Minnesota's Comprehensive Mercury Air Emission Reduction Strategy
Developed to Implement a Statewide Mercury TMDL
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Overview
- Sources of Mercury in Minnesota Fish
- Establishing Reduction Goals (TMDL)
- Strategies to Reduce Mercury Air Emissions
- Implementation Update
Waters “Impaired” by Mercury in Fish

- >0.2 ppm Hg
- Recommended to eat fish once per month or less
- 2/3 of lakes and rivers tested

The Impaired Waters Process

- Assess
- List
- Do TMDL Study
- Implement
- Evaluate
Minnesota’s Statewide Mercury TMDL

- Most (<99%) of mercury contamination comes from air sources
- 90% of mercury deposited in state comes from outside of the state
- Total Maximum Daily Load:
  - 93% reduction in manmade deposition (from 1990) to allow more frequent fish consumption
  - Reduce MN air sources to 789 lb/yr
  - Water point sources not to exceed 1% of total mercury load allocation (24 lb/yr)
  - [http://www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html](http://www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html)

Sources of Atmospheric Deposition to Minnesota, 2005 Minnesota Emissions

- Natural Emissions 30%
- Global Emissions 30%
- Regional Emissions 40%
- Minnesota Mercury Emissions (about 10% of all deposition)
- Energy Production (mostly coal) 58%
- Product Disposal 22%
- Taconite Processing 20%
Implementation Planning Process

- June 2007 - May 2008
- Third party hired to convene and facilitate stakeholder-recommended strategies to meet TMDL goals
- Two-tiered stakeholder engagement
  - group of 17 met 16 times during year
  - all known stakeholders invited to attend two input sessions and comment on drafts.
- MPCA role
  - Member of the group, technical support

Implementation Planning Outcomes: Air Reductions

- Stakeholder-developed recommendations to meet reduction target by 2025
- 70-90% reductions from nearly all source categories
- Strategy for new and expanding sources
- Improve measurement and reporting
- MPCA commitment to implement
Projected Mercury Emissions 2005-2025

Hypothetical actual emissions. Emission may rise temporarily between goals. Reductions may occur earlier than target date.

Energy Sector Strategies (2005 Emissions)

- Coal Fired Electric Generation (1,716 lb)
  - various strategies achieve 86% reduction by 2025, mostly sooner
- Industrial/Commercial Boilers (102 lb)
  - Wood and coal
  - 70% reduction at units greater than 2 lb by 2018
- Petroleum (40 lb)
  - Refineries-- 50% reduction by 2018
  - Product utilization- better quantify and reduce if needed
Hg Reductions Planned at EGUs

Mining Strategy Highlights

- Six taconite processing facilities emit 800+ lb/yr
- Reduce emissions to 210 lb/yr by 2025 (75% reduction from estimated 2010 levels)
- Continue research to identify reduction/control
- Apply and test possible technologies- 2010-2015
- Provide schedule for implementation at all facilities by 2016
Product-related Mercury Emissions

2005 (est.)

- Spills and land dumping: 24 lb
- On-site household waste incineration: 40 lb
- Smelters (cars and appliances): 139 lb
- Solid waste processing: 169 lb
- Crematories: 80 lb
- Dental preparations: 62 lb
- Recycling mercury products: 65 lb
- Municipal waste combustion: 49 lb
- Other: 67 lb

695 lb/yr

2005 Product Emission Sources

- > 50 lb/year (est.)
  - Misc. mercury in waste: ~235 lb
    - Collection and processing: ~169 lb
    - Burn Barrels: ~40 lb
  - Waste Combustion: ~49 lb
  - Smelters recycling cars/appliances: ~139 lb
  - Dental-related
    - Dental preparations: ~62 lb
    - Cremations: ~80 lb
  - Product recycling (mostly lamps): ~65 lb
  - Strategies developed to reduce sector emissions to 502 lb by 2025 (28% reduction from 2005)
Projected Mercury Emissions 1990-2025

Based on reduction targets established by the Strategy Work Group

- Incidental to energy production
- Largely resulting from the purposeful use of mercury
- Emissions incidental to material processing (mostly mining)

Factors Contributing to Successful Stakeholder Process

- Clean Water Act requirement to implement TMDL reduction goals
- Previous attempt in 1997-1999 resulted in little progress
- 2006 State legislation requiring reductions at states 3 largest power plants
- Neutral facilitation
- Good timing
Air Implementation Plan Key Elements

- **Permitted facilities** - proposed rule would require plans to achieve goals
- **Unpermitted “point” sources** - work with MPCA to improve emissions estimates and implement reduction measures
- **Product sources** - variety of approaches including outreach, assistance and enforcement
- **Guidelines for new sources emitting >3 lb/yr**

More Information

- Minnesota Pollution Control Agency web site:
  - Implementation Plan: [www.pca.state.mn.us/air/mercury/reductionplan.html](http://www.pca.state.mn.us/air/mercury/reductionplan.html)
  - TMDL: [www.pca.state.mn.us/water/tmdl/mercuryplan.html](http://www.pca.state.mn.us/water/tmdl/mercuryplan.html)
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