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DIVISION OF WASTE MANAGEMENT
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January 21, 2021

Kathy Weinel, Quality Assurance Manager
Energy Fuels Resources (USA) Inc.
225 Union Blvd., Suite 600
Lakewood, CO 80228

RE: Energy Fuels Resources (USA) Inc. October 19, 2020, Source Assessment Report for Selenium and Uranium in Monitoring Well MW-28, White Mesa Uranium Mill
Utah Groundwater Discharge Permit No. UGW370004

Dear Ms. Weinel:

The Division of Waste Management and Radiation Control (DWMRC) has reviewed the Energy Fuels Resources (USA) Inc. (EFRI), October 19, 2020 document titled "*Source Assessment Report for MW-28 White Mesa Mill*" (SAR). The SAR includes an evaluation of "out of compliance" (OOC) parameters (selenium and uranium) in monitoring well MW-28 (MW-28). MW-28 is located hydraulically downgradient from the central and eastern portions of cell 1, and mill processing areas.

It was noted that MW-28 was damaged by a mill vehicle during 2014. Damage occurred to the outer and inner casings and resulted in compliance issues with several monitoring parameters (uranium, vanadium, and cadmium). The well damage was repaired, and the well was over-pumped during the second quarter of 2014. Per review of the SAR and all historical groundwater monitoring data, the current OOC status for selenium and uranium are not associated with the previous well damage. It was noted that the monitoring parameter results corrected and were reliable after completion of the EFRI corrective actions.

Per Section 5.0 of the SAR, EFRI has concluded that current changes in groundwater chemistry and OOC at MW-28 are due to migration and detection of the nitrate/chloride plume and associated geochemical reactions at MW-28. Changes in parameter concentrations, including current selenium and uranium OOC are attributed to "*oxidation of pyrite by nitrate contained within the nitrate/chloride plume*" (SAR page 17). Additionally, the SAR Section 5.0 states "*the nitrate/chloride plume originates upgradient from the Mill and TMS demonstrating that the TMS is not contributing to the increases in concentrations observed in MW-28.*" (SAR page 18).

(Over)

DRC-2021-000642

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The SAR further supports that the source of selenium and uranium in MW-28 is not the tailings management system with other information, including: 1) Site-wide pH changes, 2) Changes in groundwater in MW-28, 3) Indicator parameter analysis, 4) Mass Balance Analyses, and 5) Data review of uranium and selenium in MW-28 with sitewide comparison.

Per DWMRC review of the SAR and historical data for MW-28, including trend analysis for indicator parameters and other key parameters (including nitrate and chloride), it appears that the nitrate/chloride plume is impacting groundwater chemistry and being detected at MW-28. Therefore, DWMRC agrees that based on data review the plume is the likely source of the current OOC for selenium and uranium in MW-28. Adjustment of Permit GWCL's for OOC parameters is appropriate at this time with acknowledgment that additional investigation and data will help to better represent plume migration and expected future impacts at MW-28 and other monitoring wells. Please be aware that while it is appropriate to increase GWCL's during characterization, GWCL's will not be increased above parameter specific Groundwater Quality Standards in this case.

Statistical Analysis

Based on DWMRC review of the SAR statistical analysis it was noted that analysis was conducted for the complete historic data set for MW-28 and for a post 2017 data set. DWMRC notes that per the MW-28 selenium and uranium plots there is a shift in 2017 with rising concentrations. Per above the rising selenium and uranium concentrations are associated with the nitrate/chloride plume. The complete data set did not show normal or log normal distribution for selenium or uranium since the shift is an upward trend associated with the plume. The post 2017 data set did show normality for selenium and uranium.

EFRI statistical methods used in the SAR included: 1) Descriptive statistics for the complete and modified data sets; 2) Mean and Standard Deviation Calculation; 3) Shapiro-Wilk Test for normality; and 4) Mann-Kendall Trend Analysis (non-normally distributed data sets). Proposed GWCL's were calculated based on Mean + 2σ of the post 2017 data set, Highest Historical Value, and Fraction of the Groundwater Quality Standard. The calculations and findings are summarized on a table in the SAR (Appendix B-1 of the SAR).

Per the SAR Section 4.2, EFRI proposed that GWCL's be adjusted according to 0.5 times the Groundwater Quality Standard, which is the highest calculation proposed in the SAR. The DWMRC approved statistical flow chart for the White Mesa Mill groundwater monitoring wells clarifies that if an upward trend is apparent for an analyte then a modified approach should be considered. The modified approach should allow for a GWCL which considers the increasing concentrations.

Based on the calculations of the post 2017 data set it was noted that a normal distribution was evident and that the proposed GWCL could be set according to mean + 2σ of the data. This is more reflective of current conditions in the monitoring well than using the fraction approach and is in conformance with the approved statistical flow chart. Use of the post 2017 data set considers the increasing trend. Additionally, the use of a modified post 2017 data set recognizes a data point of inflection and is consistent with the Environmental Protection Agency 2009 Unified Statistical Guidance.

MW-28 Approved Modified GWCL's

Per review of the SAR Section regarding proposed modifications to the GWCL's and statistical analysis of the data the GWCL's will be modified in the White Mesa Uranium Mill Ground Water Permit for MW-28 selenium and uranium as summarized on the table below:

Well Number	Parameter	Current GWCL	Modified GWCL	Method of Analysis
MW-28	Selenium	11.10 µg/L	17.9 µg/L	Mean + 2σ*
MW-28	Uranium	4.90 µg/L	12.29 µg/L	Mean + 2σ*

*Based on Mean + 2σ of the background data mean of the post 2017 data set for MW-28

Note that the modified GWCL's will not be effective until future issuance of a modified Permit, and that the modifications will be subject to formal public notice and public participation requirements. These Permit modifications are anticipated to be made during calendar year 2022.

If you have any questions, please call Tom Rushing at (801) 536-0080.

Sincerely,



Phil Goble, Uranium Mills and Radioactive Materials Manager
Division of Waste Management and Radiation Control

PRG/TR/as

c: Ronnie Nieves, Environmental Director, San Juan Public Health Department
Russell Seeley, UDEQ District Engineer