



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION IV  
1600 E LAMAR BLVD  
ARLINGTON, TX 76011-4511

August 16, 2016

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

SUBJECT: NRC INSPECTION REPORT 040-07580/2016-001

Dear Mr. Compernelle:

This letter refers to the inspection conducted by the U.S. Nuclear Regulatory Commission (NRC) on July 20 and 21, 2016, at your facility located in Muskogee, Oklahoma. The purpose of the inspection was to determine whether decommissioning activities were being conducted safely and in conformance with NRC requirements. The results of the inspection were discussed with you and members of your staff at the conclusion of the onsite inspection on July 21, 2016.

During this inspection, 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 "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. Compernelle

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Should you have any questions concerning this inspection, please contact Dr. Gerald Schlapper, Health Physicist, at 817-200-1273 or the undersigned at 817-200-1197.

Sincerely,

/RA/

Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Docket No: 040-07580

License No: SNM-911

Enclosure:

NRC Inspection Report 040-07580/2016-001

cc: Attachment

U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket: 040-07580

License: SMB-911

Report: 040-07580/2016-001

Licensee: FMRI, Inc.

Facility: Muskogee Plant

Location: Number 10 Tantalum Place  
Muskogee, Oklahoma

Dates: July 20-21, 2016

Inspector: Gerald A. Schlapper, PhD, CHP, Health Physicist  
Fuel Cycle and Decommissioning Branch

Donald L. Stearns, Health Physicist  
Fuel Cycle and Decommissioning Branch

Accompanied by: Richard A. Kaiser, Health Physicist  
Fuel Cycle and Decommissioning Branch

Gregory Chapman, Project Manager  
Materials Decommissioning Branch  
Division of Uranium Waste Program  
Office of Nuclear Materials Safety and Safeguards

Elizabeth McCaskill  
Environmental Programs Specialist  
Department of Environmental Quality  
State of Oklahoma,

Approved by: Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Material Safety

Enclosure

## EXECUTIVE SUMMARY

FMRI, INC.  
NRC Inspection Report 040-07580/2016-001

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. 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 in the process of excavating soil from Pond 2 and shipping previously bagged WIP material. The Muskogee site is continuing work in Phase 1 of decommissioning. Phase 1 decommissioning includes 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 the Chem A and Chem C buildings.

Since the last inspection, the licensee has continued to decontaminate, survey, and free-release 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, and three laborers supplied by a staffing agency and the part-time radiation safety officer. The general manager reported to the company president who routinely visits the site. In summary, site staffing was in compliance with decommissioning

plan requirements and the licensee had adequate staff to ensure continuation of shipping 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). Meetings are held quarterly as required by procedure. Annually, the radiation safety officer (RSO) performs a review of the radiation protection program as required by 10 CFR 20.1101(c). This report is submitted to the RSC for review. The most recent annual review was completed in January, 2016, and covers calendar year 2015.

### 1.3 Conclusions

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 years 2015 and 2016. 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 is 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 NRC inspectors conducted concurrent surveys with a Rad Eye B20, Serial Number 096531, with a calibration due date of October 21, 2016 and a Ludlum Model 2401-P, Serial Number 21956G, with a calibration due date of April 5, 2017 and compared reading with the site radiation technician and observed similar results to those radiation measurements obtained by the site radiation 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 results for the roadways as presented on the survey forms. The inspectors along with the site radiation technician surveyed areas external to and immediately outside of the controlled area boundary including buildings and confirmed that there was no transfer of radioactive material to locations immediately off site. A walkover survey confirmed that radiation levels were consistent with background levels in the

area. The NRC inspectors reviewed the database of portable radiation measurement instruments 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 2015 and through 2016 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. Based on the survey forms reviewed the inspectors noted that there were no items of heavy equipment that were transferred outside of the controlled area. 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 was only one active 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. The SWP specified safety precautions and the required personnel protective equipment (PPE) along with general comments of conditions on the site. This SWP was unchanged from the active SWP that had been followed during the 2015 inspection period. The inspectors noted that all active site workers at the time of issuance was provided training on the conditions of the SWP and signed it prior to the start of work governed by the permit.

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 are located. Levels near the bags are nominally in the 200-300 microR per hour range. The NRC inspectors noted that for calendar years (CYs) 2013, 2014, 2015, and 2016 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 has maintained an adequate number of detectors in its inventory to properly monitor for radioactive contamination. Survey instruments are calibrated annually by a qualified and licensed service provider. The most recent calibrations were observed to have been performed in June of 2016. The NRC inspectors confirmed that survey instrument calibrations are performed in accordance with ANSI guidance.

