

# 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*



Minnesota Pollution Control Agency

**January 18, 2014**

# MPCA – who we are & what we do

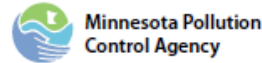
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- ❑ We are 900+ employees
- ❑ Avg age = 47 years; 53% males; 47% females
- ❑ We are 70% scientists: Biologists, Chemists, Engineers, Hydrologists, Pollution Control Specialists, Soil Scientists
- ❑ Environmental monitoring, air/water quality permits & 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**



**Mission** — Our mission is to protect and improve the environment and enhance human health.

## 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

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- ❑ Technical assistance
- ❑ Environmental review
- ❑ Rule making



# 2013 Legislation: Multi-Agency Effort

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- ❑ 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

EQB

MPCA

MDH

## SILCA SAND RULEMAKING

### Reclamation of Silica Sand Minelands

MN Laws 2013, Ch 114, Art 4, Sec 105(b)

### 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)

### Adopt Health Base Value

MN Laws 2013, Ch 114, Art 4, Sec 105 (c)  
**(COMPLETED)**

RELATED

### Trout Stream Setback Permit

M.S. 103G217

Effective: 4/30/2013 **(Finalized)**

### Environmental Review

M.S. 116C.991

Effective: 7/1/2013

Due: 7/1/2015

### Groundwater EAW

M.S. 116D.04

Inclusion of a hydrologic assessment for **ANY** proposed action requiring an EAW and a groundwater appropriation permit.

### Ordinance Library

M.S. 116C.992

Available on EQB website

### 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**

## Summary of 2013 Silica Sand Legislation

# 2013 Legislation: Multi-Agency Effort

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<http://silicasand.mn.gov/>



# 2013 Legislation: Multi-Agency Effort

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- ❑ 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

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- ❑ 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

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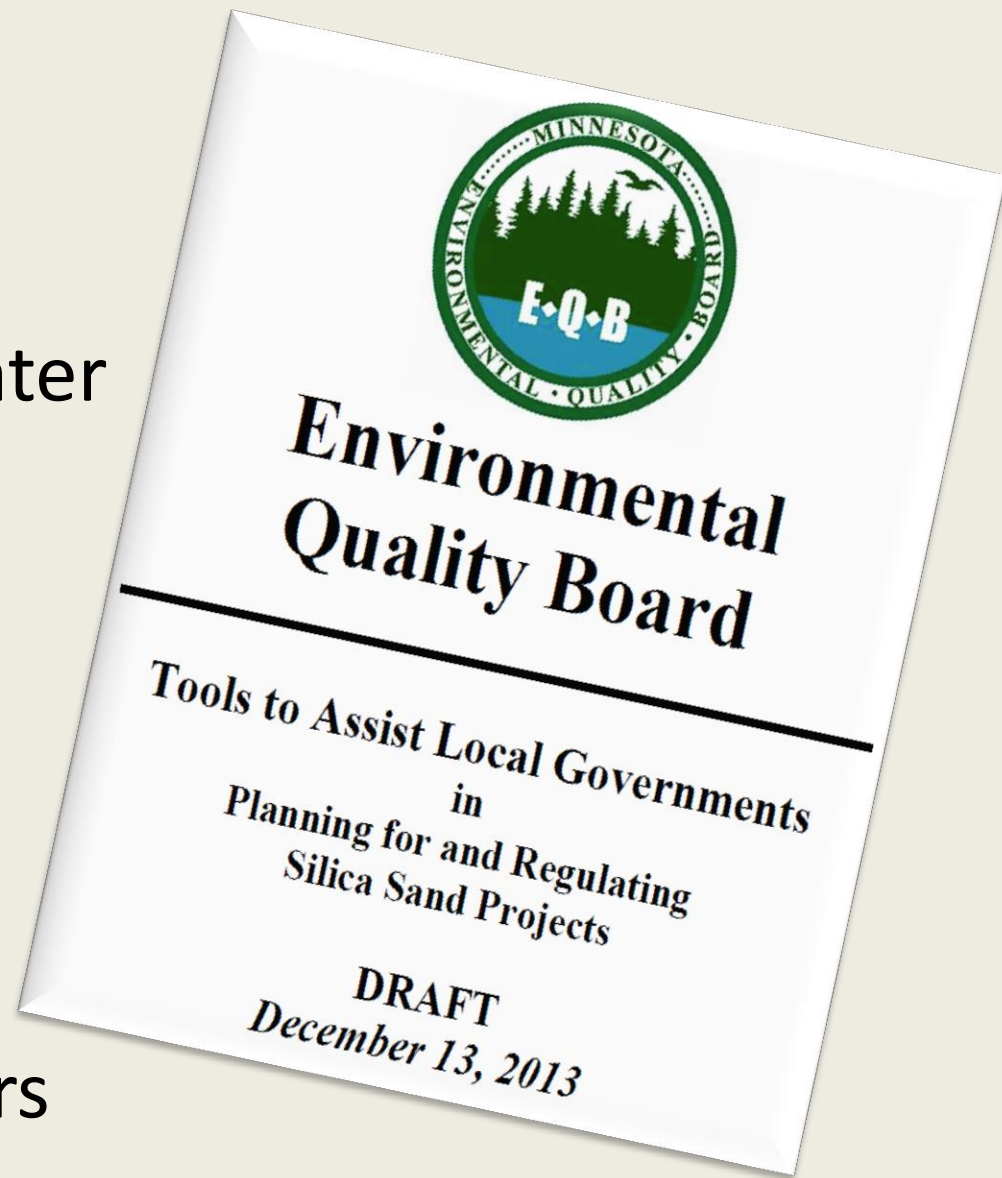
- ❑ Draft Model Standards
- ❑ Technical Assistance Teams
- ❑ Draft Ordinance Library: available online
- ❑ Consider amendments to rules governing environmental review of sand mining/processing facilities



