COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

January 13, 2023

Scott Bakken
Energy Fuels Resources (USA) Inc.
225 Union Blvd, Suite 600
Lakewood, CO 80228

RE: Whirlwind Mine, Permit No. 2007-044, Technical Revision (TR-2), Adequacy Review-1

Dear Mr. Bakken:

The Division of Reclamation, Mining and Safety (Division) is in the process of reviewing the above referenced Technical Revision in order to ensure that it adequately satisfies the requirements of the Colorado Mine Land Reclamation Act (Act) and the associated Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal and Designated Mining Operations (Rules). During review of the material submitted, the Division determined that the following issue(s) of concern need to be adequately addressed before the Technical Revision can be considered for approval. Please provide the following:

Exhibit D - Mining Plan

1. Page D-17 Within the Linkin System where does the waste from the media filters and the two ion exchangers go? How often does this waste have to be disposed of and what's the maximum volume stored on site at any given time?

Exhibit E - Reclamation Plan

2. Please include a statement within the reclamation plan that addresses the reclamation/removal of the Linkin System.
3. Page T-3 states that a 3 in, 2 in and 6 in HDPE Mine Water Pipelines will be present on site. Only the 6" Ore Pad Sump pipeline is mentioned in section 6, page E-7 of the Reclamation plan. Please revise the Reclamation Plan to clarify how all HDPE pipelines will be reclaimed upon completion of mining. Explicitly sate how those features will be reclaimed.

Exhibit L - Reclamation Costs

4. What is the new total LF of 6 ft H chain link fencing that will require removal at the Whirlwind. Additional fencing is necessary to enclose the two Linkan trailers in addition to the existing water treatment system. There is also fencing along the dry room trailer. Previously a total 1100 LF was noted, please state the new total.
5. For task 01W does the disposal of the water treatment liner include the 40 CY of sludges contained within it? If not, please provide an updated user provided cost that accounts for

inflation to dispose of the 40 CY of water treatment sludges. (Loading, transport, disposal fee)

6. The current bond accounts for closure of two 6" air shafts. The Division acknowledges that additional shafts are to be located on the Utah side. Will any of the air shafts on the Colorado side be secondary escape ways and thus greater in diameter than 6"?
7. During the 2024 inspection it was noted that the poles are owned by San Miguel Power. Cost date was provided for the utility removal. Typically, the Operator is only responsible for removal of owned poles and the utility takes care of the rest. Please clarify this relationship and who is financially liable for the removal of the 5240' LF of wire and 6 poles that service the mine.
8. Please include a task(s) to address reclamation of all the HDPE pipelines on site. Reference question 3.

Exhibit U - Designated Mining Operation Environmental Protection Plan (Exhibit T)

9. After reviewing the previous Appendix H, Hydrated Lime was previously proposed for use however the revised plans do not indicate if its continued use is contemplated. Please state if hydrated lime will be used at the Whirlwind site for water treatment.

**Not that clarification was provided in the memo from Lucas West (attached). Per Rule 1.1(19) chemicals used for water treatment are not considered designated chemicals. Thus, the chemicals to be used for water treatment were not reviewed for compliance with Rule 6.4.21

Disposal of Sludges

10. Will the new water treatment system generate additional sludges or mine waste that will need to be disposed of. If so, please clarify under Rule 6.4.21(19) how the material will be properly disposed of. This information should also be address in the Reclamation Cost Estimate. Also reference question 1.

**Also see the two memos from Leigh Simmons regarding his review of TR-2. No concerns as to the water treatment system were identified. Leigh Simmons did recommend that revisions to the hydrologic monitoring plan be made. The Division will send formal notification under a separate cover as to not delay this revision.

Please submit your response(s) to the above listed issue(s) by December 19, 2024. in order to allow the Division sufficient time for review. If you cannot address the above issues by December 19, 2024 please request an extension to the decision due date to ensure adequate time for the Division to review materials. A decision due date of December 21, 2024, has been set. If any adequacy issues remain by the decision due date the Division may deny your request.

The Division will continue to review your Technical Revision and will contact you if additional information is needed. If you require additional information, or have questions or concerns, please feel free to contact me.

