



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

March 13, 2007

Mr. E. Jonathan Jackson, President  
FMRI, Inc.  
Number Ten Tantalum Place  
Muskogee, Oklahoma 74403-9296

SUBJECT: NRC INSPECTION REPORT 040-07580/07-001

Dear Mr. Jackson:

This refers to the inspection conducted on February 13, 2007, at FMRI's rare earth recovery facility in Muskogee, Oklahoma. An exit briefing was conducted with you and your staff at the conclusion of the inspection. The enclosed report presents the results of that inspection.

The purpose of the inspection was to examine activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, conditions of your license, and the approved decommissioning plan. Within these areas, the inspection consisted of selected examination of procedures and representative records, site tours, and interviews with personnel. No violations were identified; therefore, no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document 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, proprietary, or safeguards information so that it can be made available to the public without redaction.

Should you have any questions concerning this inspection, please contact Robert Evans at (817) 860-8234 or the undersigned at (817) 860-8191.

Sincerely,

*/RA/*

D. Blair Spitzberg, Ph.D., Chief  
Fuel Cycle & Decommissioning Branch

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

FMRI, Inc.

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Enclosure:

NRC Inspection Report  
040-07580/07-001

cc w/enclosure:

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FMRI, Inc.

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bcc w/enclosure (via ADAMS distrib):  
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 JMPeckenpaugh, FSME/DWMEP/EPPAD  
 DBSpitzberg  
 JFKatanic  
 LMGersey  
 RJEvans  
 RITS Coordinator  
 FCDB File  
 RIV Nuclear Materials File - 5th Floor

SUNSI Review Completed: RJE ADAMS:  Yes  No Initials: RJE  
 Publicly Available  Non-Publicly Available  Sensitive  Non-Sensitive

DOCUMENT NAME: s:\dnms!\fcdb!\rje\70758001.wpd final r:\ dnms

RIV:DNMS:FCDB	FSME:DWMEP:EPPAD	C:FCDB
RJEvans	JMPeckenpaugh	DBSpitzberg
<i>/RA/</i>	<i>/RA/</i>	<i>/RA/</i>
03/12/07	02/26/07	03/13/07

OFFICIAL RECORD

T=Telephone

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**ENCLOSURE**

U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 040-07580

License No.: SMB-911

Report No.: 040-07580/07-001

Licensee: FMRI (a subsidiary of Reorganized Fansteel)

Facility: Muskogee Plant

Location: Muskogee, Oklahoma

Inspection Date: February 13, 2007

Inspectors: Robert J. Evans, P.E., C.H.P., Senior Health Physicist  
Fuel Cycle & Decommissioning Branch

Jon M. Peckenpaugh, Systems Performance Analyst  
Environmental Protection and Performance Assessment  
Directorate  
Division of Waste Management and Environmental Protection  
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Accompanied By: Linda M. Gersey, Health Physicist  
Nuclear Materials Inspection Branch

Approved By: D. Blair Spitzberg, Ph.D., Chief  
Fuel Cycle & Decommissioning Branch

Attachment: Supplemental Inspection Information

## **EXECUTIVE SUMMARY**

FMRI, Muskogee Plant  
NRC Inspection Report 040-07580/07-001

The inspection included a review of the licensee's environmental monitoring, effluent monitoring, and transportation activities. In addition, the inspectors conducted a follow up review of a previous NRC inspection finding. Overall, the licensee was conducting Phase 1 reclamation and routine site operations in accordance with regulatory and license requirements.

### **Effluent and Environmental Monitoring**

- The licensee recently identified elevated concentrations of uranium in monitoring well MW-74 located down-gradient of Pond 3. The uranium concentrations in this well trended upward concurrently with commencement of reclamation of Pond 3. The licensee reported these exceedances to the NRC in accordance with license requirements. The licensee expects the uranium concentrations in the groundwater to trend downward after reclamation of Pond 3 has been completed (Section 1).
- The NRC inspectors concluded that the Pond 3 french drain, the site groundwater intercept trench, and the sump pump systems were operating as designed. Accordingly, the contaminated groundwater was likely being captured by the intercept trench and was routed to the wastewater treatment facility for processing prior to release to the environment (Section 1).

