

Location



Location map of Dinero dumps and tunnel reclamation projects, west of Leadville, Colorado

Problem

Lake Fork flows approximately five miles into the Arkansas River. The Arkansas River does not meet Colorado water quality standards for numerous metals in the reach below the Lake Fork confluence. Historic studies have demonstrated that this reach for up to 16 miles down-gradient continues to be contaminated. The CDOW has inventoried the fisheries habitat and found that while the Lake Fork provides an adequate physical setting for trout habitat, the actual biomass is reflective of a water quality impaired system.



Photo showing South Dinero Dump in wetland

The Sugarloaf mining district that contains a large number of abandoned mines, is the principle contributor to water quality impairment within the Lake Fork of the Arkansas. These mines located at higher elevations in the mining district had drainage tunnels constructed to lower the water levels in the mines. These drainage tunnels now are dumping acidic and metals laden water directly into wetlands and the Lake Fork. A second problem is that dumps, particularly those below the Nelson and Dinero Tunnels are sitting in saturated wet ground and are also contributing acidic metals laden water to the wetlands and stream. The Dinero Tunnel appears to be one of the major contributors of acid mine drainage with the Nelson, Bartlett, and Siwatch tunnels contributing to a lesser extent. The Colorado and Frying Pan Gulches

also appear to be principle contributors to the problem.

Water chemistry and aquatic macro-invertebrate data compiled by the Bureau of Reclamation indicates that mine drainage from Sugar Loaf Gulch adversely affects Lake Fork. "Water quality in Sugar Loaf Gulch exceeds aquatic life values for a

variety of metals including zinc, cadmium, and lead. Densities of many macro-invertebrate taxa decline in Lake Fork below Sugar Loaf Gulch, and trout are present only in low numbers or absent from much of this stretch of stream.... In Lake Fork below Sugar Loaf Gulch, zinc exceeded its computed chronic aquatic life criterion by factors ranging from 4.3 to 9.7 in 1991.... it similarly exceeded its acute aquatic life criterion by factors ranging from 3.9 to 8.8.... Cadmium and lead exceeded chronic aquatic life criterion by a factor of 1.2 in 1991 and lead exceeded chronic aquatic life criterion by as much as 4."



During construction, the lower part of the dumps were very loaded up with water that was "wicking" through the dumps and leaching out metals and contamination. There are many thousands of dumps located in Colorado but not all are a problem. In this situation, the location of the dumps in the wetlands was the primary issue and simply moving them to dry ground solves the problem. One of the extra accomplishments at this site was removing about a foot of original ground below the dumps that had become contaminated with heavy metals and including that along with the other dump materials in the repositories.

Aerial Photo of Dinero Dumps, upper dump is southern dump and closer dump is northern dump

Work to Date

Prior to construction, the two mine dumps were located within the wetlands area of the Sugarloaf Gulch area. The dump on the upper part of the above picture is termed the south dump and the dump on the lower part of the picture is termed the north dump. The decision was made to fold the north dump out of the wetlands to the area just below and south of the tunnel portal. Once this dump was moved, a repository was developed to house the south dump. This repository location also provided cover material for the north dump.



North Dump being folded back out of the wetlands



Looking west along the southern dump that is located in the wetlands Construction work on the northern dump is in progress



North repository under construction looking east



South repository after the majority of materials had been moved out of the wetlands. Cover material/topsoil is stored near the top of the repository.



Looking northwest at the northern repository the first year after seeding took place.



Southern repository one year after seeding took place



In the wetlands area where the dumps were formerly located, composted wood chips were incorporated into the soils to improve potential for wetlands vegetation to become established.