STATE OF COLORADO

Simmons - DNR, Leigh <leigh.simmons@state.co.us>

C1981010, Trapper Mine, PR-11, Groundwater Review

1 message

Simmons - DNR, Leigh <leigh.simmons@state.co.us> Thu, Feb 23, 2023 at 8:15 PM
To: Robin Reilley - DNR <robin.reilley@state.co.us>

Robin,

My memo is attached.

Apologies for the length of time I took to respond to your request - the volume of material I had to read in order to make meaningful comments was daunting, even in comparison to other coal permits.

Thanks for your patience.

Leigh Simmons
Environmental Protection Specialist

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

P 303.866.3567 x 8121 | C 720.220.1180 | F 303.832.8106
1313 Sherman Street, Room 215, Denver, CO 80203
leigh.simmons@state.co.us | https://drms.colorado.gov

2 attachments

C1981010_TrapperPR11_LDSmemo1.pdf
645K

C1981010_TrapperPR11_LDSmemo1.docx
1811K

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

Interoffice Memorandum

February 23, 2023

From: Leigh Simmons
To: Robin Reilley

Subject: **Trapper Mine (C-1981-010)**
PR-11
Groundwater Review

As you requested, I reviewed the material submitted with the PR-11 application pertaining to groundwater. I also reviewed Sections 2.7, 4.0 and 4.8 of the currently approved permit application packet (PAP) and the 2021 Annual Hydrology Report (AHR). The quantity of material in the PAP made this review challenging for me given that I'm somewhat unfamiliar with the Trapper permit; I apologize in advance if I have requested information that is already available.

My comments are organized by rule, below:

Rule 2.04.6(2)(b) Geology Description; Surface Mining

1. Map 36 shows the locations of core holes used to characterize overburden geochemistry, and Section 2.7.2 (Page 2-357) presents the results of the analysis. No revisions to Section 2.7.2 have been proposed with PR-11, and Map 36 shows that few core holes were drilled in the western part of the permit area (see Figure 1 below).

   Please update Section 2.7.2 with a discussion of the characterization of overburden geochemistry for the C, I and J Pits.

2. Figure 2.7-5 (Page 2-393) is proposed to be added. The figure shows a typical stratigraphic section of the Trapper mine area, from the F-seam overburden to the R-seam. The pagination would place the figure into the currently approved PAP between an extensive discussion of overburden geochemistry in the PR-7 area (Section 2.7.2.3; Pages 2-391a through 2-391z) and Section 2.74, Pre-mining Conditions – Surface Water. No additional text is proposed that refers to or explains the significance of the figure.

   Please explain proposed Figure 2.7-5.

