State of Utah

Department of Natural Resources

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October 14, 2004

Earl R. White
American Gilsonite Company
HC 73 Box 28
Vernal, Utah 84078-9284

Subject: Basic Revegetation Recommendations, American Gilsonite Company, Bonanza Mine, M/047/010, Uintah County, Utah

Dear Mr. White:

Many mines in Utah are in harsh sites with little rainfall and poor soils, and revegetation of these areas is often very difficult. While some factors are beyond anyone's control, there are steps that can be taken to maximize the chances for revegetation success.

Attached to this letter is a simplified list of revegetation recommendations that apply to most mines in the state. We have prepared this list because several operators have had trouble with revegetation. While some mines did everything reasonably possible in the reclamation process, we have found that many mines have not used topsoil, have waited too long between site preparation and planting, have not prepared a good seedbed, have seeded at the wrong time of year, or have used seed of questionable quality.

The Division of Oil, Gas and Mining has prepared a more thorough publication entitled "The Practical Guide for Reclamation in Utah." It is available over the Internet at ftp://ogm.utah.gov/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.pdf.

Division rules require that vegetation cover of reclaimed areas achieve 70 percent of the values of pre-mining vegetation cover. The Division may also release a site if it determines that the revegetation work has been satisfactorily completed within practical limits, but before allowing release of a site on this basis, we need to know that the operator has made a conscientious attempt at revegetation and has used good revegetation techniques. These attempts need to be documented.

If you have questions about revegetation, we encourage you to call one of the biologists in the Minerals Regulatory Program, Lynn Kunzler at 801-538-5310, or Paul Baker at 801-538-5261.

Sincerely,

Daron R. Haddock

Daron R. Haddock
Permit Supervisor
Minerals Regulatory Program

DRH:PBB:jb
Attachment: Basic Revegetation Guidelines
O:\M047-Uintah\M0470010-AGC\final\revegetationtechniques.doc

Division of Oil, Gas and Mining
Basic Revegetation Recommendations

October 14, 2004

1. **Do it right the first time.** Throwing out more seed does not make up for poor timing or surface preparation.

2. **Soil Quality.** Take soil samples for lab analyses. Use the reclamation plan and soil surveys to determine how much soil to salvage. More is not better if deep soils have undesirable characteristics. BYU (801-422-2147) and USU (435-797-2217) both have soils labs. Basic parameters for which the soil should be analyzed are texture (sand, silt, and clay), coarse fragments, sodium adsorption ratio (SAR), electrical conductivity (EC), organic matter, cation exchange capacity, nitrogen, phosphorous, and potassium.

3. **Soil Storage and Protection**. Seed soil stockpiles to reduce the number of weed seeds. Put signs on the stockpiles so they won't be used as backfill material.

4. **Surface Preparation**. Rough and rocky. The surface should be left very rough so it can hold water. Rocks on the surface also increase water infiltration. Two commonly used surface preparation methods are ripping parallel to the contour and making pock marks with a trackhoe.

5. **Surface Preparation Timing**. Surface preparation must be done almost immediately before seeding. Otherwise, the soil may form a crust that is not conducive to vegetation establishment. If it is necessary to grade an area several days or longer before it can be seeded, the surface will need to be reworked to get it ready for the seed. If a graded area must be left through a growing season, a grain (wheat, barley) cover crop should be planted to reduce the number of weeds, but it is much better to do the grading shortly before seeding.

6. **Seed Quality**. Buy seed from a reputable dealer. Make sure the seed has been tested recently (9 months for shrubs and forbs; 18 months for grasses). As much as possible, buy seed from local sources. Store the seed properly. Ideal temperature is about 40-70 degrees (room temperature works well). Seed should be kept dry and away from rodents; hot temperatures will kill the seed.

7. **Timing of Seeding**. Plant in the fall; do not plant in the spring. The best time to plant is about late September through early December. Late winter and spring seedings rarely work, and this has been the cause of many revegetation failures.

8. **Notification and Documentation**. Notify the Division as far as possible in advance of seeding. If someone from the Division is on site during the seeding operations, they can often make recommendations that will improve revegetation and save time and money. Keep seed tags, take pictures, and keep written notes of reclamation operations.