

What is *sulfide mining?*

Sulfide ores are ores containing heavy metals (such as copper or nickel) that are bonded to sulfur, forming sulfide minerals. When exposed to air and moisture, a chemical reaction generates sulfuric acid that can leach into the surrounding environment and cause the release of the metals into streams and lakes at levels that are toxic to fish and other aquatic life. This phenomenon is known as ***Acid Mine Drainage (AMD)***.



Acid Mine Drainage (Penn. DEP)

In a surface mine like the one proposed by PolyMet, mining leaves huge piles of waste rock and a huge pit exposed to the elements. Like the ore that has been removed, the waste rock and the pit walls contain sulfide minerals. The potential for Acid Mine Drainage and for contamination of surface and ground water by heavy metals remains for centuries, and even millennia, into the future.

***Please help us protect
Minnesota's Arrowhead from
new sources of pollution!***

**ACT NOW to protect Northeastern
Minnesota from the effects of sulfide mining
and industrialization. Contact:**

Save Our Sky Blue Waters
info@sosbluewater.org
www.sosbluewater.org

Center For Biological Diversity
(218) 525-3884
mfink@biologicaldiversity.org
www.biologicaldiversity.org

Save Lake Superior Association
mail@savelakesuperior.org
www.savelakesuperior.org

Friends of the Cloquet Valley State Forest
friends@friendsevsf.org
www.friendsevsf.org

Northeastern Minnesotans for Wilderness
www.nmw.org

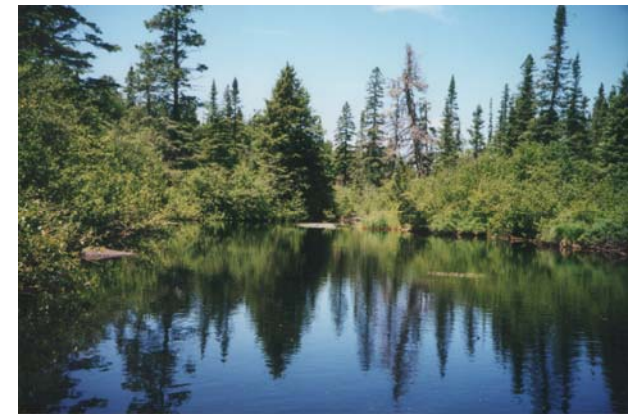
National Wildlife Federation
(906) 361-0520
greatlakes@nwf.org
www.nwf.org

Sierra Club
(612) 659-9124
north.star.chapter@sierraclub.org
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Northeastern
Minnesota's
waters and forests
threatened by
sulfide mining and
industrial expansion.

Located between the North Shore of Lake Superior and the Boundary Waters Canoe Area Wilderness (BWCAW), the Arrowhead Region is Minnesota's most loved recreation area and a place that millions visit for rejuvenation. This region faces an unprecedented industrial expansion that is certain to affect the qualities that draw people here.



Areas in and near the BWCAW will be affected

One of the worst threats from this expansion is from the mining of sulfide ores, a particularly harmful type of mining that has not been conducted in Minnesota before. PolyMet Mining's NorthMet Mine, located between Babbitt and Hoyt Lakes, is the first of many sulfide mine proposals.

What is the track record for sulfide mining?

Acid mine drainage has already polluted more than 12,000 miles of rivers and streams and over 180,000 acres of lakes and impoundments in the United States. According to the U.S. EPA, Acid Mine Drainage from coal mining is the leading source of water pollution in the Mid-Atlantic States. Acid Mine Drainage from metal mines in Western states has caused some of the country's largest and most contaminated Superfund sites. Mining companies argue that modern mining methods can protect against Acid Mine Drainage, but they cannot point to a single mine that is more than a few years old that has not resulted in contamination. Because Acid Mine Drainage often takes several years to develop, recent mines that have not yet contaminated nearby waters do not provide proof that these ores can be mined safely.



