



# 2011 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 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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# Celebrating a Successful Year

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## Director’s Welcome

2011 has been a busy year for MnTAP. After joining the organization in early January, I more fully recognize how important MnTAP’s work is and how committed the staff members are to working with businesses in Minnesota. In addition to our pollution prevention work supported by the Minnesota Pollution Control Agency (MPCA), we have had an additional six projects either start or continue during the year. Our staff members have taken active roles in leading the projects and meeting our goals for all projects. I am pleased to announce that we have exceeded the outcome goals set forth in our MPCA workplans.

While it has been a successful year, we have had challenges to overcome. The three-week state shutdown in July 2011 has impacted the continuity of our work with businesses. Thanks in part to the MPCA as well as other funding opportunities, MnTAP staff members remained on the job part-time through the shutdown supporting our summer interns and their projects. Due to the limited time available, we were unable to attend team meetings, conduct site visits, participate in events, or manage our communications beyond the work of the interns. Following the shut-down, it has taken several months for staff members to regain the momentum lost in July. I’m happy to say that we have bounced back and are looking forward to a successful 2012.

Overall, I believe you will find an impressive set of results this year. We have worked with well over 100 companies and have reached out to many more. With MnTAP assistance, companies are realizing reductions of over 5 million lbs of waste, 7.7 million kWh and 2.1 million therms of energy, as well as 13.8 million gallons of water. These reductions are saving companies over \$3 million annually. Throughout this report, you will read success stories from some of the companies we assisted in 2011. The cost savings these companies achieved in 2011 are helping many of them increase production, add employees, and invest back in their businesses. This is good business for Minnesota.

Laura Babcock, Director

## Links to MPCA’s Strategic Goals

### Objective R2c)

By January 1, 2013, technical assistance at specific facilities will reduce the amount of pollution generated by 10% from 2009 levels.

*MnTAP provides on-site assistance to help facilities prevent pollution and reduce energy use.*

### Objective A1d)

Reduce overall emissions of volatile organic compounds (pollutants that are toxic and contribute to ozone formation) by 20% from 2002 levels by January 1, 2012, and 30% by January 1, 2018.

*MnTAP continues to provide information and assistance to businesses to reduce VOCs and HAPs.*

### Objective A3b)

Reduce GHG emissions by 15% from 2005 levels by January 1, 2015, and by 30% by January 1, 2025 as set in the Next Generation Act of 2007.

*Through on-site work and outreach, MnTAP provides industrial energy efficiency solutions to businesses.*

### Objective W3b)

Wastewater National Pollutant Discharge Elimination System facilities do not contribute to impairment or degradation of state waters.

*MnTAP provides technical assistance to POTWs and industrial users through on-site work.*

# Executive Summary

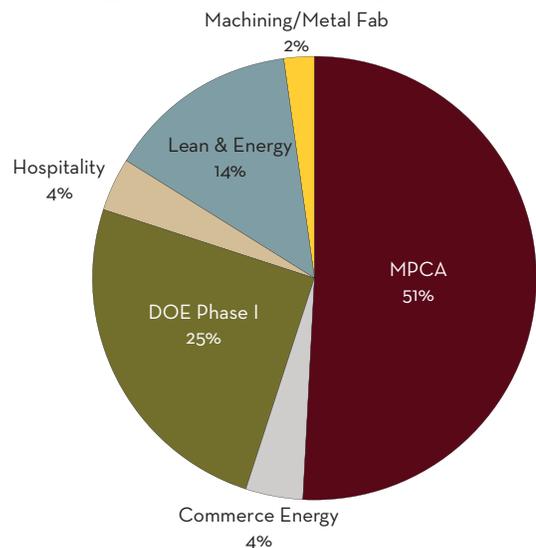
## Program Highlights

Through a number of projects and assistance methods in 2011, MnTAP has been successfully helping several businesses identify and implement pollution prevention and energy efficiency solutions. This work continues to be 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 2011 include:

- Conducting over 100 site visits, attending nearly 75 company team meetings, and placing eight interns.
- Upgrading and continuing to operate the Minnesota Materials Exchange to provide businesses with a reuse option for usable items.
- Completing Phase I of the Department of Energy industrial energy efficiency project and securing funding for Phase II.
- Starting or continuing a total of six special grant-funded projects.
- Reaching a five-year high for cost savings achieved through company implementation (\$3.1 million).
- Continuing to develop working relationships with a variety of partner organizations such as the Center for Energy and the Environment, Enterprise Minnesota, counties, cities, and other environmental organizations throughout Minnesota.

