

Sugarite Gob Reclamation Project - Phase IV



The Sugarite Gob Reclamation Project – Phase IV is located about six miles northeast of Raton in Colfax County, New Mexico. The project area is on unplatted public and private land within the Maxwell Land Grant.

This project consisted of reclaiming and controlling erosion on Gob Sites A1 and A4. Included in the work was construction of straw bale and coir roll terraces, diverter and spreader coir rolls, straw wattles, sediment barrier dams, gully branch packing, and brush check dams. Wood waste, lime, gypsum, organic fertilizer, compost and mycorrhizal inoculum were incorporated by hand into indicated areas of these gob sites. Temporary stream and wetland crossings were installed and removed to allow access to the site with minimal impact to the streams and wetland (at the head of Gob Site A1). About 13,000 seedlings were planted, including some replanting of seedlings at earlier work sites, and the project gob sites and sites disturbed during construction were seeded. All species used were natives. Seedling survival after six months was 82%.

The contractor was C&R Forestry, Inc. based in Albuquerque, NM.

Year Completed: 2004

Cost: \$577,809.62

Project Engineer: John Kretzmann, P.E.

Project Manager: Randall Armijo

BEFORE AND AFTER IMAGES

Before Construction





Post-construction (2006)



Sugarite is located in northeastern New Mexico, in a deep canyon on the edge of the Great Plains and a few miles south of the border with Colorado. In the years 1901 through 1941, coal was mined in Sugarite Canyon serving the domestic fuel market in New Mexico and east to Kansas. As many as 250 miners, largely immigrant, were on the payroll and a company mining town of up to 600 people flourished at the base of the canyon.

Waste rock from the underground mines on both sides of the canyon was brought to the surface and dumped, creating steep mine dumps. In a couple of places the mine waste piles almost reached the usually perennial stream 300 feet in elevation below the mine entries. Coal mine waste dumping eventually impacted a total of 22 acres.

Today the mine waste piles are located within Sugarite Canyon State Park, where the history of coal mining in the area is celebrated in a museum display, hiking trails through the ruins of the town site and to the edges of the mine waste piles, and reconstruction of the original mule barn and town post office. As part of the historic coal mining landscape in a heavily visited, publicly-owned area, the State Historic Preservation Office required that the Bureau reclaim the mine waste piles in place and without significant alteration.

The coal mine waste is largely composed of shale fragments, with some sandstone and coal pieces. Weathering of the material has produced a soil high in clay content, with samples averaging 40 percent clay. The soil is moderately acid with pH averaging 5.8 and mildly saline, with electrical conductivities averaging 4.5 mmhos/cm. The main deterrent to plant growth, however, appears to be sodium with sodium absorption ratios for the coal gob averaging 24, and in one sample as high as 43. This compares with generally acceptable SAR values of below 8 for soils with high clay content.

Excess sodium results in poor soil aeration, slow infiltration rates, and causes serious nutritional disturbances in plants by affecting the availability of calcium, magnesium, and other ions required by plants. Slopes on the gob piles are extremely steep, averaging about 2:1, are rapidly eroding, and are extensively gullied, in some places to as much as twenty feet deep. At gully side walls, slopes are nearly vertical and are steeper than 1:1 at landslide scarps. The site is in one of the wetter areas of New Mexico, receiving an average of about 20 inches of precipitation per year.

The five largest gob piles all have signs of one or more landslides – hummocky, irregular, flatter slopes below steep upper slopes – although site inspections and slope stability analyses lead AML to conclude that the slopes are largely stable from further mass movement.

AML objectives for the project are then three-fold (and to some extent contradictory):

1. to improve water quality in Chicorica Creek, which is used for trout fishing and downstream irrigation, by reducing the rapid rate of erosion on the gob piles;
2. to preserve historic mining structures and mine waste piles;
3. to reduce the physical hazards for visitors of deep gullies and steep slopes on the waste piles.