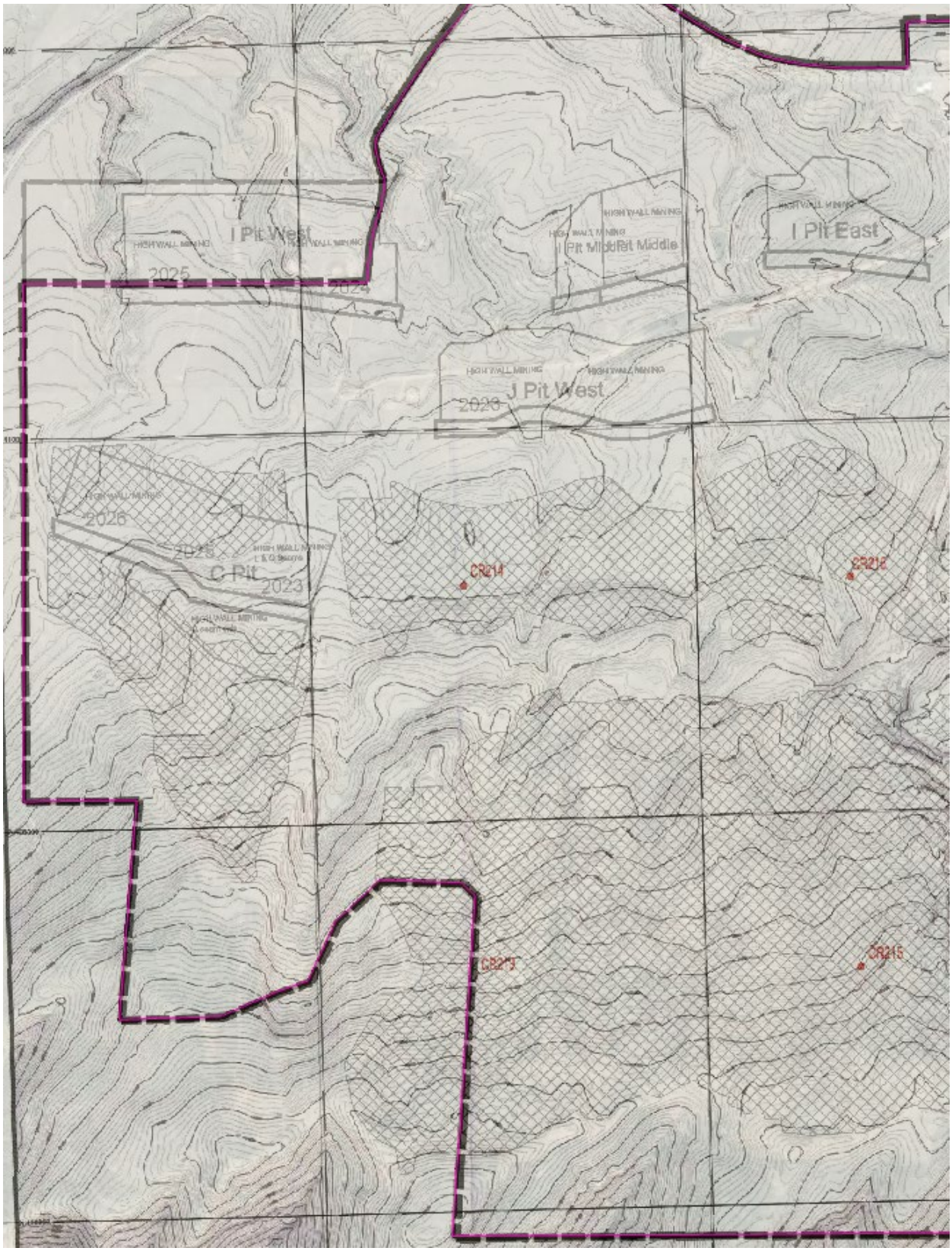

Figure 1: Screenshot showing currently approved permit boundary (pink polygon) and Map M36 (with core hole locations) overlain on proposed Map M4 (with pit locations)

Rule 2.04.7(1) Hydrology Description; Groundwater Information

3. Section 2.7.5.1d (Page 2-462o) describes aquifer characteristics of the I and J pits, it was last updated with PR-10.

   Please update Section 2.7.5.1d to address the mine plan proposed with PR-11.

4. The water levels in the Twentymile Sandstone, Third White Sandstone, Second White Sandstone and Alluvial Aquifers are presented on Map 54G, which was last updated with PR-7 in 2014. The map shows projected contour lines at 100' intervals of the potentiometric surface in each of the named aquifers, from which the direction of groundwater flow can be inferred. The map suggests that groundwater flows generally to the NNW across most of the permit area in all three of the identified bedrock aquifers. There is an anomaly in the Third White Sandstone in the region of the PR-11 addition to the permit area (see Figure 2), where the 6300' contour line is shown curving dramatically around by 180°. If this line were accurate groundwater flow in the Third White Sandstone would be to the W, or possibly SW, beneath the proposed I Pit West, and neither of monitoring wells 81-03A or CY-3 would be downgradient of the proposed disturbance. Based on the information available in the PAP, the Division finds the projected potentiometric surface shown on the currently approved Map 54G implausible, particularly given that no such anomaly is shown in the Second White Sandstone which overlies it. According to Figure 2.7-4 (page 2-356) the axis of the synclinal basin is approximately 2 miles to the north, so there is no structural rationale.

   Given that the Third White Sandstone is immediately below the G-seam (according to figure 2.7-18p, page 2462b), further characterization of this aquifer in the PR-11 area is warranted.

   Characterization of the the alluvial aquifers in the three drainages in the west of the permit area appears to be lacking.

   (a) Please discuss the anomaly in the Third White Sandstone aquifer described above.
   (b) Please update Map 54G with the most recent data available to show the best possible prediction of the potentiometric surface in each of the named aquifers. (It may be necessary to collect data from another point south and west of 81-03A and CY-3)
   (c) Depending on the response to (a) and (b), please propose an additional downgradient monitoring well in the Third White Sandstone if necessary.
   (d) Please discuss the characterization of the alluvial aquifers in the west of the permit area.