## Cost Saving Information by Project



## 2011 Outputs

| Technical Assistance Activity        | 2011 Results |
|--------------------------------------|--------------|
| Contacts (calls/emails)              | 453          |
| Total Staff Site Visits (facilities) | 206 (73)     |
| Student Interns                      | 8            |
| Materials Exchange (# of exchanges)  | 76           |
| Materials Exchange Referrals         | 1,179        |
| Presentations                        | 34           |
| MnTAP Web Visits                     | 637,768      |

## 2011 Outcomes

| Activity     | Waste (lbs)         |                             |                          | Energy             |                    | Water (gallons)     | Savings              |
|--------------|---------------------|-----------------------------|--------------------------|--------------------|--------------------|---------------------|----------------------|
|              | Air Emissions (lbs) | Solid/Hazardous Waste (lbs) | Wastewater Loading (lbs) | (kWh)              | (therms)           |                     |                      |
| Goal*        | 2,100,000           |                             |                          | 3,500,000          | 315,000            | 10,500,000          | \$2.3 million        |
| Calls/Emails | 0                   | 0                           | 0                        | 38,000             | 0                  | 620,000             | \$5,300              |
| Site Visits  | 0                   | 3.6 million                 | 230                      | 1.6 million        | 950,000            | 0                   | \$1.37 million       |
| Teams        | 0                   | 735,000                     | 810,000                  | 2.3 million        | 75,600             | 7.1 million         | \$677,000            |
| Interns      | 4,200               | 10,500                      | 0                        | 3.8 million        | 1.2 million        | 6.2 million         | \$1.1 million        |
| <b>TOTAL</b> | <b>5.15 million</b> |                             |                          | <b>7.7 million</b> | <b>2.2 million</b> | <b>13.9 million</b> | <b>\$3.1 million</b> |

\*These goals represent 1/2 of FY2011 and 1/2 of FY2012 goals as set forth in the respective MPCA workplans.

# MPCA-Funded 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. This includes providing technical assistance to Minnesota businesses and other organizations.

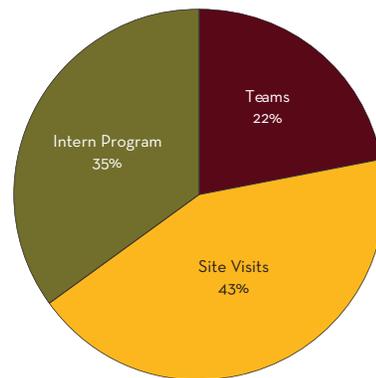
## Modes of Interaction

- 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.

## Overall Project Results

Through site visits, teams, interns, and phone calls/email, MnTAP's staff of ten have been able to assist nearly 230 companies and to engage 40 in making changes that reduce their environmental footprint and save money. Companies that have worked with MnTAP are saving approximately \$3.1 million annually. Over 43% of the savings stem from site visits, 35% from the intern program, and 22% from companies with MnTAP-supported internal teams.

% of Cost Savings Achieved by Interaction Type



| Interaction         | Air Emissions (lbs) | Energy             |                    | Waste (lbs)        | Wastewater Loading (lbs) | Water (gallons)     | Savings               |
|---------------------|---------------------|--------------------|--------------------|--------------------|--------------------------|---------------------|-----------------------|
|                     |                     | (kWh)              | (therms)           |                    |                          |                     |                       |
| Site Visits         | 0                   | 1.6 million        | 950,000            | 3.6 million        | 230                      | 0                   | \$1.37 million        |
| Teams               | 0                   | 2.3 million        | 75,600             | 735,000            | 810,000                  | 7.1 million         | \$677,000             |
| Intern Projects     | 4,200               | 3.8 million        | 1.2 million        | 10,500             | 0                        | 6.15 million        | \$1.1 million         |
| Calls/Emails        | 0                   | 38,000             | 0                  | 0                  | 0                        | 620,000             | \$5,300               |
| Materials Exchange* | 0                   | 0                  | 0                  | 380,000            | 0                        | 0                   | \$11,000              |
| <b>TOTAL</b>        | <b>4,200</b>        | <b>7.7 million</b> | <b>2.2 million</b> | <b>4.7 million</b> | <b>810,000</b>           | <b>13.9 million</b> | <b>\$3.14 million</b> |

\* The Minnesota Materials Exchange was upgraded during FY2011. The new system did not track cost savings in 2011, but will in 2012.

## On-Site Assistance: Site Visits

### 2011 Outputs

- 121 site visits
- 83 team meetings
- 71 different facilities

### 2011 Outcomes

- 3.6 million lbs of waste
- 230 lbs of wastewater loading
- 1.6 million kWh
- 950,000 therms
- \$1.36 million

### What they said...

“Having area experts available, like MnTAP, to review a particular issue and then sharing their knowledge and/or recommending appropriate solution(s) is seen as a very positive problem solving approach at the facility.”

-- Greg Waletzko, Vice President of Manufacturing at Standard Iron's Minnesota facilities

### 2011 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. This site visit goal for 2011 includes visits to facilities for team meetings, which are presented on the following page.

### 2011 Accomplishments (includes all special project results)

A total of 121 staff site visits (not including team meetings) were conducted in 2011, primarily within the food processing, fabricated metals, primary metal manufacturing, and hospitality industries. These site visits were conducted at 59 different facilities. Site visit numbers were consistent with MnTAP target areas, as well as some special projects that MnTAP is focusing on.

