

Surface Water Pollution at the Partially Reclaimed Flambeau Mine

A Summary of the Chambers & Zamzow Report ¹ Provided by Wisconsin Resources Protection Council - June 2009

Flambeau Mining Company (FMC), a subsidiary of Kennecott Minerals of Salt Lake City, Utah constructed an open pit copper sulfide mine on the banks of the Flambeau River near Ladysmith, Wisconsin in the mid 1990s. The river formed the western boundary of the project area, and the pit itself was constructed to within 150 feet of the river. The Flambeau Mine was operational for four years. It ceased production in 1997 and has since been partially reclaimed.

In 1991 (prior to ore production) FMC began submitting surface and groundwater quality data to the Wisconsin Department of Natural Resources (WDNR) on a regular basis in an effort to track potential mine impacts on water resources. Data collection continued through the mining years (1993-1997) and continues to this day.

Dr. David Chambers and Dr. Kendra Zamzow of the Center for Science in Public Participation (Bozeman, Montana) did an independent analysis of FMC's water quality data for the Wisconsin Resources Protection Council (WRPC). They identified two areas of concern with regard to contamination of water coming from the partially reclaimed Flambeau mine site: ²

First (surface water):

Contaminated water from a pond designed to collect runoff from the mine site is draining into a small creek known as Stream C. This water does not meet Wisconsin **surface water** quality standards and is flowing into the Flambeau River.

Second (groundwater):

Groundwater in a monitoring well between the pit and the Flambeau River (on the Flambeau River side of a man-made slurry wall designed to separate pit water from the river) does not meet Wisconsin **groundwater** quality standards.

As summarized in the Chambers & Zamzow Report: *[In surface water] copper contamination in excess of Wisconsin water quality standards is reaching the Flambeau River from the Flambeau mine site, and [in groundwater] the Flambeau pit is leaching contaminants that exceed Wisconsin groundwater quality standards to beyond the slurry wall designed to separate pit water from the Flambeau River.*³

This summary outlines Chambers and Zamzow's findings with regard to surface water pollution at the Flambeau Mine site; a separate summary is provided for groundwater pollution.

To view the Chambers & Zamzow Report in its entirety, please go the WRPC web page: www.wrpc.net

STREAM C ("Churchill Creek"):

This small stream, dubbed "Churchill Creek" by members of WRPC, is classified as "navigable,"⁴ which means it is a **public water**. As stated in the Chambers & Zamzow Report:

*All indications appear to be that [prior to the construction of the Flambeau Mine] Stream C was much like other streams in this area – relatively clean water with low copper content.*⁵

Now that the mine has come and gone, water from a pond designed to collect runoff from the mine site is draining into Stream C and from there into the Flambeau River (see attached map). Flambeau Mining Company has tested the water for contaminants, and the company data is analyzed by Chambers and Zamzow in their report. As the authors point out:

*It appears that **copper is a contaminant of significant concern.** This is potentially significant since aquatic organisms are not only very sensitive to copper, but also sensitive to changes in copper over background levels.*⁵

So how high are the copper levels in Stream C? As pointed out in the Chambers & Zamzow Report:

*Surface water data from 2008 shows that ... **the copper level is approximately 10 times the hardness-based acute water quality standard [at a sampling site downstream from where the contaminated pond drains into Stream C], and the zinc level is approximately twice the hardness-based acute water quality standard.** Copper and zinc are synergistic metals, so their combined impact on the aquatic organisms is greater than that of either by itself.*⁶

Have living organisms in Stream C been impacted by the Flambeau Mine? A survey of aquatic life in Stream C was commissioned by Flambeau Mining Company in 2005, and the company's own consultant concluded that:

“The stream appears to be very limited in biota in all aspects including aquatic vegetation, macroinvertebrate populations, and fish.”⁶

Chambers and Zamzow state the following:

With copper levels significantly exceeding both chronic and acute water quality criteria [in Stream C], it is likely that these high metal levels are contributing to the lack of aquatic life in Stream C. These levels also suggest that better monitoring of Stream C and the Flambeau River below Stream C should be done.⁶

Is the pollution in Stream C being regulated by the Wisconsin Department of Natural Resources? According to Chambers and Zamzow, the answer is “No.” As the authors point out:

Stream C is being presently used as a conduit for contaminated water from the mine site to the Flambeau River, where dilution by the large volume of water in the river occurs. ... Dilution of water from Stream C would constitute a “mixing zone” under a discharge permit ... At present no permit or authorized mixing zone exist.⁷

FLAMBEAU RIVER:

But what about the Flambeau River? Has water quality been impacted by the contaminated water draining into the river from Stream C?

Starting in late 2007, FMC began reporting water quality data for the Flambeau River immediately downstream of where Stream C drains into the river. So far only three rounds of data have been reported, and the results are analyzed in the Chambers & Zamzow Report. When comparing copper levels at two different sampling sites in the river, one upstream and one immediately downstream of where Stream C enters the Flambeau River, the authors noted the following:

On all three sampling dates the copper level is greater ... below the outlet of Stream C.⁸

In particular, the authors noted that the April 2008 round of data showed the copper level in the river below the Stream C outlet was “approximately double the Wisconsin water quality standard” while the copper level above the outlet was “below the standard.”⁸

SUMMARY: Chambers and Zamzow conclude the following in their report:

Copper contamination in excess of Wisconsin water quality standards is reaching the Flambeau River from the Flambeau mine site ... Since [the Stream C drainage] is an ongoing discharge from an industrial facility, the discharge should be more carefully monitored, and should either be cleaned up before it leaves the mine site, or the discharge should be regulated under a Clean Water Act discharge permit.³

References:

1. Report on Groundwater and Surface Water Contamination at the Flambeau Mine. David M Chambers, Ph.D.. Kendra Zamzow, Ph.D., Center for Science in Public Participation, June 5, 2009. To view the complete report, go to www.wrpc.net
2. *ibid*, p. 2
3. *ibid*, p. 16
4. Final Environmental Impact Statement for the Flambeau Mine, Mar 1990, p. 32, as quoted in Chambers & Zamzow Report, p. 2 (go to <http://digital.library.wisc.edu/1711.dl/EcoNatRes.FinEnvImpMar90> to view the EIS in its entirety)
5. Chambers & Zamzow, p. 3
6. Foth & Van Dyke, Stream C – 2005 Analysis of Collected Data, Oct. 10, 2005, as quoted in Chambers & Zamzow Report, p. 4
7. Chambers & Zamzow, pp. 4, 5
8. *ibid*, p. 5