

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION IV 1600 E. LAMAR BLVD ARLINGTON, TX 76011-4511

March 14, 2017

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

SUBJECT: NRC INSPECTION REPORT 040-07580/2017-001

Dear Mr. Compernolle:

This letter refers to the inspection conducted by the U.S. Nuclear Regulatory Commission (NRC) on February 15, 2017, at your facility located in Muskogee, Oklahoma. The purpose of the inspection was to determine whether decommissioning activities were being conducted safely and in compliance with NRC requirements. The results of the inspection were discussed with members of your staff at the conclusion of the onsite inspection on February 15, 2017.

During this inspection, the NRC staff examined activities conducted under your license as they relate to public health and safety 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, and interviews with personnel. The enclosed report presents the results of this inspection. No violations were identified and no response to this letter is required.

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

# R. Compernolle

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Should you have any questions concerning this inspection, please contact Mr. Donald Stearns, Health Physicist, at 817-200-1176 or the undersigned at 817-200-1549.

Sincerely,

/RA/

Lee E. Brookhart, Acting Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety

Docket No: 040-07580 License No: SNM-911

Enclosure: NRC Inspection Report 040-07580/2017-001

Attachment

# U. S. NUCLEAR REGULATORY COMMISSION REGION IV

| Docket:      | 040-07580                                                                                                      |  |  |  |  |
|--------------|----------------------------------------------------------------------------------------------------------------|--|--|--|--|
| License:     | SMB-911                                                                                                        |  |  |  |  |
| Report:      | 040-07580/2017-001                                                                                             |  |  |  |  |
| Licensee:    | FMRI, Inc.                                                                                                     |  |  |  |  |
| Facility:    | Muskogee Plant                                                                                                 |  |  |  |  |
| Location:    | Number 10 Tantalum Place<br>Muskogee, Oklahoma                                                                 |  |  |  |  |
| Dates:       | February 15, 2017                                                                                              |  |  |  |  |
| Inspector:   | Gerald A. Schlapper, PhD, CHP, Health Physicist<br>Fuel Cycle and Decommissioning Branch                       |  |  |  |  |
|              | Donald L. Stearns, Health Physicist<br>Fuel Cycle and Decommissioning Branch                                   |  |  |  |  |
| Approved by: | Lee E. Brookhart, Acting Chief<br>Fuel Cycle and Decommissioning Branch Division of Nuclear<br>Material Safety |  |  |  |  |

# **EXECUTIVE SUMMARY**

# FMRI, INC. NRC Inspection Report 040-07580/2017-001

This inspection was a routine, announced inspection of decommissioning activities being conducted at the FMRI facility in Muskogee, Oklahoma. In summary, the licensee was conducting site activities in compliance with regulatory and license requirements.

#### Organization, Management, and Controls

• The licensee maintained staffing in accordance with license requirements. (Section 1.2)

# Radiation Protection/Maintenance and Surveillance Testing

• The licensee implemented its radiation protection program in compliance with Title 10 Code of Federal Regulations (CFR) Part 20 requirements and the license. Occupational exposures were a small fraction of the regulatory limits. (Section 2.2)

# Radioactive Waste Management/Low-Level Radioactive Waste Storage and Transportation of Radioactive Materials

• The licensee was storing bagged work-in progress (WIP) and waste materials in the onsite buildings in accordance with license requirements. No shipping operations were in progress during the inspection. (Section 3.2)

# Environmental Protection

• The licensee conducted environmental monitoring in accordance with license requirements. No samples exceeded the reporting limit specified in the license. (Section 4.2)

#### Emergency Preparedness/Fire Protection

• The licensee had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operation. (Section 5.2)

# **Report Details**

# Summary of Plant Status - Unit 3

At the time of the inspection, the licensee was preparing to resume excavation of soil from Pond 2 and getting ready to load future shipments of bagged WIP material. The Muskogee site is continuing work through Phase 1 of decommissioning. Phase 1 decommissioning included removal of WIP residue material from Ponds 2 and 3 and shipment of this material to an out-of-state uranium mill (White Mesa Mill, Blanding, Utah) for use as alternate feed material.

The licensee commenced with Phase 1 work during 2005. The licensee started by removing, bagging, and shipping WIP material from Pond 3. Removal of WIP material from Pond 3 was completed during 2010. During 2011, the licensee removed all material stored outside and placed the packaged material in storage in on-site buildings.

