

Background Information on the Flambeau Mine

An Excerpt from:

Report on Groundwater and Surface Water Contamination at the Flambeau Mine

David M Chambers, Ph.D. and Kendra Zamzow, Ph.D.
Center for Science in Public Participation*

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For a copy of the complete report issued by Chambers and Zamzow, please go to the web page of the Wisconsin Resources Protection Council at www.wrpc.net

The Flambeau Mine, an open-pit copper-gold-silver mine located near Ladysmith, Wisconsin was permitted in January 1991 and began production in 1993. The ore body ... yielded 181,000 tons of copper, 334,000 ounces of gold and 3.3 million ounces of silver over the mine's brief four-year lifespan.¹ Approximately 4.5 million tons of waste rock characterized as "high sulfur" and 4 million tons of "low sulfur" waste were generated and stockpiled on site for eventual return to the pit.²

When mine operations ceased in 1997, the open pit was 220 feet deep, a half mile long and 32 acres in size. Backfill operations commenced promptly, and over 30,000 tons of limestone was blended into the sulfide-bearing waste rock on relocation.³ In addition, a layer of non-acid generating waste was placed on top of the acid-generating waste backfilled into the pit. Although groundwater has infiltrated the backfilled pit, the combination of neutralizing limestone and submergence of the acid-generating material in water, which limits the availability of oxygen, is meant to slow the generation of acid and dissolution of metals in this material to an acceptable amount.

Backfill operations were completed by early 1998, at which time surface reclamation began. This entailed recontouring the surface, spreading topsoil and establishing plant communities. In late 2001 a Notice of Completion for reclamation activities was submitted to the state regulatory agency, followed by a mandatory four-year monitoring period.

A **partial** Certificate of Completion for reclamation activities was granted in May 2007 subsequent to an agreement negotiated between opposing parties at a contested case hearing. Groundwater contamination within the backfilled pit, exceedances of applicable groundwater standards at the mine's legally-established intervention boundary, and data related to potential impacts of the mine on macroinvertebrates, sediment, crayfish, and walleye in the Flambeau River **were not assessed as part of the certification process and therefore did not factor into the decision.** Rather, partial certification for the site was based upon completion of backfill operations according to plan and successful revegetation of the surface. Due to ongoing problems with surface water pollution in a small creek that receives runoff from the mine site, **certification was withheld for a 32-acre section of the mine site known as the Industrial Outlot.** The Industrial Outlot includes the area where the mine's rail spur, runoff and surge ponds, water treatment plant and administrative building were located during the mining years, as well as a portion of the high sulfur waste rock stockpile.

¹ Flambeau Mining Company, 2007 Annual Report, January 2008, pg 3

² Flambeau Mining Company, 1997 Backfilling Plan for Stockpiled Type II Material, March 1997, pg ii-iii

³ Flambeau Mining Company, 2007 Annual Report, January 2008, pg 3

During mining, water was pumped from the pit to keep it relatively dry. This pumping caused a groundwater cone of depression to form around the pit, directing all groundwater flow during mining toward the pit. At mine closure the pumping ceased and natural groundwater flow patterns were restored. The southwestern edge of the pit is 140 feet from the Flambeau River. The pit is separated from the Flambeau River by a slurry cutoff wall designed to limit groundwater flow to/from the river both during and after mining. The post-mining groundwater hydrology is described as flow from the pit towards the Flambeau River (see Figure A and Figure B).

Ore from the mine received only minimal processing at the mine site. An ore crusher was positioned close to a mine site rail terminal, and from there the ore was shipped to Canada for further processing. During mining, water pumped from the pit that came in contact with acid-generating rock and contaminated water from the mine's high sulfur waste rock stockpile was routed to a surge pond and from there to an onsite water treatment plant. After mining ceased, the reclamation plan was modified to allow the surge pond to stay in place, and the pond was modified to facilitate its use as a biofilter for treating water collected from the southeast corner of the mine site where the Industrial Outlot is located (see Figure C). This wetland, the "Outlot (0.9 acre) Biofilter," now discharges into Stream C, which flows into the Flambeau River (See Figure D).

There are presently two areas of concern with regard to contamination of water coming from the reclaimed mine site.

- First: Water discharged from the Outlot Biofilter wetland into Stream C does not meet Wisconsin surface water quality standards. This water flows into the Flambeau River.
- Second: Groundwater in a monitoring well between the pit and the Flambeau River (on the Flambeau River side of the slurry wall separating the pit from the river) does not meet Wisconsin groundwater quality standards.

*The Center for Science in Public Participation provides technical advice to public interest groups, non-governmental organizations, regulatory agencies, mining companies, and indigenous communities on the environmental impacts of mining. **CSP** specializes in mining, especially with those issues related to water quality impacts and reclamation bonding.