



# A Journey Towards Achieving Pollution Prevention Goals: A Minnesota Wastewater Based Example

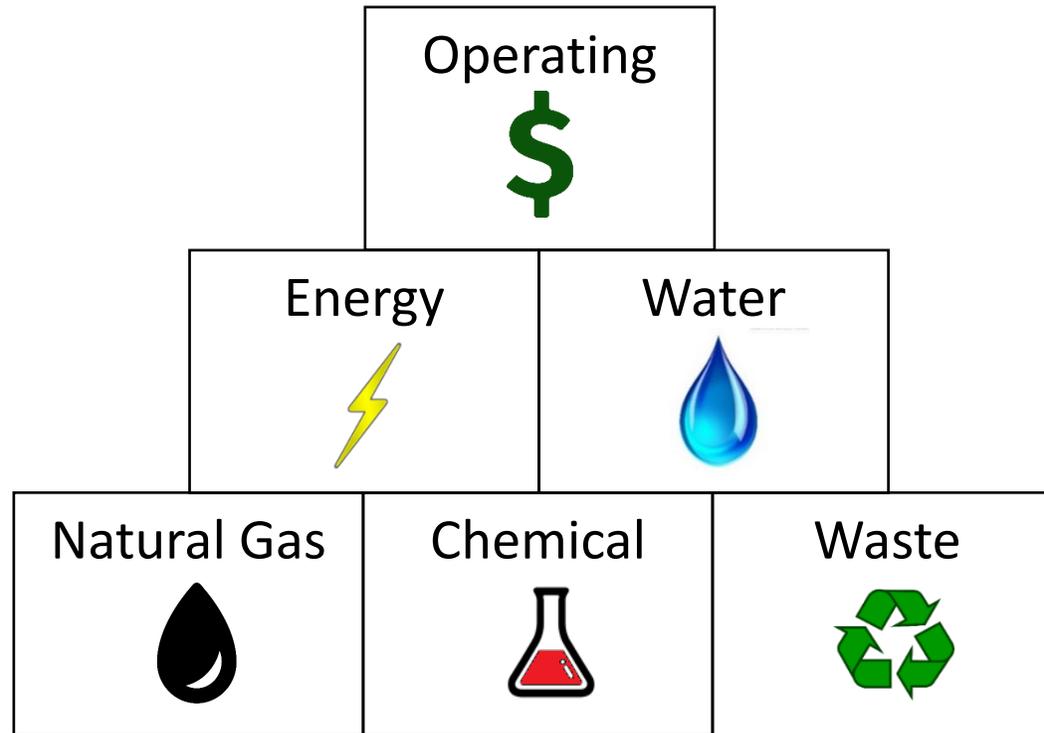
**P2 West  
EPA Region 9 & 10  
Pollution Prevention Roundtable  
10/20/2022**

**Jon Vanyo  
Engineer  
Minnesota Technical Assistance Program  
University of Minnesota**

# Minnesota Technical Assistance Program

We work with industrial businesses on process efficiency projects.

