

Water Reuse in Minnesota

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Water reuse in Minnesota

- Clean Water Fund water reuse project
- Minnesota reuse project examples
- Reuse regulations & codes
- Moving forward with a vision of success

Support for water reuse

- Minnesota Water Sustainability Framework
 - Calls for state agencies to plan for water reuse
 - MPCA and MDH to set appropriate standards for water reuse applications



Support for water reuse

“Update plumbing codes and treatment standards to allow for safe and practical water reuse”



Clean Water Fund Water Reuse Project

- (1) a comprehensive assessment of regulatory and non-regulatory approaches for ensuring safe and sustainable water reuse
- (2) recommendations for practices and policy for water reuse in Minnesota



Clean Water Fund Water Reuse



Water Resources Center

UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

MDH Minnesota
Department of Health



**Minnesota Pollution
Control Agency**





Water reuse project objectives

- Define successful implementation of reuse in Minnesota
- Identify current conditions that support successful reuse and identify barriers and solutions to barriers
- Develop recommendations for safe, sustainable water reuse practices and policies

Current reuse in Minnesota

- Reclaimed municipal wastewater
 - Shakopee Mdewakanton Sioux Community: treated wastewater discharge to wetlands, downstream ponded areas provide irrigation
 - Golf course irrigation
 - Agricultural irrigation of non-food crops
 - Energy plant cooling

Current reuse in Minnesota

- Stormwater harvesting and use
 - Target Field
 - St. Anthony Village
 - Oneka Ridge Golf Course
 - Centerville ballfield irrigation
 - 17th Avenue residence hall

Current reuse in Minnesota

- Rainwater harvesting
 - St. Louis County Garage Duluth
 - CHS Field: St. Paul Lowertown Ballpark
 - Cottage Grove City Hall
 - Schaar's Bluff Gathering Center
 - Residential

Current reuse in Minnesota

- Other sources
 - Lake Vermilion State Park graywater reuse
 - Goldn' Plump process water reuse
 - Other industries



So....

What is possible with reuse in
Minnesota?

Almost anything!

What is easy with reuse in Minnesota?

Almost nothing!

Barriers to water reuse

Cost

Operation &
Maintenance

Regulatory/Code
Issues

Lack of Design
Standards

Contractor
Unfamiliarity

Lack of Water
Quality
Standards

Public
Perception

Public Health
Concerns

Agency roles and responsibilities

- MDH: Safe Drinking Water Act: protecting source to tap; well code; public health standards
- DNR: Water appropriation permits for water use (> 10,000 gallons per day / 1 million gallons per year); ecosystem protection, water supply planning and conservation
- DLI: In-building and drainage oversight through Plumbing Code; Plumbing Board reviews variances
- MPCA: Clean Water Act: water quality standards; wastewater permitting; stormwater permitting

Agency goals

- Protect public health
- Protect the environment
- Manage resources wisely
 - Support local efforts to reduce reliance on groundwater
 - Support conservation
- Track information to inform best practices and future planning

Water reuse regulatory challenges

- Reuse crosses many jurisdictional lines
- Current rules and statutes were not written with reuse in mind
- No national regulations
 - Many guidance documents or codes available that often times conflict with one another
 - No base federal funding
- Not enough public health and resource risk data

Water reuse regulatory challenges

- Expertise not always in area of authority (e.g. MPCA knows wastewater, but graywater reuse falls under plumbing code)
- Competing priorities-relatively low number of requests
- Other conservation efforts not maximized

Current state of reuse regulations

- Many applications require a variance
- Approval may vary depending on location (delegated authorities)
- Concern over future regulations can delay implementation
- No comprehensive tracking of stormwater reuse
- Little oversight and monitoring of existing reuse systems (except reclaimed wastewater)

Potential public health risk

- Legionella and other acute microbial exposure
- Chemical contaminants
- Irrigation outbreaks/concerns
- Cross connections
- Aquifer recharge and storage: arsenic mobilization



News Feature | January 8, 2016



Elephants Will Not Drink Recycled Water In Denver



By Sara Jerome
@sarmje

Recycled water is coming under scrutiny in Denver, where a major consumer is narrowing its use of this resource.

