

## **2 2008 Summary**

### **2.1 Introduction**

On January 14, 1991, after an exhaustive permitting process including extensive opportunity for public input, the Flambeau Mining Company (Flambeau), wholly owned by Kennecott Minerals Company, received from the Wisconsin Department of Natural Resources (Department) eleven permits to operate an open pit copper mine in Rusk County, Wisconsin. Over the life of the mine (1993 – 1997), 181,000 tons of copper, 3.3 million ounces of silver, and 334,000 ounces of gold were mined.

Backfilling of the open pit began in earnest in early 1997. Waste rock and soils were replaced to their approximate original location in the open pit. Over 30,000 tons of limestone were added to the sulfide-bearing waste rock to neutralize and buffer the groundwater as it resaturated the backfilled materials.

In 1998, the surface reclamation of the mine site began by returning the land surface to its approximate original contour. Stockpiled topsoil was spread across the site where grasslands and woodlands were created. Hydric (wetland) soils had been stockpiled as well and were used to create over ten acres of wetlands. Reclamation activities since 1998 have included seeding, plug planting, tree planting, erosion control, mowing, invasive species control, trail construction, and prescribed burning. During 2001, Flambeau completed the planting plan and submitted the Notice of Completion (NOC) to the Department. Concurrent with the submittal of the NOC, the reclaimed Flambeau Mine nature trails were opened to the public for non-motorized recreational activities. The City of Ladysmith had partnered with Flambeau to develop the four-mile nature trail system.

During 2006, monitoring of the reclaimed mine site documented the continued development of high quality native grassland, woodland and wetland communities. Ecological monitoring has documented that 272 native plant species are established on the site. Fifty-two bird species were found to be using the reclaimed mine site and 33 bird species were recorded as nesting on the site.

During 2007 Flambeau petitioned the Department for Certificate of Completion (COC). The COC process included a preconference hearing, public hearing and contested case hearing. At the contested case hearing, the parties negotiated an agreement and entered into a stipulation which was subsequently accepted by the administrative law judge and resulted in a signed order. The order granted a COC to Flambeau for 149 acres of the Flambeau Mine site that includes the backfilled pit and not including the 32-acre Industrial Outlot. Among the other aspects of the stipulation included in the Order was an agreement by Flambeau to withdraw the COC petition for the Industrial Outlot and that it would not apply for a COC for the Industrial Outlot for at least three years, a reduction of the reclamation bond to 20 percent of the \$11 million bond on file with the Department at that time (maximum reduction allowed by Wisconsin law), and a commitment by Flambeau to conduct further environmental monitoring.

During 2008 Flambeau completed extensive monitoring as required by the 2007 COC stipulation and also supplemental monitoring on a voluntary basis. The monitoring completed during 2008 documents that the Flambeau River remains fully protected and Flambeau maintains compliance with its permits.

Throughout each phase of the project, samples have been collected from the Flambeau River and include water quality, sediments, fish, and macroinvertebrates. Continued protection of the Flambeau River, located 140 feet from the backfilled pit, has been documented throughout the Flambeau project by extensive monitoring.

## **2.2 Groundwater Quality Assessments**

Assessments of the backfill groundwater quality have been routinely performed with the most recent being completed in January 2009. The assessments show that the regional groundwater flow, including backfill water, is flowing toward the Flambeau River as was predicted during permitting; all acidity in the backfill has been neutralized by the limestone; sulfate concentrations in the majority of the backfill are now controlled by gypsum precipitation and dissolution; and concentrations of solutes in the backfill are stable and should not significantly increase in the future and, in fact, many are showing a decreasing trend. Further detail on groundwater quality can be found in Section 4 of this report.

## **2.3 Notice of Completion/Certificate of Completion**

Data obtained during monitoring of the reclaimed vegetation during 2000 documented that Flambeau met the vegetative performance standards for NOC.

During September 2001, Flambeau submitted the NOC to the Department . In a letter dated March 8, 2002, the Department accepted Flambeau's NOC. The four-year monitoring period prior to COC began November 19, 2001. For Flambeau to receive the COC, the performance standards were met during the final year of the 4-year monitoring period. The final year of the 4-year monitoring period was 2005. All performance standards were met in 2005 and again in 2006 even during extreme regional climatic conditions such as the regional drought experienced in 2005 and 2006. On January 9, 2007, Flambeau Mining Company petitioned the Department for COC.

