

Recycling Treated Wastewater for Industrial Water Use in Minnesota

**Metropolitan Area Water Supply
Advisory Committee**

May 24, 2007

Interest in Wastewater Recycling in MN is Growing

■ Applications

- Agricultural irrigation, throughout Greater MN
- Golf course irrigation, Nisswa, Montgomery, etc.
- Toilet flush water system, Hennepin Cty PW
- Power plant water supply, Mankato

■ Quantity

- Current (non-ag) = 6.5 mgd (6 mgd for Mankato)

■ Drivers

- Receiving stream limitations
- Water supply concern

Growing Interest Resulted in LCMR Grant

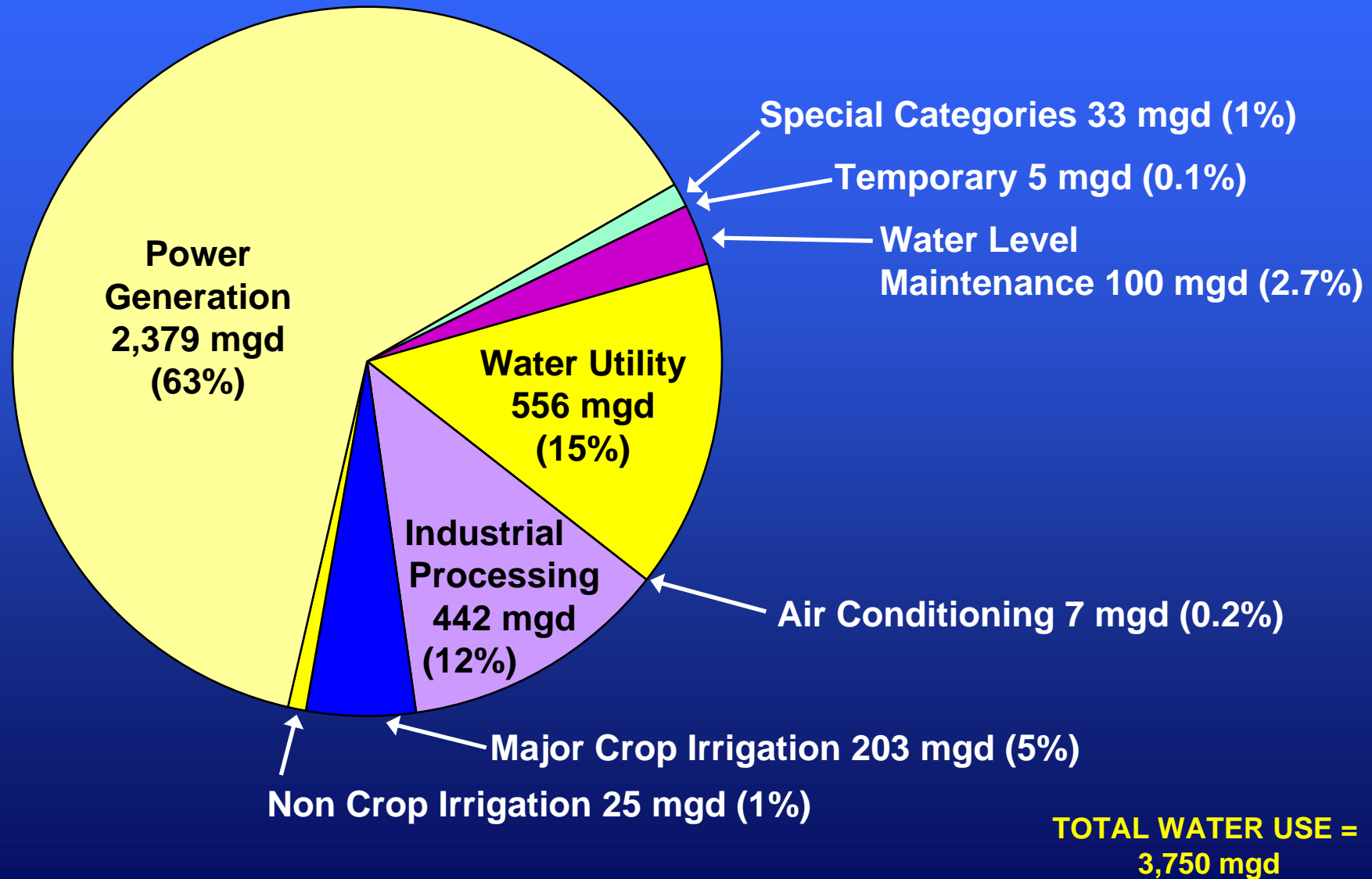
- Compare industry demand with treated wastewater supply
- Compare industry water quality needs with treated wastewater quality
- Estimate treatment and conveyance costs
- Identify implementation issues

