Land Stewardship Project

Silica Sand in Minnesota: Balancing human, environmental and economic health

John Linc Stine
Commissioner

Our Mission:
Protect and improve the environment and enhance human health
MPCA – who we are & what we do

- We are 900+ employees
- Avg age = 47 years; 53% males; 47% females
- We are 70% scientists: Biologists, Chemists, Engineers, Hydrologists, Pollution Control Specialists, Soil Scientists
- Environmental monitoring, air/water quality permits & clean-up, trash/recycling/composting, environmental review, environmental standards
- We are cousins to EQB, DNR and MDH
Our strategic plan

The vision and goals that underlie the work of our agency | 2013–2017 five-year plan

**Water**

Vision: Minnesota’s clean water supports aquatic ecosystems, healthy communities, and a strong economy

**Goal**
- Lake, stream, wetland, and groundwater conditions are evaluated and communicated.
  - Monitor conditions of surface and groundwater and analyze data in a timely manner.
  - Develop monitoring reports and provide information for decision-making.
  - Communicate monitoring and assessment results.

**Goal**
- Pollution from all Minnesota sources is reduced or prevented.
  - Regulate point source discharges to protect uses and maintain consistency with major watershed strategies.
  - Manage non-point source discharges to protect uses and maintain consistency with major watershed strategies.

**Goal**
- Surface and groundwater management system is streamlined and effective.
  - Continue to build a synchronized approach to water management across state agencies.
  - Support local government capacity and capability to implement their role in the water management system.

**Air**

Vision: Minnesota’s clean and clear air supports healthy communities and a strong economy

**Goal**
- Minnesota’s outdoor air is healthy for all to breathe.
  - Ensure ambient air is better than air quality standards and health benchmarks, particularly for pollutants that represent key air quality indicators.
  - Ensure emissions from non-point and non-permitted point sources do not create unacceptable exposures.

**Goal**
- Minnesota reduces its contribution to regional, national, and global air pollution.
  - Reduce Minnesota’s contribution to global mercury levels by meeting the TMDL air emission target.
  - Reduce Minnesota’s contribution to global GHG concentrations by meeting the GHG reduction goals in the Next Generation Energy Act of 2007.
  - Reduce Minnesota’s contribution to regional haze.

**Land/waste**

Vision: Minnesota’s land supports healthy ecosystems and sustainable land uses

**Goal**
- Solid waste is managed to conserve materials, resources, and energy.
  - Ensure waste is reduced, recycling and organic recovery is increased, resource recovery capacity is maintained, and landfilling is reduced.

**Goal**
- Land is managed to prevent, minimize, or reduce the release of contaminants.
  - Regulate aboveground and underground storage tank systems and solid and hazardous waste management facilities to ensure all federal program commitments are met.

**Goal**
- Contaminated sites are managed to reduce risks to human health and the environment and allow continued use or reuse.
  - Manage risks at remediation sites.
  - Prepare sites for continued use or re-use.
  - Address sites in a timely and efficient manner.
  - Maintain agency preparedness procedures to ensure that environmental and health risks are mitigated in major incidents and disasters; acute risks are managed within hours or days.
2013 Legislation

- Technical assistance
- Environmental review
- Rule making
2013 Legislation: Multi-Agency Effort

- Minnesota Pollution Control Agency
  - Protect and improve our environment and enhance human health

- Minnesota Department of Natural Resources
  - Work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life

- Minnesota Department of Health
  - Protecting, maintaining and improving the health of all Minnesotans

- Minnesota Department of Transportation
  - Provide the highest quality, dependable multi-modal transportation system through ingenuity, integrity, alliance and accountability
2013 Legislation: Multi-Agency Effort

**DNR**
- **Reclamation of Silica Sand Minelands**
  - MN Laws 2013, Ch 114, Art 4, Sec 105(b)

**EQB**
- **Amend EQB Rules for Silica Sand Projects**
  - MN Laws 2013, Ch 114, Art 4, Sec 105(d)
- **Particulate Emissions**
  - MN Laws 2013, Ch 114, Art 4, Sec 105(a)

**MPCA**
- **Adopt Health Base Value**
  - MN Laws 2013, Ch 114, Art 4, Sec 105(c) (COMPLETED)

**MDH**
- **Technical Assistance Team**
  - M.S. 116C.99 Subd 3
  - Available upon LGU request

- **Model Standards and Criteria**
  - M.S. 116C.99 Subd 2
  - Due 10/1/2013
  - DRAFT IS AVAILABLE FOR COMMENT

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**SILCA SAND RULEMAKING**

- **Trout Stream Setback Permit**
  - M.S. 103G217
  - Effective: 4/30/2013 (Finalized)
- **Groundwater EAW**
  - M.S. 116D.04
  - Inclusion of a hydrologic assessment for ANY proposed action requiring an EAW and a groundwater appropriation permit.

