License No.	SMB-1541
Licensee:	Heritage Minerals, Inc.
Address:	4000 Route 66 Tinton Falls, NJ 07753
Location Inspected:	Lakehurst, New Jersey
Inspection Period:	February 7- December 11, 2003
Inspector:	Craig Z. Gordon Senior Health Physicist
Approved By:	Ronald R. Bellamy, Chief Decommissioning and Laboratory Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Heritage Minerals, Inc.
NRC Inspection Report No. 04008980/2003001

Between February 7, 2003 and December 11, 2003, an inspection was conducted of decommissioning activities being performed at the Heritage Minerals, Inc., Lakehurst, NJ facility. Areas inspected included radiological controls associated with demolition and removal of mill process buildings, removal of contaminated soil, review of the licensee's final radiological survey, and conduct of the NRC confirmatory survey prior to license termination.

No violations were identified. The organizational structure and management involvement adequately support the planned decommissioning activities. Facilities and equipment provided by the licensee in support of the decommissioning activities were available and used effectively. Although the results of the licensee's final survey indicated that required soil remediations were completed, results of the NRC confirmatory survey for soils indicated that pockets of source material in excess of licensable quantities were found to remain on the property. Demolition, decontamination, and removal of mill buildings and equipment were completed in accordance with NRC unrestricted release guidelines.

REPORT DETAILS

I. Organization and Scope of the Program

a. Inspection Scope

Review of the Heritage Mineral's Inc. (HMI) organizational structure to determine the involvement of management and licensee contractor personnel in decommissioning activities.

b. Observations and Findings

The inspector reviewed licensee documents and interviewed licensee/contractor personnel to determine the organizational structure, interface effectiveness, and staff involvement in the decommissioning activities. From interviews with HMI management, their legal counsel, contractor, and site personnel, an adequate organizational structure was in place to support decommissioning activities. Throughout the decommissioning effort, HMI management provided weekly e-mails which reported the status of current site activities, and those planned for the following week. NRC held periodic status calls with the property owner to discuss progress of remediation activities.

A new decommissioning contractor, Enercon Services, Inc. (ENERCON), was hired to manage site activities related to radiological controls. Their initial efforts involved a review of plant operations history, characterization data, and radiological surveys to determine what additional site remediations were necessary for the process mills and outdoor areas. ENERCON personnel were primarily responsible for daily control of contamination. Good radiation safety practices were maintained during razing of mill buildings, excavation and removal of material, soil sampling, and final surveys. The HMI site manager was involved in all decisions related to contractor work onsite. ENERCON personnel provided management oversight of HMI's primary decommissioning activities, particularly with regard to building demolition and excavation of contaminated material.

The licensee undertook a final status survey in April 2003 in an attempt to justify release for unrestricted use. The results were provided to the NRC on June 26, 2003, and the licensee's data supported release for unrestricted use. An NRC confirmatory survey was performed September 8-10, 2003. In preparation for this survey, NRC held conference calls with HMI management and ENERCON staff to develop the scope of the survey plan. Planning for the NRC confirmatory survey was based on radiological surveys performed by HMI's previous decommissioning contractor, Radiation Science, Inc. (RSI), and final status surveys performed by ENERCON, which showed remediation of licensed areas was completed. NRC arranged for the confirmatory survey to be performed under contract by the Oak Ridge Institute of Science and Education (ORISE). The final ORISE confirmatory survey plan (Attachment 1) was discussed and reviewed with licensee representatives.

c. Conclusions

The organizational structure, management involvement, and contractor support implemented planned decommissioning activities, and ensured HMI's readiness for the NRC confirmatory survey.

II. Decommissioning and Remediation Activities

a. Inspection Scope

Decommissioning activities related to completing the remediation of mill buildings and outdoor areas in preparation for the licensee's final status survey and NRC confirmatory survey.

b. Observations and Findings

After the NRC license was issued in 1991, HMI began to recover waste material containing concentrated levels of monazite which resulted from the mineral extraction process. The monazite pile was stored in a fenced location adjacent to the dry mill. When HMI operations were terminated, the licensee took actions to initiate final site decommissioning, including cleaning and decontamination of both mills and removal of contaminated soil. In the 1997 document, "Final Status Survey Plan (FSSP) for License Termination of Heritage Minerals License No. SMB-1542", specific activities were proposed to complete the site decommissioning. This document was reviewed and approved by NRC on October 19, 1999 and is considered the decommissioning plan.

In 2001, the monazite pile was removed and shipped offsite. The licensee contracted RSI to perform cleanup of mill buildings and conduct the final status survey prior to license termination. When the work was completed, results of the RSI final survey report showed the mills and soil were remediated to satisfy NRC release guidelines for unrestricted use.