Recycling Wastewater Conserves Water Resources and Supports Industries and Economic Development

Purpose of presentation

- Present the project and key findings
- Coordinate with Water Supply Master Plan Project

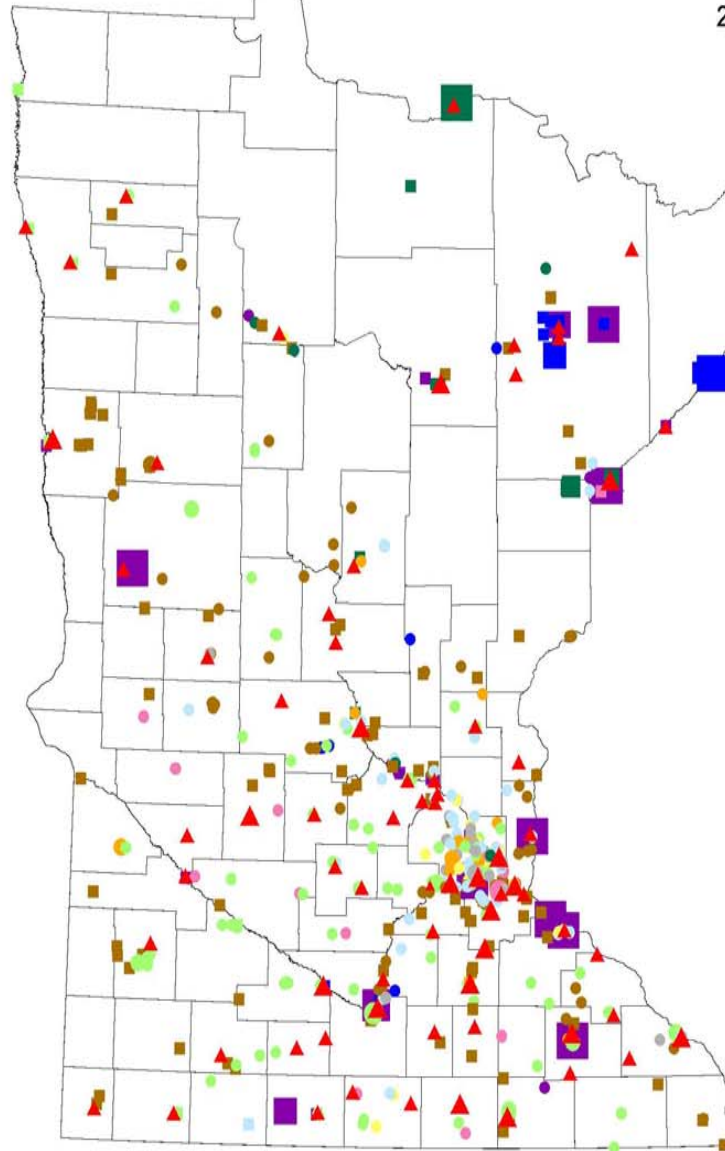
Water Use in Minnesota






























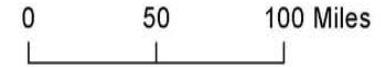
Source: MDNR Water Appropriations Permit Program, 2004