The COC process included a preconference hearing in April, public hearing in mid-May and contested case hearing in late May 2007. The contested case portion of the process had just started when the parties began negotiating an agreement. At the hearing, the parties entered into a stipulation which was subsequently accepted by the administrative law judge and incorporated into an order. The order was signed by the judge granting a COC to Flambeau for 149 acres of the Flambeau Mine site that includes the backfilled pit and not including the 32-acre Industrial Outlot. Among the other aspects of the Stipulation included in the Order was an agreement by Flambeau to withdraw the COC petition for the Industrial Outlot and that it would not apply for a COC for the Industrial Outlot for at least three years, a reduction of the reclamation bond to 20 percent of the \$11 million bond on file with the Department at that time (maximum reduction allowed by Wisconsin law), and a commitment by Flambeau

to conduct further environmental monitoring.

## **2.4 Industrial Outlot**

### **2.4.1 Reuse of Industrial Outlot Facilities**

On January 8, 1998 Flambeau submitted a request for modification of the Mining Permit and Reclamation Plan. The requested modifications included modification of the final land use for 32 acres of the mining site to allow for alternative use of the on-site buildings and related ancillary facilities, railroad spur and a portion of the former Type II waste rock stockpile area by the Ladysmith Community Industrial Development Corporation (LCIDC).

On July 30, 1998 the Department approved the request for modification of the final land use for the 32 acre industrial outlot with the following condition: “If the portion of the site covered by the lease agreement with the LCIDC has not been put to an acceptable alternative use by the end of 2004, the site shall be reclaimed in a manner consistent with reclamation of the remainder of the mining site. Any demolition waste resulting from such reclamation shall be disposed of in a properly licensed solid waste facility.”

A long-term lease agreement exists between Flambeau and the LCIDC, where the LCIDC leases a 32-acre portion of the former mine site referred as the industrial outlot. The 32-acre area includes the former administration building now occupied by the Ladysmith Department of Natural Resources Service Center; the former Water Treatment Plant (WTP) building now occupied by Xcel Energy and the Department; the railspur for which the LCIDC has installed major improvements and purchased adjacent property outside of the mine project area; an approximate eight-acre area north of the railspur in the former Type II stockpile area; and a 0.9-acre biofilter constructed in 1998 to reduce suspended solids and other contaminants resulting from precipitation runoff from the industrial outlot.

During 2000, the LCIDC completed renovations on the administration building, now serving as the Department’s Ladysmith Service Center, and WTP building, now housing Xcel Energy’s line maintenance shop and the Department’s equipment storage area. In addition, the LCIDC constructed another building for the Department between the Service Center and the former WTP to house additional Department equipment. The Department and Xcel Energy continue to occupy the former mine buildings.

During 2003, the LCIDC submitted a request to the Department for the retention of the rail spur located east of Highway 27 as part of the communities’ on-going efforts to increase industrial development. The LCIDC had committed to remove and reclaim about 200 feet of the rail spur east of Highway 27. In a letter dated June 12, 2003, the Department stated that it “...is satisfied that the portion of the rail spur east of the highway is being used for alternate purposes. Therefore, the rail spur east of Highway 27 will not need to be removed and revegetated...”

During early 2004, the Flambeau Riders, Inc. (Riders) approached Flambeau about the

possibility of developing non-motorized trails on property owned by Flambeau south of the Industrial Outlot and east and south of the Flambeau River. In addition, the Riders inquired about using a portion of the Industrial Outlot as driveway access and as an equestrian trailhead. In documents dated May 19 and 28, 2004, Flambeau proposed to the Department an alternate use plan for Flambeau's former rail spur area west of Highway 27 and the eight-acre area north of the west rail spur area within the Industrial Outlot as a driveway and equestrian trailhead.

During 2004, a Community Advisory Group was formed to advise Kennecott Minerals on development of a land use management plan for the 2177 acres owned by Flambeau as of year end 2004. The Advisory Group is represented by Rusk County, City of Ladysmith, Town of Grant, Ladysmith Area Trails Association, Flambeau Riders, LCIDC and the Department's Northern Rivers Initiative. During a late December 2004 meeting, the Advisory Group agreed that the expansion of trails south of the reclaimed mine site and using a portion of the Industrial Outlot as an equestrian trailhead were acceptable and beneficial uses of the property. It was agreed to formalize the agreement with 1) a Trail Easement & License between Flambeau and the City of Ladysmith and 2) a Sublease between the LCIDC and the City of Ladysmith. Fully executed documents, Trail Easement & License and Sublease, dated January 1, 2005 are in place.