### **Inspection of Transportation Activities**

- The licensee was staging the bagged Work-In-Progress material in accordance with requirements established in the NRC's October 7, 2005, letter (Section 2).
- The licensee's transportation operations were found to be in compliance with site procedures, license requirements, and U.S. Department of Transportation Regulations (Section 2).

### **Followup**

- The inspector discussed the status of Notice of Violation 040-07580/0501-01 with the licensee. Since the previous inspection, the NRC issued a letter dated November 20, 2006, reminding the licensee of its continued non-compliance with the previously cited violation. By letter dated December 4, 2006, the licensee provided the NRC with an updated Table 15-12. At the close of the onsite inspection, the licensee's financial data was still under NRC review (Section 3).

## **Report Details**

### **Summary of Site Status**

Decommissioning of the FMRI site is expected to occur in phases. At the time of the inspection, the licensee was conducting Phase I decommissioning in accordance with the NRC-approved Decommissioning Plan dated January 14, 2003. Phase 1 consists of removal and transfer of work-in-process (WIP) residue material from Ponds 2 and 3 to an out-of-state uranium mill. The licensee originally estimated that the two ponds contained about 18,800 tons of WIP material.

At the time of the inspection, the licensee had excavated about 11,761 tons of WIP material from Pond 3 and had placed the material into 6,015 2-ton super-sacks. Excavation, drying and packaging operations were temporarily suspended pending selection of a new work contractor. The licensee estimates that about 3,000 tons of WIP material remain in Pond 3. The licensee plans to finish reclamation of Pond 3 by the end of 2007.

The licensee continued to ship WIP material previously collected from Pond 3 by both rail and truck to the out-of-state mill. To date, the licensee has shipped about 1,600 tons of material in 84 shipments. The material was being shipped in reusable intermodal containers. The WIP material was being shipped to the uranium mill in Utah for use as alternate feed material.

The licensee originally planned to commence with the reclamation of Pond 2 immediately after the completion of Pond 3. However, by letter to the NRC dated January 12, 2007, the licensee requested a revision to the decommissioning schedule. The licensee has proposed that Pond 2 reclamation be deferred until late 2010 or 2011. As of the date of this inspection, the NRC has not formally responded to the licensee's request for a revised schedule.

## **1 Effluent and Environmental Monitoring (84750)**

### **1.1 Inspection Scope**

The inspectors reviewed the licensee's groundwater monitoring and corrective action programs to determine if the programs were being implemented in accordance with regulatory and license requirements. The inspectors also conducted a followup review of recent monitoring well exceedances that were reported to the NRC.

### **1.2 Observations and Findings**

The inspectors conducted a followup review of recent monitoring well exceedances and conducted a site tour to observe activities in progress. Areas and features examined during the site tour included Ponds 2, 3, 6, 7, 8, and 9; the french drain system and interconnected sump surrounding Pond 3; the interceptor trench and its four sump pump facilities; the five outfalls to the Arkansas River; the water treatment facility; and the storage areas for Pond 3 WIP material.

The licensee's groundwater monitoring program requirements are provided in License Condition 10, License Application Section B.3.5.6. The program consists of sampling

19 monitoring wells and 4 sumps that accumulate groundwater from the unconsolidated water-bearing unit at this site. The wells and sumps are sampled quarterly, and the samples are analyzed for gross alpha and gross beta radioactivity concentrations. The gross alpha and beta concentrations are compared to administrative action levels. If the action levels are exceeded, then the licensee is required to conduct an isotopic analysis of the sample. If the radionuclides identified from the isotopic analysis exceed a reporting level specified in the license, then the licensee is required to report the exceedance to the NRC. The 23 sampling points are also sampled on a semi-annual basis for a number of chemical constituents in accordance with State's National Pollutant Discharge Elimination System discharge permit.

During September 2005, the licensee became aware of an increase in the radioactivity concentrations of water samples collected from monitoring well MW-74. This well is located down-gradient from Pond 3 but up-gradient of the interceptor trench that runs parallel to the Arkansas River. At that time, the elevated sample results did not exceed the NRC reporting levels.

