



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

October 21, 2021

Mr. Robert Compernelle, President
FMRI
Number 10 Tantalum Place
Muskogee, OK 74403

SUBJECT: FMRI NRC INSPECTION REPORT 040-07580/2021-001

Dear Mr. Compernelle:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on September 21-22, 2021, at your FMRI facility located in Muskogee, Oklahoma. This inspection examined activities conducted under your license as they relate to public health and safety, and to confirm compliance with the Commission's rules and regulations and with the conditions of your license.

Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, independent radiation measurements, and interviews with personnel. The inspection findings were discussed with Mr. James Burgess, General Manager, and Mr. Robert Miller, Radiation Safety Officer, at the conclusion of the onsite inspection. The enclosed report presents the results of the inspection. No violations were identified, and no response to this letter is required.

In accordance with Title 10 *Code of Federal Regulations* 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you chose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Should you have any questions concerning this inspection, please contact Ms. Linda Gersey, Health Physicist, at 817-200-1299 or the undersigned at 817-200-1156.

Sincerely,



Signed by Gepford, Heather
on 10/21/21

Heather J. Gepford, PhD, CHP, Branch Chief
Materials Licensing and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 040-07580
License No. SMB-911

Enclosure:
Inspection Report No. 040-07580/2021-001

cc w/Enclosure:
M. Broderick, ODEQ
J. Burgess, FMRI

SUBJECT: FMRI NRC INSPECTION REPORT 040-07580/2021-001 DATED OCTOBER 21, 2021

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**U. S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No.: 040-07580

License No.: SMB-911

Report No.: 040-07580/2021-001

Licensee: FMRI

Facility: Muskogee Plant

Location: Muskogee, OK

Dates: September 21-22, 2021

Inspector: Linda M. Gersey, Health Physicist
Materials Licensing and Decommissioning Branch

Accompanied by: James Smith, Sr. Project Manager
Uranium Recovery and Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery, and Waste Program
Office of Nuclear Material Safety and Safeguards

Approved by: Heather J. Gepford, PhD, CHP, Chief
Materials Licensing and Decommissioning Branch

Enclosure

EXECUTIVE SUMMARY

FMRI NRC Inspection Report 040-07580/2021-001

This inspection was a routine, announced U.S. Nuclear Regulatory Commission (NRC) inspection of decommissioning activities being conducted at the FMRI site in Muskogee, Oklahoma. Within the scope of the inspection, no violations were identified.

Decommissioning Inspection Procedure for Materials Licensees

- The NRC inspector confirmed that the licensee's program for managing and storing solid waste material was performed in accordance with license and regulatory requirements. The licensee has not transported any radioactive material offsite since the previous inspection. (Section 1.2.a)
- The licensee had implemented its radiation protection program in accordance with license and regulatory requirements. The licensee's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers received required training, and no contamination issues were identified. (Section 1.2.b)
- The licensee conducted environmental and effluent monitoring in accordance with the license and regulatory requirements. (Section 1.2.c)
- The licensee maintained adequate staffing and a program commensurate with the scope and risk associated with the site activities to ensure compliance with license and regulatory requirements. (Section 1.2.d)
- The licensee continued to operate the wastewater treatment system as required by the 2003 Decommissioning Plan. (Section 1.2.e)
- The licensee had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operation and for licensee response. (Section 1.2.f)

REPORT DETAILS

Site Status

The licensee started Phase 1 decommissioning work in 2005. Phase 1 decommissioning work included removal of Work-in-Process (WIP) residue material from Ponds 2 and 3 and shipment of the material to an out-of-state uranium mill for use as alternate feed material. The removal of WIP from Pond 3 was completed in 2010. The licensee began removing WIP material from Pond 2 in August 2011 but suspended this work in December 2011. At the time of this inspection, the licensee continued to suspended Phase 1 decommissioning due to insufficient funds.

Site activities in progress during the inspection included routine license compliance activities. The licensee continued to operate the wastewater treatment system and to conduct routine radiological monitoring and surveys. In addition, the licensee occasionally decontaminated, surveyed, and free-released material from the site.

