



# 2012 Environmental Benefits Report

*Minnesota Technical Assistance Program*

Submitted to the Minnesota Pollution Control Agency

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# About MnTAP

The Minnesota Technical Assistance Program (MnTAP) is an outreach and assistance 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 cost to improve public health and the environment.

Discovering a need for waste reduction and pollution prevention assistance, the Minnesota Legislature amended the Waste Management Act in 1984 to “provide for the establishment of technical and research assistance for generators of hazardous and industrial waste in the state.” The Minnesota Toxic Pollution Prevention Act, enacted by the Legislature in 1990, directed the then Minnesota Office of Waste Management (OWM) to “establish a pollution prevention assistance program” for all persons in the state using, generating, or releasing toxic pollutants, hazardous substances or hazardous wastes. Today, the Minnesota Pollution Control Agency (MPCA) provides that assistance primarily by providing funding to the University of Minnesota, School of Public Health, Environmental Health Sciences Division for MnTAP.

Pollution prevention and energy efficiency technical assistance is tailored to individual businesses through a number of services including site visits, student interns, materials exchange, facilitated teams, workshops, and industry specific resources. Since MnTAP’s inception in late 1984, staff members have conducted over 3,500 site visits to small and large businesses, both manufacturing and service, in all parts of the state. These visits help businesses preserve Minnesota’s natural environment through pollution prevention measures.

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The University’s mission, carried out on multiple campuses and throughout the state, is threefold: research and discovery, teaching and learning, and outreach and public service. The University of Minnesota shall provide equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression.

# Celebrating a Successful Year

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### Director's Welcome

2012 was another great year for MnTAP. The work of our dedicated staff members has resulted in significant source reduction of hazardous pollutants and improved raw material and energy efficiency at businesses across Minnesota. In addition to our pollution prevention work supported by the Minnesota Pollution Control Agency (MPCA), we have launched eight new projects, and concluded five projects over the course of the year. These additional projects have afforded staff the opportunity to provide assistance in the areas of energy efficiency, water conservation, reuse, life cycle assessment, lean processes, solid and organic waste management.

We thank Jeff Becker, Sarah Haas, and Krysta Larson for all their efforts on behalf of Minnesota businesses while they were at MnTAP and know they will continue to promote business sustainability throughout their careers. We welcome Anna Arkin, Matt Dowski, Linda Maleitzke, and Mark Powers to the MnTAP staff and look forward to their contributions now and for many years to come. In addition to these personnel changes, MnTAP invested in a new client management system to better track program efforts and accomplishments. We will continue to use this tool to plan and execute new projects that will help businesses across the state remain strong and competitive.

MnTAP staff have worked together to achieve another impressive set of implemented outcomes for the calendar year 2012. We have conducted site visits with approximately 100 companies. We have reached out to nearly 200 more across the entire state. With MnTAP assistance, companies have realized the reduction of over 1.8 million pounds of waste, 7.5 million kWh and 350 thousand therms of energy, and conserved over 42 million gallons of water. Combined, these reductions are saving companies \$2 million annually. Throughout this report, you will read success stories from some of the companies we assisted in 2012. The cost savings these companies achieved in 2012 are helping many of them increase production, add employees, and invest back in their businesses. This is good business for Minnesota.

We thank our clients and partner organizations for the opportunity to work with them in 2012 and we look forward to serving businesses across the state in 2013.

Laura Babcock

*Director, Minnesota Technical Assistance Program*

## Links to MPCA's Strategic Plan

### Water

**Goal - Pollution from all sources is reduced or prevented**

MnTAP provides technical assistance to POTWs and industrial water users through on-site assessments.

### Air

**Goal - Ensure emission do not create unacceptable exposures**

MnTAP provides information and assistance for businesses to reduce VOCs and HAPs.

**Goal - Reduce contribution to greenhouse gas emissions**

MnTAP provides industrial energy efficiency solutions to businesses through on-site assessments and outreach.

### Land/Waste

**Goal - Solid waste is managed to conserve resources and energy**

MnTAP has active outreach and assistance efforts to reduce waste through source reduction and reuse.

### People and Approaches

**Goal - Conserve resources and prevent pollution to protect the environment and economy**

MnTAP is an outreach and assistance program 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 cost to improve public health and the environment.

# Executive Summary

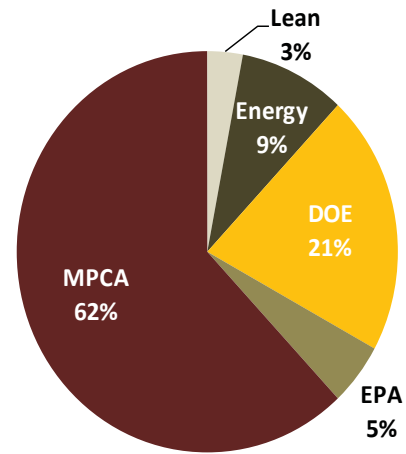
## Program Highlights

MnTAP has been successfully helping businesses identify and implement pollution prevention and energy efficiency solutions through a number of projects and assistance methods throughout 2012. This work is driven by MnTAP's mission to help Minnesota businesses maximize resource efficiency, increase energy efficiency, prevent pollution and save money.