<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)

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- ❑ 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

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- ❑ Adopt air quality health-based value (HBV) for respirable crystalline silica by January 1, 2014
  - 3  $\mu\text{g}/\text{m}^3$  is the HBV
  - Technical support documentation available online

<http://www.health.state.mn.us/divs/eh/risk/guidance/air/silicasand.html>



# MN Department of Transportation

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- ❑ 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

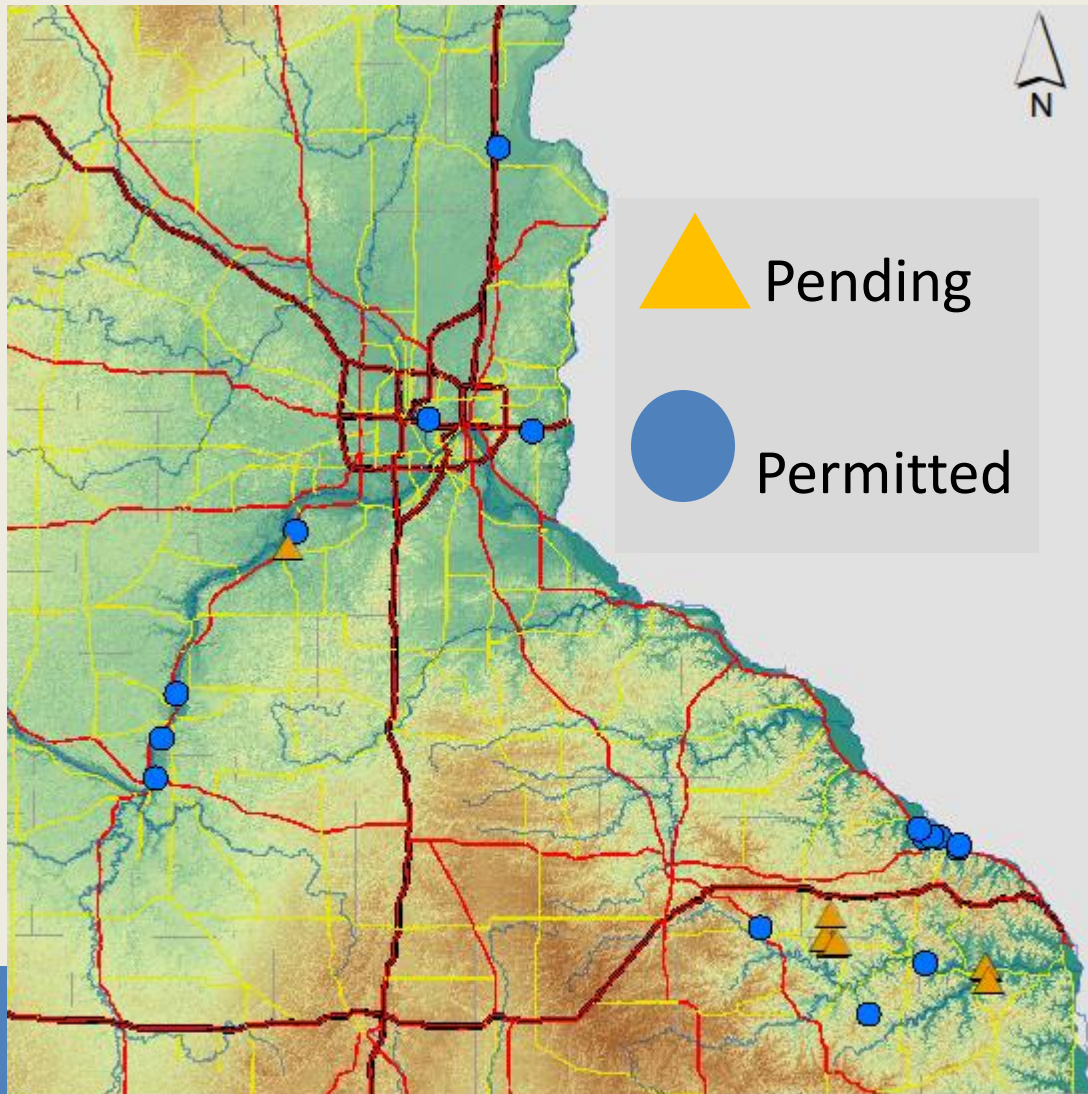
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- ❑ Develop rules for particulate emissions
  - Notice of intent published July 2013
  - Public notice closed September 2013
  - Comments received have been posed online