- Technical Assistance, Intern Program, Special Projects



# Minnesota Technical Assistance Program

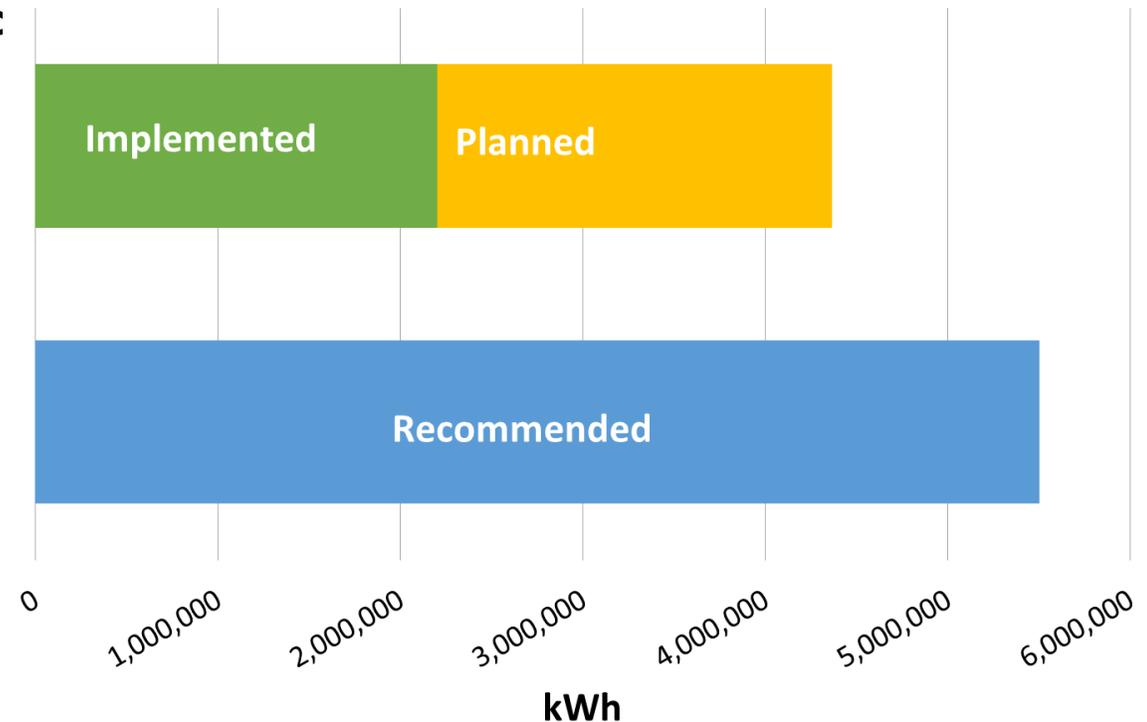
Demonstrating how a single outreach project targeting the wastewater treatment sector expanded to a continuing state-wide pollution prevention and energy efficiency program.



# 2014 – Energy Efficiency in MN WWTPs

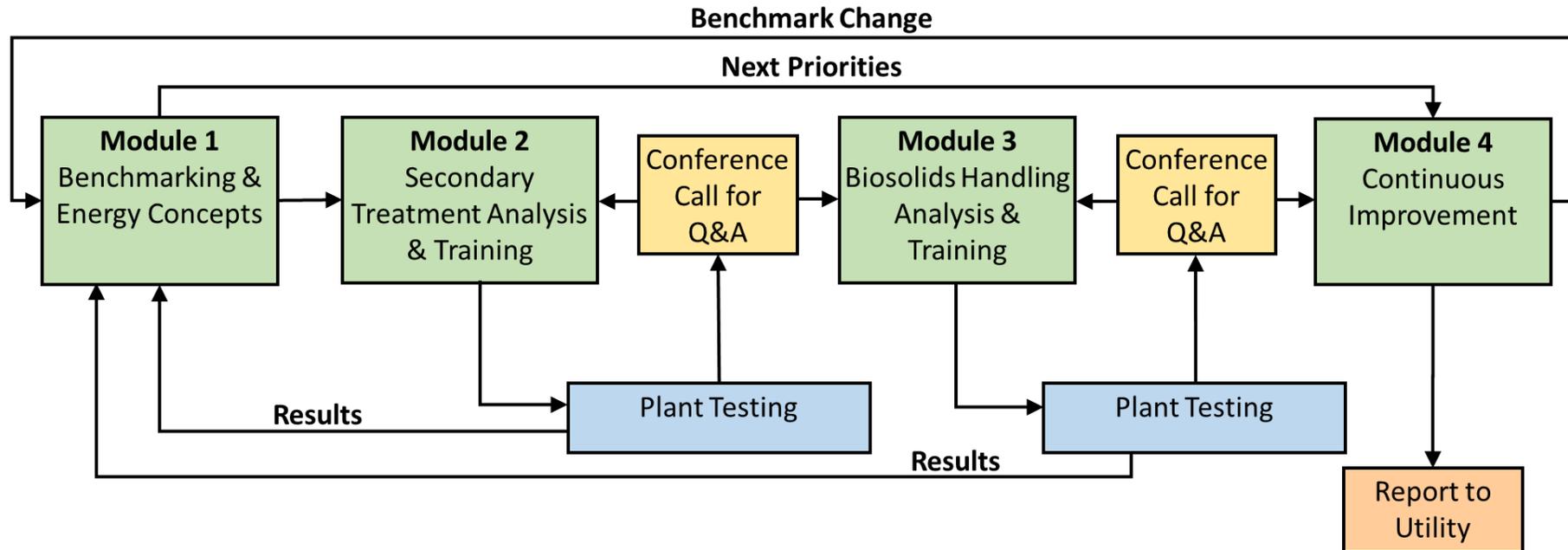
- Assessments at 11 midsize WWTPs
- Total Energy Potential
  - 5.5 million kWh electricity
  - 40% implemented with no capital
- Average Savings per Site:
  - 200,000 kWh / year
  - \$15,000 / year

