

0015



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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Mine file

## TECHNICAL FIELD VISIT

**Date :** June 3, 1998  
**DOGM Staff:** Robert Davidson and Susan White  
**Attendants:** Jayne Belnap, U.S. Geologic Service  
**RE:** Cryptogamic Soil Research Plots, Western States Minerals Corp., J.B. King Mine, ACT/015/002, Emery County, Utah.

### Purpose:

- To sample the cryptogamic soil research plots.

### Background:

- The cryptogamic research plots were installed in April 1996. The goal was to establish crust to drastically disturbed soils and soil resource materials during final reclamation of Utah coal mining areas. Three blocks (replications) located within the J.B. King reclaimed site. Each block consists of eight, two-meter square sized, randomly placed plots. The statistical research design is a randomized block factorial using three different treatments, i.e., inoculation, sugar application, and sulfur application. Two-pound sugar treatments were applied quarterly for the first year to each of the designated sugar-treatment plots. Soil sampling and analyses were obtained immediately prior to, and two months after, plot installation. Analyses verified soil chemistry and the presence, or lack of, blue-green algae.

### Observations:

- The soils at each test location were sampled. Soil tests and analyses will include soil chemistry parameters and chlorophyll, an indicator for blue-green algae.
- Native, undisturbed soils located within the disturbance boundary were also sampled. These native soils contain active, highly visible colonies of cryptobiotic crusts.
- Site verification of sugar-treatment effects were visually striking. Any of the sugar-treatment plots had a significant effect on inhibiting annual weed growth. These plots were essentially devoid of annual weed establishment, mainly halogeton. Microbiological activity is verified because as the soil microbes metabolize the sugar, they tie up the readily available nutrients that are essential for annual weed growth and establishment.

### Recommendations/Conclusions:

- Samples will be analyzed at Jayne Belnap's laboratory which is located at the U. S. National Park headquarters in Moab.
- Based on analyses results, determine if cryptobiotic activity has been established and what treatments, if any, have been effective.

Signature:  on June 5, 1998  
Robert A. Davidson, Soils Reclamation Specialist