In a letter to the Department dated December 30, 2004, Flambeau provided notice that the 32 acre industrial outlot has met the condition of "acceptable alternative use."

The Department responded in a letter dated February 18, 2005 that the only portion of the industrial outlot for which an acceptable alternate use had not been designated was the section lying north of the railspur in the area of the former Type II waste rock stockpile. The Department conceptually found the proposed use as an equestrian trail head acceptable, but required further details to review and approve the proposed construction plans.

In submittals dated March 1 and July 21, 2005, Flambeau provided to the Department drawings and detail regarding the proposed equestrian trailhead and access via Copper Park Lane. The Department provided approval for the project in a letter dated July 28, 2005.

The construction of the equestrian trailhead initiated on August 11, 2005 and was complete by September 8, 2005.

## **2.4.2 Rail Spur Reclamation**

During Spring 2003, Flambeau and the LCIDC agreed that the Wisconsin Department of Transportation should remove the rail crossing as part of the renovation of Highway 27 during 2004. In addition, storm water sampling had measured copper concentrations entering the 0.9-acre biofilter that may have been associated with the west rail spur area.

During Fall 2003 the top two feet of ballast and gravel were excavated from the rail spur area west of Highway 27. Reclamation of the west rail spur area and 200 feet east of Highway 27 was completed during Spring 2004.

A submittal, Rail Spur Reclamation Documentation, dated November 10, 2004 was made to the Department and included a topographic drawing showing the east and west reclaimed rail spur areas and details regarding the reclamation of the rail spur areas.

### **2.4.3 Intermittent Stream C**

The Flambeau Mine remains committed to the protection of water quality in the Flambeau River. Since final reclamation in 1999, Flambeau has continued its monitoring of water quality in the Flambeau River as well as surface runoff into the Flambeau River. This monitoring indicates that the water quality of the Flambeau River remains fully protected.

Copper and zinc concentrations have been measured in offsite background storm water runoff and in runoff from the Industrial Outlot located on the reclaimed mine site. The non-point sources of runoff from the Industrial Outlot are being passively treated by the 0.9-acre biofilter that substantially reduces the concentrations of metals before flowing into Intermittent Stream C that eventually discharges to the Flambeau River. The biofilter itself supports populations of aquatic biota, including fish and frogs.

An expanded surface runoff monitoring program including bioassessment of the intermittent stream was conducted during 2004 and 2005. The work plan evaluated 1) the biological conditions within Stream C, 2) areas of the Stream C watershed that contribute to the water in Stream C, 3) aspects of the industrial outlot bio-filter that may influence copper levels that are discharged from the bio-filter to Stream C; and 4) the hydrology and water quality within Stream C.

In a submittal dated January 20, 2005, Flambeau provided a memorandum prepared by Foth & Van Dyke that summarized and assessed the data that was collected in 2004.

In summary, Stream C is an intermittent stream with poor aquatic habitat that lacks aquatic vegetation and aquatic macroinvertebrates. As a result of the poor habitat and very limited food source, no fish were observed in the stream during the 2004 biological assessment. Stream C does not possess the types of characteristics that are needed for it to support any type of fishery. The sediment sampling of the biofilter indicates that it is functioning as designed. This is supported by the fish and amphibians that have been observed in the biofilter. The surface water sampling that has been completed within the watershed of Stream C suggests that some areas, particularly those affected by highway runoff, may naturally exhibit elevated copper levels in the water. In addition, the 2004 sampling indicated that there appeared to be localized areas at the Industrial Outlot that were contributing elevated copper levels to storm water that flowed to the biofilter. Based on this last point, Foth and Van Dyke advised that Flambeau consider implementing measures to minimize storm water contacting the localized areas that appeared to be contributing to the

elevated copper levels.

In a document dated October 24, 2005, Flambeau submitted to the Department the results of the 2005 surface runoff monitoring program. The 2005 results were consistent with the 2004 results.