Highlights of MnTAP achievements during 2012 include:

- Conducting nearly 200 site visits and team meetings
- Placing and supporting nine summer interns at companies throughout Minnesota
- Relaunching the Minnesota Materials Exchange to provide businesses with a reuse option for usable items
- Developing technical outreach for the final phase of the Department of Energy industrial energy efficiency project
- Launching eight new grant funded projects and concluding five projects
- Continuing to develop partnerships with a variety of organizations such as Enterprise Minnesota, ReUSE Minnesota, Environmental Initiative, counties, cities, and other environmental organizations throughout Minnesota

## Cost Saving Information by Project



## 2012 Outputs

Technical Assistance Activity	2012 Results	Goals
Contacts (calls/emails)	493	500
Total Staff Site Visits (facilities)	196 (82)	200
Student Interns	9	8
Materials Exchange (# of exchanges)	70	300
Presentations	35	--

## 2012 Outcomes

Activity	Waste (lbs)				Energy		Water (gallons)	Savings
	Air Emissions (lbs)	Hazardous Waste (lbs)	Wastewater Load (lbs)	Non-Haz/Solid Waste (lbs)	Electric (kWh)	Gas (therms)		
Goal*	1.6 million				4.5 million	330,000	11.0 million	\$2.5 million
Site Visits	1,350	0	270,000	36,200	1.9 million	55,000	1.3 million	\$590,000
Teams	0	17,000	1,200,000	241,000	1.8 million	149,000	29.9 million	\$810,000
Interns	50	14,400	0	33,000	3.8 million	153,000	11.6 million	\$590,000
Mat. Exch.				26,000				\$5,000
<b>TOTAL</b>	<b>1.8 million</b>				<b>7.5 million</b>	<b>357,000</b>	<b>42.8 million</b>	<b>\$2.0 million</b>

\*These goals represent 1/2 of FY2012 and 1/2 of FY2013 goals as set forth in the respective MPCA workplans.

# MnTAP Activities

## Project Overview

MnTAP provides pollution prevention information and assistance to help businesses maximize resource efficiency, prevent pollution, reduce energy use, reduce costs, maintain a safe and healthy work environment for employees, and comply with environmental regulations. Pollution prevention technical assistance is tailored to individual businesses through a number of services including site visits, student interns, materials exchange, facilitated teams, workshops, and industry specific resources.

## Project Goals

MnTAP, at the University of Minnesota, School of Public Health, Division of Environmental Health Sciences, works under a grant from the Minnesota Pollution Control Agency (MPCA) to partially fulfill the environmental technical assistance requirements of the Minnesota Waste Management Act (WMA) and the Minnesota Toxic Pollution Prevention Act (TPPA) during fiscal year 2012. MnTAP has leveraged direct MPCA funds to win additional competitive grant funding totalling 35% of the FY 2012 budget.

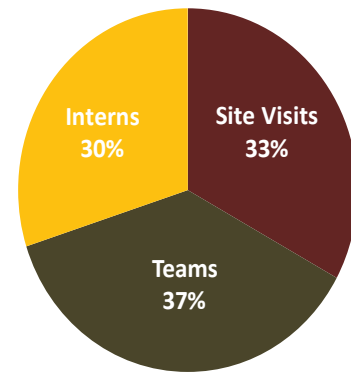
## Overall Project Results

Through **700 interactions** MnTAP staff have been able to **assist over 280 organizations** during the calendar year 2012. This includes **site visits to 82 companies** as part of a technical assistance assessment, intern project, or team. There have been 44 companies who reported making changes to their processes that reduce their environmental footprint and save money. Companies that have implemented recommendations made by MnTAP are saving nearly **\$2 million in first year savings**. These savings are split roughly equivalently for the three primary assistance methods, site visits, interns, and company teams.

## Modes of Interaction

- Conducting **on-site assistance** to help businesses implement pollution prevention practices and improved management of wastes and pollution
- Coordinating the **Minnesota Materials Exchange Program**
- **Communicating and promoting solutions** that help businesses reduce waste, prevent pollution, reduce energy use, and save money

## % of Cost Savings Achieved by Interaction Type



## 2012 Outcomes: MPCA-Sponsored Activities

Activity	Waste (lbs)				Energy		Water (gallons)	Savings
	Air Emissions (lbs)	Hazardous Waste (lbs)	Wastewater Load (lbs)	Non-Haz/Solid Waste (lbs)	Electric (kWh)	Gas (therms)		
Site Visits	1,350	0	270,000	300	366,000	0	1.2 million	\$410,000
Teams	0	17,000	1,200,000	2,100	14,000	0	27.9 million	\$460,000
Interns	50	14,400	0	1,800	1.2 million	75,000	11.6 million	\$360,000
Mat. Exch.				26,000				\$5,000
<b>TOTAL</b>		<b>1.5 million</b>			<b>1.5 million</b>	<b>75,000</b>	<b>40.7 million</b>	<b>\$1.2 million</b>

## On-Site Assistance: Site Visits

### 2012 Outputs

108 site visits  
88 team meetings  
82 different facilities

### 2012 Outcomes

300,000 lbs waste  
1.3 million gal water  
1.9 million kWh  
55,000 therms  
\$590,000

### 2012 Goal

Conduct 200 site visits (or 5,000 site visit hours) to 100 different facilities to identify opportunities for companies to prevent waste and pollution and conserve resources including water and energy. Support MnTAP activities with 500 calls and emails.

