



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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February 4, 1997

David Shaver  
Andalex Resources, Inc.  
6750 Airport Road  
P.O. Box 902  
Price, Utah 84501

Re: Vegetation Information Requirements for the Proposal to Culvert a Portion of Crandall Creek, Genwal Resources, Inc., Crandall Canyon Mine, Folder #2, ACT/015/032, Emery County, Utah

Dear Mr. Shaver:

In our meeting on January 28, 1997, where we discussed remaining deficiencies in the proposal to culvert Crandall Creek, I indicated it might be best if I met with David Steed of Environmental Industrial Services to discuss what I would like to see for their summation of the riparian area vegetation information. Through this letter, I would like to try to explain what I need. Then, perhaps, I could meet with him to discuss any questions.

According to information in your proposal, the baseline method would be used to judge revegetation success for final bond release in the riparian areas. Statistical comparisons, as I'm sure you are aware, include comparisons of the variability in the data. It is common in vegetation sampling that data is not normally distributed, so it becomes necessary to transform the data to make the comparisons valid. The data from each sample has to be transformed individually, so it is important to include in the plan complete data from each sample or transect.

Ideally, the plan would show the following:

1. Percent cover from each species in each transect.
2. Total vegetation, litter, bare, cryptogam and rock cover in each transect.
3. A summation showing:
  - A. Mean cover from each species and life form category (shrub, broadleaf forb, and grass).



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- B. Mean cover for each cover category (vegetation, litter, bare, cryptogam, and rock).
- C. Statistical data showing the minimum sample size and the standard deviation for vegetation cover.

In addition, the Division needs to have premining woody plant density and productivity information. The Natural Resources Conservation Service should be able to provide productivity information, but that will not be possible until, at the earliest, the first part of May. Knowing this may be a problem for your construction schedule, we may be able to find a similar area up- or downstream where the productivity information can be obtained.

Mr. Steed may have taken woody plant density information, but I'm not aware of it. Assuming he didn't, it should be possible to obtain this information as soon as the snow is mostly gone.

Not all of the information in Mr. Steed's report is for vegetation in the riparian area. Information from the riparian area needs to be separated from the information from other areas. I believe, however, based on the raw data I've seen, the sample size is adequate even when this information is separated.

I recognize your time constraints on this project and will be happy to work with you as much as possible to solve the problems relative to vegetation information.

Sincerely,  
  
Paul B. Baker  
Reclamation Biologist