5. There is currently no map in the PAP which shows location of the outcrop of the various aquifers identified within the permit area (or the coal seams).

   It would make an assessment of the probable hydrologic impacts on groundwater significantly easier if these outcrop locations were shown on a map; Map 54G would be an ideal candidate. Is it Trapper's assumption that the recharge zone for each of these aquifers is at or near the outcrop?

6. Baseline groundwater quality information is presented in Section 2.7.5.2 of the currently approved PAP (Page 2-463). The text, which is not proposed to be revised, states that:

   > *Water quality has been monitored at five different locations at the mine site; Sites GA, GB, GC, GD and GE are shown on Map 52*

   Please update Map 52 with the locations of sites GA, GB, GC, GD and GE.

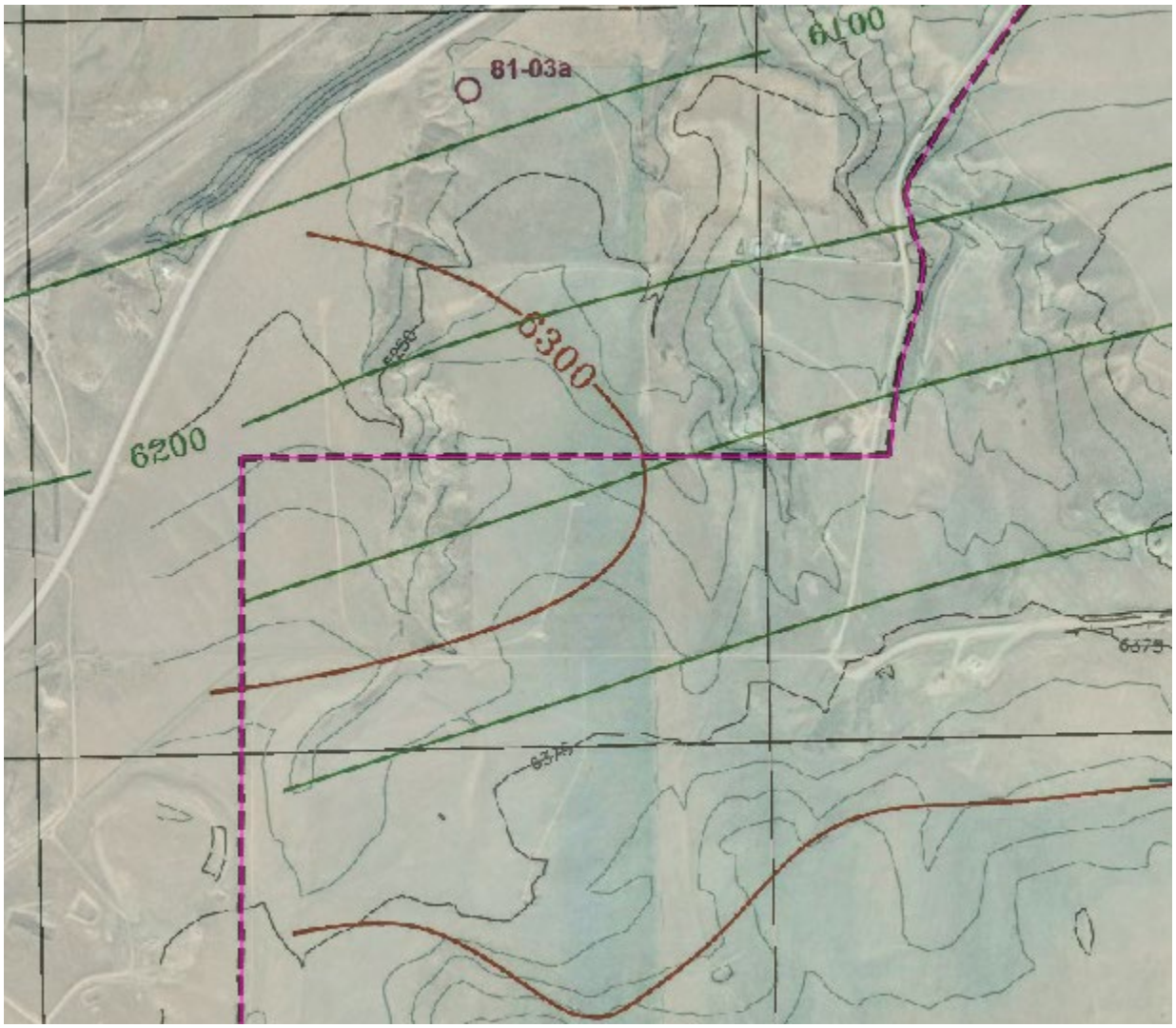

Figure 2: Screenshot showing currently approved permit boundary (pink polygon) overlain on currently approved Map M54G, with potentiometric surface of Third White Sandstone (red contour lines) and Second White Sandstone (green contour lines)

7. Section 2.7.5.2d (pages 2-520yy to 2-520zz), which is proposed to be revised, describes groundwater quality in the I and J pits, including the PR-11 expansion area. It does not mention the C pit, the mining of which is newly proposed with PR-11.