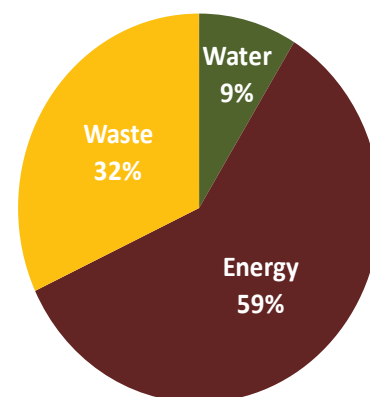
### 2012 Accomplishments (includes all special project results)

During site visits, MnTAP staff members analyze the current production situation, research possible alternatives for reduction, and complete a report with specific recommendations to the organization for material, water or energy utilization improvement. MnTAP staff have made over **\$1.6 million** in resource conservation recommendations to Minnesota businesses in 2012 for all onsite services. Forty-four companies reported implementation of recommendations to MnTAP in calendar year 2012.

### 2012 Proposed Reductions

Recommendation Area	Proposed Reduction
Water Use - gal/yr	128 million
Energy - kWh/yr	7.6 million
Energy - therms/yr	434,000
Water Pollution - lb/yr	128,000
Hazardous Waste - lb/yr	28,000
Hazardous Material - lb/yr	24,000
Non-Hazardous Material - lb/yr	1.1 million
Solid Waste - lb/yr	4.1 million
Air Emission lb/yr	40

Cost Savings by Recommendation



### Site Visit Success

During 2012 a graduate student from the Carlson School of Management started analyzing the impact of MnTAP outreach activities on company implementation of pollution prevention and energy conservation recommendations. Based on MnTAP's archived data from past site-visits, statistical probability models were developed to understand the factors affecting the implementation rates for recommendations. Results of this analysis indicate:

- Shorter length of time to the initial follow up
- Higher frequency of future follow-up conversations conducted by MnTAP staff
- Fewer, but more focused recommendations all correlated with an increase in implementation

These results highlight the role of MnTAP staff in the diffusion of pollution prevention and energy conservation practices and the importance of relationships between MnTAP and its business partners.



## On-Site Assistance: Team Facilitation

### 2012 Outputs

88 team meetings  
2 new teams

### 2012 Outcomes

1.2 million lbs wastewater load  
29 million gallons water  
1.8 million kWh  
150,000 therms  
\$810,000

### What they said...

"Thanks for getting us to expand what and how we think about in the plant. You helped us see the "total forest" not just the individual trees that we tend to focus on."

-- Jim Mueller, Quality Assurance Manager, Franklin Foods Duluth

### 2012 Goal

Facilitate at least six internal company teams.

### 2012 Team Results

MnTAP participated in teams at 9 companies over the course of 2012. Six of these teams ended in 2012, two launched, and four have continued from 2011.

Facility Type	Total Env. Reductions	2012 Savings	Total Savings
Metal Fab 2009 - 2010	2100 lbs solid waste	\$1,100	\$32,000
Food Processing 2004 - 2012	5.5 million gal water	\$12,200	\$122,000
Food Processing 2008 - 2012	3.1 million gal water	\$0	\$317,000
Food Processing 2010 - 2012	24,000 therms	\$18,000	\$31,000
Food Processing 2010 - ongoing	WW loading reduction 5.1 million gal water	\$279,000	\$343,000
Food Processing 2011 - ongoing	78,000 lbs WW loading 6.1 million gal water	\$98,000	\$170,900
Food Processing 2012 - ongoing	4.6 million gal water	\$35,000	\$35,000
Food Processing 2012 - ongoing	1.8 million kWh 125,000 therm 2.0 million gal water 17,000 lb haz material 239,000 lb non-haz material	\$329,000	\$329,000
Food Processing 2012 - ongoing	13,400 kWh 8.1 million gal water	\$36,000	\$36,000
<b>TOTAL</b>		<b>\$810,000</b>	<b>\$1.4 million</b>



### Team Success: Franklin Foods, Duluth, MN

Franklin Foods is a fluid milk bottling plant that serves customers throughout northern Minnesota, Wisconsin, and the Upper Peninsula of Michigan. At the plant, approximately 129,500 gallons of fluid milk and 5000 gallons of cream are processed each week. In 2010, MnTAP was asked to assist the company in forming a pollution prevention team to reduce water use and wastewater loading.

During 2012, the team took on the task of identifying the source of a large fluid yield loss. This search indicated the butter fat and cream yields were lower than expected. The process for flushing product forward in a new pasteurizer system was investigated in more detail. The new pasteurizer had longer pipe lengths which required doubling the flush time to clear the line of product prior to clean in place operations. Increasing the flush time for the line solved the fluid yield loss problem and saved the company \$279,000 in lost product when comparing yields from 2011 to 2012.

## On-Site Assistance: Intern Program

### 2012 Outputs

9 intern projects  
6 funding partners

### 2012 Outcomes

14,400 lbs hazardous waste  
33,000 lbs non-hazardous waste  
3.8 million kWh  
153,000 therms  
\$590,000

### What they said...

"We understand the importance of reducing our waste and our MnTAP intern helped us realize the waste and cost savings associated with collecting and separating organics."

-- Rebecca Kenow, Director, Sustainability, Land O'Lakes

### 2012 Goals

Place at least four students within businesses to identify and implement pollution prevention and energy efficiency solutions. Leverage external resources to fund an additional four students in the intern program.

### 2012 Accomplishments

A total of nine interns were placed in companies across Minnesota in 2012. Five of these projects focused on waste and water issues and four projects had an energy focus.

### Intern Implementation\*

Project Year(s)	Waste (lbs)			Energy		Water (gallons)	Savings
	Air Emissions (lbs)	Hazardous Waste (lbs)	Non-Haz/Solid Waste (lbs)	(kWh)	(therms)		
2010		83,000		1.4 million	147,000	6.3 million	\$630,000
2011	4,200		10,500	3.8 million	1.2 million	6.2 million	\$1.1 million
<b>2012</b>	<b>50</b>	<b>14,400</b>	<b>33,000</b>	<b>3.8 million</b>	<b>153,000</b>	<b>11.6 million</b>	<b>\$590,000</b>

\*Implementation reported in 2012 for intern projects from all years.