The licensee began removing WIP material from Pond 2 in August 2011, but suspended this work in December 2011. Bagging operations of Pond 2 material were resumed in July 2012. Bagging operations were stopped in October 2012 because storage space in buildings in use (Chem A and Chem C buildings) were full of bagged material. The licensee resumed shipping of bagged material stored in the Chem A building to the out- of-state uranium mill in September 2013 for processing. Excavation and bagging of material from Pond 2 was resumed with bagged material stored in buildings on-site.

Since the last inspection, the licensee has continued to decontaminate, survey, and freerelease scrap material from the facility. The waste water treatment system remains in service as required by the decommissioning plan instructions. The licensee continued to conduct routine monitoring and surveys in accordance with license requirements.

# 1 Management Organization and Controls (88005)

# 1.1 Inspection Scope

The Nuclear Regulatory Commission (NRC) inspectors evaluated the licensee's management organization and controls to ensure that the licensee was maintaining effective oversight of decommissioning activities.

# 1.2 Observations

The licensee's organizational requirements are provided in Figure 9-1 of the decommissioning plan. At the time of the inspection, site staffing consisted of the general manager/operations manager, one radiation protection technician, an operations staff member, and the part-time radiation safety officer. The general manager reported to the company president who routinely visited the site. The licensee had arrangements with a contract firm for supply of laborers should the need arise for additional staff. In summary, site staffing was in compliance with decommissioning plan requirements and the licensee had adequate staff to ensure continuation of shipment of WIP material and compliance with routine monitoring and maintenance as required by the license.

The NRC inspectors reviewed the reports of the FMRI, Inc. radiation safety committee (RSC). The inspectors verified that the meetings were held quarterly as required by procedure. Annually, the radiation safety officer (RSO) performed a review of the radiation protection program as required by 10 CFR 20.1101(c). This report is required to be submitted to the RSC for review. The most recent annual review was conducted in January 2017 and covered calendar year 2016. The final report for this review was in preparation at the time of the inspection and will be reviewed during the next inspection at the site.

#### 1.3 <u>Conclusions</u>

The NRC inspectors concluded that the licensee maintained site staffing in accordance with license and regulatory requirements.

# 2 Radiation Protection/Maintenance and Surveillance Testing (83822/88025)

# 2.1 Inspection Scope

The NRC inspectors reviewed the licensee's implementation of its radiation protection program to ensure compliance with 10 CFR Part 20.

# 2.2 Observations

The NRC inspectors reviewed a selection of daily, weekly, bi-weekly, monthly, quarterly, and annual area radiation surveys for the last quarter of 2016 and 2017 to the date of the inspection. The RSO determined survey frequencies were based on prior history and ongoing work and he posted a summary of required surveys in the laboratory for ease of reference for the radiological technician who was responsible for conducting the radiation surveys for FMRI. Radiation survey forms were reviewed by the NRC inspectors and were determined to be complete with specific locations of measurements being specified on the form. Appropriate radiation and contamination surveys were observed to be posted in surveyed areas. The inspectors noted that completed surveys had been reviewed by the RSO.

The NRC inspectors conducted concurrent surveys with a Rad Eye B20, Serial Number 096532, with a calibration due date of November 07, 2017 and a Ludlum Model 2401-P, Serial Number 21956G, with a calibration due date of April 5, 2017 and compared readings with the site radiation technician and observed similar results to those radiation measurements obtained by the site radiation protection technician. The inspectors reviewed surveys of roadways on-site that are conducted on a bi-weekly basis and noted no levels above background. The inspectors, as part of the site tour, confirmed the survey results for radiation levels in various storage areas as indicated on the survey forms. The NRC inspectors reviewed the database of portable radiation measurement instruments, air sampling equipment, and selected instruments in the field and noted that calibrations were current.

License SMB-911 states that equipment released from the site must satisfy the contamination limits provided in Regulatory Guide 1.86. Selected release forms for 2016 and through 2017 to the date of inspection were reviewed for items with potential contamination such as tools, equipment, and departing vehicles. The NRC inspectors

confirmed that the release criteria in Regulatory Guide 1.86 were met. The NRC inspectors noted that the RSO had reviewed and approved all release survey results of equipment leaving the FMRI controlled area.

The NRC inspectors noted that at the time of the inspection there were no active Special Work Permits in place. Special Work Permit (SWP), Number 1864, titled, Pond 2 – WIP, Package WIP in Bags, which was approved by the operations manager on June 6, 2016, and the RSO on June 8, 2016 had been closed in January 2017. The inspectors reviewed this SWP as an example and noted that the SWP specified safety precautions and the required personnel protective equipment (PPE) along with general comments of conditions on the site.