Monitoring of the surface water at the site since the completion of reclamation has indicated that the Industrial Outlot biofilter is working well in lowering copper levels of surface water runoff flowing from the Outlot area. During 2003 and 2004 the former rail spur was reclaimed in an effort to reduce the concentration of copper in surface water runoff.

During 2006, Flambeau further reduced sources of copper from the Outlot area to the Biofilter. Foth & Van Dyke oversaw the design and implementation of the work plan. The work plan was implemented starting May 18, 2006 and complete by June 21, 2006. The work consisted of excavation of approximately 900 linear feet of the existing drainage ditch collecting storm water runoff from the area around the Copper Park buildings and replacement of the cobbled drainage way with limestone cobbles. Approximately 2.2 acres of gravel parking lot was excavated to a minimum depth of four inches. Soil sampling was conducted following completion of excavation. The average copper concentration of the exposed subgrade after removal was approximately 38 mg/kg (ppm). A non-woven geotextile fabric was placed on the exposed subgrade of all excavated areas within the area of asphalt and the drainage ditch prior to backfilling. Crushed limestone gravel was placed on the non-woven geotextile fabric as subgrade material and the parking lot was paved with three inches of bituminous concrete (asphalt). All excavated material (2300 cubic yards) was appropriately disposed at the licensed Timberline Trail Landfill.

Storm water samples collected during 2006, 2007 and 2008 indicate a marked reduction in copper concentrations in storm water reaching the biofilter.

A report prepared by Foth & Van Dyke titled Construction Documentation Report – Flambeau Industrial Outlot was submitted to the Department on September 12, 2006. Included with the report were results of soil sampling following excavation. The report provides further detail on the completion of the work plan.

On January 12, 2007, the Biofilter Management Plan was submitted to the Department. The report presents surface water data collected during 2006 and post 2006 construction which documents a dramatic reduction in copper loading to the biofilter. The report also presents a biofilter management plan including monitoring of the biofilter.

In a document dated October 14, 2008 Foth Infrastructure & Environment, LLC, on behalf of Flambeau Mining Company, provided a summary of stipulation and supplemental monitoring results. The voluntary supplemental monitoring Flambeau conducted included stormwater and soils within the Industrial Outlot in the vicinity of the Copper Park Lane. Based upon elevated copper concentrations within the stormwater and soils, Foth proposed a work plan in the vicinity of Copper Park Lane that included removal of surficial soils and replacement with clean fill and topsoil. The work plan was proposed to eliminate any possibility that this

area could be considered a potential source of copper to Stream C.

Following review and concurrence by the Department, the work along the Copper Park Lane was completed November 5 – 7, 2008. A total of 303.85 tons of surficial soils were excavated and disposed as special non-hazardous waste at the Timberline Trail landfill. Analyses of the sub-base soils indicate that materials of concern were removed. Gravel covered with by topsoil were used as clean fill materials in the area of excavation. Seeding and placement of a net free erosion control blanket completed the work. A January 23, 2009 documentation report provided to the Department contains further detail on the Copper Park Lane work.

Additional samples were collected October 27, 2008 and results submitted December 9, 2008. These include samples that were collected just prior to the completion of the work described in the work plan.

## **2.5 Community Involvement**

Flambeau's involvement with the surrounding communities has included promotion of community activities, partnering with the communities, economic development, promoting tourism, enhancing communication, restoration projects, and maintaining an open door policy.

The major achievements for 2008 are set forth below:

- The Flambeau Community Advisory Group formed during 2004 continued to advise Kennecott Minerals on the development of a land use management plan related to the 2168 acres owned by Flambeau.
- Flambeau's partnership with the City of Ladysmith and Flambeau Riders, Inc. continued with improvement of the non-motorized multi-use recreational trails south of the reclaimed mine site. These trails, the Copper Park Equestrian Trails and Trailhead, were opened to the public in September 2005. During 2008 a bridge crossing on an unnamed non-navigable stream was installed, trails were widened, hitching tie lines were installed, as well as additional work.
- The Reclaimed Flambeau Mine nature recreation trails were open to the public for the seventh year. In addition, through a cooperative effort, the Hunt Hill Audubon Nature Center, Department's Ladysmith Service Center and Flambeau held a wetland wildlife workshop and nature hike during early May 2008 on the reclaimed mine site.
- During 2008 Flambeau partnered with Rusk County Tourism to sponsor a countywide geocache contest that included locations on the reclaimed mine site. Geocache sites can be searched out along the Reclaimed Flambeau Mine Nature Trails, Copper Park Equestrian Trails and Sisters Farm Trails. Details on geocache sites can be found at [www.geocaching.com](http://www.geocaching.com).