U.S. Nuclear Regulatory Commission (NRC) Materials License SMB-911, License Conditions 10 and 26 include requirements for the licensee's wastewater discharge permit. The licensee received an updated permit from the Oklahoma Department of Environmental Quality which became effective on October 1, 2020. The revised permit changed several of the water sampling frequencies and sample analysis requirements.

In accordance with License Condition 42, the licensee is required to submit annual updates of the decommissioning schedule to the NRC. The licensee submitted the most recent schedule to the NRC by letter dated January 13, 2021 (Agencywide Documents Access and Management System [ADAMS] Accession No. ML21025A299). According to the licensee's letter, the only activities scheduled for 2021 and beyond were groundwater treatment and health and safety activities.

License Conditions 43, 44, and 45 require the licensee to submit annual updates for expenses, income, and cost estimates. The licensee provided the requested information by letter dated March 31, 2021 (ADAMS Accession No. ML21176A006). The inspector confirmed that the licensee had submitted the required financial information but did not review the information during the inspection.

1 Decommissioning Inspection Procedure for Materials Licensees (IP 87104)

1.1 Inspection Scope

To determine if licensed decommissioning activities were being conducted in a manner that was protective of health and safety, and to determine if licensed decommissioning programs are being conducted in accordance with the NRC license and regulatory requirements.

1.2 Observations and Findings

a. Security and Control of Licensed Material

The inspector reviewed the licensee's indoor storage of WIP material. At the time of the inspection, the licensee was storing bagged WIP material within the Chem C building. The stored material included twenty blue one-ton bags of WIP precipitated with ammonium hydroxide and four white one-ton bags of WIP containing natural uranium and thorium. The licensee also continued to store approximately 2,000 bags of contaminated soil in the sodium reduction building. This material originated from the berms of former Ponds 1-North, 1-South, and 5. The Chem A building contains sacks with the former Pond 3 liner and miscellaneous trash from the former Pond 2. In addition, the Chem A building has approximately twenty sacks of floor sweepings and clean out soil material from the 1989 clean out of on-site ditches. The licensee also continued to store about 7,000 cubic yards of potentially contaminated soil in an outdoor area under synthetic liners. The soil was excavated during the construction of the groundwater intercept trench in 1998-1999. Gates, fences, and postings were being maintained at the site.

License Conditions 10 and 25 allow the licensee to stage or store WIP licensed material in outdoor areas under certain conditions. At the time of the inspection, no licensed material was being staged or stored in outdoor areas. All licensed material previously staged or stored outdoors was either shipped offsite or moved indoors for long-term storage.

The licensee established a program for routine site inspections. The routine inspections were documented on log sheets that specified the attribute to be inspected and the frequency requirement. The items inspected included survey meter source checks, perimeter sample station checks, pond pH level measurements, and visual inspection of site status. The inspector confirmed that the licensee was maintaining its program for routine site inspections.

During site tours, the inspector conducted independent radiological surveys within the restricted area. Ambient gamma radiation levels were measured using a Ludlum Model 19 survey meter (NRC No. 015518, calibration due date of February 8, 2022). With a background of approximately 8 microrentgen per hour ($\mu\text{R/hr}$), the highest measurement was approximately 300 $\mu\text{R/hr}$ from bagged WIP material being stored in two locations. No area was identified that met the definition of a radiation area (greater than 5,000 $\mu\text{R/hr}$).

b. Radiation Protection

The licensee maintained a radiation protection program commensurate with the limited activities in progress. The radiation protection program activities in place at the time of the inspection included routine radiological surveys, worker training, and instrument calibrations. Equipment release surveys were conducted as needed to support site activities. No special work permits were issued since the last inspection, and no occupational monitoring was conducted since the last inspection.

The licensee discontinued use of external personnel monitoring devices at the end of 2007 as allowed by Title 10 of the *Code of Federal Regulations* 20.1502, based on

historical results and the work activities onsite. The licensee also discontinued the use of personnel lapel air samplers for monitoring internal dose in 2012 based on monitoring results from 2011-2012.

