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From: Angela Nance
To: cwmining@etv.net
Date: 1/26/2007 10:04:39 AM
Subject: Bear Canyon, Lease Addition, #2734

Please find attached the Division's Technical Review of the Revised PHC for the Bear Canyon Mine, Lease Addition Project, Task ID #2734. The original is being sent via regular mail.

CC: Sheila Morrison; Wayne Hedberg



State of Utah
Department of
Natural Resources

MICHAEL R. STYLER
Executive Director

Division of
Oil, Gas & Mining

JOHN R. BAZA
Division Director

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

January 26, 2007

Charles Reynolds, Resident Agent
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Subject: Technical Review of Revised PHC, Bear Canyon Lease Addition Project, Co-Op Mining Company, Bear Canyon Mine, C/015/0025, Task ID #2734, Outgoing File

Dear Mr. Reynolds:

On January 22, 2007, a conference call was held between the Division, Co-Op Mining Company (Co-Op), its consultant (Mayo & Associates, LC), and representatives from the Manti La Sal National Forest. The purpose of the call was to discuss preliminary technical concerns and questions pertaining to the *Revised Probable Hydrologic Consequences (PHC) for the Wild Horse Ridge and Mohrland Permit Areas* document.

At the conclusion of the call, Division and Forest Service personnel committed to finalize their respective review comments on that document and send them to the permittee by Tuesday, January 23rd. As promised an email was sent to Co-Op with the agencies draft comments Tuesday afternoon. This letter is intended to formally transmit the PHC review comments to C.W. Mining to enable you to respond accordingly.

If you have questions or concerns regarding our comments, please contact me, Joe Helfrich, or Steve Christensen directly. For questions regarding the Forest Service comments, please contact Dale Harber at (435) 636-3548, Price area office.

Sincerely,

A handwritten signature in black ink that reads "D. Wayne Hedberg".

D. Wayne Hedberg
Permit Supervisor

an
attachment

cc: Dale Harber, Manti-La Sal NF (PFO)
James Kohler, BLM (SLO)
Ranvir Singh, OSM (Denver)
Mary Ann Wright, DOGM
Price Field Office
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Division of Oil, Gas & Mining
January 23, 2007

**Bear Canyon Lease Addition
PHC Comments**

Provide supporting information/calculations that address the potential for water to up-well into the mine from the Star Point Sandstone.

There needs to be a more thorough discussion as to the potential for mining related impacts on the springs and surface waters located within the proposed expansion area. The Permittee should be specific in discussing potential impacts on the water resources within the proposed expansion area. Springs located in the proposed expansion area are referenced one time (relative to water quality) on page 21 of the revised PHC document. The Groundwater and Surface Water Availability section on Page 23 of the revised PHC document cites Section 9.1 of the original PHC document as to where the discussion of "expected impacts to the hydrologic balance of either groundwater or surface water systems" is located. However, Section 9.1 does not include any direct discussion/reference to any springs located in the proposed expansion area.

The Permittee should specifically address the potential for mining related impacts on the springs identified during the field investigations as well as springs located within the proposed expansion area. The springs identified as of critical importance by the water users are SBC-16, SBC-16A, SBC-16B, SBC-22 and SMH-5 (note: discussion should also include potential impacts to other springs in the expansion area that supply base flow to the Left and Right Forks of Fish Creek as well as McCadden Hollow. See Plate 7-4).

The Permittee should provide a discussion as to the possibility of subsidence related impacts on water quantity in the Left and Right Forks of Fish Creek. Both drainages overly areas where both the Tank and Hiawatha seams will be mined. Page 14 of the revised PHC document and pages 136 and 137 of the original PHC document discuss impacts to surface water systems. Both documents state, "*the hydrologic balance of these systems would be impacted if groundwater discharge that provided base flow for these systems were impacted*". The revised PHC continues on page 14, "*As noted in the previous section, impacts to the groundwater discharge rates are not expected*". As noted above, the "previous" sections do not discuss the springs located in the expansion area.

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Forest Service Comments
PHC Addendum
January 23, 2007

1. Section 1.1.1 Groundwater, page 5, 3rd paragraph, 1st sentence.

Springs 16-7-24-3 and SBC-17 are not "in the permit expansion area." They are in the previous permit expansion area.

2. Section 1.1.1 Groundwater, page 6, 2nd paragraph.

The paragraph discusses 4 springs in the Panther Sandstone that occur in the old permit area. The discussion in Chapter 8 regarding the springs was centered on their relationship to the Bear Canyon Fault. Explain in more detail how you reached the conclusion that "...we do not anticipate any impacts from mining activities in the Mohrland Federal lease area....."

The conclusion refers to Panther Sandstone springs in the Morhland Lease area. On the previous page in the 2nd paragraph, the 2nd sentence states that "No springs discharge below mining horizons in the Mohrland Federal lease and private land area." The inconsistency needs to be corrected.