Industrial Reuse Customer Inventory

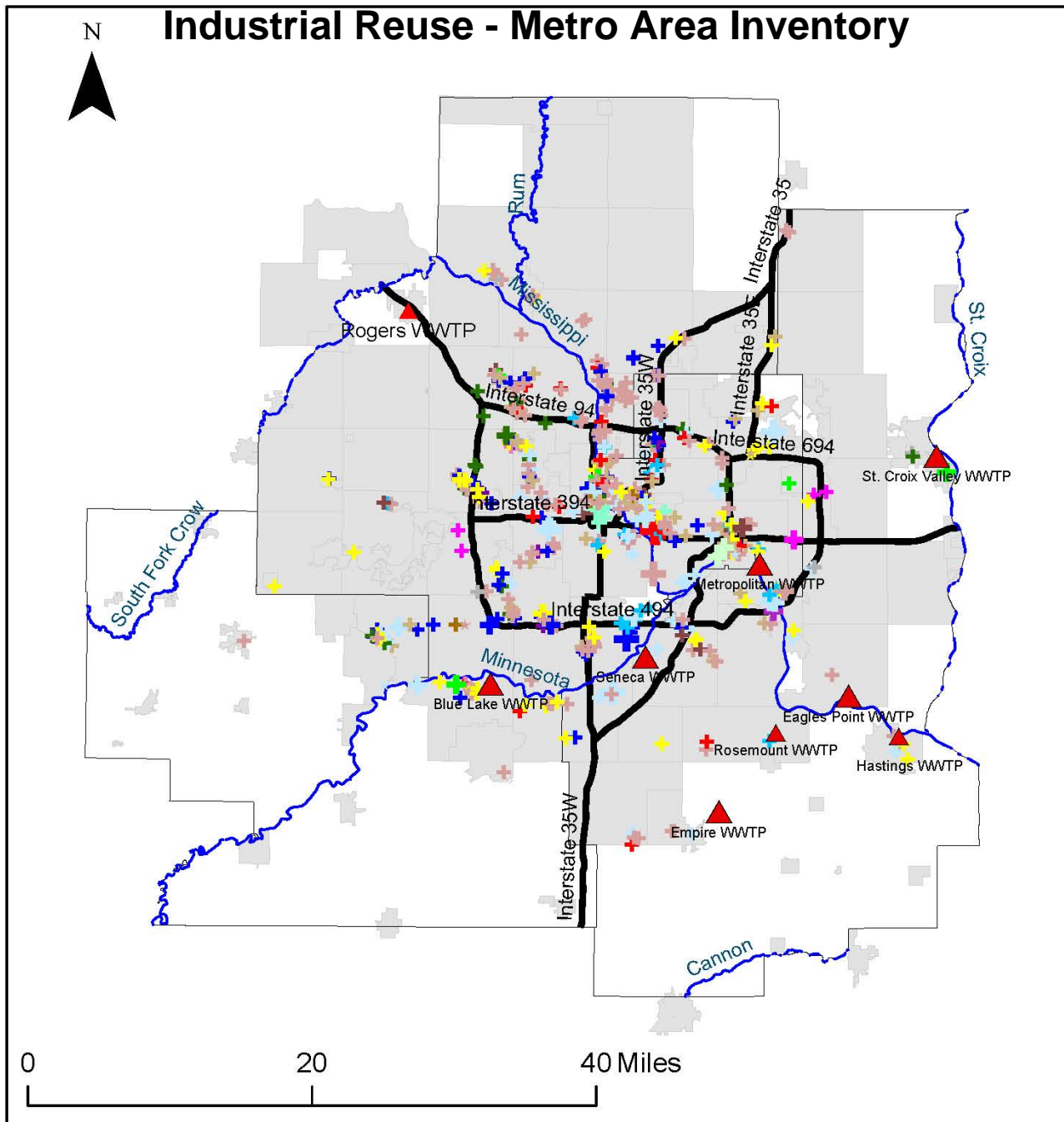
2004 Water Use 



-  Agricultural Processing
 -  Industrial Process Cooling
 -  Industrial Processing
 -  Metal Processing
 -  Mine Processing
 -  Non-Metallic Processing
 -  Petroleum-Chemical Processing
 -  Pulp and Paper Processing
 -  Sand and Gravel Washing
 -  Power Generation
-
-  WWTP ≥ 5 mgd
 -  WWTP 1-5 mgd
 -  Ground Water
 -  Surface Water
 -  County
-
- | | | |