The NRC performed confirmatory survey activities using ORISE in December 2001. Results of ORISE survey activities found residual contamination in excess of the unrestricted use guidelines. Elevated radioactivity levels were identified on building and equipment surfaces of the wet and dry mills. In addition, pockets of soil contamination were found in and around the monazite pile footprint, while unremediated soil near the dry mill was found to exceed unrestricted release levels. Results of samples taken in selected outdoor areas exceeded the 10 pCi/g criteria of the FSSP for total uranium and total thorium. For indoor areas, it was determined that the licensee used an ineffective method to measure beta contamination on equipment surfaces.

NRC approved the Decommisioning Plan (FSSP) October 19, 1999, and as of November 2002, HMI had not completed the decommissioning. Since HMI failed to complete decommissioning of the facility within the 24 month period following NRC approval of the decommissioning plan as required by 10 CFR 40.42 (h)(1), a pre-decisional enforcement conference was held in January 2003 to discuss potential enforcement against the licensee. NRC enforcement action is being held in abeyance pending completion of site decommissioning relative to the licensee's commitments

made at the enforcement conference, and confirmed in their letter dated March 10, 2003. Included in the letter was a proposed plan and schedule to complete decommissioning activities by removing pockets of licensable material from outdoor areas and decontaminating mill buildings in accordance with NRC guidance.

To determine the extent and location of additional material identified by ORISE, in 2002 HMI conducted a more comprehensive process history analysis than what was described in the FSSP. According to the updated process history report, individual circuits of the mill operations could be shut down during equipment malfunctions while the mill continued to operate. If a particular circuit was shut down, mineral concentrates containing monazite sands continued to build up, and allowed to accumulate on the ground just outside the mill. The area was regraded as material became stockpiled. The additional material considered for remediation was addressed in a followup radiological characterization performed by RSI. In the November 2002 report titled, "Characterization Survey for Heritage Minerals, Inc.," licensable concentrations of source material were found in the soil around areas south of the dry mill building and at certain locations within the monazite pile footprint.

In followup discussions with the licensee's staff and legal counsel, agreement was reached on the scope of final site remediation for soil and the mill buildings. Residual material in need of further cleanup was identified in the letter dated March 10, 2003 and also in the letter of May 6, 2003 from A. J. Thompson, counsel to HMI, to R. Bellamy, NRC. The letters adequately described the agreements, and the licensee's plan to complete remediation of the mills and contaminated soil within the area affected by former operations. Further remediation was based on:

- information provided in the process history report
- mass balance analysis performed by SENES Consultants Limited (licensee contractor) of licensed material generated from former operations compared to material removed from the site
- limited source material migration due to chemical insolubility of the heavy minerals contained within the processed fraction that was discharged to the monazite pile during routine operations
- color variation of processed material remaining in the monazite pile
- measurement of contamination on equipment surfaces in the mills to meet NRC guidance for acceptable contamination levels

Actions described in the letters included 1) demolition and decommissioning of mill buildings, 2) decontamination of scrap metal to meet NRC guidelines for acceptable contamination levels, 3) removal of "fugitive licensable material" [1] found within the

[1]fugitive licensable material is noted in the licensee's May 6, 2003 letter as additional source material identified in the RSI and ORISE reports in need of further remediation

monazite pile footprint and in pockets of contaminated soil found outside the pile near the dry mill, to meet approved FSSP criteria (10 pCi/g for total U and 10 pCi/g for total Th), and 4) performance of final radiological surveys to ensure that residual licensable material identified in the ORISE and RSI reports was removed from the site.

Proposed decommissioning activities and schedule to complete work were discussed with HMI representatives and described in the licensee's May 6, 2003 letter. ENERCON initiated work activities by excavating material around the former monazite pile area, south of the dry mill. Contaminated soil was removed from areas where surface scans showed radiation readings above 300,000 cpm (beta). Soil removal continued until radiation readings were reduced to 40,000 cpm (beta). The completed excavation left a small trench located near the pump house and monazite pile footprint. Soil samples were taken across the bottom of the trench, and in locations where ORISE sample results from the December 2001 survey exceeded licensable quantities of material. A global positioning system (GPS) was used to identify sample locations. Licensee results were reported in the document entitled, "Removal of Fugitive Licensable Soil, Heritage Minerals, Inc." dated June 26, 2003. Licensee sample results for all excavated locations indicated that residual licensable material was remediated to levels below 10 pCi/g total thorium and 10 pCi/g total uranium.

Additional licensee measurements were taken approximately one meter away from each excavated location. The purpose of the additional measurements was to determine that residual material (showing elevated thorium concentrations) placed in the area prior to licensing was below the unimportant concentration level for source material described in 10 CFR 40.13. Licensee results of soil samples taken at locations adjacent to the excavations were below source material concentrations (116 pCi/g) for total thorium. Based on the results of the ENERCON survey, arrangements were made to conduct the NRC confirmatory survey.