Sincerely,

Amy Yeldell
Environmental Protection Specialist

Enclosures:
LJW Designated Chemical Evaluation 12/11/2024
LDS Whirlwind Mine TR-2 Hydrologic Balance 12/10/2024
LDS Whirlwind Mine Groundwater Monitoring 12/13/2024

Ec:
Travis Marshall, Senior EPS, DRMS
Leigh Simmons, DRMS
Lucas West, DRMS
Dawn Kolkman, Energy Fuels
Jenniffer Whittington, BLM

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Division of Reclamation, Mining and Safety
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Memo

Date: December 11, 2024
To: Amy Yeldell, DRMS
From: Lucas West, DRMS
CC: Travis Marshall, DRMS

Re: Response to Request for Assistance, Whirlwind Mine, Permit No. M-2007-044, Technical Revision 2 – Water Treatment System Add-on

Amy,

On December 4, 2024 you submitted a request for Technical Assistance for the evaluation of chemicals proposed to be used at the Whirlwind Mine in Mesa County. The chemicals requested for evaluation were Hydrochloric Acid, Sodium Hydroxide, Sulfuric Acid, Sodium Metabisulfite, Barium Chloride and Ferric Sulfate. Though some of these chemicals would be considered Designate Chemicals, the proposed use of the chemicals is for water treatment operations, not for use in the Extractive Metallurgical Process. In accordance with the attached Designated Chemicals Evaluation Guidance Document, chemicals used for water treatment operations are exempt from review. Therefore, the above listed chemicals cannot be evaluated for their status as a Designated Chemical pursuant to Hard Rock and Metals Mining Rule 1.1(19).

If you have any questions or concerns, please feel free to contact me.

Sincerely,

Lucas West
Environmental Protection Specialist

Encl. Designated Chemical Evaluation Guidance Document

Ec: Travis Marshall, DRMS

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GUIDANCE DOCUMENT

To: DRMS Minerals Staff and Operators

From: Russ Means, Minerals Program Director
Michael Cunningham, Senior Environmental Protection Specialist

Subject: Designated Chemicals Evaluation

The Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (Rules) requires the Division to evaluate chemicals that are used or proposed to be used in extractive metallurgical processing. Rule 1.1(19) defines a designated chemical as a toxic or acidic chemical used within the permit area in extractive metallurgical processing, the use of which, at certain concentrations, represents a potential threat to human health, property or the environment.

Designated Chemicals List

To assist mine Operators in the permitting process, the Division has developed a Designated Chemicals List (DCL) consisting of chemicals which have been evaluated for use in metallurgical processing. The DCL includes chemicals that have been determined to be designated chemicals as well as those chemicals that are exempt from additional permitting requirements. The DCL is not a comprehensive list of all chemicals that may be utilized at a mine site, but rather a list of all chemicals which have been proposed for use in metallurgical processing and which have been evaluated by the Division. The DCL will be updated as new chemicals are evaluated. The Division reserves the right to reevaluate chemicals on the DCL at any time. The DCL does not include fuel, oil, lubricants, pesticides, or deicers. Other chemicals that may be present at a mine site, but are otherwise not used in metallurgical processing are exempt from review such as those for water treatment and other mine operations. Minor amounts of chemicals used in bench scale testing are exempt from the designated chemicals evaluation process.

Chemicals that are proposed for use in metallurgical processing will be evaluated on their potential to affect human health, property or the environment; taking into consideration the size of the project, the expected concentrations and fate of such chemicals.

Designated Mining Operations

Operators must identify any chemicals that are used in metallurgical processing when an application is filed for a new mining operation or through a permit revision for permitted mining operations. The use of designated chemicals at a mining operation is only allowed for operations which are

permitted as Designated Mining Operations (DMO). All DMOs must include an Environmental Protection Plan (EPP) which contains a discussion of the types, quantities, and concentrations of designated chemicals within the permit area. In addition, a Designated Chemicals and Material Handling plan must be included in the EPP which describes how all designated chemicals will be handled during active mining operations, during periods of Temporary Cessation, and shall fully describe the procedures for secondary containment, emergency spill notification procedures, the disposal, decommissioning, detoxification or stabilization of designated chemicals at the conclusion of operations so as to comply with all applicable environmental protection and reclamation standards and regulations.