|---|---|--------------------|
|  |  | 0.00 - 0.50 mgd |
|  |  | 0.51 - 1.50 mgd |
|  |  | 1.51 - 5.00 mgd |
|  |  | 5.01 - 10.00 mgd |
|  |  | 10.01 - 25.00 mgd |
|  |  | 25.01 - 505.00 mgd |



Source: Minnesota DNR Water Appropriations Permit Program, 2004 (Withdrawals greater than 1 mgd or 10,000 gpd)



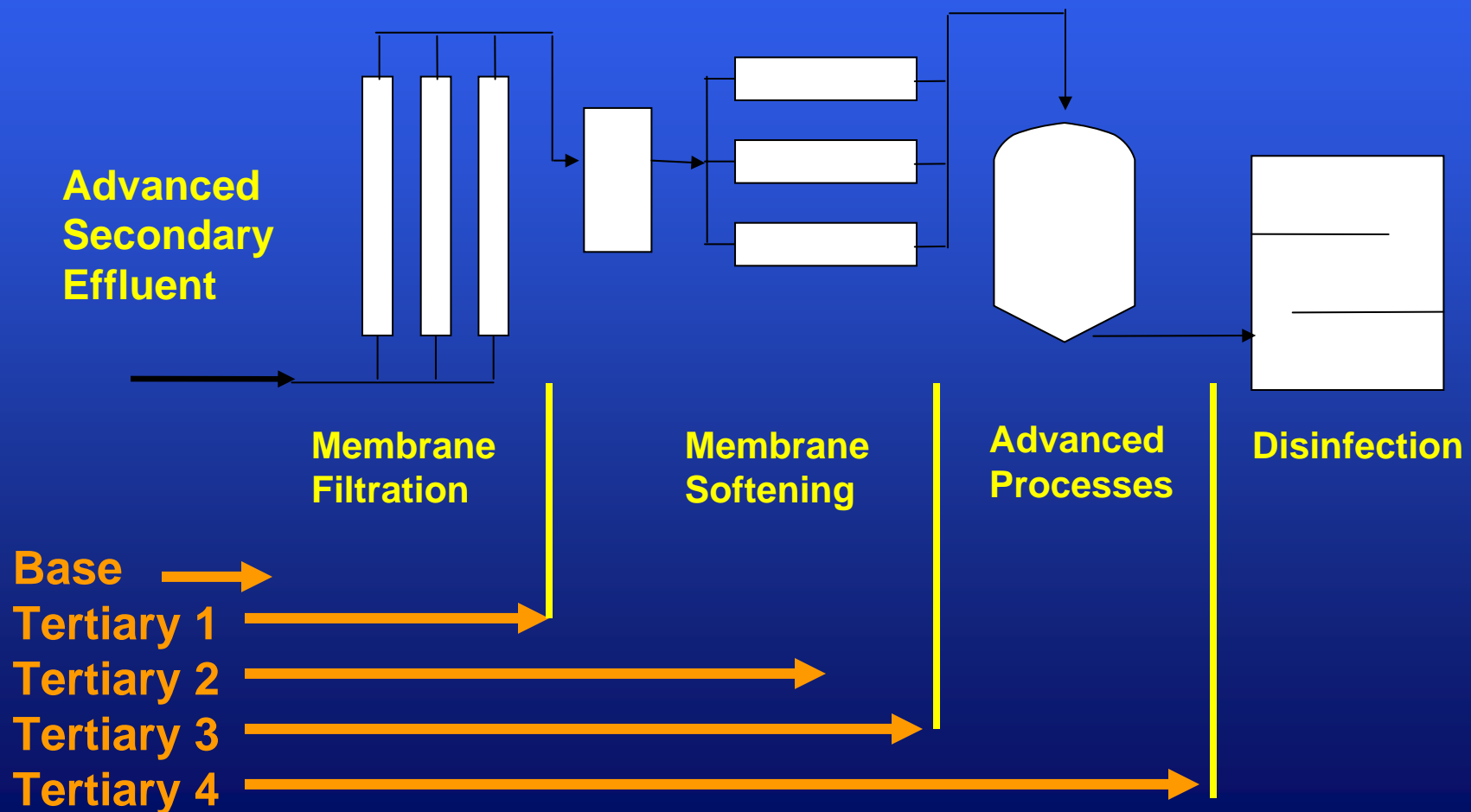
- Building Material
- Chemical Products
- Electronic Products
- Food Product
- Glass Products
- Laboratory
- Laundry
- Leather Products
- Medical Products
- Metal Products
- Other
- Paper/Packaging
- Photofinishing
- Printed Products
- Research Development
- Textile
- Transportation
- Utilities_Power
- Utilities_Steam
- ▲ WWTP ≥ 5 mgd
- ▲ WWTP 1-5 mgd
- Major Rivers
- Interstate
- ★ Well/Other Nonmunicipal
- + Municipal
- County
- Municipality
- + 0.00 - 0.50 mgd
- + 0.51 - 1.50 mgd
- + 1.51 - 5.00 mgd
- + 5.01 - 10.00 mgd
- + 10.01 - 25.00 mgd
- + 25.01 - 505.00 mgd

