

## INSPECTION REPORT

Inspection Module: RADMOD-IM: Internal Monitoring

Inspection Location: Energy Fuels - White Mesa Uranium Mill, Blanding Utah.

Inspection Items: Occupational Air Sampling and Bioassay Monitoring

Inspection Dates: July 26 & 27, 2022

Inspectors: Ryan Johnson, Utah Division Waste Management and Radiation Control (DWMRC)  
Phil Goble, DWMRC

Personnel Contacted:  
Terry Slade, Energy Fuels Resources Radiation Safety Technician (RST)  
Garrin Palmer, Radiation Safety Officer (RSO)  
Justin Perkins, RST  
Shawn Begaye, Laboratory Technician  
Logan Shumway, Mill Manager

Governing Documents:

- UAC R313-15
- Radioactive Materials License (RML) UT1900479
- Applicable Mill procedures and manuals

**Opening Meeting**

**Energy Fuels Resources:**

Garrin Palmer (RSO)

**Utah DWMRC:**

Ryan Johnson (Health Physics Inspector)  
Phil Goble (U-Mill/RAM Section Manager)

During the opening meeting, the inspector discussed the inspection items and documentation to be reviewed during the inspection. The Mill is processing calcine alternate feed. The Mill staff reminded the inspector of the safety requirements for the Mill.

DRC Meters Used	Model	Serial Number	Calibration Due Date
Dose Rate	Bicron	318	8/5/2022

### **Inspection Summary**

The inspection consisted of a RSO interview, reviewing applicable documentation and a mill tour. The following discussion provides more detail of the specific items reviewed.

**Item 1. Documentation Review:** The Inspector reviewed applicable documentation.

**Observations:** The DWMRC inspector reviewed the following documents:

- Calibration sheets for general area and breathing zone sample pumps;
- General area air sampling worksheets;
- Breathing zone sampling worksheets; and
- Bioassay analytical results and chain of custody forms.

While reviewing the paperwork for breathing zone sampling, the inspector noticed that the derived air concentration (DAC) values being recorded were lower than in previous years. The DAC values observed in 2021 ranged between 0 and 15,000% DAC. These DAC values are higher than last year but lower than years when the Mill is processing ore. The Mill has not processed a lot of ore (natural and alternate feed) in 2021.

The work (i.e. cleaning out tanks) at the Mill has been done under Radiation Work Permits (RWPs) or according to Standard Operating Procedures (SOPs). The inspector verified that:

- Respirator protection was being used by the mill personnel performing the work;
- Bioassay samples were being collected from the mill personnel performing the work;
- Bioassay results indicated that the mill personnel were not inhaling uranium; and
- Bioassay sampling and analysis standard operating procedure (SOP) was being followed.

The Mill analyzes its bioassay samples in its own lab. While reviewing the paperwork for the bioassay results the inspector noticed that only one or two bioassay samples were above the Mill's action level in 2020. Most samples were non-detect during this time. The Inspector interviewed the Laboratory Technician that analyzes the bioassay samples. In that interview the Inspector verified:

- The Laboratory follows a procedure that uses ANSI/HPS N1330-2011 *Performance Criteria for Radiobioassay* as a guide (which is referenced in NRC Regulatory Guide 8.22 *Bioassay at Uranium Mills*);
- Results are reviewed by the Laboratory Technician and given to the RSO;
- 25% of the samples are sent to an offsite laboratory as a quality control check; and
- The sample preparation area is regularly surveyed for Alpha to prevent contamination of the samples.

**Deficiencies:** None

**Item 2. Mill Tour:** The Inspectors walked through the restricted area on a general site tour. The tour included the ore pad, the mill, the alternate feed circuit, solvent extraction building and the lab.

**Observations:** The DWMRC inspector also observed:

- Ore and Alternate feed material being stored on the ore pad. While looking at the area where the Silmet alternate feed material was being stored radiation readings, were between 2 to 3 mrem/hr. The area was posted as a radiation area out of caution because the RSO stated that some spots within the Silmet area are near 5 mrem/hr;
- OSL badges were appropriately being used by all observed employees at the Mill; and
- Water being put into tailing impoundment 4B.

Note: All of the expected Silmet material that was suppose to come onsite is now at the Mill. Approximately 660 metric tons. According to the Mill Manager, EFRI does not know when they will receive more.

Note: Contents of Leach Tank #7 are being transferred to Leach Tank #2. According to the Mill Manager, the transfer is so the material will be used to make Yellowcake later this year. The material that has been stored in Leach Tank #7 is from processing the monzonite sands/ore for Chemours.

Radiological readings observed during Mill tour.

Location	Dose Rate (µrem/hr)
Product Yard	20
Ore Pad	100-180
Silmet Alternate Feed	2,000 to 3,000
Mill	100-400
Solvent Extraction Building	40
Alternate Feed Circuit	120
Tank #7	3,000

**Deficiencies:** None

**Item 3. Ambrosia Lake Equivalent Feed:**

In a letter dated July 20, 2022, EFRI informed the Division that the Mill plans on receiving 16 drums of Uranium Loaded Ion Exchange Resins (URL) from a property near Ambrosia Lake, New Mexico as equivalent feed. The URLs were reported as being from mine water treatment. The letter concluded that a file is available at the Mill for Division review.

As part of this inspection the Inspector reviewed the documentation for the Ambrosia Lake URLs to confirm that the URL meet the criteria for equivalent feed as set forth in NRC RIS 2012-06 *NRC Policy Regarding Submittal of Amendments for Processing of Equivalent Feed at Licensed Uranium Recovery Facilities*. The Documentation reviewed was a:

- Technical Memo;
- Analytical results; and
- NRC RIS 2012-06 *NRC Policy Regarding Submittal of Amendments for Processing of Equivalent Feed at Licensed Uranium Recovery Facilities*.

The Inspector confirmed that the Ambrosia Lake URL meets the criteria for equivalent feed as per NRC RIS 2012-06.

**Deficiencies:** None

**Closeout Meeting**

**Energy Fuels:**

Garrin Palmer (RSO)

**Utah DWMRC:**

Ryan Johnson (Health Physics Inspector)

Phil Goble (U-Mill/RAM Section Manager)

**Findings**

None

**Recommendations**

None

**Recommendation for Next Inspection**

Prepared By:	<u>Ryan Johnson</u> (Print Name)	<u></u> (Signature)	<u>8/4/2022</u> (Date)
Reviewed By:	<u>Phil Goble</u> (Print Name)	<u>Phillip Goble</u> (Signature)	<u>8/4/2022</u> (Date)