The ORISE survey was conducted on September 8-10, 2003. Gamma surface scans were performed over the designated area around the wet and dry mill building pads, as noted in the report, "Confirmatory Survey of Portions of the HMI Facility, Lakehurst, NJ, Phase 2," dated December 11, 2003 (Attachment 2). Locations which showed elevated direct exposure rates were selected for soil samples. GPS locations from the ENERCON survey were also selected for confirmatory measurements. A total of 41 surface and subsurface soil samples were collected from the monazite pile footprint, the area between the dry mill pad and pile footprint (including waste material recovered from equipment decontamination activities), the adjacent trench excavation, and subsurfaces around the two mill building concrete pads. ENERCON took several subsurface soil samples in the same locations as the ORISE samples, and the results were compared.

Results of the ORISE soil sample analysis indicated that residual contamination above the unrestricted release guidelines in the FSSP remained in the monazite pile and trench areas. Elevated concentrations of source material were also found in selected samples taken at other subsurface locations. Material found between the pile and dry mill, and in locations northwest of the wet mill exceeded licensable quantities. Sample

results identified in Tables 1 and 2 of the ORISE December 2003 confirmatory survey report are summarized as follows:

1. Soil samples.

Results indicate that 34 of the 41 soil samples exceeded the NRC release guideline of 10 pCi/g for total uranium.

2. Monazite pile and trench areas.

Results indicate that 15 of the 17 soil samples exceeded the NRC release guideline of 10 pCi/g for total thorium.

3. Fugitive licensable material- located in the areas surrounding the monazite pile and trench excavation (south of the dry mill), and around the mill pads.

For the 21 soil samples, source material concentrations for individual samples ranged between negligible to 190 pCi/g for total uranium, and 0.65 to 775 pCi/g for total thorium. Results indicate that six soil samples exceeded the licensable source material concentration of 116 pCi/g for total thorium.

4. The wet mill pad.

The wet mill pad was used as the staging area for washing and decontamination of equipment and rubble contained within both mill buildings. Surface scans were performed on the entire pad and subsurface samples were taken from exposed soil openings. The surface scans showed elevated readings in a few specific locations. These areas were brought to the licensee's attention, immediately cleaned, and resurveyed by ORISE prior to leaving the site. At the conclusion of the inspection, wet mill pad surfaces were concluded to be adequately decontaminated. Subsurfaces contained elevated concentrations of source material residues from the cleaning and washing operation, and this material was recovered and placed in an isolated waste pile.

5. The dry mill pad.

Surface scans were performed on the entire pad and subsurface samples were taken from borings drilled in different dry mill pad locations. Scan surveys showed the dry mill pad surface was within acceptable surface contamination levels. Although contamination was found at various depths in the areas surrounding the dry mill, subsurface sample results immediately under the floor pad were equivalent to background soil concentrations in undisturbed areas.

c. Conclusions

For the mill buildings and equipment, demolition, decontamination, and removal were completed in accordance with FSSP unrestricted release guidelines. However, final results of the ORISE confirmatory survey for soils indicate that licensee commitments

made in the decommissioning plan and in followup correspondence were only partially met. Pockets of source material in excess of licensable quantities were found to remain within the monazite pile footprint, the areas around the trench excavation, and adjacent to mill building pads. Further remediation is required prior to license termination.

III. Facilities and Equipment

a. Inspection Scope

Facilities and equipment associated with the remediation and decommissioning activities of mill buildings and soil excavations.

b. Observations and Findings

Facilities used to support the licensee decommission activities were found adequate to meet licensee needs. The warehouse building includes an office, and was used for storage of instruments and the counting laboratory. Review of radiation detection instrumentation indicated that the appropriate quantity and types of instrumentation were available to support the planned remediation activities.

Good contamination control was demonstrated during the cleanup activities observed during the inspection, as evidenced by the designated staging area for power washing of contaminated equipment from buildings, recovery of wash water and residual material, survey of building rubble and decontaminated steel prior to offsite transport, roping off areas of potentially contaminated equipment and soil, and survey of heavy machinery used for building demolition and soil removal after each use.

Sufficient supplies used to support daily activities included protective clothing, waste storage containers, tanks to supply water for washing and drainage recovery, dust suppression covers, and ropes for contamination control. Backhoes, jack hammers, metal cutting equipment, and other heavy machinery used for demolition and removal of contaminated structures and equipment were routinely available. High pressure washers were effective in removing sand and compacted contamination from building rubble.

The concrete pad of the wet mill was used as the controlled area for equipment decontamination. Contaminated material recovered from equipment washing was stockpiled onsite. Discussions are being held with HMI staff to determine disposition of this stockpiled material.

c. Conclusions

Adequate equipment and facilities were available and used to support decommissioning activities for removal of mill buildings and remediation of contaminated soil. Radiological controls were implemented effectively.

IV. Exit Meeting

The findings of the inspection and results of the ORISE confirmatory survey were discussed with the licensee and ENERCON staff during a phone conversation on September 26, 2003, and with the President of HMI on October 8, 2003.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

D. Chambers, SENES
C. DeWitt, ENERCON
E. Hovnanian, HMI
J. Lord, HMI
C. Pugsley, counsel to HMI
A. Thompson, counsel to HMI
G. Williams, ENERCON