

**From:** <James\_Kohler@ut.blm.gov>  
**To:** <ahowe@fs.fed.us>  
**Date:** 6/30/2004 5:27:37 PM  
**Subject:** South Crandall Canyon R2P2 Hydrologic Concerns

Aaron,

Earlier this month we met with you and your staff to discuss your concerns with the R2P2 for the South Crandall Canyon Tract. In your written comments to the State, you opined that the lease terms and conditions did not allow any longwall mining in Little Bear Canyon in areas with less than 600 feet of overburden. I believe that this restriction is based on Special Lease Stipulation No. 9 that reads as follows:

Except at locations specifically approved by the Authorized Officer, with the concurrence of the surface management agency, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to existing surface structures, and (3) damage or alter the flow of perennial streams. The lessee shall provide specific measures for the protection of escarpments, and determine corrective measures to assure that hazardous conditions are not created and perennial streams are not damaged.

Mining must be conducted in a manner necessary to prevent subsidence in the Little Bear Canyon area of the lease with overburden less than 600 feet, unless it can be demonstrated to the satisfaction of the Authorized Officer, with concurrence of the surface management agency, that the effects of subsidence to Little Bear Creek and the associated ecosystem would be negligible. This requirement shall apply to each seam mined. (emphasis added)

As we have discussed, we believe that this stipulation is meant to preclude subsidence under the stream channel in Little Bear Canyon, not the upslope areas. Our position is based, in part on the joint Decision Notice / Finding Of No Significant Impact (DN/FONSI) signed by the Forest Supervisor and the State Director. In the DN/FONSI, the selected alternative (Alternative 3) provides that, "Subsidence of the stream channel in Little Bear Canyon with less than 600 feet of overburden would not be allowed and only full-support room-and-pillar would be allowed under Little Bear Creek as defined by the area with overburden less than 600 feet, unless specific approval is given" (emphasis added).

When we met earlier this month, you indicated that the Forest Service's had concerns with allowing full extraction mining under areas with less than 600 feet of overburden on areas outside of the stream channel because of the springs discharging at the surface. In particular, you identified the springs identified as LB-5 and LB-5A as being of particular concern. Since our meeting, the company has surveyed the Little Bear Canyon area to more accurately locate the springs. The spring identified as LB-5 was not evident on the ground, but LB-5A was located at an elevation of 8,620 feet.

The surveyed location for LB-5A relative to the proposed mining is shown on the attached map (LB5A Location.pdf). This map indicates that the spring is located more than 600 feet above the upper coal bed, and therefore should not be as impacted by the proposed mining. In reviewing the spring and seep inventory of the Little Bear Canyon area, we are not aware of any other springs over the areas where the proposed longwall panels have less than 600 feet of overburden. I am also enclosing a brief summary of LB-5A provided by Erik Peterson where he describes the spring and provides flow measurements.

