STATE OF COLORADO

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C1981012, New Elk Mine, PR-6, Adequacy Review Memo

1 message

Simmons - DNR, Leigh <leigh.simmons@state.co.us> Thu, Mar 9, 2023 at 12:53 PM
To: "Bowles - DNR, Brock" <brock.bowles@state.co.us>

Brock,

My memo is attached.
Please let me know if you have any questions.

Leigh Simmons
Environmental Protection Specialist

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2 attachments

C1981012_PR6_LDSMemo_2.pdf
339K

C1981012_PR6_LDSMemo.docx
161K

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

Interoffice Memorandum

March 9, 2023

From: Leigh Simmons
To: Brock Bowles

Subject: **New Elk Mine (Permit No. C-1981-012)**
PR-6

I reviewed the material submitted by New Elk Coal Company (NECC) on February 9 in response to the last PR-6 adequacy review.

Items copied from my earlier memo are in *italics.* Items that still need to be addressed are in **bold**.

Rule 2.04.7 Hydrology description

1. *On proposed page 2.04-25a the applicant states:*
   There are a total of twelve potential springs and seeps sites identified within a one-mile buffer of the PR-6 permit boundary. Locations of these springs and seeps are shown on Map 8 and are summarized in Table 11a, Preliminary Spring/Seep Locations.
   And later:
   As part of the hydrology sampling the springs and seeps will be monitored as well as their locations confirmed. Parameters measured will included pH, flow, conductivity, and temperature. The results of this inventory will be presented in Table 12, Results of Field Spring and Seep Inventory.

   Please update Tables 11a and 12.

   The applicant responded that no new springs or seeps have been identified, so no changes have been proposed to Tables 11a or 12. The response is sufficient.

Rule 2.05.6(3) Protection of hydrological balance

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/1 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 µS/cm – Allen) and NE-6-10 (1,106 µS/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 averaged1,628 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 imapcts to water quality in the Allen and Apache seams cannot be extrapolated to the Blue Seam**

4. *A revised version of Map 8, Regional Hydrology, has been submitted. During the revision process the map frame was reduced, so that the western end of the permit area has been clipped off. Although the changes proposed with PR-6 are to the east of the current permit area, the information to the west should be retained.*

Please revise Map 8 to restore the coverage of the area to the west.

Map 8 has been revised. The response is sufficient.

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.

References

Colorado Department of Public Health and Environment, Water Quality Control Commission. Regulation 41 - The Basic Standards For Groundwater, 5 CCR 1002-41 § (2020). Retrieved from: https://www.coloradosos.gov/CCR/GenerateRulePdf.do?ruleVersionId=8819&fileName=5%20CCR%201002-41

Groundwater Monitoring and Protection Technical Bulletin, November 19, 2019 https://drive.google.com/file/d/121Uc_KmuAx7xhc8heQcROPnK_u-kcG-J/view?pli=1