The NRC inspectors reviewed the documentation of training for active site personnel for CY 2015 and 2016 up to date of the inspection. Training and qualification memos were issued by the RSO and general manager in CY 2016 for all current workers. All on-site personnel other than visitors are required to complete General Employee Training (GET) as described in Standard Operating Procedure G-005, Revision 1. Levels of training are 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 operating any heavy equipment. The GET procedure requires refresher training on an annual basis. Licensee records reviewed by the NRC inspectors reflect the completion of annual refresher training in June 2016 by all active employees.

The inspectors noted that 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. Training included the following topics: General Awareness, Function-Specific, Hazmat Transportation Security Awareness, Hazardous Materials Transportation Security, and Safety and Security Plans. The general manager is the only party 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 is recovered the remaining byproduct material will end up in the mill disposal cell. The DOT requirements state that recurrent training is required at least once every three years. Although the DOT training had not expired at the time of the inspection, the licensee is aware that recurrent training must be completed prior to the next shipment of additional materials to the White Mesa Mill.

### 2.3 Conclusions

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 continues to store bagged WIP material awaiting shipment at the Chem A and Chem C buildings on site. Resumption of shipping efforts has significantly eliminated the inventory of previously bagged WIP material, also known as "old WIP material." Newly excavated material from Pond 2 is bagged, weighed and grouped for placement in a DOT approved transport container and stored in Chem A and Chem C buildings. 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 is stored in a central location outside and under sheets of plastic. The licensee also stores 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 shipment of bagged WIP material is based on a transportation plan dated September 25, 2013. The inspectors reviewed the plan and noted that activities at the site are 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 is required that indicates that all documents associated with the shipment have been completed in accordance with licensee procedures and that the material is packaged, characterized, classified, marked, labeled, placarded and transported in accordance with NRC and DOT regulatory requirements.

#### **3.3 Conclusions**

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 is discharged through Outfall 001 while Outfalls 002, 003 and 004 are used for discharge of storm water runoff. All outfalls discharge to the Arkansas River. Outfalls at the FMRI site are 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 is 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 2015 to the date of inspection. As of the closure date of the inspection, all condition reports generated during the inspection interval had been closed.

The NRC inspectors noted that the licensee routinely samples 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. The NRC inspectors noted that the licensee had made an error in working level calculations presented in a

spreadsheet for review. The RSO immediately corrected the error on the spreadsheet, conducted training of the radiological technician utilizing the revised spreadsheet, and retroactively corrected the results that were in error during the period of the inspection. 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 is required to be reviewed every 24 months and the inspectors noted that the procedure had been reviewed by the RSO in June 2015. The emergency response procedure indicates that no process lines are 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. Attachment 2 of the procedure contained emergency contact information and the inspector noted that the information was current.

#### 5.3 Conclusions

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

### **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 of July 21, 2016. The licensee did not identify as proprietary any information provided to or reviewed by the inspectors.

**SUPPLEMENTAL INSPECTION INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

Licensee

J. Burgess, General Manager/Operations Manager  
R. Compennolle, President, FMRI  
T. Lawrence, Radiation Technician  
R. Miller, Radiation Safety Officer, Omega Project Services

State of Oklahoma, Department of Environmental Quality

L. McCaskill, Environmental Programs Specialist

**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**

Opened

None

Closed

None

Discussed

None

## LIST OF ACRONYMS

CR	Condition Report
CFR	<i>Code of Federal Regulations</i>
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

R. Compernelle

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Should you have any questions concerning this inspection, please contact Dr. Gerald Schlapper, Health Physicist, at 817-200-1273 or the undersigned at 817-200-1197.

Sincerely,

/RA/

Jack E. Whitten, Chief  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

Docket No: 040-07580

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Enclosure:

Inspection Report 040-07580/2016-001

Attachment: Supplemental Information

DISTRIBUTION:

See next page

ADAMS ACCESSION NUMBER: ML16230A126

<input checked="" type="checkbox"/> SUNSI Review By: GAS	ADAMS: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Sensitive <input checked="" type="checkbox"/> Non-Sensitive	<input type="checkbox"/> Non-Publicly Available <input checked="" type="checkbox"/> Publicly Available	Keyword NRC-002
OFFICE	RIV/DNMS/FCDB	FCDB		C/FCDB
NAME	GASchlapper	DLStearns		JEWhitten
SIGNATURE	/RA/	/RA/		/RA/
DATE	8/16/16	8/16/16		8/16/16

OFFICIAL RECORD COPY

Letter to Robert Compennolle from Jack Whitten dated August 16, 2016

SUBJECT: NRC INSPECTION REPORT 040-07580/2016-001

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