- During August 2008 Flambeau partnered with local prairie enthusiasts to hold a Prairie Workshop.
- The UW-Extension's Healthy Lifestyles for Rusk County held their third annual community walk on the reclaimed Flambeau Mine nature trails in early September 2008.
- During late September 2008, as part of the Leaf it to Rusk Fall Festival, Flambeau and the Flambeau Riders partnered to host trail rides and horse drawn wagon rides on the Copper Park Equestrian Trails. Over 50 community members turned out for the event.
- Flambeau continued its open door policy and upon request conducted tours of the mine site. Included were the Indianhead Headstart and Ladysmith and Flambeau grade school children taking spring and fall hikes on the reclaimed mine site to learn about natural resources.
- Flambeau partnered with the Rusk Area Arts Alliance to produce the 2009 Reclaimed Flambeau Mine calendar featuring local artists. The artists provided artwork of varying media depicting their interpretation of the natural beauty of the reclaimed mine site.

## **2.6 Water Management**

### **2.6.1 Precipitation Runoff**

Since 2000, the reclaimed mine site surface remains stabilized by vegetative growth and there is minimal evidence of erosion. Aerial photographs (color and infrared) taken during August 2006 document surface stabilization of the reclaimed mine site.

Flambeau River water quality samples were collected upstream and downstream from the reclaimed mine site during 2008. Comparing analytical results, there was no notable difference between downstream and upstream samples and this further confirms that the reclaimed site is stable and functioning as designed. A summary of Flambeau River water quality results is found in Appendix B and Appendix C.

### **2.6.2 River Water Withdrawal**

On May 5, 1998 the Department approved Flambeau's application to withdraw water from the Flambeau River for use on site. The Department's approval requires submittal of monthly summaries for months during which a withdrawal occurs. When the irrigation pump system operates it is powered with a portable generator since electrical supply had been removed during 2001. During 2008 no water was withdrawn from the Flambeau River.

Wetland 1 is located immediately west of the reclaimed mine site. With the backfilling of the open pit being complete in 1997, the groundwater table has recovered significantly and

Wetland 1 has been documented to be notably moister with groundwater seeps again flowing.

During 2008, Flambeau continued to monitor the staff gauge within Wetland 1 and maintain the ability to add mitigation water to the wetland. A regional drought during 2005 and 2006 continued into 2007 and resulted in lowering of water levels of wetlands located in the region including Wetland 1. During 2008 increased precipitation improved surface hydrology in the region as well as Wetland 1. Since Wetland 1's condition resulted from natural causes and regional climatic conditions, mitigation water was not added during 2008 as was also the case between 2002 and 2007..

## 2.7 2008 Milestones

The following is a summary of significant milestones throughout the year:

**Table 2-1. 2008 Milestones**

	<b>Month</b>
Ninth Year Prescribed Burn Complete	April
Flambeau Partnered with the Community to Host Several Events on the Reclaimed Mine Site	Summer/Fall
Tenth Year Subsidence Fly Over	May
Completed Updated Bonding Requirements	May

## 2.8 Modifications & Deviations

Condition 2-4 in the Mine Permit requires an inventory of deviations and modifications to the Permit received subsequent to permit issuance. Activities during 2008 were consistent with permits, approved plans, and modifications received subsequent to permit issuance. During 2008 there were no modifications or deviations to the Permit.

## 2.9 Construction Reports

There were no activities requiring the preparation of construction reports during 2008.

## **2.10 Incident Log**

Mine Permit Condition 2-6 requires a log of all incidents such as spills, pond overflow, embankment failure or leakage. This log is maintained on-site and is available for inspection. Spills are reported in accordance with Wis. Adm. Code ch. NR 706, CERCLA Reportable Quantities and SARA Section 302 Extremely Hazardous Substances Reportable Quantities.

During 2008 there were no reportable or recordable incidents that occurred on the reclaimed Flambeau Mine site.

## **2.11 Drill Holes**

Mine Permit Condition 2-7 requires a summary of all exploration drilling activities conducted on the mine site during the previous year. No exploration drilling activities were conducted on the reclaimed mine site during 2008.