### 2012 MnTAP Intern Program Funding Partners:

- Minnesota Pollution Control Agency
- U.S. DOE through a grant from Minnesota Department of Commerce, Department of Energy Resources
- Ramsey and Washington Counties
- Xcel Energy
- Minnesota Energy Resources Corporation
- CenterPoint Energy



### Intern Success

Land O'Lakes Research Center in Arden Hills hosted a MnTAP intern funded through the Ramsey/Washington County Resource Recovery Project to identify beneficial reuse opportunities for organic waste generated at the facility. Approximately 60% of the food waste generated at the site, 15 tons per year was suitable for beneficial reuse in a food-to-hogs waste recovery program. Benefits to Land O'Lakes from implementation of the food-to-hogs program include:

- Reduced disposal cost - Implementation of the program saved the company \$11,000 annually
- Improved employee safety - Reduce the amount of heavy lifting due to moving food waste
- Increased material utilization - Food waste that was previously landfilled is now used for animal feed

The intern generated a comprehensive model for food waste management in industrial food processing facilities based the experience at Land O'Lakes and additional research into best practices. This model will be used to provide assistance to other facilities.



## Minnesota Materials Exchange

### 2012 Outputs

345 new members  
 11,220 unique website  
 visitors  
 302,974 webpages viewed  
 271 listings  
 70 successful exchanges

### 2012 Outcomes

26,131 lbs diverted material  
 \$5,330 reported cost savings

### What they said...

"We were very happy that not only could we find someone who could find a purpose for what we could no longer use, but that it is also helping the community."

-- Jessie Richardson  
 Sheet Metal Connectors, Inc.

### 2012 Accomplishments

The goal of the program is to develop and improve MnTAP's online business exchange to facilitate reuse across the state of Minnesota. MnTAP continued to refine the website to make it more user-friendly and to utilize the site's capacity for data collection to quantify the benefits of the exchange. The new system puts more control into the hands of the user and automates many system functions. Users now voluntarily self-report exchange information, including cost savings and weights.

### Partnerships

MnTAP has partnered with the University of Minnesota ReUse Program to develop a "Virtual Warehouse," through which they are expanding their on-campus reuse program to the web and to the coordinate campuses. This virtual warehouse is a sub-exchange within the Minnesota Materials Exchange. This partnership allows us to explore the capability of the system to host satellite exchanges as part of an effort to enhance reuse across the state.

### Impact

Unisys, a worldwide information technology company, recently downsized it's Roseville facility and used the Materials Exchange to donate many items including:

- Two stage-like carpeted platforms to a restaurant
- A truckload of chairs to a non-profit organization
- Fifty tables to a school district

"We had many other successful donations on a smaller scale as well," says Duane Dittberner of Unisys. "We always use the Exchange as a first option before recycling or disposal."



### ReUSE Minnesota

ReUSE Minnesota became an incorporated non-profit organization in December 2012, with a mission to promote and facilitate reuse across the state. ReUSE Minnesota has been founded to increase the visibility of Minnesota's reuse sector and highlight the environmental, social, and economic benefits to businesses and consumers. Through an MPCA Environmental Assistance grant, MnTAP staff coordinate organizational activities to support formation, membership recruitment, and outreach. Organizational goals include:

- Provide support for stakeholders who advocate for reuse
- Reduce barriers to reuse and to promote reuse in Minnesota
- Document the environmental impacts of the reuse, repair, and rental industry

ReUSE Minnesota started accepting members in spring 2013.

## Client Communications

### 2012 Outputs

465 calls/emails  
 3 Market surveys  
 700 E-newsletter subscribers  
 2,000 Source subscribers  
 35 Presentations

### 2012 Goal

MnTAP will develop and disseminate technical information useful to Minnesota businesses that help them implement pollution prevention and energy efficiency practices and technologies. Promote MnTAP services and results through publications and presentations.

### 2012 Accomplishments

In 2012, MnTAP utilized a number of outreach techniques to promote available project opportunities, gather information, and share the results of our efforts. Communication methods included electronic newsletters, targeted email campaigns, and printed materials.

#### Surveys

Conducting targeted surveys of Minnesota businesses can generate a quick gauge of industry self-reported current practices and perceived areas of need. Over the course of 2012, MnTAP has conducted project-specific surveys in the following areas to develop industry-tailored program development and outreach:

- Wastewater treatment facility energy use
- Industrial water use
- Industrial energy practices and training needs

#### Events

MnTAP staff members use industry and organizational presentations to disseminate the results of our work that may be most closely related to the audience interests. Events can serve to promote the results of projects and provide an opportunity to share information within a target industry sector. A variety of events have been hosted by MnTAP staff members over 2012:

- “Managing Organics in Event Centers and Restaurants” was targeted to large food serving venues
- “Reducing Your Blue Wrap Waste” was targeted to healthcare surgical units
- “2012 MnTAP Intern Presentations” highlighted the successful projects completed by the 2012 MnTAP Interns. This event reaches over 75 attendees annually

### Event Success: Energy Efficiency in Minnesota Industrial Facilities

On August 22, 2012 during the MnTAP Intern Presentations, four student projects were highlighted as part of the Save Energy Now (SEN) project sponsored by U.S. Department of Energy through a grant to the Minnesota Department of Commerce, Division of Energy Resources. These four intern projects were supported in part through SEN grant funds with utility partner and company contributions.

