

# PolyMet’s mercury air emissions

## Minimizing mercury emissions to prevent water quality impacts

Poly Met Mining Inc. (PolyMet) is proposing to develop a mine and processing facility for the extraction of copper, nickel, and platinum group elements from the NorthMet Deposit in northeastern Minnesota. The MPCA and its partners are working to reduce mercury in our lakes and streams. The purpose of this fact sheet is to provide information about PolyMet’s emissions of mercury and the actions it must take to minimize those emissions.

### Statewide goal: Reducing mercury emissions

Mercury is a neurological toxin that accumulates in the food chain. Airborne mercury is deposited over land and water. Water runoff from land brings mercury into lakes. As big fish eat smaller fish, mercury concentrations build up in fish tissue. Fish in many of the lakes and rivers in Minnesota have elevated concentrations of mercury.

Because 99 percent of mercury in Minnesota’s lakes and streams is from atmospheric deposition, mercury emissions reductions are needed to reduce mercury concentrations in fish. The Statewide Mercury Total Maximum Daily Load (TMDL) sets a statewide goal for reducing mercury emissions. Achieving this goal relies on the existing sources of mercury emissions making large reductions and new sources minimizing mercury emissions.

The MPCA and its partners created guidelines to ensure new sources of mercury emissions would not jeopardize meeting the statewide reduction goal. Therefore, any new sources of mercury emissions in Minnesota must:

- Complete environmental review (an Environmental Assessment Worksheet or an Environmental Impact Statement [EIS])
- Install the best mercury emissions controls available
- Accept a limit on the amount of mercury the new source is allowed to emit
- If a new source has mercury emissions greater than three pounds per year (lb/yr) and will impede TMDL reduction goals, it must submit a mercury mitigation plan.

In accordance, PolyMet has done an EIS, is installing the best available mercury controls, and the air permit contains a limit on the amount of mercury emitted. Due to faster than expected reductions in statewide mercury emissions and because PolyMet’s projected mercury emissions are small (4.6 lb/yr), the MPCA determined the proposed PolyMet project will not impede progress toward the TMDL reduction goals.

### PolyMet’s mercury emissions

PolyMet’s waste rock, ore, and fuels contain trace amounts of mercury. When the ore is processed or fuel is combusted mercury is released to the environment. Total maximum mercury emissions allowed from PolyMet will be 4.6 lb/year. The majority of the emissions are from the autoclave and there is a small amount emitted from fuel combustion and ore processing.

### Issue summary

The state of Minnesota has long-term goals to reduce mercury in the state. PolyMet must minimize its mercury emissions in order to ensure it won’t jeopardize those goals.

PolyMet’s air permit limits its mercury emissions to no more than 4.6 lb/year. Actual emissions will be less. The permit does this by requiring installation, operation, and maintenance of mercury control equipment, and monitoring and recordkeeping.

The autoclave is a high-pressure, high-temperature vessel used to extract platinum group elements, precious metals, and base metals. The draft air permit limits mercury emissions from the autoclave to no more than 4.1 lb/yr. To meet this limit, PolyMet is installing mercury emissions controls consisting of a venturi scrubber followed by a wet scrubber. The venturi scrubber removes particle-bound mercury and the wet scrubber will remove any oxidized mercury which has not been captured in the venturi scrubber. This two-stage mercury control system is the best available for mercury emission control. The scrubber effluent is recycled within the hydrometallurgical process to conserve water. Water and waste solids discharged from the process, which may contain mercury, are sent to the Hydrometallurgical Residue Facility where they will be safely managed and remain isolated from further transport to the environment.

PolyMet would emit up to 0.4 lb/yr of mercury from fuels used for space heating and generating steam. The permit requires the use of natural gas, which has the lowest mercury content of fossil fuels available.

There is a small amount of mercury emitted from the processing of the ore and as fugitive dust from the facility (0.1 lb/yr). These mercury emissions are in the form of particulate-bound mercury. Emissions from processing the ore will be controlled by fabric filters, which have been identified as the most effective emission controls for particulates. By controlling fugitive dust emissions, PolyMet will control the particulate-bound mercury emitted from the ore.

## **Determining compliance**

The draft air permit contains conditions requiring that control equipment is properly operated and maintained, documentation of ongoing performance, and routine compliance demonstrations, including:

- Stack tests to measure mercury emissions and set acceptable operating parameters for the scrubbers
- Continuous monitoring and recording of the pressure drop and liquid flow rate for each scrubber and requirements to take corrective actions if outside the acceptable ranges
- Retaining records of all monitoring and maintenance of the control equipment
- Reporting the results of all stack tests, any deviations of allowable pressure drop and liquid flow rates, and annual emissions.

The compliance demonstration requirements will ensure the mercury limit is met on an ongoing basis as well as provide information about actual emissions.