



STATE OF
COLORADO

Reilley - DNR, Robin <robin.reilley@state.co.us>

Re: Trapper GW addendum ADQ

1 message

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

Fri, Mar 31, 2023 at 8:11 PM

To: "Reilley - DNR, Robin" <robin.reilley@state.co.us>, "Ebert - DNR, Jared" <jared.ebert@state.co.us>

Cc: Amy Eschberger - DNR <amy.eschberger@state.co.us>

First, a summary of the facts:

The stratigraphy in the area of concern is as follows (from top to bottom):

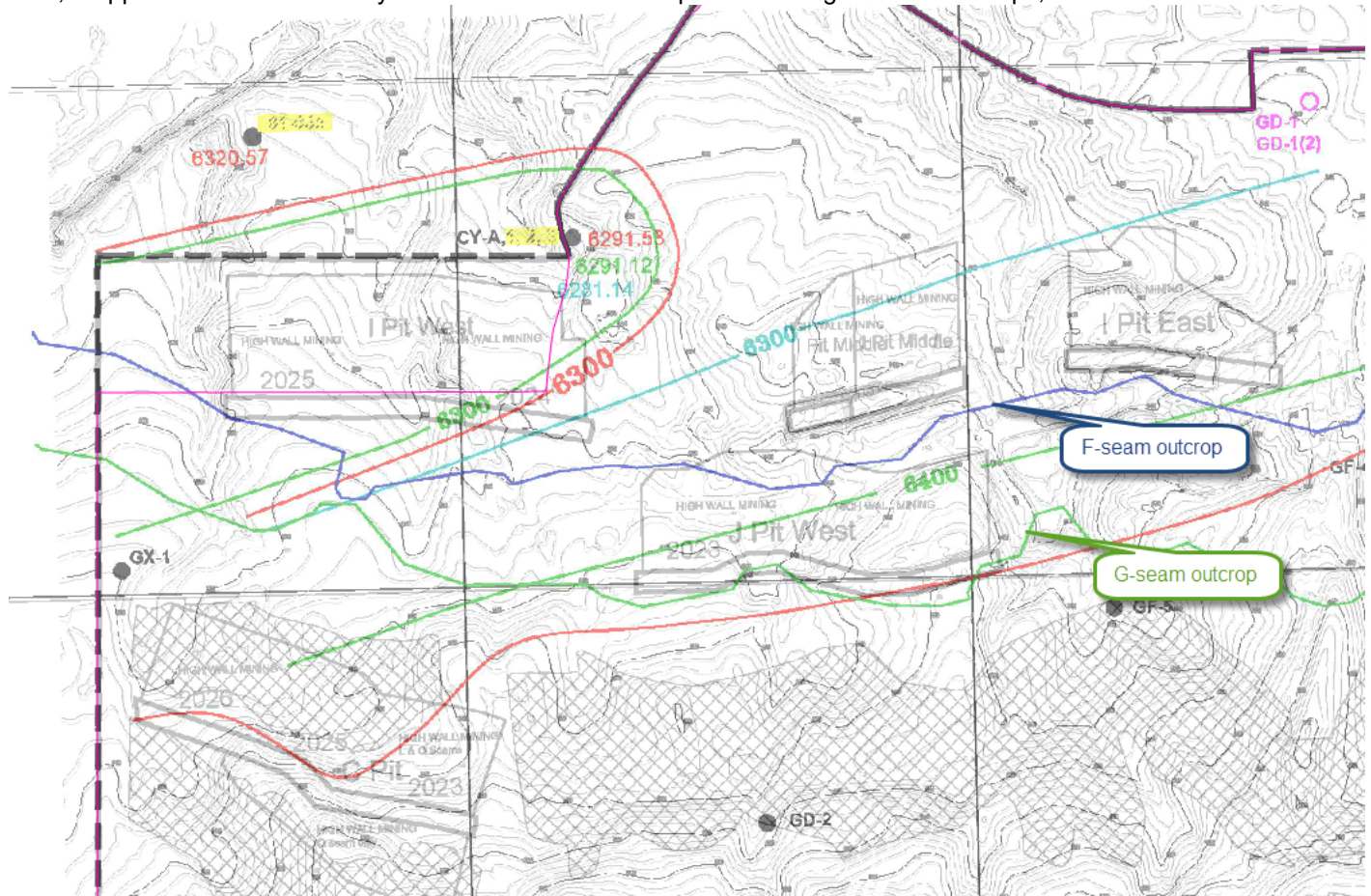
- 1st white sandstone
- Shale
- F-seam
- 2nd white sandstone
- G-seam
- 3rd white sandstone

All units dip to the north, and groundwater flow is generally to the north (although there is some confusion about this which I'm trying to clear up with item 4 in my original review memo).