The focus of these projects ranged from process changes to conserve energy to conducting an assessment of motor efficiency. Energy savings recommendations from these four intern projects totaled over **13,000 MMBtu** and carried a savings value when implemented of **\$187,000**. This recommended energy savings is equivalent to the energy required to power 62 average Minnesota homes for one year. (Home Envelope Energy Guide - Division of Energy Resources, MN Department of Commerce, December 2012).

# MnTAP's 2012 Special Projects

Project & Funding	Highlighted Activities
Implementing an Industrial Energy Efficiency Program (Phases II)  <i>U. S. Department of Energy, Minnesota Department of Commerce</i>	Completed training and assessments in fans and motor efficiency. Provided implementation assistance in the form of interns and team facilitation. Companies engaged in the project have implemented nearly \$1.2 million in energy savings since 2011.
Energy Efficiency of Wastewater Treatment Facilities U. S. EPA Region V	Provided energy efficiency benchmarking and assistance to wastewater treatment plants and shared information through training and demonstration projects.
Reducing Solid Waste in Surgical Centers  U.S. EPA Region V	Completed a comparative life cycle analysis between disposable and reusable surgical sterilization containers. Results indicated disposable containers have twice the GHG impact and eight times the solid waste impact compared with the reusable container.
Event Center Food Waste Reduction  U.S. EPA Region V	Implemented a beneficial reuse plan for organic waste generated at the Eagan Community Center. By setting up an organics collection process, the center diverted 27,000 lb of organic waste from landfill to compost.
Reducing Styrene Emissions from FRP  U.S. EPA Region V through the MPCA	Non-styrene based resins were compared with traditional resin materials. Additional work is needed to develop a fully compatible resin system to maximize physical property performance.
Developing a Template for Food Waste and Organics Management  Ramsey/Washington County Resource Recovery Project	Student interns analyzed organic management practices and opportunities for both restaurants and food processing companies. Models for reducing organics disposal to landfill were developed and will be used as the basis for implementation assistance.
Assessing the Opportunity and Barriers for Water Conservation MCES with funding from Clean Water, Land & Legacy Amendment	A survey of industrial well water use practices was conducted in 2012 and several companies were engaged for assessments and implementation assistance.
<i>Defining State P2 Targets Using Integrated TRI Data Analysis</i> <i>Environmental Council of the States</i>	Developed a database model to compare TRI data with other environmental data to identify sectors that may benefit from P2 technical assistance.
<i>Assisting Minnesota Communities with Solid Waste Reduction</i> <i>U.S. Department of Agriculture Rural Development</i>	This project that was launched in late 2012 will focus on developing training materials and assessment protocol for solid waste management for businesses in rural MN communities.
<i>Developing a Reuse Network for Minnesota</i> <i>MPCA Environmental Assistance Grant</i>	Support the development of a state based reuse network in Minnesota.

## Implementing an Industrial E2 Program

### 2012 Outputs

135 calls and emails  
 45 site visits  
 7 team meetings  
 4 intern projects  
 77 people trained  
 53 engaged companies

### 2012 Outcomes

2.35 million kwh  
 186,000 therms  
 17,000 lb hazardous material  
 240,000 lb non-hazardous material  
 2 million gal water  
 \$406,000

### Sponsor

U.S. Department of Energy  
 through the  
 Mn Dept. of Commerce, DER

### Project Overview

As part of Phase II of this project, MnTAP has delivered a full package of industrial energy efficiency resources to assist business and industry with implementation of energy efficient technologies and practices aimed at achieving energy and cost savings. Phase II, funded by the U.S. Department of Energy (DOE) and in partnership with the Minnesota Department of Commerce, Division of Energy Resources (MN Dept. of Commerce, DER), has included training events in fan and motor efficiency, on site assessment activities, technical and implementation assistance in the form of intern support and energy team facilitation.

MnTAP will continue offering energy efficiency services to industries with large scale refrigeration systems throughout the state with additional funding from the U.S. DOE through the MN Dept. of Commerce. This work will be conducted in collaboration with local utility providers and will include both scoping audits and a limited number of detailed engineering assessments.

### Total Project Results to Date

The following are a few highlights from the Phase II project and implementation activities:

- Seven assessments have been completed
  - 3 compressed air
  - 3 fans
  - 1 motor
- Recommendations from assessments total
  - 26,700 MMBtu
  - \$356,000 cost savings
- Four intern projects have been supported with DOE and utility partner funding
- Recommendations from intern projects total
  - 13,000 MMBtu
  - \$187,000 cost savings
- Energy team support has implemented 7,400 MMBtu energy savings worth \$266,000
- A compressed air assessment tool has been developed for business self-audit

Follow up from Phase I activities has resulted in the identification of an additional 4,600 MMBtu implemented energy savings worth \$53,000 in cost savings.



### Project Success: Trident Seafood

Trident Seafood's production facility located in Motley, Minnesota, is one of 17 Trident plants in the country and is the town's largest private employer. The Trident maintenance supervisor and refrigeration lead attended steam system assessment training hosted by MnTAP through the Phase I grant in 2010 followed by a steam system assessment of the Motley facility. Four changes have been implemented in this facility for a total estimated savings of **25,800MMBtu/yr** and **\$154,000 in annual savings**. These changes include concentrating steam production in the most efficient boilers, installing a condensing economizer to recover heat from the boiler stack to heat cleaning and sanitizing water, replacing an inefficient pasteurizer, and repairing the boiler blowdown control system.

