

**Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 050-B

Wastewater Nutrient Reduction through Industrial Source Reduction Assistance

Category: B. Water Resources

Sub-Category:

Total Project Budget: \$ 278,000

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

Provide industrial, source reduction technical assistance to reduce nutrient discharge to wastewater treatment facilities through industrial process optimization. Document impact of nutrient reduction on wastewater operations and discharge quality.

Name: Laura Babcock

Sponsoring Organization: U of MN

Title: Director MnTAP

Department: School of Public Health, Environmental Health Sciences

Address: 200 Oak St SE, Suite 350-1
Minneapolis MN 55455

Telephone Number: (612) 624-4678

Email lbabcock@umn.edu

Web Address www.mntap.umn.edu

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Minnesota has over 4,400 industrial facilities in towns with wastewater discharge >2ppm phosphorus and/or >10ppm nitrogen. Technical assistance decreases industrial discharge, helping wastewater facilities keep Minnesota waters clean.

<input type="checkbox"/>	Funding Priorities	<input type="checkbox"/>	Multiple Benefits	<input type="checkbox"/>	Outcomes	<input type="checkbox"/>	Knowledge Base	
<input type="checkbox"/>	Extent of Impact	<input type="checkbox"/>	Innovation	<input type="checkbox"/>	Scientific/Tech Basis	<input type="checkbox"/>	Urgency	
<input type="checkbox"/>	Capacity Readiness	<input type="checkbox"/>	Leverage	<input type="checkbox"/>		TOTAL	<input type="checkbox"/>	%
<input type="checkbox"/> If under \$200,000, waive presentation?								



PROJECT TITLE: Wastewater Nutrient Reduction through Industrial Source Reduction Assistance

I. PROJECT STATEMENT

Treatment facilities manage effluent from industries as part of the public infrastructure needed for public health, economic development and job growth. This project will provide source reduction technical assistance for industrial facilities discharging high wastewater nutrient load to their municipal wastewater facility. Businesses that generally have achievable nutrient source reduction opportunities include:

- Car/truck washing
- Dairies
- Food processing plants
- Meat packing plants
- Metal finishing facilities
- Nursing homes
- Restaurants
- Schools
- Industrial cleaning/sanitizing

By promoting strategies for upstream nutrient management in the feed to mechanical and pond wastewater systems, the treatment intensity needed to meet wastewater discharge requirements is reduced. Reduced treatment requirements may postpone or eliminate capital investment needs. The Minnesota Technical Assistance Program (MnTAP) has demonstrated source reduction strategies to improve a wastewater facility’s ability to meet effluent targets while enhancing business operations through expanded capacity, improved quality and reduced cost.

- Mankato, MN a long time manufacturer changed their coating line and optimized chemical use to eliminate 340 lb phosphorus to the wastewater stream while decreasing off-grade production
- Monticello, MN a food processing facility streamlined the chemicals used in their cleaning and sanitizing operations reducing the phosphorus in their wastewater effluent by 80%

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Identify/Engage Locations with High Nutrient Effluent and Industrial Clients for Assistance Activities

Select communities with wastewater facilities that can benefit from upstream nutrient source reduction technical assistance. This includes facilities with high P and N discharge levels that may be in areas with impaired surface water and serve industries traditionally having high wastewater load. Contact wastewater facilities, municipalities and their clients to share information on upstream effluent nutrient reduction options, the potential impact wastewater plant operations and local surface water quality.

ENRTF BUDGET: \$40,000

Outcome	Completion Date
20-30 communities identified with high potential for effluent nutrient reduction	9/30/2019
20-30 communities informed on options for nutrient source reduction	12/31/2019
5-10 communities seek to explore source reduction technical assistance	3/31/2020
5-10 upstream sites agree to source reduction assessments	4/30/2020

Activity 2: Conduct Nutrient Source Reduction Assessments at Industrial Facilities and Measure Impact

Conduct technical assistance assessments to identify and implement source reduction opportunities that will decrease municipal wastewater nutrient load. Record results and assess impact on wastewater operations and discharge. Technical assistance activities will recommend process optimization strategies and material substitution to reduce site load released to wastewater. Highly complex systems will be able to apply to the MnTAP Intern Program for a summer intern to provide added engineering manpower to support identification, implementation and outcome documentation of nutrient reduction activities.