Part B to the license, referenced in License Condition 10, states in part that radon sampling is conducted on a quarterly basis in areas identified by the radiation safety officer (RSO). During 2019, the licensee discontinued onsite radon monitoring. The RSO documented the reasons for the change in a memorandum to file. The decision to suspend onsite radon sampling was based, in part, on previous sample results being less than the action level. The licensee continued to conduct monthly working level sampling of radon progeny in the Chem C and Chem A buildings.

The inspector reviewed a selection of daily, weekly, bi-weekly, monthly, quarterly, and annual surface contamination and area radiation surveys conducted since the previous inspection. The RSO established the survey frequencies based on prior history and posted a summary of required surveys in the laboratory for use by the health physics technician responsible for conducting the surveys at the site. Equipment release surveys were conducted in 2020-2021 as needed for off-site maintenance of trucks and tires. All survey forms were determined to be complete with the specific locations of measurements being specified on the forms. No survey result exceeded the associated action levels. The inspector noted that the completed surveys were reviewed by the RSO.

Radiation safety training was provided annually to all site workers. The training included emergency response training. Visitors to the site were provided safety and health training before being allowed to access areas other than the administration building.

The licensee continued to maintain calibration records for the radiological survey meters, filter sample counter, and environmental air samplers in use at the site. The inspector verified instruments in use had current calibrations and were in working order.

c. Effluent Releases/Environmental Monitoring

License Conditions 10 and 26 reference Part B of the license application and the 2003 Decommissioning Plan. Section 11 of the 2003 Decommissioning Plan described the requirements for the liquid and airborne effluent and environmental monitoring programs. Additional liquid effluent requirements were provided in the licensee's discharge permit issued by the Oklahoma Department of Environmental Quality. Groundwater collected from the intercept trench and the Pond 3 French drain was treated and discharged into the Arkansas River through Outfall 001. Three additional outfalls into the Arkansas River, Outfalls 002, 003, and 005, are used only for discharge of storm water runoff. The licensee was required to collect water samples prior to Outfall 001 releases.

Nineteen wells and four sumps were used to monitor groundwater at the site and are sampled once every two years and twice a year, respectively. If any Outfall or water sample exceeded the 15 picocuries per liter action level for gross alpha or the 50 picocuries per liter action level for gross beta, a condition report was generated, and the sample was sent to a laboratory to be analyzed for specific uranium and thorium levels.

Since the previous inspection, four condition reports were generated by the licensee for sampling events where water samples were found to exceed the gross alpha or beta limits. The inspector reviewed the laboratory analytical data in the condition reports and verified that all results were less than the NRC reporting threshold of ten times the values for uranium or thorium listed in Title 10 of the *Code of Federal Regulations* 20, Appendix B, Table II. In summary, the licensee had implemented the liquid effluent and groundwater monitoring programs as described in the 2003 Decommissioning Plan.

The licensee's airborne effluent monitoring program was described in the July 24, 2003, letter referenced in License Condition 10. The program included monitoring the licensee's release rates of uranium and thorium by measuring alpha activity in weekly air samples continuously collected at six locations. The inspector confirmed the alpha sample results were below the licensee's approved administrative action level of $2.85\text{E}-14$ microcuries per milliliter since the previous inspection. In addition, quarterly radon samples were collected at three locations: the Background Perimeter, the Environmental Perimeter (which represents the maximum exposed member of the public), and the Front Gate. Radon concentrations since the previous inspection were verified by the inspector to be below ten percent of the effluent limit.

d. Management Organization and Controls

The licensee's organizational requirements are provided in Figure 9-1 of the 2003 Decommissioning Plan, referenced in License Condition 10. At the time of the inspection, there were no changes to staff, which consisted of the general manager, health physics technician, laborer, and part time RSO. The general manager assumes the position of alternate RSO when the primary RSO is not onsite. The general manager reported to the company president, who occasionally visited the site. The licensee had established arrangements with a contract firm for a supply of laborers should the need arise for additional staff. In summary, site staffing was adequate to ensure compliance with the routine regulatory and license requirements and commensurate with the scope and risk associated with current site activities.