## Event Center Food Waste Reduction

### 2012 Outputs

1 waste sort  
3 training visits  
1 workshop event  
40 calls/emails/visits

### 2012 Outcomes

27,000 lb/yr organic to compost  
18,000 lb/yr recycled material  
30 Mton CO<sub>2</sub>eq/yr avoided

### What they said...

"The help from MnTAP and Dakota Valley Recycling was critical. The process is second nature now and going very well."

-- Cheryl Mesko, City of Eagan, Parks and Recreation Superintendent of Operations

### Sponsor

U.S. EPA Region V

### Partners

City of Eagan, MN  
Dakota Valley Recycling

### Project Overview

MnTAP completed this project at the end of September 2012. The goals of the project were to develop and demonstrate opportunities for food waste management for an event center in Dakota County, Minnesota. According to the County, in 2009 nearly 215,000 tons of municipal solid waste was generated and 80% of it was sent to the landfill. Only 14,000 tons of food waste (6.5% of the municipal solid waste generated) was collected and sent to beneficial reuse from the residents and organizations in Dakota County. MnTAP identified the Eagan Community Center as the partner facility. Using data gathered in the first site waste sort in 2011, additional funding was received from the City of Eagan Environmental Committee to implement a set of recommended actions to establish and maintain an organic waste collection at the Eagan Community Center as a model for other facilities in the City.

### 2012 Project Activities

MnTAP assisted the City site staff in developing and setting up a three stream collection system for organics, recycling and trash within the Community Center building and at the weekly outdoor farmer's market events held during the summer. Activities included:

- Training activities were developed for site staff and catering organizations regarding the opportunity for organics collection and the logistics of the new system
- Progress was monitored and assistance offered as needed through implementation
- A second waste sort was conducted to measure the impact of the program
- An event was held in September to promote organic waste sort opportunities and the results of the project to other facilities
- A replication model has been developed as a guide to other sites seeking to reduce trash to landfill through beneficial reuse opportunities

## Project Success: Event Center Organic Waste

MnTAP has provided a template to assist event centers in reducing the level of food waste generated and divert any remaining food waste from landfill disposal through beneficial reuse opportunities available within a local community. The City of Eagan, the Eagan Community Center, and partner Dakota Valley Recycling along with MnTAP have developed and implemented a successful organics waste management program. Analysis of waste sort data gathered at the beginning and end of the project shows the Community Center has:

- Decreased the level of trash in the dumpster from 90 lb/day to 40 lb/day
- Increased the collection of recyclable material by 17%
- Diverted 3 lb of organic and recyclable material toward beneficial reuse for every 1 lb of trash in the dumpster

The City of Eagan intends to expand organics separation to other city managed facilities.



## Reducing Solid Waste in Surgical Centers

### 2012 Outputs

1 assessment visit  
3 presentations  
1 workshop event  
20 calls/emails/visits

### 2012 Outcomes

6,127 lb/yr solid waste reduced  
26 ton CO<sub>2</sub>eq/yr avoided  
\$51,000/yr

“We were impressed with the talent, expertise and thoroughness of the individuals working on the project. MnTAP also performed a site assessment and gave us several suggestions for improvements.”

-- Amanda Holloway,  
Section Head, Facilities  
Operations, Mayo Clinic

### Sponsor

U.S. EPA Region V

### Partners

UMN BBE

Mayo Clinic Surgical Services

### Project Overview

MnTAP completed this project at the end of September 2012. Through this project, MnTAP provided assistance to Mayo Clinic in Rochester, Minnesota regarding surgical suite pollution prevention and energy efficiency assessments. The specific objective of this project was to reduce solid and hazardous waste in hospital surgical tool sterilization procedures. MnTAP collected information on the use and procedures around surgical tool sterilization containers and used this data to provide a comparative life cycle evaluation to quantify extended environmental impacts of each sterilization container option.

### 2012 Project Activities

Tasks that have been completed through this project include:

- Conducting a pollution prevention and energy efficiency assessment
- Evaluating current practices and implementation of additional reusable containers at Mayo Clinic
- Collecting data on water, energy, and solid wastes associated with sterilization procedures
- Completing a comparative life cycle investigation of the environmental impacts of reusable and disposable sterilization containers
- Presenting the results of this research to the healthcare community in a workshop event



## Unwrapping Environmental Benefits: Reusable Sterilization Containers - A Life Cycle Assessment

Healthcare facilities incur considerable annual expense in managing the surgical tool sterilization process. The volume of blue wrap being disposed of by larger facilities has been estimated as high as 20% of the surgical services waste stream or 5% of a hospital total waste stream. The cradle-to-grave assessment conducted in this work compares the environmental impacts of disposable and reusable sterilization containers from raw material extraction, product manufacture and use, to end-of-life disposal. Partner organization, Mayo Clinic, allowed MnTAP to study impacts of the sterilization process in their facility.

### Single Use Equals Big Impact

Results show the reusable cases have roughly half the GHG emissions impact of the disposable wraps and 88% less of the solid waste impact. The use phase for both systems has the greatest environmental impact due to the large amount of energy consumed during the sterilization and decontamination processes.



# Organic Waste Diversion from Restaurants and Food Processing

## 2012 Outputs

- 2 intern projects
- 10 restaurant assessments
- 1 business assessment
- 1 waste sort

## 2012 Outcomes

- 15 tons organic waste diverted
- 2 templates for organic diversion
- 5 sites implementing \$11,000/yr

## What they said...

“Waste is inefficiency. This project is a great example of how a business can become more efficient and reduce its costs and risks, while also contributing to our community’s goal to recycle more.”