ENRTF BUDGET: \$195,000



**Environment and Natural Resources Trust Fund (ENRTF)
2019 Main Proposal Template**

Outcome	Completion Date
5-10 source reduction site assessments for wastewater nutrient reduction	12/31/2021
At least 2 source reduction intern projects for wastewater nutrient reduction	9/30/2021
All participating sites receive follow up assistance from MnTAP	3/31/2022
At least 5000 lb nutrient load to wastewater facilities reduced	6/30/2022

Activity 3: Share Results Achieve and Replication Opportunity Across Minnesota

Develop a process for conducting similar analysis through example case studies, assessment tools and lessons learned for broad dissemination to facilities across Minnesota for additional site engagement. Share information through publications, presentations and webinars targeting wastewater facility staff, city managers, industries and organizations that discharge high wastewater load.

ENRTF BUDGET: \$33,000

Outcome	Completion Date
At least 2 success stories published	4/30/2022
At least 2 presentations at sector specific events	4/30/2022
1 webinar presented live and recorded for future viewing	4/30/2022

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
none			

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Joel Peck	Municipal Liaison	MPCA	Agency resource
Community Partners	TBD	City or WWTP leadership	Link city, WWTP, business
Industry Partners	Site Management	Business	Facilitate assessments

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

This proposal delivers demonstrated industrial wastewater effluent nutrient reductions and quantifies impact on downstream wastewater treatment performance and nutrient release to surface waters. Once developed and documented, these strategies can be replicated throughout the state by incorporation into existing and future programs that assist local communities and water/wastewater operations.

V. TIME LINE REQUIREMENTS:

This project requires a three year timeline to identify and engage wastewater facilities and associated industry partners, conduct the technical assistance, support nutrient discharge reduction activities at industrial facilities, and provide follow up to measure and verify the impact on ability to influence effluent discharge nutrient levels.

VI. SEE ADDITIONAL PROPOSAL COMPONENTS:

A. Proposal Budget Spreadsheet

B. Visual Component or Map

2019 Proposal Budget Spreadsheet

Project Title: Greater Minnesota Wastewater Nutrient Reduction: Upstream Source Reduction

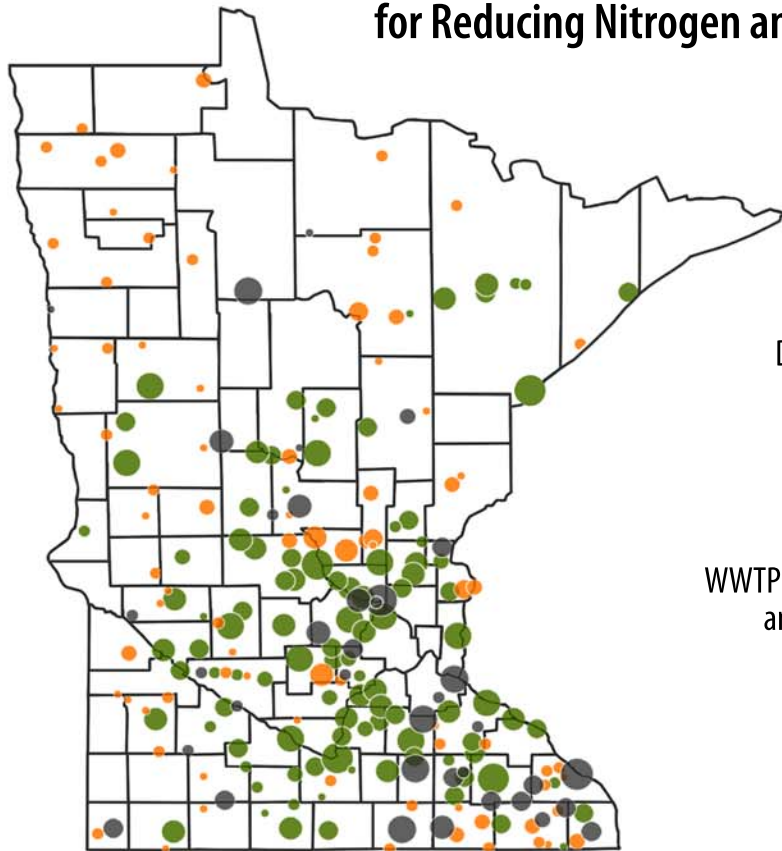
IV. TOTAL ENRTF REQUEST BUDGET 3 years

BUDGET ITEM (See "Guidance on Allowable Expenses")	AMOUNT
Personnel: University of Minnesota/MnTAP personnel - \$44.00/hr x 4750 hr = \$209,000 MnTAP interns - \$8,500 x 6 = \$51,000	\$ 260,000
Professional/Technical/Service Contracts:	\$ -
Equipment/Tools/Supplies: Field equipment for phosphorus and nitrogen analysis - digester (\$2,500), photometer (3,500), reagent supplies (\$1,000)	\$ 7,000
Equipment/Tools/Supplies: Printing - newsletter - case studies and best management practices (\$3,500)	\$ 3,500
Acquisition (Fee Title or Permanent Easements):	\$ -
Travel: Mileage to/from facilities, per diem and lodging as needed at published University rates	\$ 7,500
Additional Budget Items:	\$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 278,000

