

LAND OF 10,000 ACIDIC LAKES?

SULFIDE MINING IN NORTHEASTERN MINNESOTA

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ABSTRACT

PolyMet Mining, Inc. has proposed developing the first sulfide mine in Minnesota called the NorthMet Project. Sulfide mining extracts marketable base metals, such as copper, from sulfide ore bodies. PolyMet proposes the community would benefit from an estimated 448 direct jobs and \$14.5 million in taxes to state and local governments from the mine operation, however under-regulated sulfide mining poses a significant threat to local water quality.¹ **Can a sulfide mining industry be an environmentally responsible solution for long-term economic stability in Northeastern Minnesota?** An analysis of literature reviews and data collection indicate that the **sulfide mining industry is an inadequate alternative for the Northeastern Minnesota economy due to its negative environmental history, threat to local ecosystems, and unpredictable international markets.**



Northeastern Minnesota Wetlands. Over 1,000 acres of wetlands are proposed to be drained by the NorthMet Project.



Rouchleau Open Pit in Virginia, MN. PolyMet proposes creating an open pit mine in Superior National Forest.

METHODS

Literature review– Included historical news articles, reports to the Minnesota state legislature, Minnesota state legislative hearings, scientific papers, academic journals, and the NorthMet Project's Draft Environmental Impact Statement. Journals included *Engineering and Mining Journal*, *Journal of Finance*, *The Bell Journal of Economics and Management Science*, *William Mitchell Law Review*, *Journal of Paleolimnology*, *American Antiquity*, and *Resources Policy*.

Data Collection– Personal interviews were conducted with individuals from the US Army Corps of Engineers, Minnesota Pollution Control Agency, PolyMet Mining, Inc., Sierra Club, Center for Science in Public Participation, Water Legacy, and the University of Montana.

Data Analysis- Raw data from the United States Geological Survey was examined to extrapolate twentieth century copper and iron ore market trends and personal interviews were analyzed. Case studies from former sulfide mining operations and legislative decisions from other states were considered and compared to the NorthMet Proposal.



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FINDINGS

Sulfide Mining is a poor alternative for the Northeastern Minnesota economy due to the following:

NORTHMET'S OPEN PIT MINING METHOD

The project's mine site is located on wetlands within Superior National Forest, which explicitly prohibits open pit mining. To mitigate this issue, a land exchange between PolyMet Mining, Inc. and the United States Forest Service may occur.

PolyMet's open pit requires the loss of wetlands-- in fact, the largest one-time loss within state history... there is no man-made way to replace the natural functioning wetlands of the Arrowhead--and the habitat they provide, along with their carbon sequestering ability.

-Elsanne Palcich, member of Sierra Club North Star Chapter



The Hull-Rust Mahoning Mine in Hibbing, MN. One of the largest open pit taconite mines in the world, it spans 1,600 acres and is over a mile deep.

SULFIDE MINING & ACID MINE DRAINAGE

Current regulations intended to protect water quality are inadequate. This often leads to increased acidity levels in the local ground and surface water which can negatively impact sensitive plants and animals. The proposed sulfide tailings (acid-producing waste rock) site is an old, unlined taconite tailings basin which may impact wetlands that abut tributaries to the Embarrass River, which is a tributary to the St. Louis River that flows into Lake Superior.

The process fails- all mines are predicted to not cause acid mine drainage, but for mines with surface and groundwater nearby that have potentially acid producing waste still **75% of them fail** to meet surface and/or groundwater water quality discharge standards.

-David Chambers, Ph.D., Center for Science in Public Participation



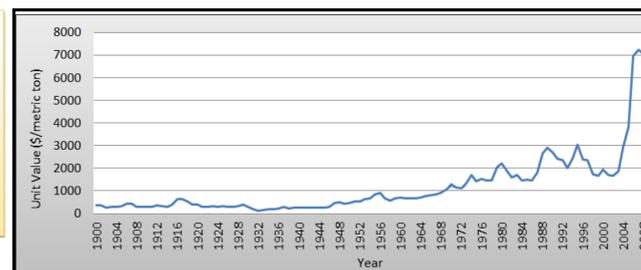
Acid Drainage from the Tulsequah Chief Mine in British Columbia. It was abandoned in 1957 due to low mineral prices- after only 6 years of operation.

