



March 16, 2023

Nick Mason
New Elk Coal Company, LLC.
12250 Highway 12
Weston, CO 81091

**Re: New Elk Mine (Permit No. C-1981-012)
Permit Revision No. 6 (PR-6)
Adequacy Review 2**

Dear Mr. Mason:

The Colorado Division of Reclamation, Mining and Safety (Division) received your responses to the December 13, 2022 adequacy questions on February 9, 2023. The Division finished its review of the adequacy responses and have the following adequacy questions or comments:

Section 2.03

1. On page 15, there is the statement “This completes Section 2.03”. The following page 16 has additional information about the Office of State Engineer. Please move the OSE information above the “This completes Section 2.03” statement so the information doesn’t get omitted.

Section 2.03.9 – Personal Injury and Property Damage Insurance Information

1. Item Resolved.

Section 2.03.10 – Identification of other Licenses and Permits

1. No adequacy questions.

Section 2.04.3 – Site Description and Land Use

1. Item Resolved.

Section 2.04.7 Hydrology Description

1. Item Resolved.
2. It is acknowledged in the introduction to the Probable Hydrologic Consequences (PHC) section of the currently approved PAP text that one of the factors that



could impact the hydrologic balance of the area is subsidence. On page 2.05-71 the following text has been proposed to be added:

The mining method and extraction of coal will use room and pillar mining. For the Blue Seam, no secondary or retreat mining is planned and subsidence is not anticipated. Mining in the PR6 area will occur in only the Blue Seam. This area was previously included in the Golden Eagle permit area where mining occurred only in the Maxwell Seam and mining in this seam did not occur in the PR-6 area. As a result, there are no seams above or below the Blue Seam that may contribute to potential subsidence. Thus, impacts to surface water resources or groundwater wells in the area of mining should not occur but monitoring of these resources and subsidence will identify any effects of mining.

The assertion that the proposed Blue Seam mining will not cause subsidence has not been supported. Although it is accepted that the subsidence impacts of room and pillar mining without retreat mining will be less than with retreat mining, it cannot be true that there is no potential for subsidence under any circumstance.

The currently approved text mentions a minimum depth of cover of 450 feet over the Apache Seam, but does not discuss the depth of cover over the Blue Seam. Based on a review of the revised maps (Map 3 Blue Mine Plan, Map 6A Sheet 5 Blue Seam Depth of Cover, and Map 7 Coal Seam Cross Sections), it appears that the depth of cover above the Blue Seam could be quite shallow, particularly at the point where the proposed workings approach the Purgatoire River. For example, Map 7 shows a depth of cover of 91 feet at A-19, and 82 feet at NE-01-10.

The potential for subsidence associated with the updated mine plan should be thoroughly evaluated, as is required by Rule 2.05.6(6). It is likely that this will involve an engineering study similar to the 2011 Agapito study found in Exhibit 24. The results of this study should be referenced when evaluating the PHC.

The text should also be updated to mention unambiguously the minimum depth of cover to the Blue Seam workings. This item has not yet been adequately addressed.

3. Also on page 2.05-71, the currently approved PAP text contains a paragraph beginning:

Well records from CDWR indicate that there are 19 permitted wells in the Raton Formation within a one mile radius of the permit boundary...

The text goes on to refer to Exhibit 8(4), which contains a 2011 report produced by Whetstone Associates. No revisions to the currently approved text or to Exhibit 8(4) have been proposed.

The Whetstone report was produced to examine the probable hydrologic impacts of an earlier revision to the mine plan (room and pillar mining in the Allen and Apache seams to the south and east of the previously approved mine plan), and forms the basis of the currently approved analysis of the probable hydrologic consequences of mining.

Although the changes to the mine plan with PR-6 are less significant than those previously proposed with PR-5, they merit greater analysis than has been presented to the Division at this point.

A thorough analysis should be made of the Probable Hydrologic Consequences of the mine plan proposed with PR-6, as is required by Rule 2.05.6(3). It is likely that this will involve at least an addendum to the 2011 Whetstone study found in Exhibit 8(4). The PAP text should be updated with reference to the study.

A memo from Arcadis has been proposed to be added as Exhibit 8(5). The memo does not contain new information, but provides an analysis of existing data in the context of the mine plan proposed with PR-6. The prediction of Probable Hydrologic Consequences is based on an assumption that no subsidence will occur as a result of the mining proposed with PR-6. As such, the response to Item 3 of this memo cannot be fully evaluated until Item 2 has been adequately addressed.

In Exhibit 8(5) wells that have the potential to be affected by mining are identified (although impacts are not anticipated), and a commitment is made to replace the water supply with city water if impacts occur.

The paragraph copied below is from section 7 of Exhibit 8(5):

Current inflow into the Blue Seam mine is intermittent, approximately 0 to 5 gpm. Dewatering discharge from the mine will be used in the mine or treated before being released to the Purgatoire River and impacts to water quality in the river from discharged water are expected to be similar to those currently observed (i.e., an average increase of about 40mg/l total dissolved solids [TDS] downstream from the mine). Water quality in the mined coal seam in the permit area is expected to be impacted by the mining operation. Impacts to water quality will include an increase in TDS, mainly in the form of sodium and bicarbonate. **Background TDS concentrations in the Blue Seam is estimated to be about 435 mg/L and**

1,105 mg/L respectively based on the electrical conductivity (EC) of groundwater from monitoring wells NE-1-10 (623 $\mu\text{S}/\text{cm}$ – Allen) and NE-6-10 (1,106 $\mu\text{S}/\text{cm}$ – Apache) and the assumption that TDS is equal to about 70 percent of EC. Observed TDS in the sealed portion of the New Elk Mine has averaged 1,628 mg/L. After mining, the TDS concentration of groundwater in the Apache and Allen Seams near the underground workings is expected to be like water in the sealed mine.