Source: Metropolitan Council Industrial Dischargers Permit Program, 2005

Treated wastewater quantity could fill a large portion of industry water demand

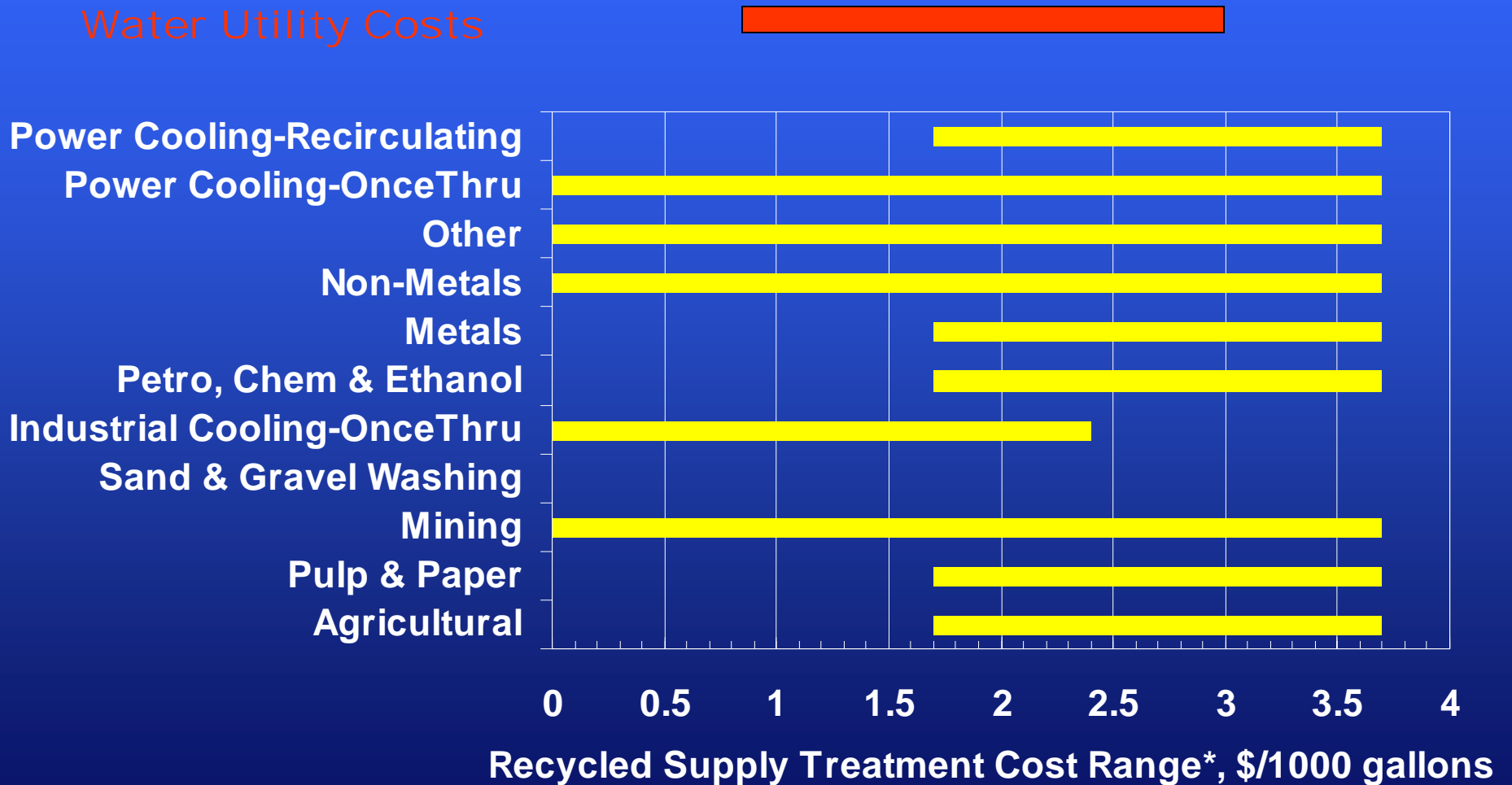
	Industry Water Demand	Treated WW Supply
Statewide	442 mgd	425 mgd
Metro	75 mgd	255 mgd

