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September 26, 2019

Div of Waste Management  
and Radiation Control

**Sent VIA E-MAIL AND EXPRESS DELIVERY**

OCT - 1 2019

DRC-2019-011789

Ty L. Howard,  
Director of Waste Management and Radiation Control  
State of Utah Department of Environmental Quality  
195 North 1950 West  
P.O. Box 144880  
Salt Lake City, UT 84114-4880

Re: **Transmittal of Installation Plan under Utah Ground Water Discharge Permit UGW370004 for the White Mesa Mill (the "Mill")**

Dear Mr. Howard:

This letter transmits Energy Fuels Resources (USA) Inc.'s ("EFRI's") Installation Plan for MW-24A pursuant the Division of Waste Management and Radiation Control ("DWMRC") letter dated September 5, 2019 under the State of Utah Groundwater Discharge Permit UGW370004 ("GWDP").

MW-24A is being installed in response to comments from DWMRC in the September 5, 2019 letter on the SAR for MW-24.

Please contact me if you have any questions or require any further information.

Yours very truly,  
**ENERGY FUELS RESOURCES (USA) INC.**

A handwritten signature in black ink that reads 'Kathy Weinel'.

Kathy Weinel  
Quality Assurance Manager

cc: Paul Goranson  
Terry Slade  
Scott Bakken  
David Frydenlund  
Logan Shumway

# **WHITE MESA MILL**

State of Utah Ground Water Discharge Permit UGW370004

Plan for Installation of MW-24A

Energy Fuels Resources (USA) Inc.

225 Union Boulevard, Suite 600

Lakewood, CO 80228



September 26, 2019

## 1. INTRODUCTION AND BACKGROUND

Energy Fuels Resources (USA) Inc. (“EFRI”) operates the White Mesa Uranium Mill (the “Mill”), located near Blanding Utah, under State of Utah Ground Water Discharge Permit UGW370004 (“GWDP”).

A plan and time schedule (the “Plan”) required under Part I.G.4(c) of the Permit relating to violations of Part I.G.2 of the Permit for MW-24 for the third quarter of 2018 was submitted to the Division of Waste Management and Radiation Control (“DWMRC”) on December 5, 2018. Part I.G.2 of the Permit provides that out-of-compliance (“OOC”) status exists when the concentration of a pollutant in two consecutive samples from a compliance monitoring point exceeds a groundwater compliance limit (“GWCL”) in Table 2 of the Permit. The Plan summarized assessments that would be completed in a Source Assessment Report (“SAR”). The Plan was approved by DWMRC by letter dated March 5, 2019.

At the time of the Plan, MW-24 had exhibited a consistently decreasing trend in pH and increasing trends in cadmium and thallium exceeding GWCLs. The Plan only contemplated the inclusion of pH, cadmium and thallium in the SAR. However, the SAR also included an analysis of beryllium, fluoride, and nickel in MW-24 due to increasing trends in concentrations and OOC status for these constituents after the Plan was submitted on December 5, 2018.

The SAR was submitted to DWMRC on June 27, 2019. As noted in the SAR, the Mill site was recently thoroughly studied in the Background Reports (INTERA, 2007a, 2007b, 2008), in various SARs, and in the University of Utah Study (Hurst and Solomon, 2008). The Background Reports (INTERA, 2007a, 2007b, 2008) and the University of Utah Study concluded that groundwater at the Mill site has not been impacted by Mill operations. Both of those studies also acknowledged that there are natural influences at play at the Mill site that have given rise to increasing concentration trends of some constituents and the general variability of background groundwater quality at the Mill site.

The focus of the SAR was, therefore, to identify any changes in the circumstances identified in those studies. Beryllium, cadmium, fluoride, thallium, nickel, and pH are exhibiting significantly increasing (decreasing for pH) trends. Cadmium and thallium have been recently analyzed in the 2016 SAR (INTERA, 2016). Indicator parameters in MW-24 chloride, sulfate, and uranium exhibit no trend. Fluoride in MW-24 is significantly increasing. Significantly decreasing pH in MW-24 has been attributed to the site-wide oxidation of pyrite. Decreasing pH can mobilize naturally occurring minerals within the Burro Canyon Formation. Due to the lack of trends in indicator parameters, the trends in beryllium, cadmium, fluoride, thallium, nickel, and pH are not related to potential tailings seepage and are likely the result of mobilization of natural sources of metals within the Burro Canyon Formation.