-- Zach Hanson,  
Environmental Health  
Director, Ramsey County  
Department of Public  
Health

## Project Overview

MnTAP’s work focused on developing a template for implementation of food waste and organics management within business clusters in the region. Two MnTAP interns worked on this project to allow for focused attention to the needs of the businesses. Project outputs included:

- Review past work to identify areas of greatest opportunity
- Select of two clusters of restaurants to participate in the organics management program
- Provide assessments and assistance for business participants to facilitate adoption of program
- Develop food waste and organics management case study models for use at other facilities

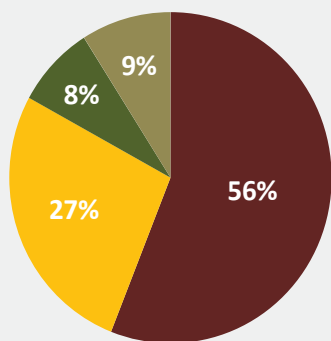
## 2012 Project Activities and Results

The following are highlights of project results.

- 10 restaurant assessments were conducted by a MnTAP Intern
- 83% of restaurant waste generated was organic or food suitable for composting
- \$56,000 of waste fees could be avoided (\$5,600/site) with an organic waste diversion program
- Additional recycling of food and beverage containers was possible at most sites
- \$8,000 in waste feed could be avoided (\$800/site) with improved recycling separation

It was estimated that these **ten restaurants could divert over 4 million pounds of waste** from landfill annually with implementation of organic waste collection and composting and improved recycling.

MnTAP Restaurant Waste Composition Study



## Project Success: Twin Cities Restaurant Solid Waste Composition

During the Ramsey/Washington County Resource Recovery Project, MnTAP interns and advisors conducted a dumpster waste sort from seven of the ten restaurants. The waste was separated into four categories: true trash, recycling, food, and compostable waste. Results of the waste sort revealed over 80% of the waste was food or compostable material like paper, 8% was recyclable, and only 9% was true trash. This restaurant waste distribution was similar to a composition study conducted by the EPA.

The MnTAP Waste Composition Study may prove helpful in eliminating the time-consuming process of waste evaluation at restaurant sites. Instead of conducting manual waste sorts to establish a waste composition profile, restaurant managers can use the percentages provided in this study to estimate trash volume reduction and cost savings for their own facilities.

# Energy Efficiency of Wastewater Treatment Plants

## 2012 Outputs

- 11 calls and emails
- 3 site visits / assessments
- 4 assessment presentations to plants
- 1 training event
- 15 people trained
- 5 demonstrations scheduled
- 10 engaged facilities
- 1 intern project designed

## 2012 Outcomes

309,600kwh  
\$17,400

## What they said...

"The assessment provided important support for change to the blower system. It was confirmation that the opportunity to save energy was real."

-- Charles Keyes, Wastewater Operator, City of Monticello

## Sponsor

U.S. EPA Region V

## Project Overview

Through this project, the Minnesota Technical Assistance Program (MnTAP) has been providing energy efficiency assistance to Minnesota's wastewater treatment plants. This assistance has included onsite energy assessments to help wastewater treatment plant operators understand, identify, and implement energy efficiency opportunities in their facilities. Additional assistance has included training on wastewater plant energy efficiency, demonstration projects, and support of interns at wastewater treatment facilities. This project started in May 2011 and continues through April 2013.

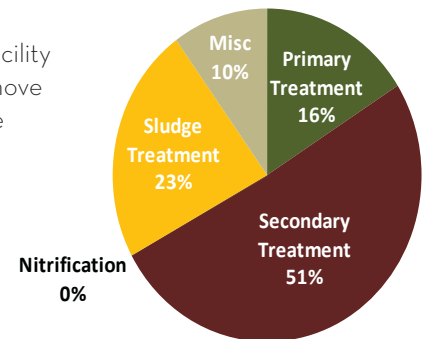
## 2011 Project Activities and Results

The following are a few highlights of project activities throughout 2012:

- Three onsite assessments were conducted.
- Final reports were delivered on four assessments.
- Energy reductions totaling 1,980,000 kWh/year saving \$128,000 annually were identified and about 13% of that was implemented in 2012.
- The four-hour training course was commissioned and presented to 15 treatment operators and engineers on energy conservation for activated sludge processes and the use of a plant energy model to evaluate improvements.

## Future Plans

MnTAP will support an intern at a wastewater treatment facility in spring 2013 to look at using excess plant capacity to remove nitrates and reduce energy. Five demonstrations and three site assessments will be completed.



## Project Success: Wastewater Treatment Plant Energy Use

Wastewater process benchmarking has been part of the assessment process and has been helpful in identifying portions of processes that are energy intense and in evaluating opportunities across a range of wastewater treatment processes. Secondary treatment, nitrification (where present), and some sludge processes tend to be high energy users because of aeration. Plant and process benchmarks vary widely with the type of process employed and can be used to compare process efficiency between plants. The comparison between plants can provide an incentive to think about more efficient process designs.

# Water Conservation by Private Industrial Water Users

## 2012 Outputs

- 28 calls and emails
- 5 site assessments
- 31 survey respondents
- 19 engaged facilities

## 2012 Outcomes

- 3 intern applications

## Sponsor

Metropolitan Council  
Environmental Services  
with funding from the Clean  
Water Land & Legacy  
Amendment to the State  
Constitution

## Project Overview

The Twin Cities metro region is fortunate to have an abundant clean water supply. Approximately 70% of the consumptive groundwater use in the area is monitored through municipal water use plans approved by Metropolitan Council Environmental Services. The remaining 30% of consumptive groundwater use is from private well users. This project focuses on private industrial water sector to identify opportunities for industrial water conservation and factors that motivate implementation of operational changes that result in decreased water use.