"The Denver Zoo has decided to stop feeding recycled water to elephants, rhinos and tapirs in its 'crown jewel' exhibit, the Toyota Elephant Passage," Westword recently reported.

The city has a substantial recycled water



Reuse criteria for reclaimed wastewater

Minimum Treatment	Reuse Permit Limits	Types of Reuse
Disinfected Tertiary Secondary, filtration, disinfection	2.2 MPN/100mL Total Coliform 2 NTU daily average; 10 NTU daily maximum turbidity	Edible food crops Irrigation of golf courses, etc. Toilet flushing Decorative fountains Cooling towers
Disinfected Secondary 23 Secondary, disinfection	23 MPN/100 mL Total Coliform	Roadway landscaping Nursery stock Cleaning roads Industrial boiler feed
Disinfected Secondary 200 Secondary, disinfection	200 MPN/100 mL Fecal Coliform	Fodder, fiber and seed crops Non food bearing trees

Why this guidance works

- Treatment barrier stands between contaminants (pathogens) and public/environment
- Water quality not stand alone: monitoring is a verification of the treatment process
- Treatment and water quality based on risk
- Tiered requirements based on use/exposure
- Certified operator is required
- Projects are monitored and data informs future applications

“Fit for purpose”

- Any level of water quality can be achieved depending upon the use of the reclaimed water
- Treating for the end use is a cost-effective and resource efficient strategy



Rainwater catchment systems

- New Minnesota Plumbing Code, based on Uniform Plumbing Code, went into effect January 2016
 - Version currently adopted includes Chapter 17 on Nonpotable Rainwater Catchment Systems
 - Amended to include water quality and treatment requirements, and to be reviewed by DLI

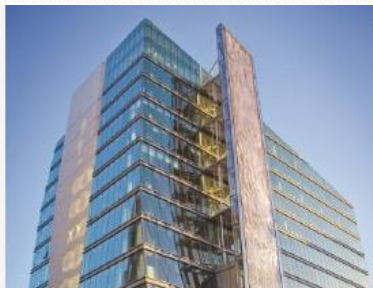
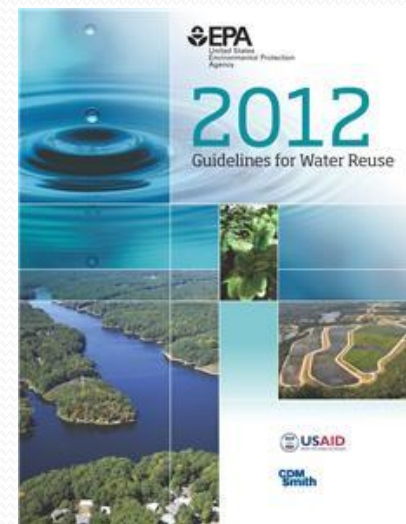
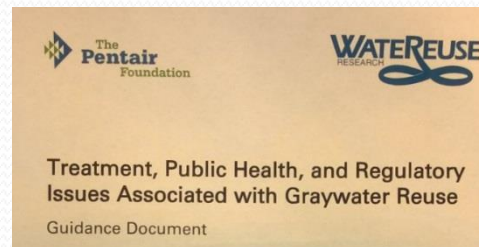
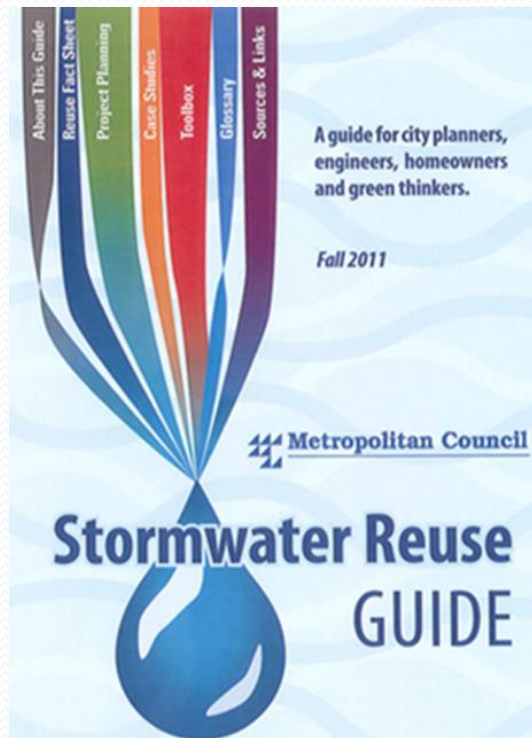
Does this rule work?

