

In August 2008, a rotating cylinder treatment system (RCTSTM) demonstration was conducted near Gladstone, CO. The RCTSTM is a novel technology developed to replace the aeration/oxidation and mixing components of a conventional lime precipitation treatment system for mining influenced water (MIW). The RCTSTM realizes several operational benefits, including enhanced lime utilization by the treatment system, reduced maintenance requirements, and reduced power consumption by the aeration/mixing components of the treatment process.

Gladstone is located in the upper Animas River watershed, near Silverton, CO at an elevation of about 10,500 ft. Approximately 1,500 abandoned mine sites exist in the region. Cement creek, a tributary to the Animas River, is characterized by elevated metals concentrations and has a typical pH of 3.3. Aluminum, cadmium, copper, iron, manganese, and zinc are the primary mining-related contaminants of concern for Cement Creek. The American Tunnel drainage is a significant source of MIW entering Cement Creek, characterized as a reduced water with elevated concentrations of aluminum, cadmium, copper, iron, manganese, and zinc, and acidic pH.

During the two-week demonstration, the RCTSTM treated surface water from Cement Creek and MIW was discharged from the American Tunnel. The RCTSTM was operated at flow rates ranging from 30 to 400 gallons per minute during this demonstration. Monitoring activities included logging field parameters including lime consumption, pH, temperature, dissolved oxygen, and oxidation-reduction potential, and collection of 50 samples for laboratory analysis.

This paper presents the results of the RCTSTM demonstration, with an emphasis on evaluating RCTSTM effluent water quality, and comparing the RCTSTM lime consumption to conventional MIW treatment systems.