V. OTHER FUNDS (This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ To Be Applied To Project During Project Period:	NA	
Other State \$ To Be Applied To Project During Project Period: Workspace rent for allocated FTE - \$4,850 per year x 3 years = \$14,550 Unrecovered University Indirect, 26% MTDC, \$278,000 x 0.26 = 72,280	\$ 86,570	Secured
In-kind Services To Be Applied To Project During Project Period:	NA	
Past and Current ENRTF Appropriation:	NA	
Other Funding History: MnTAP has an extensive funding history managing six grant sponsored projects annually with many over multiple years. MnTAP recently completed a DOE/MN Dept of Commerce Division of Energy Resources project on energy efficiency in WWTPs which has positioned us well in the industry as a service partner.	NA	

Industrial Opportunity and Technical Assistance Process for Reducing Nitrogen and Phosphorous in Surface Water



>4,400 businesses discharging to WWTPs with high:

Nitrogen		Phosphorus	Nitrogen + Phosphorus		
●	100 - 222		●	100 - 137	
●	50 - 100		●	50 - 100	
●	20 - 50	●	20 - 26	●	20 - 50
●	10 - 20	●	10 - 20	●	10 - 20
●	5 - 10	●	5 - 10	●	5 - 10
●	1 - 5	●	1 - 5	●	1 - 5
●	1	●	1	●	1

Minnesota manufacturing businesses (NAICS 31-33) in towns with wastewater treatment plants discharging >2ppm Phosphorus and/or >10 ppm Nitrogen (excluding St Paul)

Discharge to WWTP



MnTAP source reduction Technical Assistance



WWTP processes nitrogen and phosphorus



Lower influent load can lead to lower nutrients



High nutrient discharge



Low nutrient discharge

LCCMR 2019 Proposal
Greater Minnesota Wastewater Nutrient Reduction: Upstream Source Reduction
Regents of the University of Minnesota
Minnesota Technical Assistance Program

Project Manager Qualifications

Laura Babcock, Ph.D. has been the Director of the Minnesota Technical Assistance Program (MnTAP) since 2011. Prior to her position at MnTAP, Laura spent 20 years in industrial process technology roles including research, product and process development. Laura manages the MnTAP organization providing technical leadership to staff which includes 12 full time staff members and 12-18 student interns and administratively manages a grant sponsored budget of \$1.3 million per year. MnTAP is a grant funded program in the University of Minnesota, School of Public Health, Division of Environmental Health Studies that provides no-cost technical assistance to industries and communities across the state to improve environmental outcomes and business performance. Laura has extensive experience managing the technical and administrative activities of environmentally focused assistance project that generate implemented results. Past history of MnTAP annual grant performance is summarized in our annual IMPACT environmental benefits reports posted on the MnTAP website - <http://www.mntap.umn.edu/resources/publications/impact/>.

Organization Description

The Minnesota Technical Assistance Program (MnTAP) is an outreach program at the University of Minnesota that helps Minnesota businesses develop and implement industry-tailored solutions that prevent pollution at the source, maximize efficient use of resources, and reduce energy use and costs to improve public health and the environment.

MnTAP staff members provide no-cost, confidential, industry-tailored technical assistance. By reducing waste and increasing efficiency, clients can save on disposal and raw material costs and decrease regulatory compliance burdens as well as create healthier and safer working conditions while reducing environmental impacts.

Established in 1984, MnTAP is grant funded in part by a pass-through grant from the Minnesota Pollution Control Agency's Resource Management and Assistance Division to the University of Minnesota, School of Public Health, Division of Environmental Health Sciences. Other grants come from partners including Minnesota Department of Commerce, Division of Energy Resources, Metropolitan Council, counties and other local units of government, U.S. Environmental Protection Agency (EPA) Region 5, U.S. Department of Energy (DOE) and energy utilities. As part of the University, MnTAP has no regulatory responsibilities or obligations allowing us to work closely and confidentially with a variety of businesses throughout the state. MnTAP typically provides technical assistance to over 200 companies per year. In the past 5 years, MnTAP has conducted technical assistance activities in 74 of the 87 Minnesota counties and actively seeks opportunities to provide service to all regions of Minnesota.