

History – Mining in Upper Pecos Watershed

In 1881, a volcanogenic massive-sulfide ore body was discovered near the confluence of Willow Creek and the Pecos River. The Tererro ore body is the largest of its kind in New Mexico. Sulfide ore bodies and associated rocks can oxidize and release sulfuric acid and metals into water. Undisturbed ore bodies can generate acid rock drainage when exposed at the surface; and mine workings, waste piles, and tailings piles can increase the magnitude of acid rock drainage. Acid rock drainage can pollute ground and surface water and kill fish.

In 1925, American Metal Company (AMC) and the Goodrich-Lockhart Company formed a corporation called the American Metal Company of New Mexico (“AMCNM”). From 1926 through 1939, AMCNM developed and operated a lead and zinc mine, commonly known as the Pecos Mine or Tererro Mine, located approximately 16 miles north of the Village of Pecos at the confluence of Willow Creek and the Pecos River. Ore was crushed at the mine site and conveyed by a 12-mile-long aerial tramway to a mill, known as El Molino or Alamitos Canyon mill, located about two miles northwest of the Village of Pecos, where the ore was processed.

In their day, the mine and mill were the largest employer in the State of New Mexico, and the Tererro mine was one of the largest producers of lead and zinc in the United States. The El Molino Mill processed 1,293,000 tons of ore from the Terrero Mine, including 440,000,000 pounds of zinc, 138,000,000 pounds of lead, 19,000,000 pounds of copper, 5,000,000 ounces of silver, and 179,000 ounces of gold. Tailings with a high concentration of lead were deposited into two impoundments in Alamitos Creek.

Between the 1930s and 1970’s, mine and mill waste was used as fill material for roads, campgrounds, camping pads, a trailhead, and at the Lisboa Springs Fish Hatchery. In the 1950s, the State of New Mexico acquired surface ownership of the mine and mill sites and some of the areas where mine waste has been used as fill. These areas continue to be managed by the New Mexico Department of Game and Fish.

In 1973, the tailings dams at the mill site (Alamitos Creek) failed, resulting in tailings being disbursed downstream in Alamitos Creek and mostly likely into the Pecos River. After the dam failed, Alamitos Creek continued to erode the tailings piles, providing an ongoing source of contamination into the watershed.

In the mid-1980s, the New Mexico Environment Department (NMED) conducted a study of the surface water near the mine and found elevated metals concentrations in springs and other surface water features discharging from around the Tererro Mine area. Surface water contained cadmium, lead, iron, and manganese in excess of state and federal standards. Stream sediments contained elevated iron, copper, lead, and zinc. Groundwater in

monitoring wells near the tailings piles contained sulfate, manganese and total dissolved solids in excess of state standards.

In 1991, an early spring rainfall caused runoff from the Tererro mine site that resulted in a massive fish kill, and more than 90,000 trout died at the hatchery alone. The fish kill brought attention to the unaddressed contamination from the mine and mill. Concerns about human health led the U.S. Forest Service (USFS) to close forest roads, campgrounds and a trailhead where mine waste had been used as fill. The U.S. Fish and Wildlife Service reported lead concentrations in fish tissue at or near the human consumption criterion and in small mammal tissue above raptor protection criterion.

In 1992, NMED and Amax Resource Conservation Company (Amax), the successor corporation to AMC, signed an Administrative Order on Consent (AOC) to address remediation. The AOC included investigation and remediation provisions to be executed under state authority with oversight by the U.S. Environmental Protection Agency. The AOC defined five “operable units” within the greater Pecos area: (1) Pecos Mine (“PMOU”); (2) El Molino (“EMOU”); (3) State Recreation Use Areas; (4) State Highway 63; and (5) Lisboa Springs Fish Hatchery. The AOC established a Cost Sharing Agreement where the mining company was responsible for 80% of the total cost of investigation, remediation and natural resource damages, and the State was responsible for 20%. The USFS was not a party to the AOC but allocated \$1.2 million to remove or cap mine waste that had been used as fill at roads and campgrounds.