Please correct the typographical error: 40mg/1 should presumably be 40mg/L

Please clarify the section with yellow highlighting – since impacts are predicted to the Blue Seam, a baseline of water quality in the Blue Seam should be established by direct measurement prior to mining, not estimated from data collected from the Allen and Apache seams. Data from NE-06-10b should be used to establish this. Typically 5 quarters of monitoring data are considered the minimum to establish a baseline.

Please clarify the section with blue highlighting – PR-6 proposes mining in the Blue Seam, not the Allen or Apache seams. The final sentence of section 5 in Exhibit 8(5) reads: The presence of high vertical gradients indicates that permeability is low perpendicular to bedding and limits the flow of groundwater from the surrounding clastic rocks to the coalbeds. If vertical flow is assumed to be limited, predictions made of the impacts to water quality in the Allen and Apache seams cannot be extrapolated to the Blue Seam.

4. Item Resolved.
5. *The hydrologic monitoring plan is presented on pages 2.05-104 through -110 of the PAP. The currently approved plan was appropriate for the New Elk mine prior to PR-6, while the mine was inactive; it is not appropriate for an active mine, or for the mine plan proposed with PR-6.*

Please review and update the hydrologic monitoring plan, in accordance with the performance standards given in Rule 4.05.13. Please also propose locations for Groundwater Points of Compliance as appropriate. It may be helpful to refer to the Division's Groundwater Monitoring and Protection Technical Bulletin for guidance; the technical bulletin is available from the DRMS website: <https://drms.colorado.gov/programs/coal-regulatory-program/coal-program-guidelines-and-technical-documents/technical>

Three existing wells have been proposed as groundwater points of compliance (POC):

- **NE-06-10b completed in the Blue Seam, north east of the PR-6 area**
- **ACAW-1 completed in the alluvium of Apache canyon, east of the PR-6 area**
- **CCAW-1 completed in the alluvium of Ciruela canyon, east of the PR-6 area**

Please update Table 27 to identify these wells as POCs, and to show that they will be monitored quarterly.

Please note also that the applicable standard at the POCs will be the Interim Narrative Standard from Regulation 41, The Basic Standards for Groundwater (Reg 41), since groundwater in the area of the New Elk mine has not been classified. The Division does not have the authority to set standards, but it does have the authority to use historic monitoring data to determine numerical values for groundwater quality parameters, if suitable data is available. If no data is available then the most stringent values from Tables 1 – 4 of Reg 41 apply. Please consider formalising how the Interim Narrative Standard will be applied at the groundwater points of compliance either with PR-6, or with a Technical Revision following the approval of PR-6

Section 2.04.11 – Fish and Wildlife Information

1. No adequacy questions.

Section 2.05.3 – Operation Plan

1. Map 11 sheet 4 was not submitted with the latest adequacy response showing the new PR6 permit boundary. Please submit an updated Map 11 sheet 4.
2. Item Resolved.
3. Item Resolved.
4. The Exhibit 42 materials are not consistent with the referenced maps:
 - a. Details 44-47 are not include in Table 42-1. These structures are located within the permit and need to be listed in the table.
 - b. Page 42-13 submitted with the adequacy response begins with Detail 34. In the current permit, Detail 34 is on page 9. Please update Exhibit 42 so all the Detail descriptions and page numbers align.
5. Item Resolved.

Section 2.05.4 – Reclamation Plan

1. No adequacy questions.

Section 2.05.6 – Mitigation of Surface Coal Mining Operation Impacts

1. The applicant did not provide the Division with any new information regarding the subsidence section of the permit (Rule 2.05.6(6)). There was no update to the subsidence information about mining in the Blue Seam. The applicant needs to provide the Division with an evaluation specifically addressing the mining of the Blue Seam in the proposed PR-6 mining area. Exhibit 24 of the current permit was evaluated for multi-seam mining and retreat mining methods. The applicant is currently proposing room and pillar mining with no retreat mining. The subsidence evaluation should be based on the proposed mining methods.
2. Information provided in Exhibit 8(5) is insufficient. Minimal details were given in section 6, Subsidence Predictions, regarding mining in the Blue Seam. Section 6 of this document bases its claims off of Exhibit 24, which is insufficient for the proposed PR-6 mining area. The applicant should base this section off of information obtained for a PR-6 Blue Seam subsidence evaluation. The applicant should include details in section 6 in detail to support the claims about the predictions of the potential impacts of subsidence.
3. Subsidence monitoring, and control plans for the PR-6 mining area will need to be based off of a subsidence evaluation created for the Blue Seam.

Please note that the decision date for this application is April 14, 2023. If you are unable to provide satisfactory responses to any inadequacies prior to this date, it will be your responsibility to request an extension of time to allow for continued review of this application.

If you have any questions or need additional information, please contact me at (720) 774-0040.

Sincerely,



Brock Bowles
Environmental Protection Specialist
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