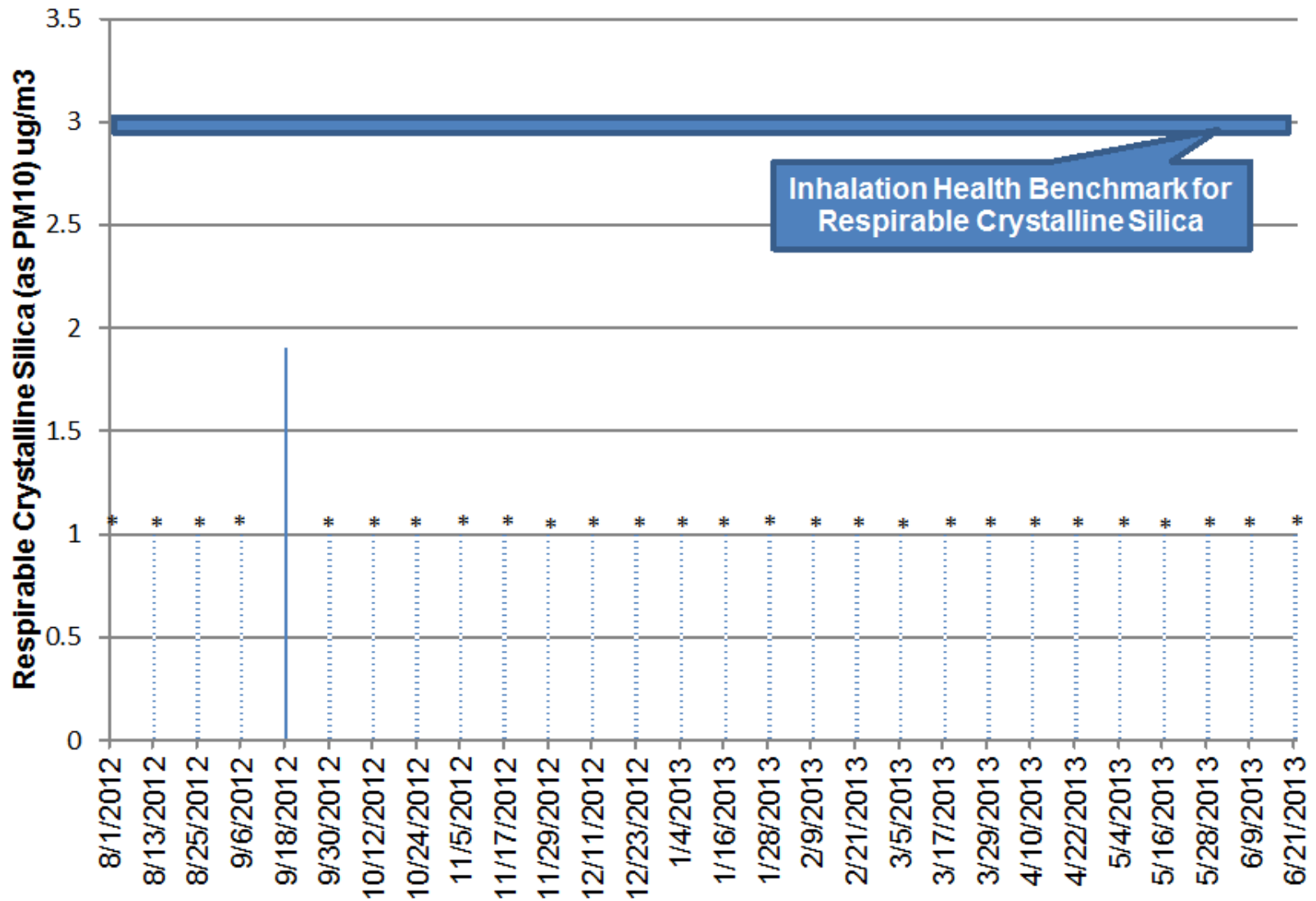
<http://www.pca.state.mn.us/index.php/air/air-quality-and-pollutants/air-pollutants/silica-sand-mining/mpca-rulemaking-for-silica-sand.html>



