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May 7, 1987

TO: File

FROM: James S. Leatherwood

RE: Response to BLM Comments, Topsoil Substitute Suitability Determination, Andalex Resources Inc., Centennial Project, ACT/007/019-87A, Folder No. 2, Carbon County, Utah

The Division has reviewed the April 6, 1987, BLM comments and recommendation regarding the test results of the substitute topsoil materials at the Andalex Mine. The following contains the Divisions response to each specific concern.

The BLM states that organic matter and percent rock fragments were not determined and that both parameters are important to establish reclamation suitability. The Division concurs with this statement. Table 2, Suitability Limits for Rating Topsoil Substitute Suitability, from the Topsoil and Overburden Guidelines contains the percent rock fragment content. The assessment of the percent rock fragment content of the substitute topsoil was not deemed necessary for the following reasons: 1) the soil survey adequately describe the rock fragment content of the native soil; and 2) verification of the percent rock fragment content by field site inspection by the reviewer. Organic matter content was also not requested. The substitute topsoil materials are derived primarily from the C and R horizons of the native soils. Organic matter content in these horizons are consideribly low. Due to the inherent arid environment, extensive vegetative root growth is not characteristical within the C and R horizons. The organic matter content should be approximately two percent. This may induce a limiting physical characteristic of the material. However, the soil material in which the requested substitute topsoil was replacing was derived from the same colluvial C and R horizon. An organic matter amendment at the time of final reclamation is presently being assessed through the on going mid-term permit review.

The BLM also comments on soil sampling techniques. The BLM feels it appropriate to sample over a broader area at less frequent depth intervals. The Division does not concur with this suggestion for this particular modification. The required volume of substitute topsoil dictated that the soil be evaluated at lower depths, therefore the Division required verification of the suitability of the soil materials at the lower depths. The operator has sampled at three sample sites along the top of the dike, giving a descriptive cross-section of the potential substitute topsoil physio-chemical characteristics.

The BLM has also questioned the requirement for boron and selenium analysis and included discusions on the available water capacity of the soil material. As to date the Division has not received boron, selenium or available water capacity analysis of the proposed substitute topsoil materials. The Division does however list these parameters within Table 2, Suitability Limits for Rating Topsoil Substitutes, in the Topsoil and Overburden Guidelines. Selenium is commonly found in the arid soils of Utah. The solubility of selenium increases with eh and pH. Available selenium is commonly found in arid-alkaline environments. Therefore selenium, is considered a factor in topsoil suitability with all arid-alkaline Utah soils. High toxic concentrations of boron on the other hand is not common throughout the state of Utah. Toxic concentrations of boron is associated with many geologic parent materials affiliated with coal. Though the analysis of this parameter is determined on a case by case basis, the potential detrimental effects of the element is sufficient to warrant concern with various coal operations. The National Soils Handbook (Table 603-25, Soil Reconstruction Material for Drastically disturbed Areas) does include limits for available water capacity of soils. This analysis is also required by the Division on a case by case basis when salts, sodic or poor texture may be a concern. However, the Division primarily calculates these values based on the saturation percentage and the texture of the soils.

cc: W. Hedberg
S. Linner
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