### Increasing Implementation from Site Visits

Each technical assistant is responsible for conducting follow-up to site visits to ensure the company has all the information necessary to make changes and to ascertain whether recommendations will be or have been implemented. Implementation rates for projects completed within the same year as the site visit range from 1% in 2010 to 29% in 2007, when implementation rates are compared against recommended savings opportunities. As shown in this table, MnTAP's implementation rate by year increases as follow-up occurs.

| Project Year | First Year (%) | Total through 2011 (%) |
|--------------|----------------|------------------------|
| 2007         | 29%            | 41%                    |
| 2008         | 28%            | 54%                    |
| 2009         | 13%            | 36%                    |
| 2010         | 1%             | 14%                    |
| 2011         | 2%             | 2%                     |



### Site Visit Success: Standard Iron and Wire Works

In 2011, MnTAP conducted a site visit at Standard Iron and Wire Works' Sauk Centre facility after receiving a referral from MN WasteWise. During the visit, MnTAP focused on opportunities such as regulating the speed of the powder coating booth exhaust fans and adjusting air seals in the dry-off oven. Additionally, MnTAP arranged a tour of another facility that improved powder coating transfer efficiencies. This tour motivated Standard Iron to make modifications that improved transfer efficiencies and are estimated to save 3,900 pounds of powder paint annually, which is valued at \$10,000. An added benefit of the project is reduced staff time required to handle the powder as a raw material and as solid waste.

Standard Iron also fabricated new oven ducting that retains more hot air in the oven and is estimated to save the company 3,600 therms, reducing energy costs by about \$2,500 annually and improving the work environment.

## On-Site Assistance: Team Facilitation

### 2011 Outputs

- 11 active teams
- 3 teams started

### 2011 Outcomes

- 735,000 lbs of waste
- 810,000 lbs of wastewater loading
- 7.1 million gallons water
- 2.3 million kWh
- 75,600 therms
- \$677,000

### What they said...

“MnTAP provided a structure to develop our team and gave us an understanding of how ingredients going down the drain affects loading. After this demonstration, the team realized anything that could be captured in process would greatly impact our BOD loadings.”

-- Mike Hinrichsen,  
Operations Manager at  
Kemps Ice Cream

### 2011 Goal

Facilitate at least six internal company teams.

### 2011 Accomplishments (includes all special project results)

MnTAP participated in a total of 12 company teams in 2011; of those, eight started prior to 2011 and three began in 2011. Implementation results from 2011 are shown below.

| Facility Type                     | Total Env. Reductions  | 2011 Savings     | Total Savings      |
|-----------------------------------|--|------------------|--------------------|
| Food Processing<br>2004 - ongoing | 168,500 lbs WW loading<br>3.6 million gal water  | \$38,000         | \$110,000          |
| Food Processing<br>2006 - ongoing | 2 million kWh & 167,000 therms<br>4.9 million lbs WW loading<br>45.5 million gal water | \$107,000        | \$2,650,000        |
| Food Processing<br>2008 - ongoing | 254,000 lbs WW loading<br>210,000 gal water  | \$165,000        | \$317,000          |
| Food Processing<br>2008 - ongoing | 100,600 kWh & 31,200 lbs waste   | \$45,000         | \$45,000           |
| Metal Fab.<br>2009 - 2010         | 400,000 lbs solid waste  | \$31,000         | \$31,000           |
| Food Processing<br>2010 - ongoing | 167,500 kWh  | \$13,000         | \$13,000           |
| Food Processing<br>2010 - ongoing | 164,000 therms & 14.5 million gal water  | \$51,000         | \$128,900          |
| Food Processing<br>2010 - ongoing | 700 lbs WW loading<br>63,000 gal water & 117,000 lbs waste                             | \$28,000         | \$30,000           |
| Food Processing<br>2010 - ongoing | 590,000 lbs WW loading   | \$126,000        | \$126,000          |
| Laboratory<br>2011 - ongoing      | 700 lbs waste  | \$375            | \$375              |
| Food Processing<br>2011 - ongoing | 186,000 lbs WW loading   | \$72,000         | \$72,000           |
| <b>TOTAL</b>                      |  | <b>\$676,000</b> | <b>\$3,493,000</b> |



### Team Success: Kemps Ice Cream

Kemps Ice Cream manufacturing plant in Rochester operates 24 hours a day, five days a week to manufacture and package 900 different items in various sizes and flavors of ice cream and frozen yogurt. To build upon success from a MnTAP-facilitated team in 2001 through 2004, the facility started another team with the goal of addressing unexplained high BOD loadings.

The team members drew and reviewed a processing diagram, which revealed a collection system for by-products that was no longer being used. As a result, most of the by-products were simply being flushed to the drain, thereby causing the high BOD loadings. The team members analyzed the system, and identified valves, piping, and controls needed for updating and rebuilding the by-product collection system. After only seven monthly meetings, the system was updated and rebuilt, and the team was credited with saving the company over \$72,000/yr in lost product and ingredients.