The licensee discontinued the use of individual dosimeters for determining external dose at the end of 2007 based on historical results of minimal exposure and based on the work that was underway at the time. The licensee's RSC reviewed and approved this action based on the historical assessment of the dosimetry records. An action level to support non-use of personnel dosimeters was set at 2000 microRoentgen (microR) per hour for any area surveys. The inspectors noted and verified that typical general area levels are less than 20 microR per hour with higher levels found in locations where a large number of bags filled with WIP were located. Levels near the bags were nominally in the 200-300 microR per hour range. The NRC inspectors noted that for calendar years (CYs) 2013, 2014, 2015, 2016 and 2017 the RSO issued a memorandum to file noting that operations had not changed and thus external dose monitoring for the ongoing activities would not be required.

The licensee has also discontinued the use of personnel lapel air samplers for the monitoring of internal dose. Justification of this action was based on a change in the technique used by FMRI for bagging of WIP material which eliminated concerns related to the generation of high levels of dust. Also noted was that levels of exposure in CY 2011 and 2012 were on the order of 120-130 millirem (mrem) per year for monitored individuals, well below the action level of 500 mrem and well below the regulatory limit of 5 rem per year.

The NRC inspectors reviewed documentation related to calibration of radiation detection equipment. The licensee had maintained an adequate number of detectors in its inventory to properly monitor for radioactive contamination.

Survey instruments were calibrated annually by a qualified and licensed service provider. The most recent calibrations were performed in June of 2016. The NRC inspectors confirmed that survey instrument calibrations were performed in accordance with ANSI guidance. The licensee had an adequate number and variety of monitoring instruments available for use.

The NRC inspectors reviewed the documentation of training for active site personnel for CY 2016 and 2017 up to date of the inspection. Training and qualification memos were issued by the RSO and general manager in CY 2017 for all current workers. All on-site personnel other than visitors were required to complete General Employee Training (GET) as described in Standard Operating Procedure G-005, Revision 1. Levels of training were specified depending on duties of the individual. Any waiver of training requirements based on prior experience must be approved by the general manager.

The general manager noted that laborers are also subject to on-the-job training prior being allowed to operate any heavy equipment. The GET procedure required refresher training on an annual basis. Licensee records reviewed by the NRC inspectors reflected the completion of annual refresher training in June 2016 by all active employees. During a future inspection, refresher training for 2017 will be reviewed.

The inspectors noted that previous training in Department of Transportation (DOT) requirements for individuals signing shipping paperwork as specified in Title 49 CFR 172.704, Subpart H, had been completed in August of 2013 and would therefore expire in August, 2016. The DOT requirements state that recurrent training is required at least once every three years. This training was updated on August 23, 2016 for the individuals authorized to sign the DOT Bill of Lading, and updated on October 5, 2016 for other individuals involved in the transportation process. All shipments in 2016 were made by personnel with the proper training. Training included the following topics: General Awareness, Function-Specific, Hazmat Transportation Security Awareness, Hazardous Materials Transportation Safety Officer were the only parties on-site authorized to sign the DOT Bill of Lading for shipments of the WIP material to the White Mesa Mill in Blanding, Utah, destined to be used as alternate feed material for source material recovery. Once the source materials was recovered the remaining byproduct material will end up in the mill disposal cell.

# 2.3 <u>Conclusions</u>

The licensee implemented its radiation protection program in compliance with requirements of 10 CFR Part 20 and 49 CFR Part 170. Occupational exposures were essentially at background levels and these exposures remained as a small fraction of regulatory limits.

# 3 Radioactive Waste Management/Low-level Radioactive Waste Storage and Transportation Activities (86850/84900/86740)

# 3.1 Inspection Scope

During the inspection, the NRC inspectors reviewed the licensee's handling and storage of radioactive wastes to ensure compliance with license requirements.

#### 3.2 Observations

The licensee continued to store bagged WIP material awaiting shipment at buildings on site. Resumption of shipping efforts had eliminated the inventory of previously bagged WIP material, also known as "old WIP material." Newly excavated material from Pond 2 was bagged, weighed, and grouped for placement in a DOT approved transport container. The licensee also continued to store about 7000 cubic yards of potentially contaminated soil. The soil was generated during construction of a groundwater intercept trench and was stored in a central location outside and under sheets of plastic. The licensee also stored approximately 68,000 tons of calcium fluoride material in other on-site ponds, numbered 5, 6, 7, 8 and 9. The potentially contaminated soil and calcium fluoride material will be transferred and/or disposed of in future phases of decommissioning.

