

NPL Site Narrative for Gilt Edge Mine

GILT EDGE MINE Lead, South Dakota

Conditions at Proposal (May 11, 2000): The Gilt Edge Mine site is located southeast of the town of Lead in the northern Black Hills, in Lawrence County, South Dakota. The area has been mined intermittently by several owners and operators from the late 1800s to present. Cyanide leaching, mercury amalgamation, and zinc precipitation among other methods were used to recover gold. Proposal of the Gilt Edge Mine site to the National Priorities List (NPL) is based on releases of cadmium, cobalt, copper, manganese, lead and zinc that have been documented in Strawberry Creek, a tributary to Bear Butte Creek, and Bear Butte Creek. Bear Butte Creek is classified by the State of South Dakota as a coldwater permanent fish life propagation water and limited-contact recreation water.

Mining activities began at the site in 1876 when the Gilt Edge and Dakota Maid claims were located. Historical underground mining operations extracted sulfide-bearing gold ores from irregular deposits in veins and fracture zones in the volcanic rocks. Production of gold and silver, and small amounts of copper, lead, and zinc are reported from the properties at Gilt Edge. Mining continued sporadically until the early 1930s.

The Gilt Edge Mine reopened in the mid-1930s and operated until 1941. The milling process involved cyanidation and countercurrent decantation. Mill tailings were discharged to Strawberry Creek until the mine closed in 1941. Piles of acidic tailings were left along Strawberry Creek. These tailings continually discharged acid and metals into Strawberry Creek, and contributed to sediment loads as the piles eroded.

During the early 1980s, the South Dakota Department of Environment and Natural Resources (DENR) observed several tens of thousands of tons of acid-generating tailings in upper Strawberry Creek. A spring at the base of these tailings was discharging water with a pH of 1.9. Underground mine entrances and shafts were also discharging acidic water and metals. No aquatic life was observed in Strawberry Creek.

In 1986, DENR issued a mining permit to Brohm Mining Corporation (Brohm) for the open pit/heap leach operations. The permit contained several conditions that addressed the tailings and the potential for acid mine drainage (AMD). One condition required Brohm to remove some of the tailings from Strawberry Creek to be used as bed liner for the leach pad. Over 200,000 tons of relic tailings were removed from Strawberry Creek by Brohm beginning in 1993. Another condition of the permit required Brohm to install a pumpback system designed to prevent acid discharges from the mine workings from entering Strawberry and Bear Butte Creeks.

In 1991, cyanide leaked from the cyanide heap leach pad into Strawberry Creek and Bear Butte Creek. Unpermitted discharges of acid water, aluminum, cadmium, copper, lead, and zinc from two areas were identified by EPA during an inspection in 1992 under the National Pollutant Discharge Elimination System (NPDES). In 1993, EPA issued an NPDES surface water discharge permit to Brohm. Three NPDES compliance points were designated including one in Strawberry Creek, and two in Ruby Gulch, an intermittent tributary to Bear Butte Creek. NPDES permit violations based on low pH and levels in excess of permitted concentrations for sulfate, aluminum, cadmium, copper, iron, manganese, and zinc have occurred on several occasions since the permit was issued.

Mining at the Gilt Edge Mine ceased in 1998. The mine site is currently inactive with the exception of a few remaining workers who operate the water treatment system.

Status (December 2000): EPA is considering various alternatives for this site.

For more information about the hazardous substances identified in this narrative summary, including general information regarding the effects of exposure to these substances on human health, please see the Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs. ATSDR ToxFAQs can be found on the Internet at [ATSDR - ToxFAQs](http://www.atsdr.cdc.gov/toxfaqs/index.asp) (<http://www.atsdr.cdc.gov/toxfaqs/index.asp>) or by telephone at 1-888-42-ATSDR or 1-888-422-8737.