# Silica Sand Facilities in Minnesota







\*Below Detection Limit of 1ug/m<sup>3</sup>



# Common regulatory concerns

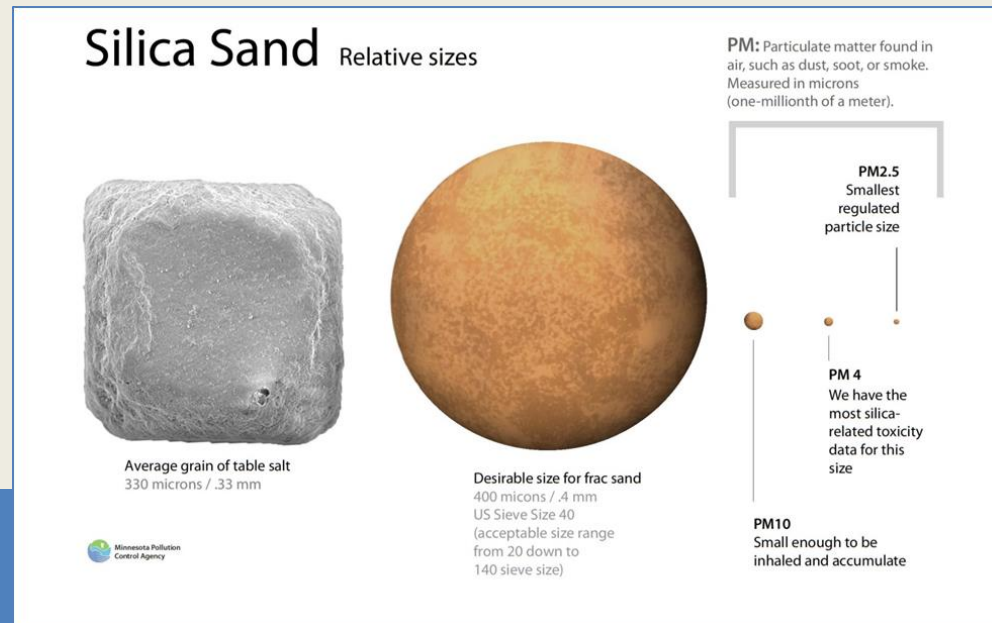
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- ❑ Air quality
- ❑ Water quality



# Air Quality Concerns

- ❑ Crystalline silica: Especially 4 micron or smaller (PM<sub>4</sub>)
  - 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<sub>chronic</sub>) = 3 µg/m<sup>3</sup> to protect against silicosis.
- ❑ Exposures can be controlled with standards in place.



# Water Quality Concerns

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- ❑ 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

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- ❑ 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



# Flocculants at Silica Sand Mines

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## ❑ 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

EPA Drinking Water  
Acrylamide Limit  
= 0.5 µg/L

MDH developing limit

- ❑ 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



# Things I used to know ... & Your Questions