   Please update Section 2.7.5.2d to include the new C pit. Please also clarify in the text which seams will be mined in each pit.

8. Section 2.7.5.2d refers to the GLUX-1 well as a source of baseline water quality data for the First White Sandstone.

   Please update Map 52 with the location of the GLUX-1 well.

<u>Rule 2.05.6(3) Protection of hydrological balance</u>

9. Several qualitative statements are made about the movement of groundwater in proposed Sections 2.7.5.2d and 2.7.5.3d (pages 2-520yy to 2-520zz and page 2-523aa). Estimates of aquifer properties will

allow the Division to better assess these statements.

Please update Table 2.7-21b (page 2-462f) with data that has been collected since 2000. Please also add a column for aquifer thickness to the table.

10. Proposed Map 31 shows the locations of neighboring wells completed in the First, Second and Third White Sandstone aquifers, within one mile of the I and J Pits. Proposed Section 2.7.5.4b (page 2-524i) discusses potential impacts to these wells. LUX Well No 1, W1406-78 is shown on the map.

    Is LUX Well No 1, W1406-78 the same well as GLUX-1?

11. The second paragraph of proposed Section 2.7.5.4b states that LUX Well No 1, W1406-78 may be impacted by upgradient mining, but the location of LUX Well No 1, W1406-78 appears to be inside the boundary of the proposed I Pit West which suggests that it will be destroyed by mining.

    Please clarify the predicted impacts to LUX Well No 1, W1406-78.

12. The third paragraph of proposed Section 2.7.5.4b states that:

    > *…wells 151991 and 93848 exist greater than one mile west of the western planned edge of the J West Pit 1 HWM*

    Comparing Maps 4 and 31, the wells appear to be significantly closer than one mile to the proposed I Pit West.

    Please revise the third paragraph of proposed Section 2.7.5.4b to predict the impacts of the mine plan proposed with PR-11 to wells 151991 and 93848.

13. [This item is included as a placeholder – further adequacy questions related to the protection of the hydrologic balance are expected to come up following Trapper's response to this review]

<u>Rule 4.05.13 Surface and Ground Water Monitoring</u>

14. In the 2021 AHR, in the introduction, it is reported that:

    > *Mining activities during 2021 include continued expansion of the L and N pits and the initial removal of coal in the I Pit West*

    The I Pit West is not shown on the currently approved version of Map M4, Life of Mine Plan (dated 3/30/22). It is the Division's understanding that the I Pit West is being proposed with this revision (i.e. PR-11).

    Please clarify whether mining of the I Pit West has already begun, or whether this is a typo in the 2021 AHR.

15. Proposed Section 4.8.5.2 (page 4-242) describes the groundwater monitoring plan. The text states that:

    > *In Technical Revision TR-93, the Division and Trapper Mining Inc. agreed that well GP-9 is the point of compliance for the Basic Standard for Ground Water for the Third White*

sandstone. In Technical Revision TR-96, the Division and Trapper Mining Inc. agreed that the Coy well is the point of compliance for the Basic Standards for Ground Water for the Flume Gulch alluvium.

Clearly GP-9 is not appropriately located to act as a point of compliance for the disturbance proposed with PR-11.

Please propose additional points of compliance for all aquifers that have the potential to be impacted by the disturbance proposed with PR-11, including alluvial aquifers.

16. The applicable standard at the points of compliance is the Interim Narrative Standard from Regulation 41, The Basic Standards for Groundwater (Reg 41). 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. (Further details of the Division's interpretation of Reg 41 is given in a Groundwater Monitoring and Protection Technical Bulletin published in 2019, and available via the Division's website, or directly from the reference given below).

    Please consider formalising how the Interim Narrative Standard will be applied at the groundwater points of compliance either with PR-11, or with a Technical Revision following the approval of PR-11.

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