The picture below shows the current permit boundary (pink) and Map 54K overlain on Map 4, (both maps are proposed with PR-11 - not yet approved).

Map 4 has the pit boundaries. Map 54K has the outcrops of the F and G seams (jagged blue and green lines), and the projected potentiometric surface of water in the 1st white (light blue), 2nd white (green) and 3rd white (red) sandstone aquifers. We don't see the outcrops of the sandstone units, but we can guess their approximate location.

Also, Trapper has told us that they assume the sandstone aquifers recharge at their outcrops, which is reasonable.



PR-11 proposes the C-pit, the I-pit west and the J-pit west.

The C-pit will mine from the L seam down to the Q-seam. I assume that the C-pit is too far south to disturb any of the three sandstone units we are concerned with, so we can leave it to one side.

Section 2.7.5.1d (approved with PR-10), tells us that the I-pit west will mine coal from the F-seam, and the J-pit west will mine coal from the G-seam.

Section 2.7.5.2d (proposed with PR-11) finishes with the following paragraph:

Mining is not expected to change the water quality in the First White Sandstone aquifer downgradient of the I Pit because the outcrop of the First White Sandstone exists to the north of the I Pit and saturation will not likely develop in the I boxcut area due to increased transmissivity in the HWM area of the I Pit. No historical water quality changes were observed in downgradient First White Sandstone well GLUX-1. The I Pit HWM will increase the transmitting ability of the Second White Sandstone but is not expected to affect the water quality in the Second White Sandstone aquifer because the recovered water level is expected to be north of the boxcut area in the I Pit. The Third White Sandstone aquifer's transmitting properties will also be increased in the J Pit HWM area and its water quality is also not expected to be affected by the J Pit because its recovered water level is expected to be north of the boxcut area in the J Pit.

Section 2.7.5.3d (proposed with PR-11) finishes with the following paragraph:

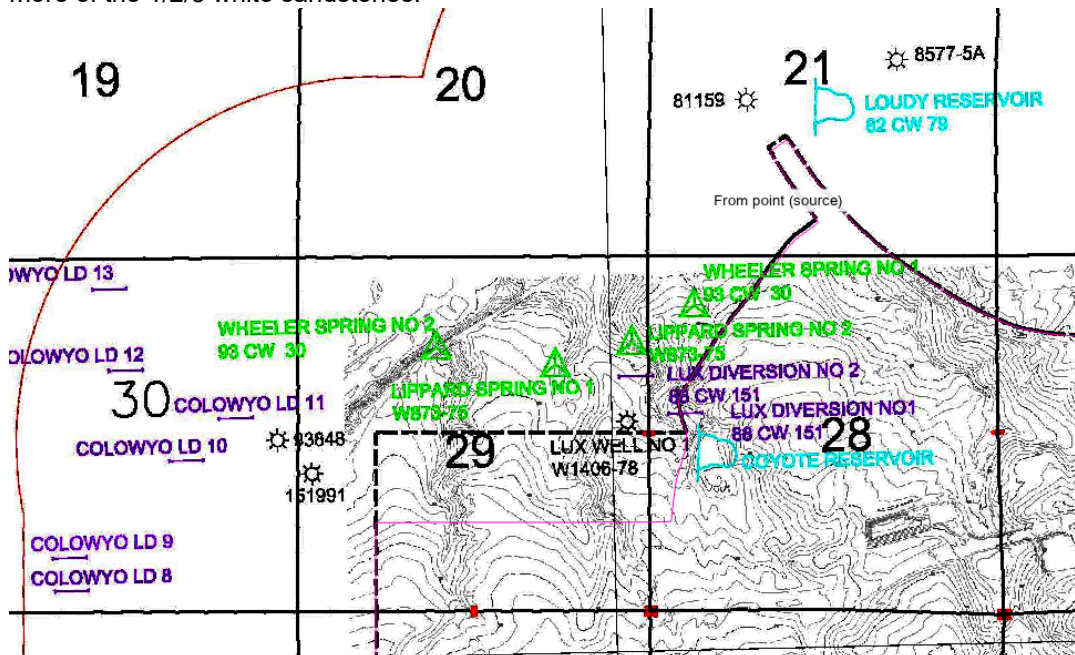
Water levels in the I and J Pit backfill aquifers will decline due to the I and J Pit boxcut and subsequent highwall mining (HWM). These drawdowns are expected to extend outward in the First, Second and Third White sandstone aquifers for up to a mile in these relatively low permeability aquifers until water levels recover in the backfill and HWM aquifer areas. The recovery of groundwater to a higher level than baseline in the northern end of the HWM area will cause the levels in these three aquifers to eventually be higher than baseline to the north of this mining. This will limit the drawdowns to the north of the mining to several years with eventual recovery of water levels to above the baseline level. Water levels in the boxcut areas will not recover to their pre-mine levels due to the increase in transmitting ability in the HWM area.