The authorization to use designated chemicals at a permitted mine site does not include a risk based health standard for measuring exposure limits, nor does it address the use of personal protection equipment. It shall be the Operator's responsibility to follow the safety guidelines listed in Safety Data Sheets and to remain in compliance with other regulatory entities that have oversight of the use of chemicals at a mining operation.

Designated Chemicals Evaluation

The Division will evaluate chemicals that are proposed to be used in extractive metallurgical processing when an application is filed for a Designated Mining Operation or through the Technical Revision process for existing operations. The use of chemicals in extractive metallurgical processing without prior approval from the Division is prohibited. The Division is available for designated chemical consultations upon request.

For additional information on designated chemicals and designated mining operations please see Rules 1.1(19), 1.1(20), 1.4.2, 1.4.5, 1.4.6, 6.1.2, 6.1.4, 6.3, 6.4.21 and 7.

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Interoffice Memorandum

December 10, 2024

From: Leigh Simmons
To: Amy Yeldell

Subject: Whirlwind Mine (Permit No. M-2007-044)
TR-2

As you requested, I reviewed the material submitted with the Whirlwind Mine TR-2 application. My focus was on aspects of the submittal concerning potential impacts to the hydrologic balance. I also reviewed documents from the currently approved permit file, and recently submitted hydrology reports.

With TR-2 Energy Fuels Resources (USA) Inc, the operator of the Whirlwind Mine, is seeking to add to the existing water treatment system.

The scope of TR-2 is rather limited: it provides details of an "add-on" water treatment system that the operator proposes to use in order to comply with the requirements of the CDPS discharge permit (CO0047562) which were made more stringent upon renewal in 2015 compared to the original 2007 permit. The original system was designed by Lyntek (details are given in Appendix H of the permit file). The proposed add-on does not replace any of the existing water treatment system, but effectively "polishes" the effluent; it has been designed by Linkan and is detailed in the proposed Appendix H2.

Linkan is a reputable company with an office in Golden, CO, and considerable expertise in mine water treatment. The Division has worked with Linkan in the past on several projects around the state.

The existing Water Treatment System has not been in operation since 2009, which has allowed a mine pool to accumulate. Since the operator intends to resume activity at the Whirlwind Mine, the pool must be dewatered which will require the treatment and discharge of an estimated two million gallons of mine water. While the existing system was effective in meeting the discharge standards of the 2007 CDPS permit, there are several water quality parameters which would exceed the more stringent standards of the 2015 permit: selenium, uranium and Total Suspended Solids (TSS) – these are identified as "primary constituents of concern". Several additional water quality parameters are identified as "secondary constituents of concern", where the parameter exceeds the discharge limit in the raw feed (i.e. mine water) but meets the standard in the treated effluent; these include arsenic, iron, lead, manganese, zinc, pH, radium 226, and radium 226+228.

The proposed add-on system is thoroughly described in the material submitted with TR-2. In summary, the system takes treated water from the existing settling/polishing tanks, and passes it in series, through

sand filters (to remove suspended solids), a strong base anion exchange resin (to remove uranium), a second ion exchange resin (to remove arsenic and selenium), and activated carbon (to remove organic compounds). The effluent is treated with sodium hydroxide, as necessary, to raise the pH prior to discharge, see Figure 1.

