

# Environmental Cooperative Research

One in a Series of Division Fact Sheets

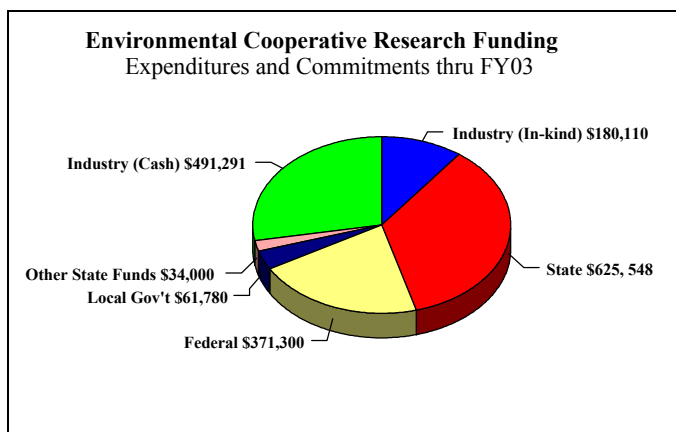


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## What is this program and why is it important?

The Environmental Cooperative Research Program funds research supporting mitigation of environmental effects of mining and the restoration of mined lands for post-mining uses. The Legislature established the program in 1993 to address mining-related environmental issues; the Division of Lands and Minerals administers it. State investment is important in leveraging dollars from partners, including industry, local governments, and federal agencies.

Completed research has benefited the environmental health of former minesites. Examples include the reclamation of former gravel pits with native vegetation statewide, and the recycling of Duluth Harbor dredge spoils mixed with taconite tailings to create wetland habitat.



## What research is being done now?

- **EAST RANGE HYDROLOGY** – The closure of LTV Steel Mining Company's operations at Hoyt Lakes has raised a number of hydrologic concerns for Minnesota Power, the communities of Aurora and Hoyt Lakes and Cliffs-Erie, the new owner of the mining property. These include uncertainties over future direction and amount of groundwater flows, and minepit water elevations and outlets. Solutions to these problems require the development of hydrologic data sets and subsequent modeling. *Cooperators:* Cliffs-Erie LLC, Minnesota Power, City of Hoyt Lakes, City of Aurora.

- **USE OF BIOSOLIDS TO RECLAIM COARSE TACONITE TAILINGS** – Biosolids generated as a waste product by the Western Lake Superior Sanitary District (WLSSD) when incorporated into tailings should greatly increase water retention capability and serve as a nutrient

source. This project is determining how varying rates of biosolids application affect production of vegetative cover and biomass. In addition, water volume and quality of both surface runoff and infiltration is being measured to determine potential water quality impacts. *Cooperators:* WLSSD and EVTAC Mining, LLC.

- **FEN RESTORATION** – Several Minnesota peat operations are currently harvesting sedge peat for horticultural use. Restoring fen vegetation to these areas will require different techniques than restoration of sphagnum peat. At Hawkes Peat, near Thief River Falls, the success of sedge meadow restoration as affected by soil application rates and other factors is being tested. *Cooperators:* Hawkes Company, Inc., Natural Resources Research Institute, Duluth.

- **PREDICTION OF ACID MINE DRAINAGE FROM SULFIDE MINERALIZED ROCKS** – Existing laboratory and field data are being interpreted from a geochemical perspective to learn how acid drainage from future mining operations can be mitigated under operational conditions. *Cooperator:* U.S. Bureau of Land Management.

## What future research is being proposed?

The following research areas are of mutual interest to the Department, private sector and other government agencies.

- Cost-effective reclamation of industrial mineral pits and quarries (including sand, gravel, limestone, and kaolin) statewide. *Cooperators:* operators and local units of government.

- Mercury has been targeted as a regulatory concern by the Minnesota Pollution Control Agency (MPCA) and the U.S. Environmental Protection Agency (EPA). Minnesota's taconite industry has been identified as a source of mercury emissions where control technology will need to be implemented. Additional work on mercury sources and control will need to be undertaken. *Cooperators:* Minnesota Taconite Industry, MPCA, U.S. EPA.

- Continuation of hydrological studies of the Mesabi Iron Range are needed to ensure proper management of these new, large, and dynamic lake systems. *Cooperators:* taconite mining industry, Iron Range Resources and Rehabilitation Board (IRRRB), Iron Mining Association of Minnesota.