## On-Site Assistance: Intern Program

### 2011 Outputs

8 interns: 1 spring, 7 summer  
30 inquires from companies

### 2011 Outcomes

14,700 lbs of waste  
3.8 million kWh  
1.2 million therms  
6.2 million gallons water  
\$1.1 million

### What they said...

“The beauty of it is (the intern) is focused on one thing.”

-- Jim Trudeau,  
Facilities and Maintenance  
Manager at CPP

### 2011 Goal

Place at least four students within businesses to identify and potentially implement pollution prevention, green chemistry, and energy efficiency solutions.

### 2011 Accomplishments

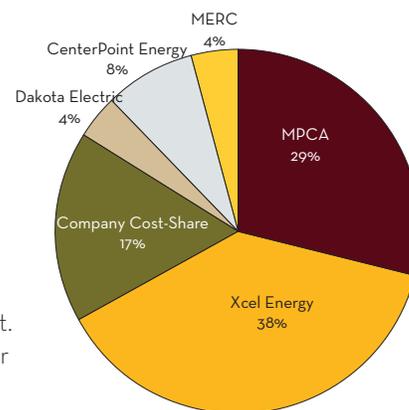
A total of **eight interns** were placed in companies in 2011. Five of the intern projects focused on waste issues and energy and three interns were dedicated solely to energy efficiency projects. One intern was placed at a metro wastewater treatment facility during the Spring semester, while the other seven were at their facilities during the summer.

### 2011 Implementation

| Project Year(s) | Waste (lbs)         |                   | Energy             |                    | Water (gallons)    | Savings              |
|-----------------|---------------------|-------------------|--------------------|--------------------|--------------------|----------------------|
|                 | Air Emissions (lbs) | Solid Waste (lbs) | (kWh)              | (therms)           |                    |                      |
| 2006-2010       | 600                 | 0                 | 2.9 million        | 960,000            | 0                  | \$870,000            |
| 2011            | 3,600               | 10,500            | 850,000            | 240,000            | 6.2 million        | \$230,000            |
| <b>TOTAL</b>    | <b>14,700</b>       |                   | <b>3.8 million</b> | <b>1.2 million</b> | <b>6.2 million</b> | <b>\$1.1 million</b> |

### 2011 Student Support

In 2011, MnTAP engaged a number of partners in funding intern projects within facilities. MnTAP partnered with Xcel Energy, CenterPoint Energy, Dakota Electric, and Minnesota Energy Resources Corp. Xcel Energy fully funded two projects and partially funded two other projects. CenterPoint Energy partially funded two projects and Dakota Electric and MERC each partially funded one project. Also, four companies provided cost-share (\$2,500) for their projects.



### Intern Success: Consolidated Precision Products

The Consolidated Precision Products (CPP) Minneapolis operation uses chemically-bonded sand to cast a variety of aluminum and magnesium alloys in parts up to 1,000 pounds for critical aerospace applications. MnTAP has placed two interns at CPP Minneapolis since 2008 to research two projects: sulfur hexafluoride (SF<sub>6</sub>) alternatives and energy efficiency opportunities.

Based on the first intern’s research, an alternative of a low concentration of sulfur dioxide (SO<sub>2</sub>) has helped CPP reduce annual use of SF<sub>6</sub> by 36,500 pounds and is saving over \$250,000 annually. This project has helped move the corporation toward eliminating the use of SF<sub>6</sub> as the primary cover gas at all three of the CPP magnesium casting facilities in the U.S. The second intern, who now is a full-time CPP employee, has helped implement energy efficiency recommendations resulting in annual reductions of nearly 1 million kWh and 93,000 therms and savings of nearly \$120,000 in energy costs.

## Minnesota Materials Exchange

### 2011 Outputs

41 calls / emails  
1,200 web self-referrals  
79 exchanges

### 2011 Outcomes

380,000 lbs of waste

### What they said...

“Our school responded to a posting that mentioned various office furniture items. We got four fire proof file cabinets for free. Now our student records are more safe than ever.”

-- Materials Exchange user

### 2011 Goal

Provide an online business reuse program to encourage reuse in the State of Minnesota and facilitate 300 exchanges activities between businesses including at least five new continuous exchanges.

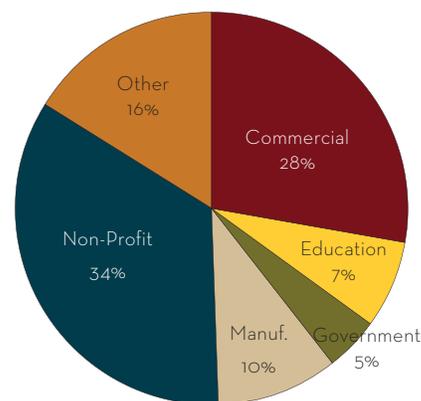
### 2011 Accomplishments

An entirely new online system was developed, tested, and rolled out in 2011. The system, installed and implemented by iWasteNot, was chosen for its ability to streamline exchanges between businesses, reduce MnTAP staff time spent gathering data, and facilitate additional exchanges for partner organizations. To date, the University of Minnesota ReUse Center has signed on to partner with MnTAP on the new system and is in the final phase of implementation for their exchange.

