

The Flambeau Mine

The Flambeau Mine was an open-pit copper-gold-silver mine located near Ladysmith, Wisconsin that was permitted in January 1991 and began production in 1993. It operated for four years, ceasing in 1997. The mine operated on the shores of the Flambeau River, a popular recreation river and one that provides habitat for a variety of aquatic and wildlife species, including muskellunge, bald eagles and osprey.

Produced:

- Metals: 181,000 tons of copper, 334,000 ounces of gold and 3.3 million ounces of silver.
- Waste rock: Approximately 4.5 million tons of high sulfur waste rock and 4 million tons of low sulfur waste were generated and stockpiled on site for eventual return to the pit.

Reclamation Action:

The 220-foot deep open-pit – a half a mile long and 32 acres in size – was backfilled with waste rock and limestone. Groundwater infiltrated the backfilled pit. The addition of limestone and the water infiltration were intended to slow the generation of acid, limit the availability of oxygen, and thus limit the dissolution of toxic metals. The surface of the former pit was re-contoured, topsoil was added and plant communities were established.

Pollution Problems:

1. Surface water runoff from the mine site does not meet Wisconsin surface water quality standards. Runoff is polluting a stream which flows into the Flambeau River. Multiple water samples between 2004 and 2008 show significantly elevated levels of copper, exceeding both chronic and acute standards. Studies show that the stream is almost devoid of life, including vegetation, macroinvertebrates, and fish. Researchers believe this is because of the high metal levels. At one sampling location, the copper level is approximately 10 times the acute water quality standard, and the zinc level is approximately twice the acute water quality standard. Copper and zinc are synergistic metals, so their combined impact on aquatic organisms is greater than that of either by itself.

The Flambeau Mine is polluting surface and groundwater – violating Wisconsin’s water quality standards and the Clean Water Act.

2. In a monitoring well between the pit and the Flambeau River, groundwater does not meet Wisconsin groundwater quality standards. Within the pit, water contamination is occurring, and these contaminants are moving out of the pit. Despite hopes that water infiltration and limestone would neutralize reactions within the pit, monitoring results show that pit reactions have not stabilized. Reactions – dissolution and precipitation of metals – continue to occur within the pit. Mine design plans called for the development of a bentonite slurry cutoff wall between the pit and the Flambeau River to limit movement of water exiting the pit. It is possible the contaminated water is now moving around, under or through the slurry cutoff wall. Another possibility is the bedrock itself is permeable and contaminated water is moving through fractures.

Not What Was Predicted:

The pollution problems at the Flambeau Mine were not predicted to occur when the mine was designed and assessed for environmental impacts. Monitoring results reveal chemical reactions taking place despite predictions that limestone and water would limit them.

Pollution at the Flambeau Mine was unexpected and not anticipated during the mine's environmental review and permitting.

In a 2009 study of the mine, two environmental engineers stated that 10 years after the mine closed, the predicted manganese concentrations in the pit effluent are four times predictions in half of the monitoring wells.

Copper and iron concentrations also exceed expected concentrations in pit wells. "The unpredictability observed in copper, iron, and manganese concentrations indicates that important assumptions were missing in original modeling..." (Chambers and Zamzow, 2009). The mine design plans presumed either that the slurry wall would contain water from moving from the pit to the River, or that the bedrock was not permeable, assumptions that documented water pollution now call into question.

Current Status:

In late 2001, the mining company submitted a Notice of Completion for reclamation activities to the Wisconsin Department of Natural Resources, followed by a mandatory four-year monitoring period.

The mining company performed all reclamation required by law, but despite their efforts, the mine continues to pollute.

A partial Certificate of Completion for reclamation activities was granted in May 2007 *without* taking into account the groundwater contamination within the backfilled pit, the exceedance of groundwater standards at the mine's legally-established intervention boundary, and potential impacts of the mine on fish and other aquatic life in the Flambeau River. Instead, the decision for partial certification was based on completion of the surface reclamation activities. Certification was withheld for the 32-acre area where surface water pollution was emanating.

In January, 2011, The Wisconsin Resources Protection Council filed a civil lawsuit against the Flambeau Mining Company in U.S. District Court alleging ongoing violations of the federal Clean Water Act. The charge was that the discharge of copper, zinc, iron and other pollutants to Stream C was done without a permit and in violation of the Act.

In July 2012, a federal judge ruled that the mine was the source of the pollution and that the mining company had indeed violated the Clean Water Act. At the same time, the judge praised the company for its environmental practices – recognizing the effort to clean up the pollution, but acknowledging it had not been fully successful.

Early in 2012, after the lawsuit was filed, the Flambeau Mining Company removed the liner from the water containment area that was a source of the pollution to prevent further discharges to surface waters. This now directs contaminated water to seep into groundwater.

Sources:

Chambers, D. M. and K. Zamzow. 2009. Report on Groundwater and Surface Water Contamination at the Flambeau Mine. Center for Science in Public Participation.