



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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TO: File

FROM: David W. Darby, Geologist 

RE: Subsidence Evaluation, Crandall Canyon Mine, Genwal Coal Company (Genwal), ACT/015/03, Emery County, Folder #2

## Synopsis

In letters sent to the Division on June 1, 1988 and October 17, 1988, the U.S. Forest Service expressed concerns for escarpment failure along Huntington Canyon induced by mine subsidence.

Genwal intends to undermine the escarpment west of Huntington Creek with the addition of Lease U-54762. Mining of this lease places the mine working closer to Huntington Creek and under low overburden. Development of mine workings under low overburden creates the potential for subsidence-induced fractures extending to or near the surface which could intercept spring flow, or decrease the stability factor of the escarpment and cause slope failure.

This memorandum summarizes the process used to characterize the risk for the development of subsidence-induced material damage to the surface and renewable resources that exist along the western escarpment of Huntington Creek in and adjacent to the Crandall Canyon mine permit area.

## Summary of Permit Review

The potential for escarpment failure was assessed by the Division using information presented in Genwal Coal Company's Mining and Reclamation Plan (MRP). The Division has determined the risk of subsidence to be moderate using a classification of high, moderate and low, based on the data and information submitted in the MRP. Genwal has assessed subsidence as having minimum impacts, however, no geotechnical information was presented supporting their position.

The Division's determination was based on several factors, a major factor being the standards the surface owner intends to maintain on and adjacent to the minesite. The U.S. Forest has conveyed to the Division that escarpment failure is not acceptable based on the resources in the vicinity of the mine (personal communication with Pete Kilburn, November 8, 1988). Specific factors considered for evaluating the potential of slope failure included the depth of overburden, the number of coal seams to be mined (which is only the Hiawatha seam), the thickness of the coal seam in the area (not specified), the type of mining to be used, the resources in the vicinity of potential failure, the geologic conditions in the area, detailed lithologic information (not given) and the method used to derive the angle of draw and sizing of the pillars.

The surface lease agreement and UMC 817.124 provides the U.S. Forest Service, as the surface owner, with the authority to require that underground coal mining activities be planned and conducted using measures consistent with known technologies to prevent material damage to the surface.

Proposed mine development beneath escarpments and adjacent to perennial streams requires Division review of compliance with performance standards under UMC 817.41, 817.57 and 817.122-.126. The focus of these regulations provide requirements to minimize adverse impacts to renewable resources (e.g. wildlife, vegetation, hydrologic).

Potential impacts and a geotechnical analysis of slope stability after mining must be addressed by the operator. Listed among the concerns are:

1. The protection of Huntington Creek.

Huntington Creek is a major fishery. It is feared that debris subsidence-induced slope failure reaching the creek will pollute or block the flow in Huntington Creek if spawling or slumping occurs.

2. Protection to spring along the escarpment.

Stability controls should be analyzed by the operator. This information should mention the relationship of joint systems operating in the canyon. Geologic map submitted in the Mining and Reclamation Plan shows a fault trending northwest at the mouth of the unnamed canyon north of Crandall Canyon.

3. Slope protection and public safety.

The escarpment facing Huntington is highly visible and easily accessible to recreationists. Ninety percent of the traffic entering the Manti-Lasal Forest travels through Huntington Canyon.

The moderate risk for slope failure determination was reached primarily because there was not information supplied in the MRP to establish escarpment stability after mining. No information has been supplied for the thickness of the Hiawatha coal seam in the new lease (U-54762) area.

Conclusion

The Division concludes that Genwal needs to provide more technical information to ensure protection to the renewable resources outlined above. The Division will require Genwal to submit geotechnical information to establish escarpment stability after mining. Genwal will be limited to developmental mining only in areas with less than 500 feet of overburden until a reasonable professional study concludes that no adverse impacts will occur to resources. Recovery mining will still be allowed with overburden greater than 500 feet.

dwd

cc.

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