Due to the transition between systems, Materials Exchange activity experienced a lull through Fall 2011. Once the new system was complete and online, activity increased substantially. Financial savings, as reported, is not reflective of the total amount businesses saved by using the exchange because the new system did not account for that metric in 2011. This feature will be included in 2012.

### 2011 User Profile

The Materials Exchange is utilized by various types of organizations with the greatest number in the non-profit sector. During 2011, a greater amount of materials were exchanged in the metro area versus out-state areas. Approximately 55% of users were located in the metro area, 36% of users were outside the metro area, and 8% were out-of-state users.



## Reuse Success: Reuse Alliance MN

Reuse Alliance MN is the state chapter of Reuse Alliance, a national nonprofit organization dedicated to promoting, connecting and supporting reuse initiatives and organizations around the country. Reuse Alliance envisions a world where people are actively engaged in the reuse movement; and as a result, have created a cleaner environment and a greener economy for their communities. MnTAP, through the Materials Exchange, is a member of the Reuse Alliance and active in project planning for the group. The Minnesota chapter of Reuse Alliance has been selected to work on a specific project, Measure Your Treasure, in partnership with the MPCA and the Institute for Local Self Reliance. This work will synthesize what impact data reuse organizations are currently measuring, or have the potential to measure. From this basic data, we will be able to highlight the triple bottom line benefits of reuse. For example, if you incinerate 10,000 tons of materials you create one job; if you landfill it, you create six jobs; if you recycle it, you create 36 jobs; and if you reuse it, you create between 28 and 296 jobs (ILSR).

## Client Communications

### 2011 Outputs

453 calls / emails  
 638,000 web hits  
 8 revised & 1 new resource  
 10 monthly e-newsletters  
 700 e-news subscribers  
 3 *Source* issues  
 2,000 *Source* subscribers  
 34 presentations

### What they said...

"I think that for the most part the articles provide a good source for ideas which, even though they may not pertain to us today, may affect us in the future."

-- Survey Respondent from  
 2011 Communications Survey

### 2011 Goal

Develop and disseminate technical information useful to Minnesota businesses that helps them implement pollution prevention and energy efficiency practices and technologies. This includes answering phone calls, conducting outreach, and maintaining online and print information.

### 2011 Accomplishments

In 2011, MnTAP experienced a number of successes in outreach and communications.

#### Web site

The new MnTAP Web site was launched in January 2011. The upgrade took over a year to develop and was done primarily to streamline the information and to realign the site with the University of Minnesota's web standards. Some new features of the site include a searchable database for publications and a section devoted to "Greening your Business" that features more general pollution prevention and energy efficiency information.

#### E-Newsletter

The e-newsletter was also launched in January of 2011 and sent 10 times. The purpose of this newsletter is to streamline information from MnTAP regarding upcoming events, projects, or other pollution prevention news into one message each month. Previously, MnTAP would send project- or event-specific information multiple times each month. Each issue directs readers to MnTAP's web page multiple times and click-throughs are tracked. Event announcements are clicked most often in the e-newsletter and it averaged a 25% open rate in 2011.

#### Project-Specific Communications

MnTAP started a number of new projects in 2011 and many of them had an outreach and/or communications component included. Outreach methods used included mailed postcards describing the project, surveys to gather facility-specific information and interest, e-newsletters to specific audiences, and email messages regarding projects.



### Event Success: Waste Minimization for the 21st Century

On November 9, 2011, the United States Environmental Protection Agency (U.S. EPA) Region 5 in partnership with the Minnesota Pollution Control Agency, MnTAP, Hennepin County, and Ramsey County sponsored a special conference, "Waste Minimization for the 21st Century: A Dialogue with Great Lakes Business and Industry."

As part of the event, waste minimization success stories at facilities in Minnesota were presented and a number of discussions were held on how facilities can achieve similar success while saving money, reducing liability, and protecting human health at the same time. The companies that highlighted their success included 3M, Latuff Brothers, Pilgrim Dry Cleaners, and Cass Screw Machine Products. Assistance programs like MnTAP, Mn WasteWise, SBEAP, and ReTAP also presented information. Over 90 people attended this half-day event and over 90% of the people who responded to the survey were satisfied with the event's content and structure.