Section 2.7.5.4b (proposed with PR-11) finishes with the following paragraph:

Backfill aquifers at Trapper can be characterized by higher major constituent concentrations such as TDS in some areas. These higher TDS concentrations might persist for an extended period of time. The higher concentrations from the backfill aquifers in the I and J Pits area may recharge the First, Second or Third White Sandstone aquifers and, therefore, eventually increase major constituent levels in these aquifers.

(These three sections don't all seem to be saying quite the same thing)

Here's another picture: this shows part of Map 31 (proposed with PR-11). We can see 5 permitted wells in the area (black symbols). According to the DWR database, they are all used for domestic water supply. DWR doesn't identify the aquifer they are completed in, but their depths range from 200' to 700' which suggests that they could be completed into one or more of the 1/2/3 white sandstones.



Impacts to the 5 wells are discussed in Section 4.8.2.2 (approved with PR-10). Trapper commits to "replace the water supply of any owner of a vested water right which is proximately injured as a result of the Trapper Mine."

Here are the problems:

1. Although the water in the 1/2/3 white sandstones has not been classified by the WQCC, the fact that 5 domestic supply wells have been completed in them in the small area we're concerned with suggests that the water is of good quality - Trapper says as much somewhere in the text of the PAP, I just can't find it right now. There is text in the PAP that discusses mitigation of impacts to well owners, but there is no text discussing mitigation of impacts to the aquifer itself.
2. A groundwater point of compliance must be downgradient of the disturbance/potential contamination - in this case the two backfilled pits. The current monitoring wells CY-A, CY-1, CY-2 and CY-3 are completed in the alluvium, 1st white, 2nd white and 3rd white respectively, but they are all at the same location (see the first picture). I don't think it's reasonable to say that a single point can be downgradient of both pits. In fact, based on the projected potentiometric surface given on Map 54K (which I am not ready to accept as accurate without more information), those wells are actually upgradient of the I-pit west.
3. If Trapper were to characterize the three aquifers more thoroughly and to provide sufficient evidence that the projection of the potentiometric surface is accurate, and then agree with the Division suitable locations for points of compliance, we would have to apply the interim narrative standard at those points. Precisely how that standard will be applied is not straightforward, but to take a simple example Table 4 from Reg. 41 specifies that the limit for TDS will be 1.25x the background level. We know that the water recharging the 2nd and 3rd whites, will have to flow through the backfilled pits. Does Trapper have evidence from elsewhere on the site or from modeling to suggest that they would meet the standard?
4. Suppose the mine plan were to go ahead as proposed, and following backfilling of the pits the water quality at the points of compliance was found not to meet the standard. How would Trapper be able to mitigate the impacts they had caused? How would the Division be able to release the site?

With all that said, I went back to the word doc you attached. I made a few edits (attached), but in general I agree with what you wrote - it's hard to know how best to phrase everything, but you have cited the appropriate rules, and put the ball back into Trapper's court. I can talk to you more about it on Monday if necessary.

I hope you all have a great weekend.

Leigh Simmons
Environmental Protection Specialist



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On Fri, Mar 31, 2023 at 9:08 AM Reilley - DNR, Robin <robin.reilley@state.co.us> wrote:
Thank you Jared, and Leigh in advance.

This is tough stuff! After our convo yesterday I thought about where additional information could be gleaned from the Trapper Permit. I came up with the following:

- Appendix H for a discussion on alluvial aquifers
- AHR's have aquifer discussions as well, the older versions may have information on the CPit area, as that has been previously mined.
- Appendix V has the drill logs for the Coyote wells. Could these be useful?
- Also, the ownership map indicates that most land is either State, BLM land and Williams Fork. Could make it complicated for additional wells.

All in all I think the burden is on Trapper Mine to point us to the information while providing their analysis of it.

Best
Robin

Robin Reilley, M.S. GISP
Environmental Protection Specialist II



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