License Conditions 10 and 14 specify the requirements for the radiation safety committee. The licensee's records indicated that the committee met quarterly as required. Annual program reviews were conducted as required by Title 10 of the *Code of Federal Regulations* 20.1101(c) and License Condition 10. The annual program review for 2020 was attached to the 4th quarter radiation safety committee report. The annual audit report was reviewed by the inspector and provided a comprehensive overview of the radiation protection program.

e. Essential Systems and Services

The inspector reviewed the licensee's operation of the wastewater treatment system. The operation of the system is described in Section 8.4 of the 2003 Decommissioning Plan which is referenced in License Conditions 10 and 26. The purpose of the system was to collect and adjust the pH of the incoming fluid prior to discharge to the holding ponds.

The incoming wastewater included potentially contaminated storm water, Pond 3 French drain sump water, and intercept trench sump water. The wastewater entered the system in one of four water treatment basins. At the time of the inspection, the system was

collecting approximately 8-10 gallons per minute of incoming fluid, primarily from the intercept trench sumps.

The wastewater was treated with lime (calcium oxide) in the second basin, to adjust the pH of the water. The treated water drained by gravity to the third basin for further mixing. The fourth basin was used for temporary storage and mixing. Depending on the water level in the basin, the treated water was pumped from the fourth basin to Ponds 8 or 9 for settling of sediments. The treated water was eventual discharge to the environment in accordance with the requirements of the licensee's discharge permit.

The inspector interviewed licensee staff who displayed detailed knowledge of systems operation. The inspector discussed potential operability issues with licensee staff including maintenance issues with the existing equipment. The licensee's staff described their plans to repair and maintain the equipment for the foreseeable future. In summary, the licensee continued to operate the wastewater treatment system as required by the 2003 Decommissioning Plan.

f. Occupational Health and Safety

The inspector reviewed procedure EP-100, "General Emergency Response," Revision 2, dated August 2020. The procedure states that potential emergency events are those common to the construction industry, i.e., personal injury, fire, and severe weather. These potential events may involve radioactive material as a contaminant. The procedure provides the locations of flammable, combustible, and hazardous materials, and locations of fire extinguishers and first aid kits. The licensee had implemented daily, weekly, and monthly task check lists for routine activities. The task lists included monthly observations and annual refills for the fire extinguishers and verifications that the first aid kits remained stocked. Overall, the inspector confirmed that the procedure was adequate for responding to health and safety emergencies and the task check lists were being implemented.

1.3 Conclusions

The NRC inspector confirmed that the licensee's program for managing and storing solid waste material was performed in accordance with license and regulatory requirements. The licensee has not transported any radioactive material offsite since the previous inspection.

The licensee had implemented its radiation protection program in accordance with license and regulatory requirements. The licensee's records indicated that no workers were assigned an occupational exposure since the last inspection, all workers received required training, and no contamination issues were identified.

The licensee conducted environmental and effluent monitoring in accordance with the license and regulatory requirements.

The licensee maintained adequate staffing and a program commensurate with the scope and risk associated with the site activities to ensure compliance with license and regulatory requirements.

The licensee continued to operate the wastewater treatment system as required by the 2003 Decommissioning Plan.

The licensee had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operation and for licensee response.

2 Exit Meeting Summary

The inspector presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on September 22, 2021. During the inspection, the licensee did not identify any information reviewed by the inspector as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

Partial list of Persons contacted

Licensee

J. Burgess, General Manager
T. Lawrence, Radiation Technician
R. Miller, Radiation Safety Officer

Inspection Procedure (IP) Used

IP 87104 Decommissioning Inspection Procedure for Materials Licensees

Items Opened, Closed and Discussed

Open

None

Closed

None

Discussed

None