- **Environmental Review**
  - M.S. 116C.991
  - Effective: 7/1/2013
  - Due: 7/1/2015
- **Ordinance Library**
  - M.S. 116C.992
  - Available on EQB website

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**Summary of 2013 Silica Sand Legislation**
2013 Legislation: Multi-Agency Effort

http://silicasand.mn.gov/
2013 Legislation: Multi-Agency Effort

- Joint Silica Sand Advisory Committee
  - Purpose: Provide comment on rulemaking activities
  - Membership
    - 5 Local government representatives
    - 5 Citizen representatives
    - 5 Industry representatives
MN Department of Natural Resources

- Trout stream setback permit
  - Completed; application available online

- Develop sand mine reclamation rules
  - Notice of intent to develop rules published in State Register July 22, 2013
  - Comment period remains open

http://www.dnr.state.mn.us/silicasand/index.html
MN Environmental Quality Board

- Draft Model Standards
- Technical Assistance Teams
- Draft Ordinance Library: available online
- Consider amendments to rules governing environmental review of silica sand mining/processing facilities

http://www.eqb.state.mn.us/
- Air Quality
- Water Quantity, Water Quality
- Transportation
- Operations
- Setbacks and Buffers
Mandatory Environmental Review: Temporary Thresholds (until July 1, 2015)

- 20 acres or more; mean depth 10 feet
  - Local government is RGU

- 7,500 tons storage or 200,000 ton annual throughput
  - MPCA is RGU
MN Department of Health

- Adopt air quality health-based value (HBV) for respirable crystalline silica by January 1, 2014
  - 3 μg/m³ is the HBV
  - Technical support documentation available online

http://www.health.state.mn.us/divs/eh/risk/guidance/air/silicasand.html
Supporting EQB’s efforts
- Technical Assistance Panel

Monitoring the situation to assess any impacts to safety, mobility or road conditions

http://www.dot.state.mn.us frac/
MN Pollution Control Agency

- Develop rules for particulate emissions
  - Notice of intent published July 2013
  - Public notice closed September 2013
  - Comments received have been posed online

Silica Sand Facilities in Minnesota
Inhalation Health Benchmark for Respirable Crystalline Silica

*Below Detection Limit of 1ug/m³
Common regulatory concerns

- Air quality
- Water quality
Air Quality Concerns

- Crystalline silica: Especially 4 micron or smaller (PM$_4$)
  - Has been a major occupational hazard but ambient silica risks to people living downwind of mining operations are not as well understood yet.

- Chronic Health Based Value (HBV$_{chronic}$) = 3 µg/m$^3$ to protect against silicosis.

- Exposures can be controlled with standards in place.
Water Quality Concerns

- Groundwater quantity usage
- Removal or reduction of cover above aquifers
- Chemicals used within the mining area
  - Fuel and other standard oils and lubricants
  - Explosives and processing chemicals (e.g., flocculants)
- Contaminated runoff entering the mine
- Discharges to surface waters
- Illegal waste disposal in mine
- Improper reclamation & future land use
Water Quality Permits

- **NPDES/SDS Permits** – regulating pollutant discharges to surface waters and groundwater.
  - Stormwater, dewatering, washing discharges
  - Monitoring & limits for silica sand facilities
    - Solids, pH, flow, additives
  - Pollution Prevention Requirements

*Minnesota Pollution Control Agency*
Flocculants at Silica Sand Mines

- **Polyacrylamide Flocculants**
  - Acrylamide (usually less than 0.05%)
    - Probable carcinogen and known neurotoxin.
    - National Primary Drinking Water Regulation: 0.5 µg/L

- MDH developing health based guidance for drinking water
Preliminary Water Quality Data

- Shakopee Sands (AKA Great Plains Sand)
  - 2.2-7.4 µg/L in pit water (likely from blasting agent)
  - No detections in groundwater

- Sand and gravel mine
  - 0.26-0.28 µg/L in pit water
    - Corresponds with MPCA permitted application rate estimates
  - 0.047 µg/L in recirculating water
  - Not detected (<0.017 µg/L) after 4 days in holding pond

- Drinking water treatment plants
  - 0.021-0.04 µg/L in process water
  - 0.046-0.056 µg/L in finished water

EPA Drinking Water Acrylamide Limit
= 0.5 µg/L

MDH developing limit
Things I used to know ... & Your Questions