Project Results (kWh)



# Documenting an Effective TA Process

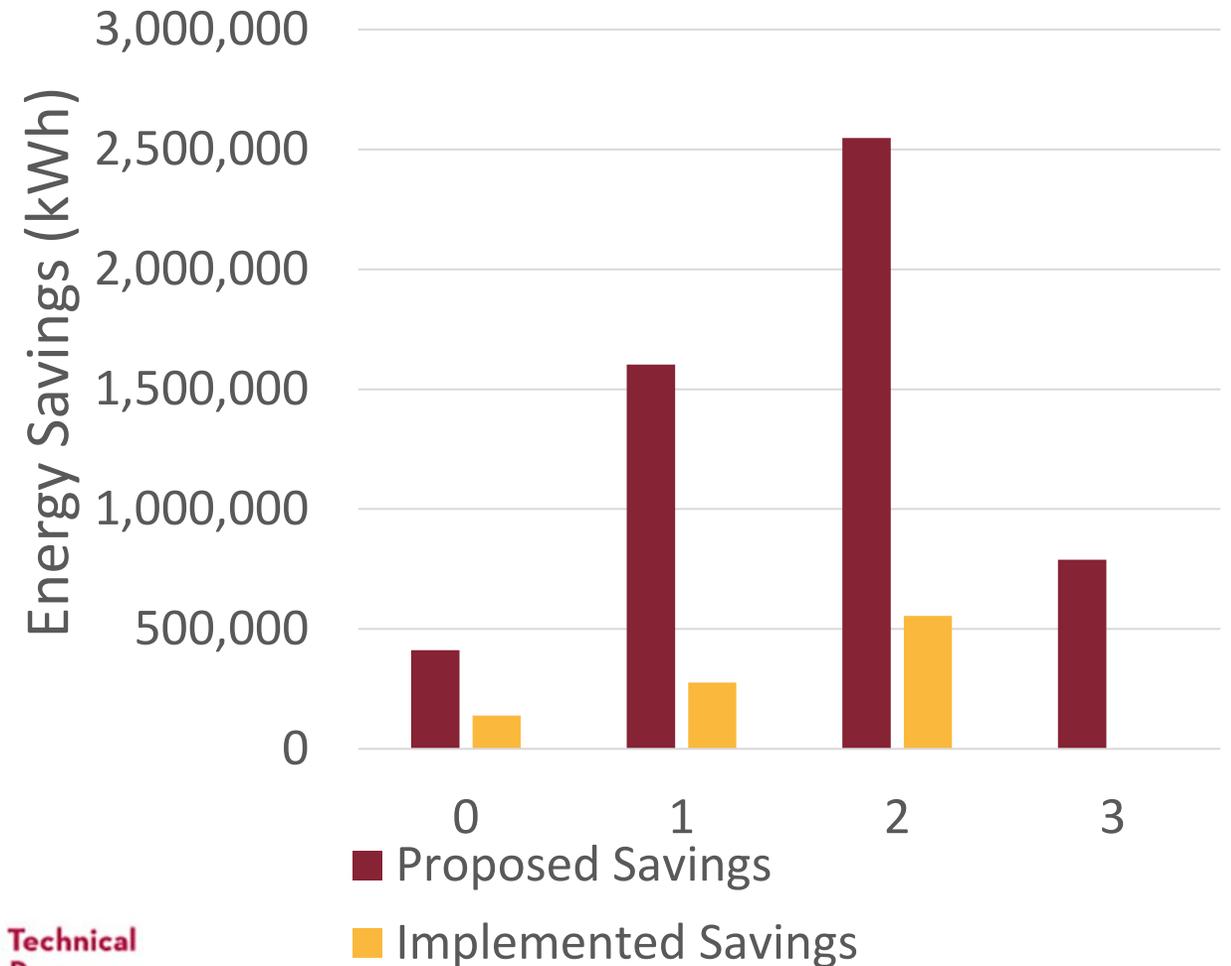
2017: Develop an energy training curriculum for MN WWTP operators