# MnTAP's 2011 Special Projects

## Projects Started or Completed in 2011

| Project & Funding  | Highlighted Activities  |
|--|---|
| Implementing an Industrial Energy Efficiency Program (Phases I and II)<br><i>U. S. Department of Energy,<br/>Mn Dept of Commerce</i> | Completed Phase I, reported out results, conducted follow-up with companies engaged in the project, and kicked off Phase II. Companies engaged in the project have implemented over \$763,000 in energy savings in 2011.  |
| Pollution Prevention and Energy Efficiency for the Lodging Sector<br><i>U.S. EPA Region V</i>  | Completed the project which included conducting on-site assessments at 28 properties and complete a full benchmarking report of each facility's utility use.  |
| Lean & Energy in Industrial Facilities<br><i>Center for Energy &amp; the Environment</i>   | Provided clients with best practices, Lean principles, and Kaizen events to encourage implementation of energy efficiency and pollution prevention opportunities.   |
| Energy Efficiency of Wastewater Treatment<br><i>U.S. EPA Region V</i>  | Providing energy efficiency assistance to Minnesota's wastewater treatment plants through on-site demonstration pilot projects and energy assessments.  |
| Reducing Solid Waste in Surgical Centers<br><i>U.S. EPA Region V</i>   | Assisting the surgical departments at the Mayo Surgical Center in Rochester with reducing the use and disposal of blue wrap by using sterilization containers and researching the relative life cycle environmental impacts of hard case sterilization containers and blue wrap.    |
| Event Center Food Waste Reduction<br><i>U.S. EPA Region V</i>  | Developing and demonstrating opportunities for a food waste management plan for an event center in Dakota County, Minnesota, and using the results to develop a replication model that could be used by event centers statewide.  |
| Reducing Styrene Emissions from FRP<br><i>U.S. EPA Region V through the MPCA</i>   | The goal of the project, which started in late 2011, is to work with companies on implementing non-styrene resins to reduce styrene emissions by over ten tons. A key activity in 2012 will be to assist manufacturers with trialing non-styrene resins in their current processes. |

## Projects Completed Prior to 2011 but with Continuing Implementation / Activities

| Project & Funding  | Highlighted Activities   |
|--|--|
| Researching Energy Conservation Potential<br><i>Mn Dept of Commerce,<br/>Office of Energy Security</i> | Researched and developed reports to help set the stage for major industrial energy conservation efforts within the State. Reports to utilities are being used in the development of utilities' three-year CIP plans.   |
| P2 and E2 for the Metal Fabrication and Machining Sector<br><i>U.S. EPA Region V</i>                   | Worked one-on-one with metal fabricators. Implementation has saved companies nearly \$182,000 and reduced 528,000 lbs of waste, 4.6 million gallons of water, 1.3 million kWh, and 6,200 therms since 2008.  |
| Pollution Prevention for Non-Hospital Healthcare Facilities<br><i>MPCA (U.S. EPA Region V)</i>         | In 2009, partnered with MPCA to provide regulatory and P2 information to non-hospital healthcare clinics in Minnesota. In 2011, hits to the Web pages totaled nearly 20,000 and new information, such as Green Star Facilities, were uploaded to the Web site. |

# Implementing an Industrial E2 Program

## 2011 Outputs

- 20 site visits
- 17 team meetings
- 81 calls/emails
- 697 contacts surveyed
- 380 companies engaged

## 2011 Outcomes

- 9.65 million gallons of water
- 1.8 million kWh
- 800,000 therms
- \$763,000

## What they said...

“MnTAP brought things to light; they provided information and feedback in areas that are not our expertise.”

--Lester Tessum,  
Plant Manager at PM Beef

## Sponsor

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

## Project Overview

As part of Phase I of this project, MnTAP 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 I, funded by the U.S. Department of Energy (DOE) and in partnership with the Minnesota Department of Energy Resources, began in 2010 and included trainings, assessments, an intern, technical assistance, technology demonstrations, and implementation assistance. MnTAP has recently initiated work on Phase II of the project, made possible through additional funding from the U.S. DOE through the Minnesota Department of Commerce.

## Total Project Results to Date

The following table highlights the results from Phase I implementation. Average implementation rate is 25%, with expectations that it will grow as projects continue to be implemented by facilities. A total of nearly \$900,000 in savings has been achieved by companies participating in the assessments.

| Assessment Type       | % Implemented | Potential Savings  | Implemented Savings |
|-----------------------|---------------|--------------------|---------------------|
| Compressed Air (7)    | 16%           | \$233,000          | \$79,000            |
| Steam (5)             | 177%          | \$581,000          | \$692,000           |
| Fan (5)               | 0%            | \$6,623,000        | \$19,000            |
| TA (2) and Intern (2) |               |                    | \$71,000            |
| ISU-IAC and CEE (7)*  | 33%           | \$124,000          | \$39,000            |
| <b>Total</b>          | <b>25%</b>    | <b>\$7,561,000</b> | <b>\$900,000</b>    |

\*Iowa State University Industrial Assessment Center (ISU-IAC) and Center for Energy and the Environment (CEE)



## Project Success: PM Beef

PM Beef in Windom is a privately held beef packing facility. Facility representatives attended the steam assessment training coordinated through the U.S. DOE project and then participated in a facility audit. To continue the momentum started through the training and subsequent audit, MnTAP attended seven of the energy management team’s meetings in 2011 that included management and staff from the maintenance department at PM Beef as well as representatives from the natural gas company. During team meetings, MnTAP helped team members prioritize recommendations from the facility audit and develop project ideas to reduce PM Beef’s energy use and wastewater. Several projects were completed in 2011 that are expected to result in reduced annual thermal energy use by approximately 172,000 therms and annual water use by 3.5 million gallons. Annual savings from these projects tops \$114,000; additionally, PM Beef received a \$1,000 one-time rebate from Minnesota Energy Resources Corp.