3. Section 1.1.1 Groundwater, page 6, 3rd paragraph.

Provide a discussion to support the conclusion that "impacts to Big Bear Spring or other groundwater resources in the current permit area due to mining in the permit expansion area are not expected" is valid.

Bear Canyon Fault and the other faults in the northern part of the permit expansion area need to be brought into the discussion as they pertain to the proposed mining and future mining in that area. Mining through faulted ground may accentuate subsidence effects along the fault faces resulting in greater fault related subsidence impacts to surface resources. This concern needs to be addressed.

4. Section 1.1.1 Groundwater, page 7, Item 1.

Item 1 suggests that the Bear Canyon Fault is filled with "impermeable fault gouge" throughout and yet Big Bear Spring discharges from the fault and is a municipal water supply. Most of the major springs in the area are associated with major faults in the Starpoint Sandstone. The Starpoint Sandstone does not have abundant shale and mudstone to create impermeable fault gouge.

Item 1 states that "where the Bear Canyon Fault is exposed near the headwaters of Bear Canyon, extensive fault gouge is visible." This would be expected in the Price River and North Horn formations near the headwaters of Bear Canyon; these two

formations contain abundant shale and mudstone. The conclusions that follow in the 2nd paragraph on page 7 are not substantiated by the discussion.

The last sentence of Item 1 infers that Big Bear Spring is west of the fault system but Plate 7-4 shows the spring east of Bear Canyon Fault.

The second clause of the last sentence suggests that the fractures west of the fault are supplying water to Big Bear Spring; discuss how mining in the west ½ of Section 12, T16S, R7E will impact the fault system?

5. Section 1.1.1 Groundwater, page 8, Item 2.

Again, a determination needs to be made whether Big Bear Spring is east or west of the fault. Plate 7-4 shows one thing and the text says the opposite.

6. Section 1.1.1 Groundwater, page 8, Item 4, 3rd sentence.

The sentence refers to "the proposed portals for the Wild Horse Ridge expansion". Were the portals built or are they still just proposed? References such as this need to be corrected or deleted throughout the document.

7. Section 1.1.1 Groundwater, page 8, Item 4.

The part of Item 4 on page 8 uses chemical data to explain how there is "no hydraulic communication between the area east and the area west of the Bear canyon Fault." Two of the springs east of the fault are in the Blackhawk Formation and one (SBC-14) is in the Spring Canyon sandstone (immediately below the mined out coal seam) while Big Bear Spring issues from the Panther Sandstone. The closest spring to Big Bear Spring (SBC-14) is more than a mile away, approximately 300 feet higher in elevation and in a different formation. Also, it is common for Blackhawk springs to be higher in sulfate concentration. It is possible that water from the mined out area above SBC-14 is leaking into that spring and mixing with it. The statement that "there is no hydraulic communication" east and west of the fault seems too broad.

8. Section 1.1.1 Groundwater, page 9, 3rd paragraph.

As we discussed in the conference call on January 23, Dr. Mayo has information on water seeping into other mines in the area, and the fact that although there is the potential for water to well up from the Spring Canyon sandstone, it rarely does. This paragraph just needs to be updated with a discussion of Dr. Mayo's data to support the conclusion.

The statement that "historic inflows as great as 100 gpm were reported when the Bear Canyon Fault was intercepted" needs to be supported with data showing where in the stratigraphic sequence the fault was contacted. The fault would probably produce much less water in the Blackhawk Formation than in the Starpoint Sandstone.

9. Section 1.1.1 Groundwater, page 10, 1st paragraph, 2nd sentence.

Mining in Sections 10, 11, 12, 13, 14, and 15 must be discussed further. Describe the potential hydrologic impacts.

10. Section 1.1.1 Groundwater, page 10, 3rd paragraph.

The discussion on encountering channels is good; state what the impacts would be.

The 4th sentence states "No mining will take place in the Blind Canyon Seam within the Mohrland mine lease/private area." This is incorrect. Discuss the mining that will take place within that seam in the new permit revision area.

11. Section 1.1.1 Groundwater, *Direct interception of water associated with faults*, page 11, 2nd paragraph, 2nd sentence.

The sentence states "Based on inflows from the Bear Canyon Fault in the Hiawatha Complex, the maximum anticipated inflow from the Bear Canyon Fault in the Hiawatha Mine will be 100 gpm." Explain how the 100 gpm was calculated. Cite the inflow data referred to. State where the reader can go to in the document to look at this data. If there are tables or graphs identify them and where they can be found.

12. Section 1.1.1 Groundwater, *Direct interception of water associated with faults*, page 11, 2nd paragraph, 3rd sentence.