# Amplifying Results

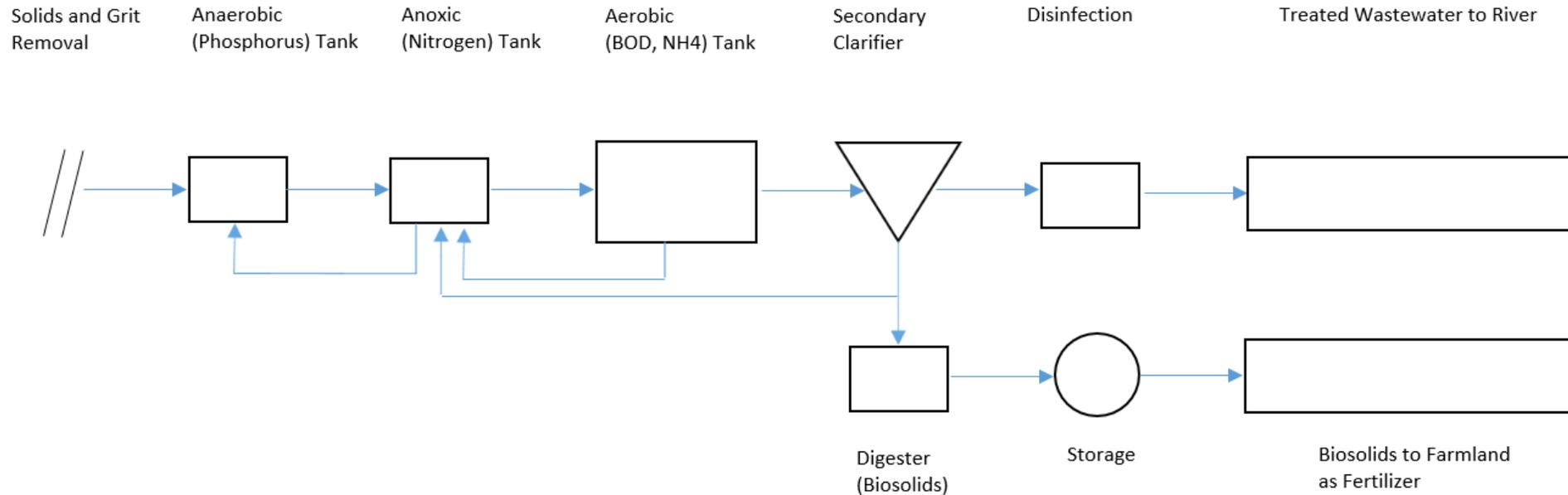
- 2021 – Launch cohort-based energy efficiency training program for MN WWTP operators
- Program:
  - 11 cohorts of 5 sites
  - 4 training sessions
  - 3 completed