UNPREDICTABLE INTERNATIONAL MARKET

Demand for base metals has skyrocketed during the last decade due to industrialization in India and China. This high demand has motivated mineral deposit prospecting all over the world, including Northeastern Minnesota. Developing a new boom and bust industry could make the region more vulnerable to future economic instability.

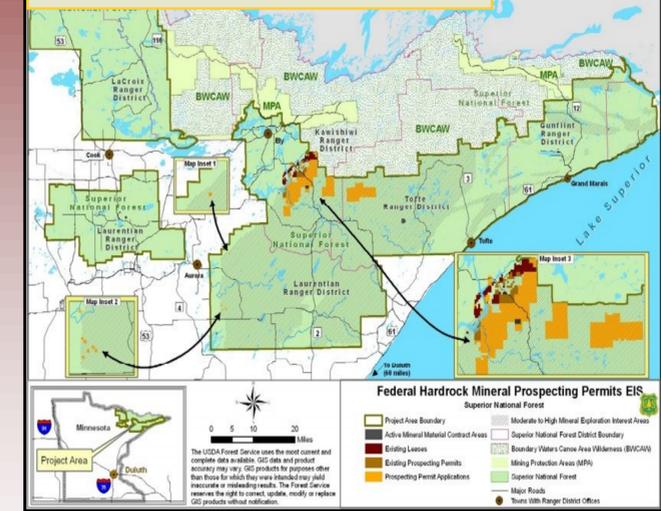
Minnesota will have to compete with a flood of copper mining that is going to come on line at the current prices. Many of those new development(s) **will fail** as the supply rises and drives the price back down.

-Thomas Power, Ph.D., University of Montana



Copper Unit Value During Twentieth Century. Note the recent increase, likely due to industrialization in China and India.

Permit Prospecting and Mineral Exploration Interest Areas Map, Northeastern Minnesota.



CONCLUSIONS

Sulfide mining is a poor option for the Northeastern Minnesota economy due to its unpredictable international markets, history of environmental degradation, and the sensitivity of the regional environment within and around the NorthMet Project proposal. To avoid the establishment of an under-regulated sulfide mining industry, while still allowing economic development in the region, the following must be considered:

- **Adopt a successful policy similar to Wisconsin's "Prove it First"** policy. Established in 1998, this policy requires prospecting sulfide mining companies to **operate a similar mine for ten years** without polluting surface or groundwater from the mine site or the tailings basin. **Twelve years later in 2010, no companies have been permitted to mine sulfide rocks.**²
- **Identify failures of other sulfide mining states, like Michigan.** The 2004 non-ferrous mining law requires permit applications to include an Environmental Impact Assessment. However, **permitting officials' failure to critically analyze** the permit application's Environmental Impact Assessment led to the permitting of a mine which had **no air, water, or other natural resource quality standards available to hold the company accountable.**³
- Approximately **75% of operating sulfide mines do not comply** with air and water standards. If the NorthMet Site is approved by the Environmental Protection Agency, Minnesota legislatures must **establish and enforce strict air and water standards** which force mining companies to comply to remain in operation.
- **Develop and diversify regional industries** which promote long-term regional sustainable development to become less reliant on the mining industry. **State investment** should be directed towards funding **jobs in forests and wilderness areas**, which would stimulate the region's recreation and tourism industry and **invest in protecting Minnesota's unique natural resources.**

REFERENCES

1. Minnesota Dept. of Natural Resources and United States Army Corps of Engineers- St. Paul District. *NorthMet Project Draft Environmental Impact Statement*. St. Paul: Minnesota Dept. of Natural Resources and U.S. Army Corps of Engineers- St. Paul District (2009): 583-584.
2. Pache, Tiffany D. "Midwest Mining Rush Threatens Water: Part IV: Challenging the Mine Permitting Process." DC Bureau. <http://www.dcbureau.org/201011151264/Natural-Resources-News-Service/midwest-mining-rush-threatens-water-part-iv-challenging-the-mine-permitting-process.html> (Accessed November 16, 2010).
3. Pache, Tiffany D. "Midwest Mining Rush Threatens Water: Part V: Wisconsin, the "Prove It First" State." DC Bureau. <http://www.dcbureau.org/201011171268/Natural-Resources-News-Service/midwest-mining-rush-threatens-water-part-v-wisconsin-the-prove-it-first-state.html> (Accessed November 17, 2010).