Wastewater Can be Treated to Match Industry Needs



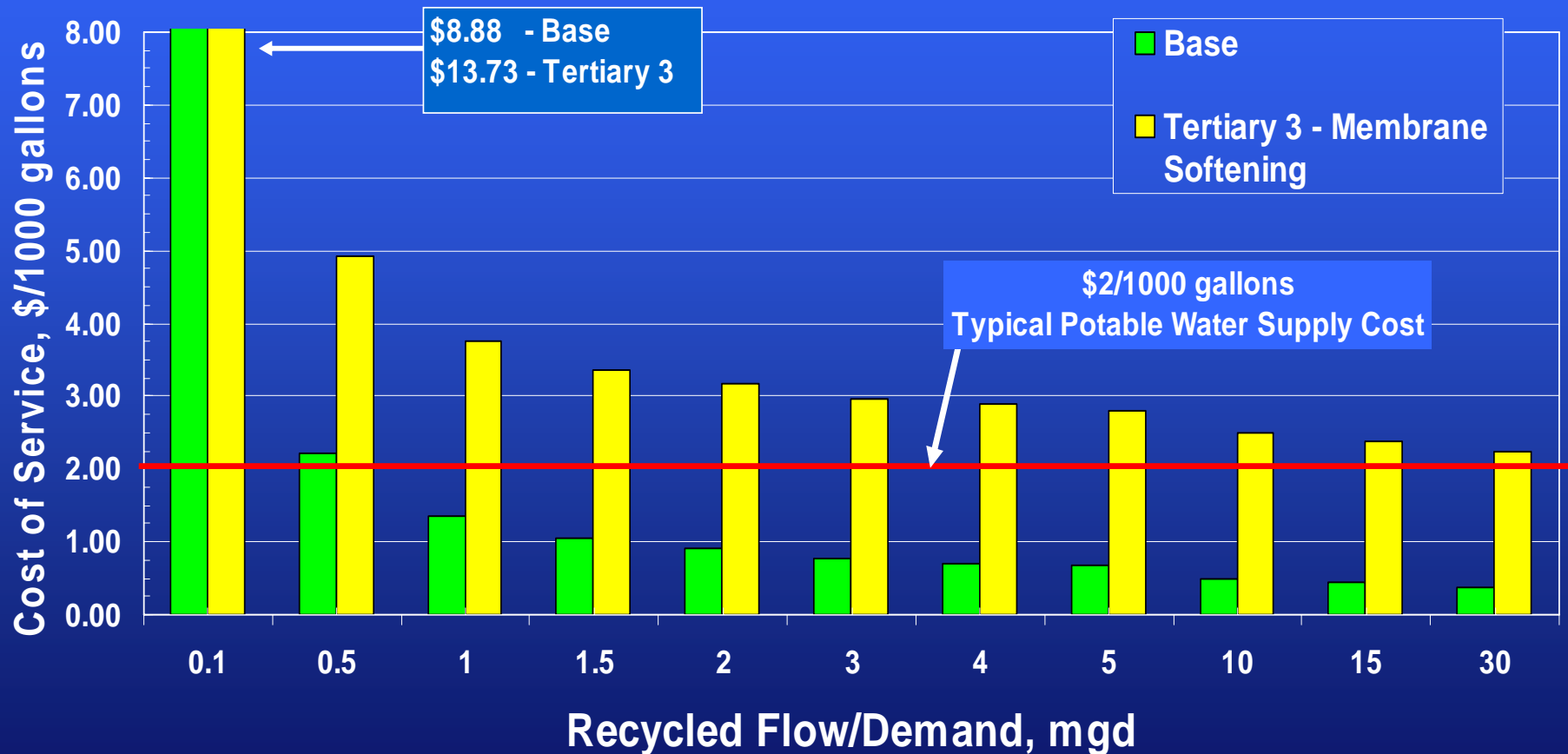
Treatment Cost for Recycled Wastewater Compared to Potable Supply (1 mgd)

Water Utility Costs



*Add \$1.50/1000 gallons for 5-mile transmission

Economy of Scale Points to Recycled Systems > 1 mgd



*Assumes a 5-mile transmission system

Stakeholders Clarified Implementation Issues

1 of 3

- **Stakeholder Forums: Regulatory, Industry, Broad Base Representatives**
- **Resulting Issue Areas**
 - Environmental Stewardship
 - Regulations
 - Incentives & Risks
 - Data Collection

Stakeholders Clarified Implementation Issues

2 of 3

■ Environmental Stewardship

- Wastewater recycling: “right thing to do”
- Wastewater recycling public image: move from unknown to positive

■ Regulations

- Case-by-case regulatory approach matches current permit demand
- Approach may deter some recycling projects

Stakeholders Clarified Implementation Issues

3 of 3

■ Incentives & Risk

- Economic incentives: currently cost of water vs. cost of recycling
- Unresolved industry concerns with risk and liability

■ Data Collection & Research

- Wastewater effluent quality data gaps
- Testing treatment technologies for specific applications needed

"Demonstration" Project

- Grant sought recommendation
- Approaches: unilateral, partnered, other
- Unilateral: utility takes initiative alone
- Partnered:
 - Industry and wastewater agency partner
 - Enlist participation from regulators, etc.
 - Focus on implementation issues, not technology
 - Document outcomes

Summary and Conclusions

- **LCMR grant requirements completed**
- **Demand and Supply Analysis: wastewater recycling for industrial use is feasible**
- **Economics: wastewater recycling is competitive in some situations**
- **Implementation Issues: identified and addressable**
- **“Demonstration” project: could take multiple forms**