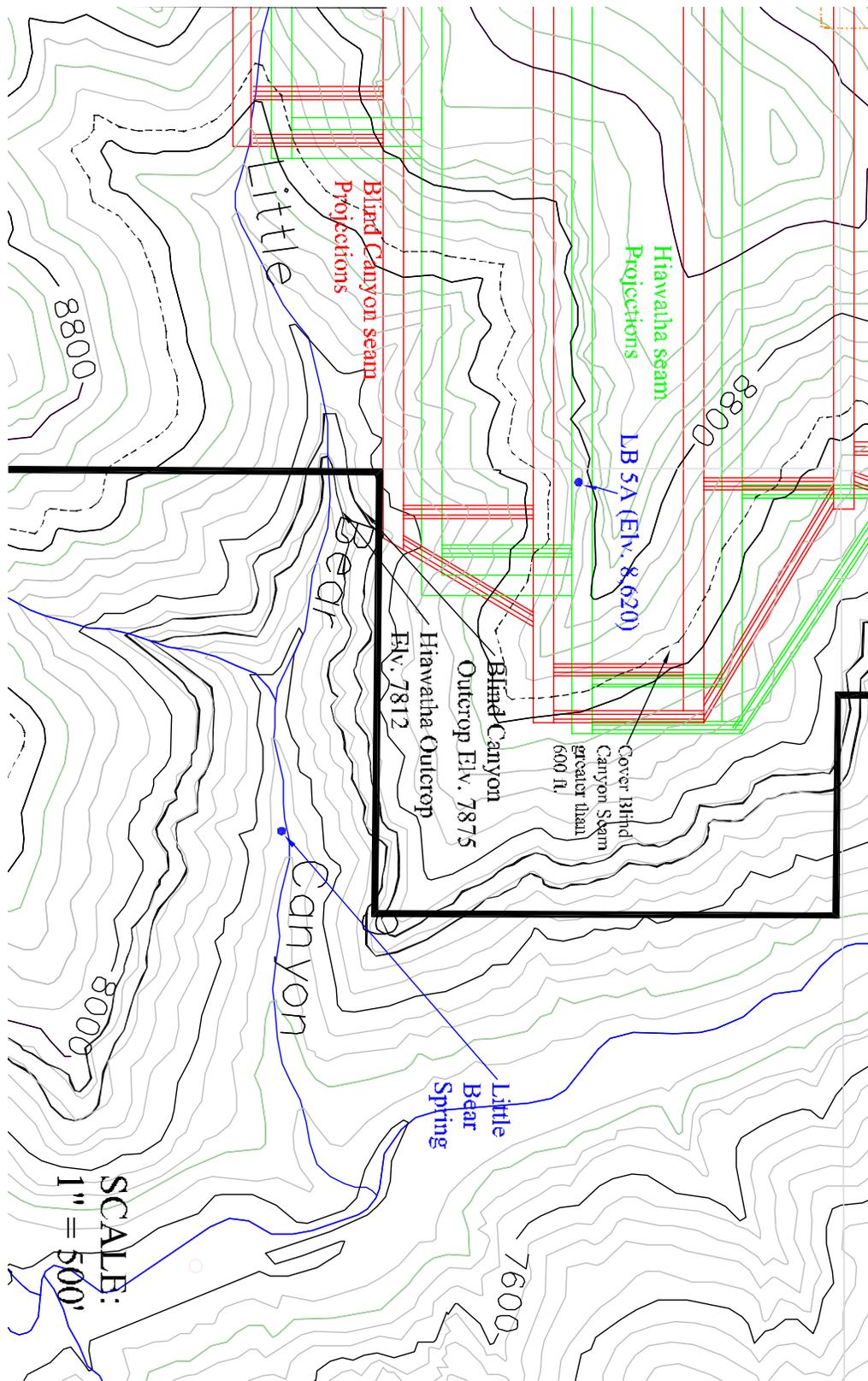
Based on the survey showing that LB-5A is more than 600 feet above the highest mine interval, the hydrologic information provided for the spring, and the fact that there are no identified springs in the area proposed for longwall mining with less than 600 ft. of overburden, BLM is prepared to make the determination that the effects of this mining would be negligible on Little Bear Creek and the associated ecosystem.

Please let me know if the Forest Service can concur or if we need to discuss further.

Jim Kohler

(See attached file: LB 5A Location.pdf)(See attached file: Jim Kohler LB-5A.pdf)

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## Petersen Hydrologic

27 June 2004

Mr. James Kohler  
Bureau of Land Management  
Utah Office  
P.O. Box 45155  
Salt Lake City, Utah 84145-0155

Jim,

At your request I am providing you this information regarding spring LB-5A, which is located in the new GENWAL South Crandall lease area.

Spring LB-5A is located on the steep, south-facing canyon slope in Little Bear Canyon in the east-central portion of Section 8, Township 16 S., Range 7 E., SLBM. The approximate UTM coordinates of the spring (obtained with a hand-held GPS) are: Zone 12 S 486510, 4366085 (UTM, NAD 27).

LB-5A discharges from the base of a fractured sandstone unit in the Blackhawk Formation. The discharge appears to be primarily fracture controlled. The spring discharge flows over tufa and loose colluvial deposits down the steep hillside for approximately 100 feet before infiltrating completely into the subsurface. Further down the canyon slope, the spring flow reemerges in some locations before again infiltrating into the subsurface.

The spring has been monitored periodically since 1993. Historical discharge measurements are summarized below:

<u>Date</u>	<u>Flow</u>	<u>(gpm)</u>
1993	seep	
June	1996	15
7	Aug 1997	7
30	Jun 2003	1.95
24	Aug 2003	2.01
20	Oct 2004	1.57
15	Jun 2004	1.95

Mr. Jim Kohler  
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The discharge from LB-5A in 2003 and 2004 averaged about 1.9 gpm. Flow rates measured in 1996 and 1997 were somewhat higher. The lower flow rates measured recently are likely the result of the drought the region is currently experiencing.

The spring was sampled for radiocarbon and tritium content on 7 Aug 1997. The tritium content (17.1 TU) indicates that the groundwater in LB-5A has a significant recharge component that is less than about 50 years old. The radiocarbon content of the groundwater (61.06 pmC) is likewise indicative of modern groundwater (<500 years old). This isotopic information suggests that the groundwater discharging at the spring originates from active groundwater systems. Active groundwater systems in the region are in generally in good hydraulic communication with seasonal recharge and are sensitive to climatic variability. By contrast, groundwaters encountered in coal mines in the Wasatch Plateau are usually from perched, inactive groundwater systems. The inactive groundwaters encountered in Utah coal mines typically contain little or no tritium and have radiocarbon ages of several thousand years.

Please feel free to contact me should you have any questions or require additional information in this regard.

Sincerely,

Erik C. Petersen, P.G.  
Principal Hydrogeologist  
Utah PG #5373615-2250