# Pollution Prevention & Energy Efficiency for Lodging Facilities

## 2011 Outputs

- 12 site visits
- 33 calls/emails
- 19 different facilities
- 1 intern project

## 2011 Outcomes

- 10,000 lbs waste
- 490,000 kWh
- 260,000 therms
- \$164,000

## What they said...

“The impact of the MnTAP study has been amazing. We immediately began to implement some suggestions, but when we received a company-wide report, it clearly identified what a huge impact our organization could make on our operations and our communities.”

-- Pete Bromelkamp, VP, Associate Training & Development at TPI

## Sponsor

U.S. EPA Region V

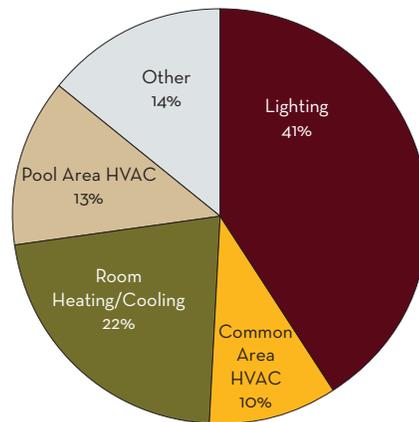
## Project Overview

The increased growth and environmental impact of lodging facilities provide potential for significant improvements in pollution prevention practices in the hospitality industry. Therefore, MnTAP spent 18 months working with lodging facilities in Minnesota to identify opportunities to reduce waste, resulting in an increase in energy efficiency, reduction in water use, and reduced solid waste while saving money and improving community and employee health. The grant-funded project ended in September 2011.

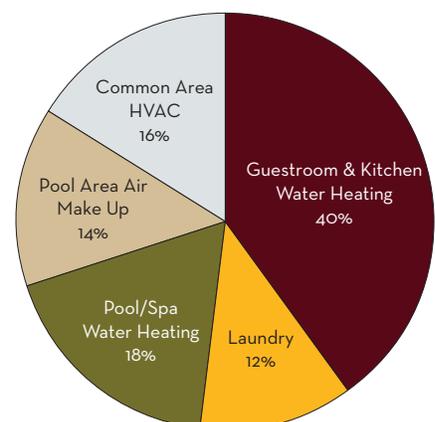
## Average Footprints for Mn Hospitality Facilities

MnTAP used data collected during the grant project to develop energy and water use footprints specific to Minnesota properties. While this type of data exists in other regions of the country, data specific to Minnesota was not available. These state-specific footprints are important as they consider variables typical to this region such as indoor pools, extreme temperature shifts, etc. Energy use footprints can be used to prioritize energy reduction projects in facilities by focusing on hotel operations that use the largest percentage of energy.

Electric Footprint



Natural Gas Footprint



## Project Success: Torgerson Properties Inc.

Torgerson Properties, Inc. (TPI) develops, builds and manages hotels and restaurants throughout greater Minnesota and Florida. In 2010, TPI agreed to have MnTAP conduct site assessments at 26 of the 27 TPI properties in Minnesota to identify waste reduction and energy efficiency opportunities. Easily implementable opportunities were presented to each facility following the visit. Further research was conducted on larger capital investment projects and presented to TPI and included in a company-wide report. MnTAP also used two years of utility data to develop benchmarks and energy use footprints for each facility. The energy footprints were compiled to develop an average footprint for Minnesota properties, which previously did not exist. The data was also entered into the EnergySTAR benchmarking program and the results indicate that five properties are potentially eligible for certification. Overall, TPI could realize savings of 5.8 million kWh; 460,550 therms; 4.3 million gallons of water; 418 tons of solid waste; and nearly \$710,000 in annual savings following implementation of recommendations made.

## Lean and Energy in Industrial Facilities

### 2011 Outputs

- 6 site visits
- 3 calls/emails
- 3 different facilities

### 2011 Outcomes

- 3.03 million lbs waste
- 133,400 kWh
- \$447,000

### What they said...

"The expertise in lean methods along with green technology development that both MnTAP and Enterprise Minnesota brought to our company complimented the process knowledge that already existed."

-- Dave Olson, Director of Engineering at Jones Metal

### Sponsor

Xcel Energy through Center for Energy and the Environment

### Project Overview

MnTAP partnered with the Center for Energy and Environment and Enterprise Minnesota to identify opportunities and implement changes that can reduce energy use and waste at three industrial facilities. The project utilized Value Stream Mapping to develop a comprehensive plan to prioritize actions to measure and improve operations. Rapid improvement events were used to implement changes and verify the results. This project ended in early 2011.