Routine sampling of MW-74 was conducted during mid-March 2006. The uranium-238 and uranium-234 concentrations in the sample exceeded the reporting level of 3000 picocuries per liter (pCi/L) established in Condition 10 of the license. The exceedance was subsequently reported to the NRC by letter dated July 18, 2006. In response, the licensee implemented enhanced monitoring of well MW-74 and other monitoring wells in the vicinity of Pond 3. The licensee collected seven additional sets of samples from MW-74 between June through November 2006. These sample results also exceeded the uranium-234 and uranium-238 reporting level:

**Table: Monitoring Well MW-74 Sample Results**

Sample Date	Report Date	Uranium-238 Concentration	Uranium-234 Concentration	Reporting Level
March 15, 2006	July 18, 2006	5460 pCi/L	4740 pCi/L	3000 pCi/L
June 28, 2006	October 24, 2006	9040 pCi/L	8620 pCi/L	3000 pCi/L
July 14, 2006	October 13, 2006	3800 pCi/L	3360 pCi/L	3000 pCi/L
July 28, 2006	September 26, 2006	4100 pCi/L	4180 pCi/L	3000 pCi/L
August 10, 2006	October 13, 2006	8240 pCi/L	7890 pCi/L	3000 pCi/L
August 24, 2006	October 13, 2006	6080 pCi/L	5240 pCi/L	3000 pCi/L
September 20, 2006	January 12, 2007	11,300 pCi/L	11,030 pCi/L	3000 pCi/L
October 25, 2006	Results Unavailable	Unavailable	Unavailable	3000 pCi/L
November 15, 2006	February 15, 2007	13,900 pCi/L	11,400 pCi/L	3000 pCi/L

The October 25, 2006, sample results were in the process of being re-analyzed during the inspection. These results were not available for review. The licensee plans to forward these final sample results to the NRC at a later date.

The licensee concluded that contaminant disturbance caused by reclamation of Pond 3 was the most likely cause of the elevated uranium concentrations in MW-74. Phase I decommissioning commenced in June 2005, and a negative trend was first identified in MW-74 samples during September 2005. No other monitoring wells appear to be impacted by the reclamation of Pond 3. Pond 3 reclamation is expected to be completed in late-2007. The uranium concentrations in groundwater samples collected from MW-74 are expected to eventually trend downward when reclamation of Pond 3 has been completed.

The inspectors conducted a review of the licensee's groundwater corrective action program. Based on a records review, interviews with site personnel, and observations of equipment in operation, the NRC staff concluded that the french drain system surrounding Pond 3 and the interceptor trench surrounding the site were both operating as designed. The intercept trench was designed to capture the groundwater down-gradient of MW-74. The captured groundwater was being routed to the wastewater treatment system for processing. The treated wastewater fluid was being released from the site in batch modes through Outfall 001 in accordance with the state permit.

### 1.3 Conclusions

The licensee recently identified elevated concentrations of uranium in monitoring well MW-74 located down-gradient of Pond 3. The uranium concentrations in this well trended upward concurrently with commencement of reclamation of Pond 3. The licensee reported these exceedances to the NRC in accordance with license requirements. The licensee expects the uranium concentrations in the groundwater to trend downward after reclamation of Pond 3 has been completed.

The NRC inspectors concluded that the Pond 3 french drain, the site groundwater intercept trench, and the sump pump systems were operating as designed. Accordingly, the contaminated groundwater was likely being captured by the intercept trench and was routed to the wastewater treatment facility for processing prior to release to the environment.

## **2 Inspection of Decommissioning and Transportation Activities (87104 and 86740)**

### 2.1 Inspection Scope

The inspectors reviewed the licensee's program for packaging, shipping and transporting radioactive material.

### 2.2 Observations and Findings

#### a. Temporary Staging of WIP Material

License Condition 25 provides the requirements for storage of material in outdoor areas. The NRC issued a license condition variance letter on October 7, 2005, allowing FMRI to temporarily stage WIP material in outdoor areas. The original deadline for outdoor



staging was September 30, 2006. Beyond this date, the continued staging of material was deemed to be storage of material subject to the requirements of the license.

By letter dated July 6, 2006, the licensee requested an amendment to License Condition 25 to allow staging of source material beyond the NRC's original deadline. In response, the NRC requested additional information by letter dated November 6, 2006. In this letter, the NRC also placed the licensed storage requirements into suspension until final action was taken by the NRC. As of the date of the onsite inspection, the NRC had not completed the licensing action.

