



GS MINING COMPANY, LLC

Bates-Hunter Water Treatment Plant

The Bates-Hunter mine is shaft accessed and has a static water level approximately eighty (80) feet below the shaft collar. To operate the mine, water must be pumped from the underground workings, treated and discharged to Gregory Gulch. The discharge is a point-source regulated under the National Pollutant Discharge Elimination System as administered by the Colorado Department of Public Health and Environment. A current permit exists for the mine site which governs the handling of storm waters and the mine water discharge. The mine water exists at a pH of 2.9 (fairly acidic), equivalent to vinegar, as a result of the natural oxidation of sulphide minerals such as iron pyrite (fool's gold). As the second discovered lode mine in the Kansas Territory (pre-dating the formation of the state of Colorado), the Bates vein has been mined significantly, causing ground water to pool in the old workings. The water comes in contact with the mineralized materials underground and forms sulphuric acid, dissolving metals and creating water which does not meet water quality standards set by the State of Colorado.

Prior to discharge, the mine water is pumped to the on-site water treatment plant. This plant was designed and installed in the mid-1990's at a capacity of three-hundred (300) gallons per minute flow. The plant employs lime treatment/coagulation/filtration technology to remove metals from the water. Water pumped from the mine workings is treated with lime (Calcium Oxide) to dramatically increase the pH from acid to basic (approximately pH 11). The basic water can no longer carry the iron and other metals, leading them to precipitate and drop from the water. Coagulation reagents are added to enhance the formation of the metallic particles which fall to the bottom of the precipitation tank. These precipitates are then drawn from the tank and filtered, creating a solid sludge. Additional test work will determine the possible usefulness of this sludge as a potential product rather than a waste, due to its value of metals and potential plant nutrients.

Criteria of concern for water discharge is primarily acidity (pH), dissolved copper, dissolved iron, dissolved manganese, and dissolved zinc. The quantity of these constituents in the mine water exceed the discharge limits set by the permit. Upon treatment, the effluent easily meets the discharge standards, including limits set for total suspended solids, oil and grease, cadmium, lead, mercury, sulfide (as hydrogen sulfide). Additional Whole Effluent Testing for chronic toxicity on fat head minnows and water fleas must be performed as part of the regular testing regimen. Water testing is conducted on a daily, weekly, monthly, quarterly and continuous basis depending on the water quality parameter that must be met. The water treatment plant is a Class B Waste Treatment plant. The Bates-Hunter mine will contract with a Class A plant licensee to oversee the operation of the plant and to complete the extensive monitoring and reporting regimen.