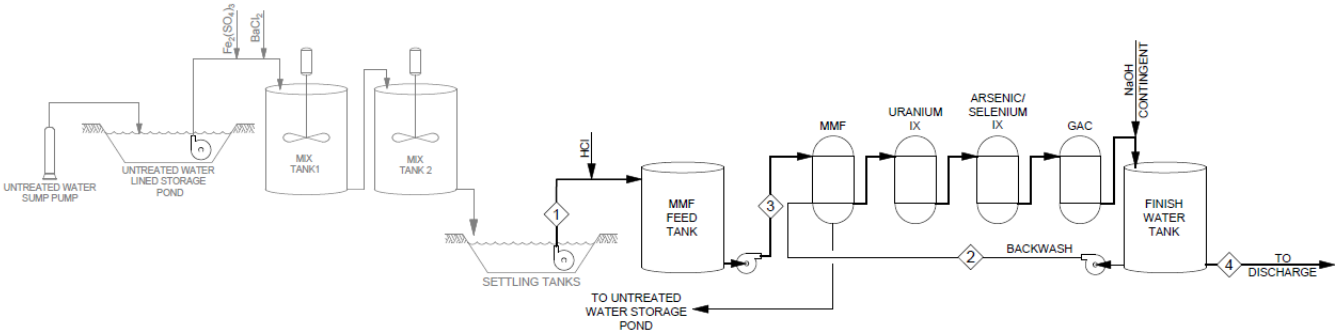

Figure 1: Process flow diagram, copied from Appendix H2

Detailed design drawings are given for the add-on system, (and aspects of the existing system), which would greatly assist a new operator in taking over responsibility for running the system in case that were to be necessary in the future. The detailed drawings show redundancy of critical parts of the system, as well as components necessary for maintenance.

The add-on system is proposed to be completely contained within two shipping containers, so bonding for reclamation is considerably simplified.

TR-2 proposes:

- No new disturbance
- No increase in sludge
- No additional water storage tanks
- No change to the outfall or discharge rate

I have no adequacy concerns about the material submitted with TR-2.

In addition to the TR-2 material I reviewed Exhibits C, D, G and T, and Appendices A, F, H and L of the permit file, the 2022 Groundwater Characterization Report by Western Water and Land, and several quarterly hydrologic monitoring reports.

I will not attempt to summarize the content of the material here, but I will note that I found it to be refreshingly thorough and clearly presented. I have the following comments:

- Ore and waste material has been geochemically characterized using a Synthetic Precipitation Leaching Potential (SPLP) procedure, (see Appendix A). The results support the operational plan for the future disposal of mine waste on the historic waste dump, assuming the best management practices described in Exhibits D and T are adhered to.

- The design of the ore pad and the water treatment facilities, described in Exhibit T with additional design details in Appendix J, has redundancy in terms of spill or leak containment. The capacity of critical elements of the system – in particular the untreated water storage pond

– allows for scheduled and unscheduled periods of treatment plant downtime as well as normal operations, and the surge capacity to retain ore pad run-off from the 100y/24hr storm event.

- Hydrologic monitoring and reporting requirements are adequate for the time being. If and when the mine becomes active a review of the reported monitoring data may indicate that additional monitoring is warranted.

- The 2022 Groundwater Characterization Report is a substantial document that collates historic data from a number of sources, as well as more recent data collected by the current operator. It presents a coherent conceptual model of the site, supported by the available data. The analysis presented is thorough. Conclusions are definitive where possible (for example, “no mine water is expected to exit the mine under free drainage conditions”), but acknowledge where uncertainty remains (for example, the authors found that the proposal by an earlier operator that there is not hydrologic connection between the Packrat Mine and the PR spring is not supported by sufficient evidence to be definitive). Future mining will likely provide additional information to build on this Report.

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Interoffice Memorandum

December 13, 2024

From: Leigh Simmons
To: Amy Yeldell

Subject: Whirlwind Mine (Permit No. M-2007-044)
Groundwater Monitoring

As we discussed, the changes proposed to the operation plan at the Whirlwind Mine with TR-2 have to do with improving the quality of water discharged from the treatment facility. Nothing that has been proposed with TR-2 has the potential to increase negative impacts to groundwater quality (or surface water quality) compared to the currently approved plan.

The operator's submission of TR-2 prompted a review of the currently approved permit by the Division, during which it became apparent that aspects of the hydrologic monitoring plan should be brought into line with current best practice before the mine returns to production. This will likely involve

i. establishing one or more groundwater points of compliance
ii. formalizing the standard(s) to apply at those points
iii. agreeing Numeric Protection Limits for individual groundwater quality parameters reflective of the applicable standard(s)

I think we are in agreement that the Division should communicate these expectations to the operator well in advance of the anticipated resumption of mining to allow time for the development of a thorough plan that will be protective of the hydrologic balance and in accordance with the Division's current guidance.

I suggest that the Division requests the submission of a new Technical Revision to address these issues, rather than hold up the approval of TR-2. I will draft some text that you can use in a letter to the operator.