## Energy Savings Opportunity



# Pollution Prevention in Wastewater Plants

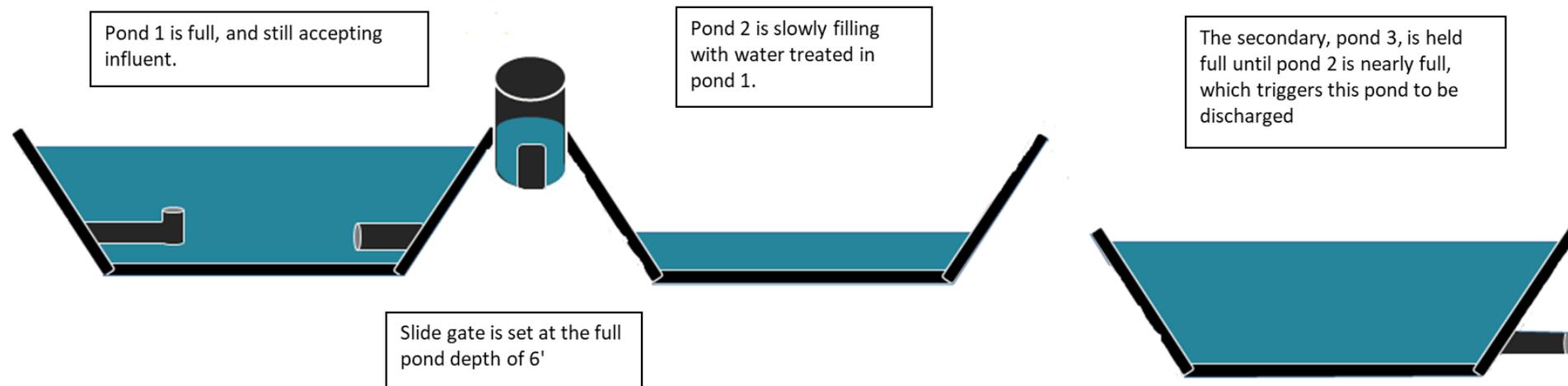
## 2018: Operational Strategies to Reduce Nitrogen and Phosphorus



