

STATE OF COLORADO

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DRMS MEMORANDUM

DATE: May 7, 2009
TO: Marcia Talvitie
FROM: Dan Mathews
RE: **New Horizon Mine, Permit No. C-81-008**
2009 Vegetation Analysis Plan
Phase 3 Bond Release: Irrigated Pasture (May 1, 2009)

The above referenced plan was submitted to me by Shawn Conner, Project Biologist for BIO-Logic, Inc; the vegetation consultant for Western Fuels-Colorado. The plan presents sampling methods that will be used to measure vegetation cover and production within delineated irrigated pasture parcels and the Irrigated Pasture Reference Area at the New Horizon Mine. The plan also addresses comparison and analysis methods to be used in demonstrations of revegetation success for the reclaimed parcels. One reclamation parcel was sampled last year and will be sampled again this year. Presumably, the reference area was also sampled last year, and will be sampled again this year, to allow for valid comparison to same year reclamation parcel data. An additional reclamation parcel will be sampled in 2009 for the first year (of the required 2 year sampling for Phase 3 bond release). Success demonstration will be based on comparison to the Irrigated Pasture Reference Area per TR-58, for which approval is imminent. My assumption in reviewing this sampling plan is that the procedures addressed in TR-58 amendments will govern the sampling and success demonstration approaches for the forthcoming Phase 3 bond release application. With that understanding, I have the following comments.

1. The sampling plan per se is acceptable, however various sections of the plan that address success standards and statistical procedures need to be revised to properly reflect permit requirements as amended by TR-58. One significant concern is that the success standard and statistical procedures for production success demonstration do not reflect the requirement that the reference area sample mean (and standard deviation if employed for two-sample hypothesis testing) would be adjusted using an area weighting procedure based on pre-mine soil type composition (refer to pages 2.05.4(2)(e)-19H through 19R of the amended application). **The plan should be revised accordingly, and the operator and/or consultant should review the plan carefully to ensure that all aspects of the**

plan are in conformance with applicable provisions of the approved permit, as revised by TR-58.

2. The plan does not address the need to demonstrate conformance with the "Quality Standard" set forth on page 2.05.4(2)(e)-19N of the amended application (e.g. 75% relative production by desirable forage species and county listed noxious species not counted toward cover or production success demonstration). **This requirement should be referenced in an appropriate section of the plan addressing success demonstration.**
3. There is an error under the "Comparison of Measured Parameters" section of the plan, with regard to hypothesis testing formula to be applied. Item 2 of the section correctly makes reference to a one-sample "standard null" t-test comparison, but incorrectly references Equation 2, set forth on page 6 of the plan. Equation 2 is the formula for a one-sample "reverse null". The proper "standard null" equation (as specified in Division regulation and the permit as amended by TR-58) is not included in the plan. **This discrepancy needs to be corrected.**
4. Given the fact that sampling approaches and success demonstration methods are addressed in considerable detail in the permit as amended by TR-58, the bond release sample plan prepared for each year's field work might be simplified by including specific reference to the applicable section of the approved permit. Rather than attempting to fully reiterate the approved approaches (with an inherent potential for errors of omission or transposition), the annual bond release sampling plan could focus on procedural details and site specific considerations that are not addressed in the permit.