Discussions among industry, government agencies and community stakeholders reached a consensus that corrective actions were necessary, but that federal Superfund listing should be avoided. Although none of these areas were designated as a Superfund site under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the AOC established a similar process for remediating the mine and mill sites.

Under the AOC, Cyprus Amax Minerals Company (Cyprus), which is the successor company to Amax, was responsible for conducting a Remedial Investigation and Feasibility Study to assess the extent of groundwater and surface water contamination and the actions that needed to be taken to remediate the PMOU and address the water quality impacts. The Remedial Investigation found that the exposed waste rock piles contained multiple metals and acid generating minerals, and concluded that the infiltration of precipitation through, and runoff from, the waste rock piles was the primary mechanism for transport of contaminants to downgradient soils, sediments, surface water, and groundwater. The RI and FS were submitted to NMED for review and were made available for public comment. Based upon the RI/FS and public comments, NMED issued a Decision Document in 1998 specifying the required remediation and abatement for the site.

Between 1999 and 2004, Cyprus implemented the remediation plan, including source control for abatement of water contamination through consolidation of mine waste and subsequent reclamation of the waste rock stockpile. The overall strategy for remediation

was to minimize contact between water and the acid-generating waste rock so as to minimize the formation of contaminated discharge that could emanate from the waste rock stockpile. The reclamation and remediation at PMOU included excavation and consolidation of all associated mine waste; installation of a geosynthetic clay liner and cover material; restoration of Willow Creek, riparian habitat and wetlands; revegetation of all disturbed areas; diversion of subsurface and surface water flows around the capped waste pile; and restoration of surface and ground water quality. NMED reviewed and approved the satisfactory completion of the reclamation and remediation work required under the AOC.

Since 2004, Cyprus has continued to monitor the ground water and surface water in the PMOU area, along with other activities required by the Decision Document. Following reclamation, water quality standards were met at most locations, but four groundwater monitoring wells within the PMOU continued to exceed the standards of 20.6.2.3103 NMAC for certain constituents.

In 2018, Cyprus petitioned the N.M. Water Quality Control Commission (WQCC) for a water quality variance that would allow Cyprus to apply lower water quality standards for eight water contaminants at the PMOU. [No. WQCC 18-03\(V\)](#). Those contaminants include barium, cadmium, fluoride, iron, manganese, total dissolved solids, zinc, and cobalt. The WQCC conducted a hearing and granted the variance, concluding that there were no technically feasible methods that Cyprus could use to meet existing water quality standards.

Under the WQCC Variance Order, the lower water quality standards apply to the two aquifers within the PMOU site: a shallow aquifer that occurs along the Pecos River and Willow Creek at less than 20 feet below ground surface, and an underlying regional aquifer that occurs in multiple bedrock units beneath the entire site. The affected water body consists of saturated alluvium/colluvium that occurs along the Pecos River and Willow Creek, and the underlying bedrock aquifer that exists below the saturated alluvium/colluvium and the reclaimed waste rock pile. The variance applies to a depth of 1900 feet.

The Order states that the NMDGF property is subject to continuing requirements of the AOC and management under a Long Term Operation and Maintenance Plan. The water within the area is not allowed to be used as a source of potable water, and NMED petitioned the N.M. Office of the State Engineer (OSE) to issue an order expressly prohibiting construction of a well in the covered area.

In July 2023, Cyprus submitted its 2022 Annual Operation and Maintenance Activities Report for the PMOU, which was prepared by contractor DBS&A. Quarterly reports are also submitted. The annual report states that groundwater monitoring results for 2022 indicated that concentrations of all water quality constituents remain below the applicable

standards. The analytical results for water samples collected from the Pecos River during the fourth quarter of 2022 did not exceed WQCC surface water quality standards.