# Pollution Prevention in Wastewater Ponds

2018: Operational Strategies to Reduce Nitrogen and Phosphorus

## The Steady State Primary Method



# Case Study in Baudette, MN



## Boosting Wastewater Pond Phosphorus and Nitrogen Treatment in Baudette, MN.



### Results

#### Phosphorus:

4.2 mg/L → .4 mg/L

#### Nitrogen:

2.5 mg/L → 1.2 mg/L

#### Ferric Chloride:

6,600 gal → 0 gal

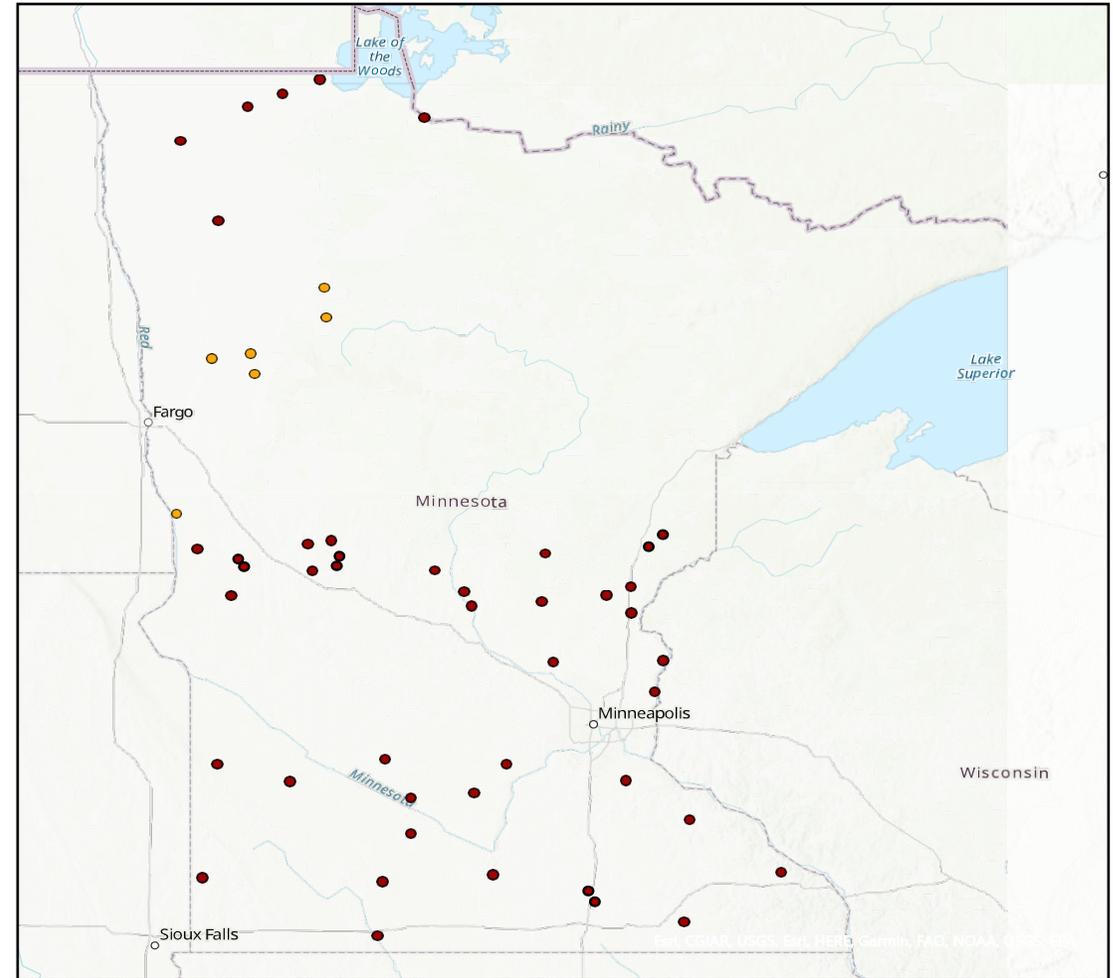
**\$22,000 Annual Savings**

# Amplifying Results

2021:

Wastewater Pond  
Optimization Implementation

Share optimization strategies  
with 150 ponds and track  
improvements through DMRs



# Moving Upstream: Connecting with Industry

2019: Wastewater nutrient reduction through source reduction technical assistance at industrial facilities



## Kerry

Recommendation	Annual Reduction	Annual Savings	Status
Update pH Process Control Logic on Effluent System	4,000,000 gallons of water with unsafe pH	\$20,000	Implemented
Reuse Evaporator Condensate Water	30,000,000 gallons of water	\$300,000	Implemented
Reduce BOD and Product Loss by Prioritizing Efficient Spray Dryer	190,000 lb BOD	\$233,000 product and BOD savings	Implemented
Reduce BOD and Product Loss Through Spray Dryer Upgrade	511,000 lb BOD	\$624,000 product and BOD savings	Future Project



MnTAP Advisor: Jon Vanyo, Engineer

# Helpful Tools

- Discharge Monitoring Report (DMR)
- ArcGIS
- Mergent Intellect
- Toxic Release Inventory (TRI)
- Spreadsheet of large water users

# Replication in other P2 Projects

- Next MnTAP Project Applications
  - Chloride Source Reduction
  - PFAS – Source Identification
  - PFAS – Source Reduction

# Questions and Discussion

Contact:

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