The sentence states "However, fault intercepts in the Tank, Blind Canyon, [and] Hiawatha seams in the Bear Canyon Mine, suggests that the Bear Canyon Fault does not convey water from the Hiawatha area to the Bear canyon area." This statement needs some background to support it. Cite pages in Chapter 7 (MRP), Appendix J, Chapters 1-8, or any other sources where supporting information can be found. Discuss how this determination was made, i.e., by comparison of isotopic data, chemical data, or any other means.

13. Section 1.1.1 Groundwater, *Direct interception of water associated with faults*, page 11, 2nd paragraph, 4th through 6th sentences.

The 4th sentence makes a statement, then the 5th and 6th sentences make conclusions based upon the 4th sentence. The 4th sentence states that water discharging from the Mohrland Portal "has a radiocarbon age in excess of 9,000 years, which is considerably older than water in either Big Bear Spring or the Bear Canyon Mine (Section 5.3)." In our phone conversation on January 22 it was pointed out that the water exiting the Mohrland Portal is mixed water from everything that enters the old Mohrland Mine and Hiawatha Complex, it is not water taken from specific points within the mine such as directly from a sampling point in Big Bear Fault. Therefore, the conclusion that "water discharging from Big Bear Spring is not the same water

that is associated with the Bear Canyon Fault in the Hiawatha Complex” is not substantiated.

The conclusion in the last sentence on the page also needs to be readdressed as it relates to Bear Canyon Fault and the other faults in Sections 1, 10, 11, and 12. Specifically, how mining in that area will affect both groundwater and surface water resources due to subsidence effects being focused along the fault faces.

14. Section 1.1.1 Groundwater, *Subsidence-related fracturing and deformation*, page 12 first paragraph.

Peng, 1992, is the original reference on the distance surface fractures propagate upward, not Kadnuck, 1994. The last sentence, concerning near-surface fractures, needs a reference.

15. Section 1.1.1 Groundwater, *Subsidence-related fracturing and deformation*, page 12 second paragraph.

This is an excellent paragraph – it discusses the actual mining data and makes a conclusion based on the data.

16. Section 1.1.1 Groundwater, *Subsidence-related fracturing and deformation*, page 13, 3rd paragraph, 2nd sentence.

If there is mining west of or near the Bear Canyon Fault, the surface impacts of mining in Sections 1, 10, 11, and 12 T16S, R7E need to be discussed, with consideration that subsidence effects may be focused along faults.

17. Section 1.1.1 Groundwater, *Subsidence-related fracturing and deformation*, page 13, 4th paragraph, 1st sentence.

Identify the two springs referred to that discharge from the Price River Formation.

18. Section 1.1.2 Surface Water, page 14, 1st paragraph.

The paragraph needs to be updated to include the new permit expansion area (Gentry Ridge-Mohrland area). The Left and Right Forks of Fish Creek will be subsided in their upper drainages. The surface impacts need to be discussed. Also discuss the effects to groundwater and surface water resources in the McCadden Hollow area when the coal reserves are mined in the faulted ground.

19. Section 1.1.2 Surface Water, page 14, 2nd paragraph.

The additional volume of water welling up through the mine floor needs to be included in the calculations for the water balance.

20. Section 1.1.2 Surface Water, page 14, 3rd paragraph, 1st sentence.

Identify the streams and drainages that could be undermined throughout the permit revision area. Identify the depth of overburden in each area and whether other factors such as faulting should be a consideration.

21. Section 1.4 Impacts to acidity, TDS, and other important water quality parameters (728.332), page 20, 3rd paragraph.

Correct the paragraph to reflect that no roads will be constructed in the permit revision area now under consideration.

22. Section 1.4 Impacts to acidity, TDS, and other important water quality parameters (728.332), page 21, 2nd paragraph, 1st sentence.

This section appears to be referring to the springs on the top of Gentry Mountain that are approximately 1,000 feet above the coal seam. However, Birch and Big Bear Springs are part of the groundwater system on Gentry Mountain that could be impacted if mining is conducted in the areas crossed by the faults supplying these springs. The discussion needs to be expanded to include this.

23. Section 1.5 Flooding or streamflow alteration (728.333), page 22, 3rd paragraph.

Explain what these discharge figures are based on. Provide information regarding how much water is coming from each source. Show the data and calculations.

24. Section 1.6 Groundwater and surface-water availability (728.334), page 23.

This paragraph needs to be updated to address the comments from previous sections. With special regard to the 4th sentence, this statement was made before the mining in sections 10, 11, 12, 13, and 14 T16S, R7E was proposed.

25. General Comment.

The volume of water welling up through the mine floor while mining in the new permit expansion area must be estimated based upon the best available information. This information would include slug test data performed on the Star Point sandstone in the new area, drill hole data showing sandstone thickness and water levels, information from previous mining in the area, and any other useful information that could be used in making an estimate. How the intercepted water will affect surface resources, how it will be disposed of, and how this will affect the hydrologic balance, water quality, and stream flow alteration are concerns that must be addressed in the PHC.

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