## 2012 Project Activities and Results

The following are a few highlights of project activities throughout 2012:

- Five assessments were conducted by MnTAP staff experienced in industrial process improvements
- Over 70 million gallons of water conservation opportunity has been identified
- Water savings identified have the potential to impact the facility's ability to:
  - Increase production
  - Reduce hydraulic loads to treatment processes
  - Reduce water heating, evaporation, or pumping energy costs
  - Avoid a new well installation
  - Avoid sewer discharge costs

## Future Plans

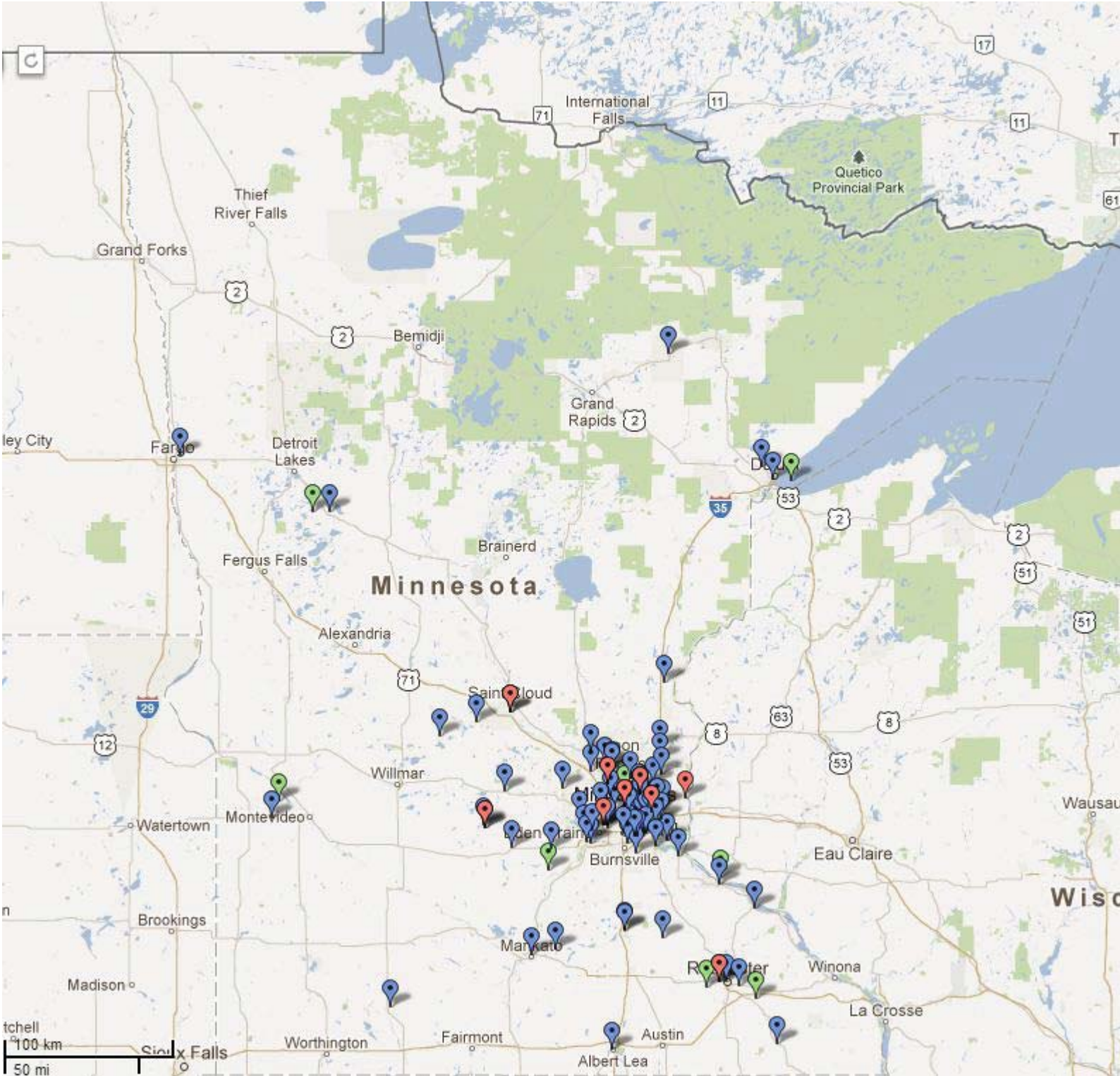
MnTAP will support implementation of identified water conservation opportunities through the 2013 summer intern program and additional assessments.



## Water Conservation Case Study

From "Recycled water cools welds at Johnson Screens" (MnTAP SOURCE 2010 Issue 1). Johnson Screens is a fabricator of metal filters and screens in New Brighton, Minnesota. The company hosted a MnTAP intern who worked with staff members to explore opportunities to improve processes and upgrade to more efficient equipment. One intern recommendation related to water conservation by integrating all screen fabrication machines into the current water recycling system and installing a centrifugal separator and belt skimmer to the tanks to improve the recycled water quality. The improved water recycling system conserves up to 2.4 million gallons of water per year, providing Johnson Screens with \$9,700 in annual cost savings.

MnTAP Interaction Summary (Interns, Team Meetings, and Site Visits)



 Teams

 Intern Projects

 Site Visits