YES

- Treatment barrier stands between contaminants (pathogens) and public
- Rainwater is relatively clean, so treatment requirements are manageable
- Water quality not stand alone: monitoring is a verification of the treatment process
- Treatment and water quality based on risk

NOT SO MUCH

- No certified operator is required
- DLI is not really set up for ongoing oversight



Technical Guidance for Public Health Standards for Onsite Water Systems



Risk Assessment

A starting point

- Determine the potential microbial risk posed to human health from certain storm water and rainwater reuse practices, specifically in Minnesota's environment
- Two example scenarios of non-potable water reuse are being examined: 1) Irrigation of an athletic field near a school with storm water 2) Toilet flushing with harvested rainwater in a public building

Regulation and guidance summary

- Complex – needs consolidation and integration
- A lot of research/information/guidance available
- Some missing pieces
- Need to decide how it all applies to Minnesota

Defining successful reuse

- Integration of governance
- Clear regulatory pathway
- Integration into infrastructure and services
- Quantified benefit to water resources
- Safe, sustainable, and sanitary systems
- Economically feasible
- Continued research and technical expertise available
- Reuse is common practice

Resources Needed

Financial
Resources/Incentives

Design Standards

Technical Assistance

Examples of
successful
ordinances/rules

Information on
Treatment Options

Case Studies

Peer Experiences

Applicable Water
Quality Standards

Opportunities for input

- Feedback from today
- Stakeholder advisory group to review recommendations
- Meetings
- Surveys
- Public comment periods
- Email: health.water.reuse.mn@state.mn.us
- GovDelivery bulletins coming soon!

Find us on the MDH Clean Water Fund page



The screenshot shows the MDH Minnesota Department of Health website. The header includes the MDH logo and navigation links for HOME, TOPICS, and ABOUT US. A search bar is located on the right. The main content area features a sidebar with links for Clean Water Fund: Source Water Protection, Planning, Grants, and Special Projects. The main text area is titled "Water Reuse Clean Water Fund" and contains a paragraph about the importance of water reuse. To the right of the text is a "Share This" button and a link to "Go to MDH's Legacy Home Page" with a logo for "CLEAN WATER LAND & LEGACY AMENDMENT".

MDH Minnesota Department of Health

HOME TOPICS ABOUT US

Clean Water Fund: Source Water Protection

- CWF Source Water Protection Home
- Planning
- Grants
- Special Projects

MDH Legacy Initiatives

- Clean Water Fund Home
- Contaminants of Emerging Concern

Water Reuse Clean Water Fund

Water reuse will be an increasingly important part of managing our water resources as demands on our water supplies continue to grow due to population increases, urbanization, climate change, and changes in water use. There are scattered examples of reclaiming municipal wastewater, stormwater, and graywater systems in Minnesota. However, those interested in reuse often run into regulatory roadblocks, technical challenges, or lacking and inconsistent regulations and standard practices.

Interagency Effort

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Go to MDH's Legacy Home Page

CLEAN WATER LAND & LEGACY AMENDMENT

www.health.state.mn.us/divs/eh/water/dwp_cwl/reuse/index.html