DWMRC reviewed the SAR and discussed the review findings in a conference call with EFRI on September 3, 2019 and summarized the results of that call in a letter dated September 5, 2019. During the September 3, 2019 conference call EFRI noted that potential anomalies were noted in MW-24 during the installation and construction of the well. The September 5, 2019 DWMRC letter concluded that:

“During the September 3, 2019 telephone conference call it was discussed that based on review of the GWCL exceedances at MW-24 and well data, it does not appear that

tailings wastewater is the source. However, beryllium was measured as non-detectable from July 2005 until April 2016, and likewise nickel shows a significantly large amount of non-detect data until the recent rising trend. Based on these data anomalies it was discussed that problems with the well (e.g. design and installation) may be the cause of the out-of-compliance status for the SAR parameters.”

As a result of the potential anomalies associated with the installation and construction of MW-24, EFRI suggested that in order to determine whether the well is the cause, an additional well will be installed close-by the existing MW-24, and monitored in tandem. This is similar to the approach used at other wells (MW-03 and MW-03A) which showed similar anomalous data. This approach will also allow more monitoring data to be collected at MW-24 for better evaluation of data trends.

## **2. WELLS SUBJECT TO THIS PLAN**

This is the installation plan for the installation of MW-24A. As stated above, MW-24A is being installed in close proximity to MW-24 in response to comments from DWMRC on the SAR for MW-24.

## **3. PLAN AND TIME SCHEDULE**

MW-24A will be installed approximately 10 feet northwest of MW-24 as shown in Figure 1 attached.

MW-24A will be installed with a screened interval similar to that of MW-24. Assuming that the Brushy Basin Member contact at MW-24A is encountered at 118.5 feet below land surface (ft bls), MW-24A would be screened from approximately 99.5 to 119.5 ft bls. If the Brushy Basin Member contact is encountered at a different depth, MW-24A will be completed with 20 feet of screen bottoming approximately 1 to 2 feet below the contact. Placing the base of the screen just below the Brushy Basin Member contact is consistent with the construction of other perched monitoring wells installed at the site.

### **3.1 TIME SCHEDULE**

The installation of the proposed well and the completion of the as-built report will be completed in accordance with the required timeframes specified in the GWDP. The proposed well will be installed and operational within 90 days of director approval of this installation plan schedule and the as-built report will be completed within 60 days of well completion.

### **3.2 EXPERTS REPORTS TO BE PREPARED**

As required by GWDP Part I.F.6, EFRI will submit an as-built report within 60 days of well installation for the newly installed well proposed herein. Boring logs for the well and test borings will be included in the as-built report.

Analytical data for MW-24A, will be included in the routine quarterly groundwater monitoring reports. Discussion of the analytical results and the conclusions resulting from the tandem

monitoring program will be submitted to DWMRC under separate cover at the end of 8 quarters of sampling.

#### 4. CONCLUSION

Given the varied background groundwater quality at the site, it cannot be assumed that consecutive exceedances of a constituent in a monitoring well means that contamination has been introduced to groundwater in that well.

With respect to field pH in MW-24, the previously identified trend suggests that the exceedances are a continuation of the statistically significant decreasing pH trend identified in the SARs and the pH Report. It has been established that the continued decreasing trend of field pH across the site is not inconsistent with natural background, and in fact was accepted as natural background for purposes of setting the revised GWCLs.