The inspectors conducted a review of onsite staging operations. The licensee had roughly 5,000 2-ton super-sacks situated in several staging areas. Most sacks were being temporarily stored in outdoor areas. Waterproof liners were installed around the sacks to protect the bagged WIP material from the environment. In some locations, the licensee had to constantly rework the liners because of seasonal wind damage. In summary, the licensee was staging the WIP material in accordance with requirements established in the NRC's October 7, 2005, letter.

During the inspection, the inspectors conducted a confirmatory survey of bagged WIP material using a Ludlum Model 2401-P survey meter (NRC No. 21190G, calibration due date of 9/25/07). The radiation exposure rates from the bagged material ranged from background, about 0.01 millirems per hour, up to about 1.5 millirems per hour at one foot from the material. These survey results were comparable to surveys taken during previous inspections.

b. Shipment of WIP Material

During December 2006, the licensee terminated its contract with the company that was conducting Pond 3 remediation. During the inspection, bagging operations continued to remain idle because the re-bidding process had not been finalized.

However, the licensee continued to package and ship previously bagged material to a mill in Utah for use as alternate feed material. The Utah mill received a license amendment on June 13, 2006, to accept FMRI's WIP material. Since that time, the licensee has shipped about 1,600 tons of material in 84 shipments. The material was being shipped by truck and rail as low specific activity radioactive material in 25-cubic yard intermodal containers. Since each intermodal would contain roughly 21 tons of WIP material, about 900 shipments may be necessary to ship all Phase I WIP material to the mill.

In accordance with License Condition 37, the licensee is required to develop work plans for remediating the contamination at the site. The inspectors compared the licensee's actual shipping operations to the Transportation Plan dated February 6, 2007. This work plan described the step-by-step process for shipping and transporting the WIP material. Transportation shipping papers were compared to the licensee's Phase I Departmental Instruction "Intermodal Shipping Container Survey." Further, the inspectors reviewed the licensee's methodology for calculating total uranium and thorium concentrations for recording on the manifests. In summary, the licensee's

shipping operations were found to be in compliance with site procedure, license and regulatory requirements.

### 2.3 Conclusions

The licensee was staging the bagged WIP material in accordance with requirements established in the NRC's October 7, 2005, letter. The licensee's transportation operations were found to be in compliance with site procedures, license requirements, and U.S. Department of Transportation regulations.

## 3 **Followup (92701)**

### 3.1 (Discussed) Violation 040-07580/0501-01: Failure to Submit Financial Information to NRC as Required by License Condition 45.

The inspector discussed the status of Notice of Violation (NOV) 040-07580/0501-01 with the licensee. This NOV was issued on July 26, 2005, and involved the licensee's failure to provide an updated version of Table 15-12 to the NRC by the March 31, 2005, deadline specified in License Condition 45.

Since the previous inspection, the NRC issued a letter dated November 20, 2006, reminding the licensee of its continued non-compliance with the previously cited violation. By letter dated December 4, 2006, the licensee provided the NRC with an updated Table 15-12. At the close of the onsite inspection, the licensee's financial data was still under NRC review.

This NOV will remain open until the NRC has completed its review of the licensee's December 4, 2006, submittal.

## 4 **Exit Meeting Summary**

The inspectors reviewed the scope and findings of the inspection during an exit meeting conducted at the conclusion of the onsite inspection on February 13, 2007. The licensee did not identify any documents or other information provided to, or reviewed by, the inspectors, as proprietary.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

FMRI

J. Jackson, President  
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J. Burgess, Manager, Site Operations

State of Oklahoma Department of Environmental Quality

J. Davis, Environmental Program Specialist, Land Protection Division  
J. Flynn, Environmental Engineer, Land Protection Division  
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Contractors

S. Blauvelt, Vice President and Director of Regional Operations, Penn E&R  
J. Harrick, Regional Manager, Penn E&R

**INSPECTION PROCEDURES USED**

IP 88045	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 87104	Decommissioning Inspection Procedure for Materials Licensees
IP 86740	Inspection of Transportation Activities
IP 92701	Followup

**ITEMS OPENED, CLOSED AND DISCUSSED**

Opened

None

Closed

None

Discussed

040-07580/0501-01 NOV	Failure to Submit Financial Information to NRC as Required by License Condition 45
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**LIST OF ACRONYMS USED**

IP	Inspection Procedure
NOV	Notice of Violation
pCi/L	picocuries per liter
WIP	work-in-process