Resumption of shipments of bagged WIP material was based on a transportation plan dated September 25, 2013. The inspectors reviewed the plan and noted that activities at the site were in compliance with commitments in the plan. To ensure compliance with applicable NRC and DOT regulations, the licensee utilized a checklist. Documents supplied in the package indicated that the container had been inspected by the licensee and determined to be in compliance with DOT packaging requirements. Radiation/contamination survey data sheets were noted that verified compliance with applicable limits as outlined in 10 CFR 71.47. Emergency response and contact information was supplied with all shipments. A review of documents for shipments selected by the NRC inspectors for review indicated that the licensee had satisfied the regulatory requirements. Prior to departure of any shipments to the White Mesa Mill in Utah, a signature by the site general manager as a registrant of DOT was required that indicated that all documents associated with the shipment had been completed in accordance with licensee procedures and that the material was packaged, characterized, classified, marked, labeled, placarded and transported in accordance with NRC and DOT regulatory requirements.

#### 3.3 <u>Conclusions</u>

The NRC inspectors confirmed that the licensee's program for storing and transporting solid waste material was found to be performed in accordance with license and regulatory requirements.

#### 4 Environmental Protection (88045)

#### 4.1 Inspection Scope

The NRC inspectors reviewed the licensee's environmental monitoring program for compliance with regulatory and license requirements.

#### 4.2 Observations and Findings

Requirements for control and sampling of liquid effluents are outlined in Section 11.2 of the decommissioning plan. Plant wastewater was discharged through Outfall 001 while Outfalls 002, 003 and 004 were used for discharge of storm water runoff. All outfalls discharged to the Arkansas River. Outfalls at the FMRI site were managed in accordance with the current State of Oklahoma Department of Environmental Quality NPDES Permit No. OK0001643 issued on May 22, 2015, with an effective date of July 1, 2015, and an expiration date of June 30, 2020.

Selected data reviewed by the NRC inspectors indicated that the licensee collected water samples prior to and during wastewater releases and sampled storm water outfalls during rain events. The FMRI site has a series of 19 wells and four sumps used to monitor the groundwater at the site. The licensee compared sample results to action levels specified in the license and established an administrative limit of 25 percent and an action limit of 50 percent of the unrestricted isotopic concentrations for licensed materials consistent with 10 CFR 20, Appendix B, Table II for effluents. If the limits on gross alpha or gross beta concentration exceeded the action level, then the licensee issued a condition report for tracking purposes and forwarded the sample to the contract analysis laboratory for an isotopic analysis of the sample to determine if the release was

reportable to the NRC. If the value in 10 CFR 20, Appendix B, Table II was exceeded by more than 10 times, then FMRI must supply a written report to the Administrator, NRC

Region IV. A review of the licensee's records by the inspectors indicated that there were no releases that required a written report to the NRC for the period June 2016 to the date of inspection.

Condition Report (CR) 16-06-01 noted that concentration at outfall 001 exceeded 15 pCi/L gross alpha resulting in an action of forwarding samples to the contracted laboratory for analysis. Results were supplied on June 15, 2016 and evaluated as required. CR 16-06-02 was prepared when a series of wells and sumps exceeded the action level of 15 pCi gross alpha and/or 50 pCi gross beta. Laboratory results were received and reviewed on June 15, 2016 for these samples. In November 2016, an exceedance of the limits was again noted for several wells and sumps as further detailed in CR 17-02-01. Laboratory analysis was completed and results forwarded and reviewed by the plant general manager in February 2017. If the concentration exceeded 25 percent of the limits for release to an unrestricted area, an investigation was conducted by the licensee to determine the possible cause and appropriate corrective action. The licensee noted that probable cause of these exceedances was due to contamination of the site during previous operations. The licensee also noted that the appropriate action to correct these exceedances was to continue to decommission the site as directed in the decommissioning plan. A review of historical data showed that in general isotopic concentration levels were decreasing as decommissioning continues. As of the date of the inspection, all condition reports generated during the inspection interval related to concentration exceedances had been adequately reviewed and closed by the licensee.