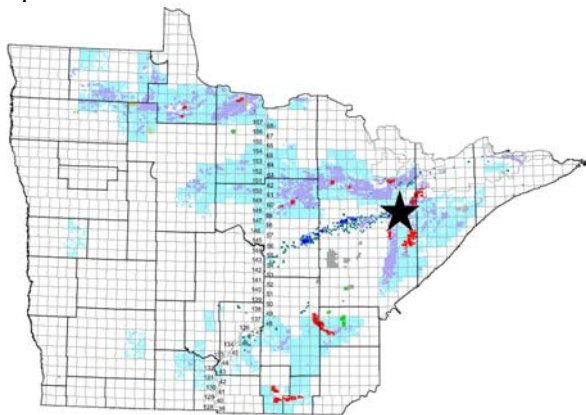
Flambeau Mine near Ladysmith, WI

For example, the Flambeau Mine in northern Wisconsin operated from 1991 to 1997, and was supposed to show how protective modern mining methods can be. In 1999, water sampling began to show contamination. Despite the removal of 7,400 tons of contaminated soil, acid drainage continues. In 2005, runoff within the site still contained copper levels as high as 100,000 $\mu\text{g/L}$. Water discharging from a runoff holding pond at the edge of the mine site contained 27 to 61 $\mu\text{g/L}$ of copper; in comparison, the acute toxicity water quality standard for copper is 7 $\mu\text{g/L}$. **Wisconsin now has a moratorium on sulfide mining.** Wisconsin Act 171 requires that no mining company will be given a mining permit unless they can: A) Prove that an existing mine has operated in a sulfide ore body for 10 years without

polluting the groundwater and surface waters with Acid Mine Drainage at the tailings site or mine site -- or from the release of heavy metals. B) Prove that a mining operation that operated in a sulfide ore body and has been closed for 10 years has not polluted the ground and surface waters with AMD and other heavy metals. To date no sulfide mining permits have been issued.

What is the PolyMet proposal?

PolyMet proposes to mine a sulfide ore body on U.S. Forest Service land near the towns of Hoyt Lakes and Babbitt. This would be the first sulfide ore mine to be permitted in the state of Minnesota. However, additional proposals for sulfide mines are advancing. How the PolyMet proposal is treated by Minnesota's permitting agencies is particularly critical in light of these coming proposals.



★ PolyMet's proposed NorthMet mine

Colored areas indicate mineral leases offered by the State of Minnesota

The PolyMet mine site covers about five square miles, two square miles of which are wetlands that will be destroyed. The mine will be an open pit, producing millions of tons of waste rock, some of which will contain sulfide mineralization. Despite the fact that the Environmental Impact Statement (EIS) is now being prepared, the company has not yet determined how it will treat its waste rock, making any determination of the potential for Acid Mine Drainage impossible. Potentially affected waters include the Partridge River and the Embarrass River, which are tributaries of the St. Louis River and Lake Superior.

What does the future hold for Northern Minnesota?

The PolyMet mine is just one of many proposed new mines, mine expansions, and new industrial plants in Northeastern Minnesota. These facilities, some of which have already been permitted, will destroy thousands of acres of wetlands and wildlife habitat, substantially increase air emissions (including mercury and acid and haze-forming pollutants), and further degrade some of the area's streams and rivers. The State's current administration has given these facilities priority, explicitly fast-tracking their permit processes. Franconia Minerals is proposing to mine a sulfide ore body that lies partially underneath Birch Lake.



Birch Lake, South of Ely, MN

Where next? Is your land at risk?

Mineral exploration companies are actively pursuing mineral rights leases all over northern Minnesota. These lease areas are under private, as well as public land. Many land owners are surprised and disturbed to learn they may not control the mineral rights under their own land. A mining company that owns or controls mineral rights to a property can mine private land without the owners permission. Due to the geology in this area, and the current high price of metals, plans for sulfide mining can be expected to continue and expand at an alarming rate.