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# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
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April 2, 1992

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Thomas Munson, Senior Reclamation Hydrologist 

RE: Erosion Control Plan for the J.B. King Mine Site, Western States Minerals, J.B. King Mine, ACT/015/002, Folder #2, Emery County, Utah

## Synopsis

The operator submitted a plan which addresses some major erosion control issues subject to Utah Notices of Violation Numbers N91-35-6-1, N91-35-7-1, N91-32-6-1, Stipulation Response R614-301-742.113, and the Informal Appeal Conference of February 11, 1992, between UDOGM and WSMC. This memo will review the submittal and provide the operator some direction in terms of whether the response is considered adequate within a regulatory framework, addressing mainly hydrologic concerns.

## Analysis

### 2.2.2 Regulatory requirements of R645.

The operator has quoted a few of the regulatory requirements of the R645 rules on page 5 and 6 of his submittal and has tried to equate expenditures at J. B. King with the surrounding value of the open range. From a realistic sense, this expenditure argument does not describe the value of the surrounding environment because of one very major reality. This reality is that a coal mine was developed at this site and certain regulatory requirements regarding reclamation of a coal mine make the comparison to "Undeveloped Land" vs. "Fish and Wildlife Habitat and Grazing Land" subject to successful reclamation at the J.B. King Mine.

The R645-301-700 Rules which apply to meeting the requirements of a stable and successful reclamation project have been copied below. With some thought and direction in regards to interpretation Utah's rules, it becomes apparent, that in one sense, designing diversions or channels or reclaimed soils that are erosionally and geomorphically compatible with the natural environment is acceptable. This philosophy could also satisfy the requirements of R645-301-742.111, "prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;" if the circumstances were correct. A design criteria incorporating this philosophy could also satisfy R645-301-742.312.1 that diversions "be stable" and "minimize erosion to the extent possible", R645-301-742.113. The following rules describe the regulatory requirements for Sediment Control.

742. Sediment Control Measures.

- 742.100. General Requirements.
- 742.110. Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:
- 742.111. **Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;**
- 742.112. Meet the effluent limitations under R645-301-751; and
- 742.113. **Minimize erosion to the extent possible.**
- 742.120. Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas will reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include, but are not limited to:
- 742.121. Retaining sediment within disturbed areas;

- 742.122. Diverting runoff away from disturbed areas;
- 742.123. Diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion;
- 742.124. Using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds and other measures that reduce overland flow velocities, reduce runoff volumes or trap sediment;
- 742.125. Treating with chemicals; and
- 742.300. Diversions.
- 742.310. General Requirements.
- 742.311. With the approval of the Division, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria of R645-301-356.300, R645-301-356.400, R645-301-513.200, R645-301-742.200 through R645-301-742.240, and R645-301-763 for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions will be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions will not be used to divert water into underground mines without approval of the Division in accordance with R645-301-731.510.
- 742.312. The diversion and its appurtenant structures will be designed, located, constructed, maintained and used to:
  - 742.312.1. Be stable;
  - 742.312.2. Provide protection against flooding and resultant damage to life and property;

- 742.312.3. Prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and
- 742.312.4. Comply with all applicable local, Utah, and federal laws and regulations.

However, uncontrolled erosion on a protected material such as Coal Refuse, presents another issue of far more stringent regulatory interpretation. As a logical progression to this train of thought, one realizes that we are dealing with two issues instead of one. These issues are as follows: 1) Creating stable reclaimed channels, erosionally and geomorphically stable, and 2) creating a protected coal refuse pile, at this site considered acid- and toxic-forming material, covered with four feet of topsoil, also erosionally and geomorphically stable. The second issue is a far greater challenge than the first issue for the following reasons.

If one was to use a rational approach to solving the erosion problem at the J.B.King Mine site it would be easy to suggest the "let it rip philosophy." In terms of protection of the coal refuse pile, this decision would not be prudent or acceptable from a regulatory standpoint. This hinges on the interpretation of the following rules.

731.300. Acid- and Toxic-Forming Materials.

- 731.310. Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by:
- 731.311. Identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated; and
- 731.312. Storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff and the infiltration of polluted water. Storage will be limited to the period until burial and/or treatment first

become feasible, and so long as storage will not result in any risk of water pollution or other environmental damage.

- 731.320. Storage, burial or treatment practices will be consistent with other material handling and disposal provisions of R645 Rules.

The important issues at stake are whether water quality, vegetation, or public health and safety may be adversely affected. Lets take this issue by issue, first water quality, etc.

### Water Quality

J.B. King has a permitted Permanent impoundment which captures all the runoff from the disturbed or reclaimed area. In all the major storm events which have been documented at the site, the pond has not discharged. In terms of water running into the pond and its quality, this has not been documented. Concentration of any dissolved salts leaching from the refuse material during storm events or otherwise has not been documented. Potential water quality impacts may include wildlife watering from the pond and their specific toxicities to certain salts, for example, birds toxicity to Selenium salts. Exposed refuse may or may not increase this risk.

The following rules discuss the intended purpose for permanent impoundments.

- 733.220. A permanent impoundment of water may be created, if authorized by the Division in the approved permit based upon the following demonstration:
- 733.221. The size and configuration of such impoundment will be adequate for its intended purposes;
- 733.222. The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable Utah and federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable Utah and federal water quality standards;

- 733.223. The water level will be sufficiently stable and be capable of supporting the intended use;
- 733.224. Final grading will provide for adequate safety and access for proposed water users;
- 733.225. The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational or domestic uses; and
- 733.226. The impoundment will be suitable for the approved postmining land use.

### Vegetation

The refuse material is known to be acidic, however, additional analysis needs to be done to assess heavy metal concentrations. Few plants of this arid region would be adapted to the acid conditions of this refuse material. One observation on site showed plant roots running on the surface of the refuse/soil interface. Possible plant up-take of heavy metals and bioaccumulation in the food chain of these metals are of concern.

### Public Health and Safety

The ability to assess public health and safety involves the risks associated with use by the public. Due to its remote location, it is felt that the overall risk to the public is minimal and, therefore, this issue does not constitute any valid concern.

### Recommendations

In regards to the feeder ditch plans proposed, the operator must present a more defined plan for a geomorphically and erosionally stable channel. The plans submitted are not adequate to define final slopes and profiles for both longitudinal slopes and perpendicular cross-sections. It is felt that all coal refuse material must be removed from the channel areas and a broad enough flood plain be created to achieve a stable channel. A channel within a flood plain may work.

Page 7  
Memo/PGL  
ACT/015/002  
April 2, 1992

It is a good idea to move the feeder ditch off the road as proposed and create energy dissipation basins at the base of the escarpments.

The erosion on the remainder of the site will depend on the exposure of coal refuse and where this occurs. The involvement of other disciplines will determine the ability to expose coal refuse and the decision regarding its regulatory outcome.

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