The NRC inspectors noted that the licensee routinely sampled airborne radioactivity at six locations, four perimeter stations, one background station and one off-site station. During a site tour the inspectors observed that the perimeter stations were in operation. The licensee continuously collects airborne particulates at these six locations and analyzed the samples for gross alpha concentrations on a weekly basis. Sample results were reviewed and the NRC inspectors determined that overall the air samples results remained as a small fraction of the administrative action level of 3E-14 microCuries per milliliter. Radon sampling was conducted on a quarterly frequency at eight locations including the environmental stations. Some elevated measurements were identified in locations where there were higher amounts of WIP present but levels remained below 10 pico-Curies/liter.

#### 4.3 Conclusions

The licensee conducted environmental monitoring in accordance with license requirements.

#### 5 Emergency Preparedness/Fire Protection (88050/88055)

#### 5.1 Inspection Scope

The NRC inspectors reviewed the licensee's emergency preparedness program to ensure that the program was being maintained in compliance with license and regulatory requirements. The inspector also reviewed the organization, equipment, and controls to implement the fire protection program.

# 5.2 Observations and Findings

The NRC inspectors reviewed the only Emergency Procedure in use, General Emergency Response, EP-100. This procedure was required to be reviewed every 24 months and the inspectors noted that the procedure had been reviewed by the RSO in June, 2015. Future inspections will verify completion of required reviews. The emergency response procedure indicated that no process lines were currently in operation. Section 3.0 of the procedure included information on characteristics of the hazardous materials present on site and indicated the location of the materials. The location of emergency response equipment such as fire extinguishers and spill kits were provided in Attachment 1 of the procedure. The inspectors reviewed selected monthly check sheets for fire extinguishers on site and found them to be satisfactory. Attachment 2 of the procedure contained emergency contact information and the inspector noted that the information was current and accurate.

# 5.3 <u>Conclusions</u>

The licensee had emergency response and fire protection programs in effect that were appropriate for the current mode of plant operation. There were no changes in these programs since the last inspection.

# 6 Exit Meeting

The NRC inspectors reviewed the scope and findings of the inspection during the exit meeting conducted at the conclusion of the on-site inspection on February 15, 2017. The licensee did not identify any information as proprietary that was provided to or reviewed by the inspectors.

# SUPPLEMENTAL INSPECTION INFORMATION PARTIAL LIST OF PERSONS CONTACTED

#### **Licensee**

J. Burgess, General Manager/Operations Manager

T. Lawrence, Radiation Technician

R. Miller, Radiation Safety Officer, Reid, Miller Associates

# **INSPECTION PROCEDURES (IP) USED**

- IP 83822 Radiation Protection
- IP 84850 Radioactive Waste Management
- IP 84900 Low Level Waste Storage
- IP 86740 Inspection of Transportation Activities
- IP 88005 Management Organization and Controls
- IP 88045 Environmental Protection
- IP 88050 Emergency Preparedness
- IP 88055 Fire Protection

# ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Opened</u> None

<u>Closed</u> None

<u>Discussed</u> None

# LIST OF ACRONYMS

| CR    | Condition Report                             |
|-------|----------------------------------------------|
| CFR   | Code of Federal Regulations                  |
| DOT   | Department of Transportation                 |
| GET   | General Employee Training                    |
| IP    | NRC Inspection Procedure                     |
| NRC   | U.S. Nuclear Regulatory Commission           |
| OKDEQ | Oklahoma Department of Environmental Quality |
| RSO   | Radiation Safety Officer                     |
| SWP   | Special Work Permit                          |
| WIP   | Work In Progress                             |

# NRC INSPECTION REPORT 040-07580/2017-001, FMRI, INC. (MUSKOGEE, OK) – DATED MARCH 14, 2017

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| SUNSI Review | ADAMS:        |  | □ Sensitive   |  | Non-Publicly Available | е | Keyword |  |  |
|--------------|---------------|--|---------------|--|------------------------|---|---------|--|--|
| By: dls      | ■ Yes 	□ No   |  | Non-Sensitive |  | Publicly Available     |   | NRC-002 |  |  |
| OFFICE       | RIV:DNMS/FCDB |  | RIV:DNMS/FCDB |  | RIV:DNMS/FCDB/C        |   |         |  |  |
| NAME         | DStearns      |  | GSchlapper    |  | LBrookhart             |   |         |  |  |
| SIGNATURE    | 3/13/17       |  | 3/13/17       |  | 3/14/17                |   |         |  |  |
| DATE         | /RA/          |  | /RA/          |  | /RA/                   |   |         |  |  |
|              |               |  |               |  |                        |   |         |  |  |

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