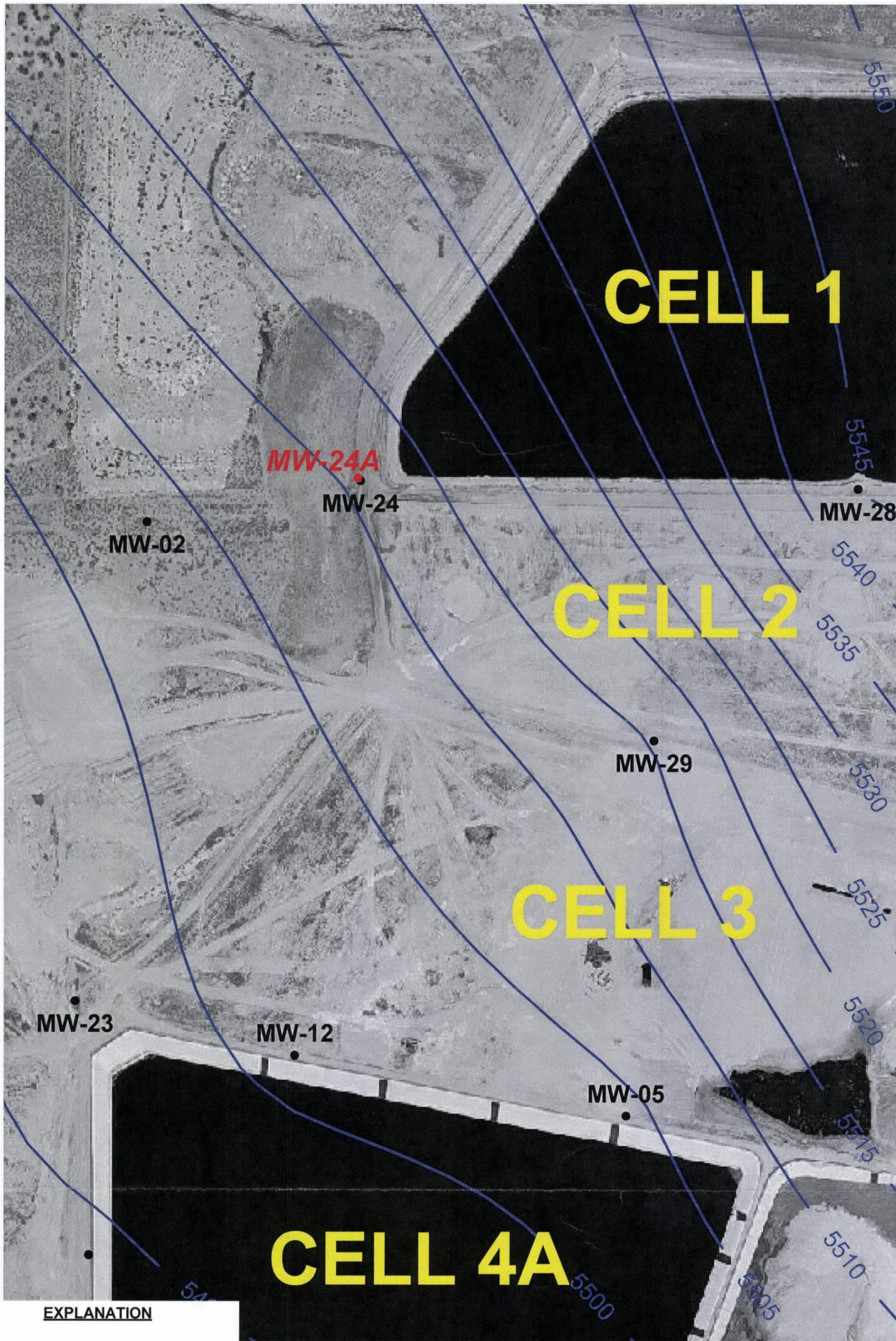
The exceedances of cadmium, nickel, beryllium, fluoride, and thallium represent impacts due to a decreasing pH (statistically significant).

Background at the Mill site was recently thoroughly studied in the Background Reports, the SAR, the pH report, and the University of Utah Study. The Background Reports, the SAR, the pH report and the University of Utah Study concluded that groundwater at the site has not been impacted by Mill operations. All of these studies also acknowledged that there are natural influences at play at the site that have given rise to increasing water levels and general variability of background groundwater chemistry at the site.

EFRI maintains that it is not practicable to redo the University of Utah Study and comprehensive Background Reports each time a monitoring well shows consecutive exceedances, particularly where the exceedances are consistent with those recent analyses. The focus should be on identifying any changes in the circumstances identified in those studies. Therefore, EFRI conducted a geochemical analysis of OOC parameters in MW-24 and assessed indicator parameters and confirmed that the out-of-compliance status is due to variations in background.

A general discussion of the site-wide pH trend is necessary because decreasing pH is one of the most important contributors to increasing concentrations of all MW-24 OOC parameters. A decreasing trend in pH has been observed in almost every groundwater monitoring well across the Mill site, including upgradient and far downgradient monitoring wells (INTERA, 2012b). The Pyrite Report (HGC, 2012) attributes the decline in pH across the Mill site to the site-wide existence and oxidation of pyrite in perched groundwater hosted by the Burro Canyon Formation. This report showed that the MW-24 drill core sample submitted for laboratory analysis by XRD contained the highest pyrite content among the samples analyzed (HGC, 2012). Most indicator parameters in MW-24 show no trend (chloride, sulfate, and uranium); whereas fluoride shows a significant increasing trend. Given the decreasing trend in pH at MW-24, mineral dissolution is a likely cause for increasing concentrations of the OOC parameters. The lack of trends in key indicator parameters suggest that the trends in beryllium, cadmium, fluoride, thallium, nickel, and pH in MW-24 are unlikely to be caused by potential tailings seepage.

FIGURE



**EXPLANATION**

5500 perched water level contour and label (feet amsl)

**MW-24A**  
 ● proposed perched monitoring well (located approximately 10 feet northwest of MW-24)

**MW-29**  
 ● perched monitoring well



HYDRO  
 GEO  
 CHEM, INC.

**APPROXIMATE LOCATION OF PROPOSED NEW WELL MW-24A (showing kriged Q2 2019 perched water levels)**

APPROVED	DATE	REFERENCE	FIGURE
		H:/718000/MW14_24_25/MW24_0919/MW24Aloc.srf	1