



STATE OF
COLORADO

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C1980007, West Elk Mine, TR-149, Initial Adequacy Review

1 message

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Fri, Jan 29, 2021 at 4:24 PM

To: "Welt, Kathy" <KWelt@archrsc.com>

Attached

Leigh Simmons
Environmental Protection Specialist



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Adequacy letter, West Elk, TR-149,1.pdf

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

Kathleen G. Welt
Mountain Coal Company, LLC
5174 Highway 133
Somerset, CO 81434
January 29, 2021

Re: West Elk Mine (Permit No. C-1980-007)
Technical Revision No. 149, (TR-149)
Initial Adequacy Review

Dear Ms. Welt,

The Colorado Division of Reclamation, Mining and Safety (Division) has completed the initial review of materials submitted by Mountain Coal Company, LLC (MCC) in support of the TR-149 application. The Division's comments and questions are below, with items that need to be addressed highlighted in bold type.

Rule 2.05.6(6) Subsidence Survey, Subsidence Monitoring, and Subsidence Control Plan

1. The requirements of Rule 2.05.6(6) are addressed by Exhibit 60E SUBSIDENCE EVALUATION FOR THE SOUTHERN PANELS, APACHE ROCKS WEST, & SUNSET TRAIL MINING AREAS. The Division notes that the proposed changes made to Exhibit 60E are effectively edits and clarifications; the modeling methodology is unchanged from that previously approved. Wright Water Engineers (WWE), the authors of the study, state explicitly on page 4:

This exhibit focuses on subsidence projections over the mined longwall panels.

On page 41 the authors address the potential for subsidence during development mining:

Although subsidence is primarily a result of the secondary recovery of coal from a longwall coal panel, subsidence-type features may occur when developing main entries/roadways under shallow, unconsolidated and saturated cover. Such was the case in October 2020 when developing main entries under South Prong Creek. To avoid similar issues in the future, MCC has performed an analysis of the minimum depth of cover required for development mining in the West Elk Mine to avoid the potential for this type of surface subsidence impacts. WWE has included this Technical Memo as Appendix A to this exhibit.



Exhibit 60E, Appendix A, is a technical memo written by Bob Munz of MCC. It presents an analysis of the potential for subsidence over development workings at the West Elk Mine. The analysis considers two subsidence mechanisms: (i) a roof fall with competent rock strata in the overburden, and (ii) a roof fall and subsequent progressive “chimney-type” failure, where the roof has no spanning ability. The potential for each of them to impact the surface under worst-case scenario conditions (specifically, under a perennial stream) was assessed. Literature citations are provided, and the predictive model used for the chimney-type failure has been populated using conservative parameter values. Mr. Munz concludes that:

...the potential for a subsidence basin to develop above a development mining area, located under a perennial stream, is practically impossible at depths greater than 110 feet.

The explicit commitment is made that:

No future development mining will be conducted at overburden depths shallower than this [110 feet] beneath a perennial stream.

With reference to the main text of the proposed revised Exhibit 60E, WWE provide a valuable clarification of their conclusions with respect to the potential for hydraulic connection between the mine workings and the surface over longwall panels, stating on page 36-37 that:

It was not the intent of the previous analysis to indicate or specify that... longwall mining could not occur in overburden less than 375 feet. WWE does believe that it is prudent to have a “buffer” to reduce the possibility of a hydraulic connection between the ground surface and the mined longwall panels. We recommend that a factor of safety of 20 percent be added to the combined fracture height and crack depth total to yield the minimum overburden necessary to avoid a hydraulic connection. For example, if mining at a thickness of up to 14 feet, then the minimum overburden cover should be 253 feet plus 20 percent, or about 304 feet.

WWE proceed to make detailed operational recommendations:

This minimum overburden... can be reduced if the longwall mining height is lowered. For example, if the mining height were to be reduced to 12 feet near the western end of longwall panel SS4, then the combined height of the caved and fracture zones capable of transmitting water is projected to be 204 feet ($5t = 60'$; $2/3(18t) = 144'$). Adding in the maximum projected crack depth of 15 feet yields a combined height of 219 feet, or 263 feet with the 20 percent “buffer.” Therefore, the mine can make operational decisions based on the actual

*overburden encountered in specific locations. **We do not recommend that longwall mining occur where overburden thickness is not at least 250 feet, even with reduced mining height.***

The current projection of minimum overburden over the Sunset Trail longwall panel is approximately 280 feet at the western end of longwall panel SS4. Should this projected overburden prove to be accurate, MCC can either shorten the longwall panel at a location where the overburden drops below approximately 300 feet or reduce the mining height in accordance with the actual overburden thickness.

The three statements in bold quoted above constitute recommendations from MCC's consultant (even the memo written by Mr. Munz is included as an appendix to WWE's report). The Division concurs with the recommendations.

Please make an explicit commitment to adhere to these recommendations in the text of section 2.05.6(6) of the PAP

2. The proposed text of section 2.05.6(6) has been significantly revised, yet it still contains details that have been duplicated from the Exhibit 60 series. For the sake of clarity, and to avoid the unintentional errors and inconsistencies that creep in when complex technical information is duplicated, the Division would prefer that the text in section 2.05.6(6) be further reduced with the goal of retaining simple factual statements and operational commitments in the text, and to refer to the relevant exhibit for supporting information.

Please either:

- (i) **restore deleted discussion to section 2.05.6(6), or**
- (ii) **revise the text more thoroughly to avoid duplicating supporting technical information from the Exhibit 60 series**

(It may be helpful to discuss this adequacy item over the phone)

3. Figures 19, 19A, 21A appear to have been inadvertently omitted from the proposed revised text of section 2.05.6(6)

Please restore figures 19, 19A, 21A

Rule 2.10 Maps and Plans

4. The Division understands that the currently approved version of Map 51 is no longer up to date.

Please update Map 51 with the current E-seam mine plan

5. Map 19 shows E-seam overburden depth contours. It was last updated in March 2018. The Division understands that the contours shown are projections made from borehole data and that data gained during mining in the time since that map was published may provide a more accurate projection of the E-seam overburden depth.

Please review Map 19 and update with recent data if necessary

The changes to the PAP proposed with TR-149 do not require any changes to the Reclamation Cost Estimate.

The proposed decision due date for TR-149 is March 1, 2021.

Yours sincerely,



Leigh Simmons
Environmental Protection Specialist