### GreenLean<sup>SM</sup> Means Savings, Improvements

As part of this project, Enterprise Minnesota studied the effects of the GreenLean<sup>SM</sup> process with MnTAP and has shown that, on average, another 30% reduction in costs can occur by incorporating a sustainability element in the lean process.



### Project Success: Jones Metal Inc.

Jones Metal Products, Inc. of Mankato offers a variety of metal components for dozens of partners and customers. To further improve the company's Lean performance, the company wanted to generate traditional Lean projects that incorporated green practices and sustainability initiatives to reduce energy, water, and material use. A team of employees identified focus areas for the GreenLean<sup>SM</sup> project including the paint kitchen and facility-wide energy efficiency. As a result of this project, the company implemented a cost-effective solvent recovery system and is realizing over \$10,000 in annual savings. The facility also lessened the regulatory burden and is able to report less generation through a Recycled Waste exemption. Additionally, the company has reduced energy use, set-up time, work-in-progress (WIP) inventory, and ultimately production lead time. The GreenLean<sup>SM</sup> process made them more capable of meeting customer timelines and allowed the facility to add operational capacity, which enabled Jones Metal to hire an additional 40 employees during 2011 to meet customer orders.

# Energy Efficiency of Wastewater Treatment Plants

## 2011 Outputs

6 site visits  
1 intern  
5 different facilities  
49 survey respondents

## 2011 Outcomes

41,000 kWh  
\$2,600

## Sponsor

U.S. EPA Region V

## Project Overview

Through this project, the Minnesota Technical Assistance Program (MnTAP) will provide energy efficiency assistance to Minnesota's wastewater treatment plants. MnTAP will provide on-site demonstration pilot projects and energy assessments to help wastewater treatment plants understand, identify, and implement energy efficiency opportunities. This project started in May 2011 and continues through May 2013.

## 2011 Project Activities

The MnTAP team working on this project accomplished the first few tasks in 2011, as detailed below.

### Outreach to Facilities

Once MnTAP had identified wastewater treatment plant contacts, we sent a postcard describing the project to 174 plants. The response from this postcard, as well as information sent via e-newsletters and through associated organizations (Wastewater Treatment Operators Association) was tremendous. A survey was then sent asking facilities for more information and for their level of interest in the project. In total, 49 surveys were returned, some from vendors and some from partner utilities, and the remaining from wastewater treatment plants.

### On-Site Assessments

Four of the 10 scheduled assessments were conducted in 2011. These assessments were conducted by MnTAP staff members and focused on identifying energy use as well as energy efficiency opportunities.

### Future Plans

The MnTAP team will be conducting an additional six on-site assessments, coordinating a DOE training, and working with facilities on implementation. An additional intern project may also be supported by this project.



## Project Success: City of Rogers Wastewater Treatment Plant

From 1996 to Summer 2011, the wastewater treatment facility in the City of Rogers had largely been operated the same way; the oxidation ditches that drive their activated sludge process had limited controls, but were set at an operating point that allowed them to treat wastewater by using the same settings for day and night, regardless of loading fluctuations. While the facility received several awards over this period for maintaining pristine effluent quality, the public works superintendent suspected that the ditches may be using more electricity than needed. Therefore, a MnTAP intern investigated the energy efficiency of the oxidation ditch rotors and identified a new control scheme that would lower energy use by better controlling the rotational speed to match incoming waste loadings. In total, he identified projects that would save the City of Rogers \$15,000 in electric costs and 240,000 kWh annually. Since the project's completion, the City has already realized energy savings by implementing the optimal control setpoint supported by the current equipment and has installed two new floating pond aerators.

## Reducing Solid Waste in Surgical Centers

### 2011 Outputs

3 site visits  
35 calls/emails

### Sponsor

U.S. EPA Region V

### Project Overview

MnTAP's goal for this project, which started in October 2011, is to assist the surgical departments at the St. Mary's Surgical Center, an affiliate of the Mayo Clinic in Rochester, with reducing the use and disposal of blue wrap by using reusable sterilization containers. Part of the grant funding will be used to procure the hard sterilization cases for the surgical center. Additionally, MnTAP is partnering with a University of Minnesota professor to supervise a student who will conduct research to evaluate and quantify the relative life cycle environmental impacts of hard case sterilization containers and blue wrap. This student will be conducting the study in the summer of 2012.

### 2011 Project Activities

The MnTAP team working on this project accomplished the first few tasks in 2011, as detailed below.

#### Initial Site Visit

MnTAP staff visited the St. Mary's Surgical Center to review surgical records and meet with staff members to determine the number and size of cases required by the Center. The goal of this visit was to complete a pre-assessment walk-through and discuss project plans with facility staff members.

#### Life Cycle Assessment Pre-Work

While the student intern will work on the life cycle environmental impacts during Summer 2012, MnTAP guided pre-work in this area during the Fall semester of 2011. MnTAP worked with students in Professor Jason Hill's Environmental Life Cycle Analysis course (ESPM 5603) to develop a preliminary life cycle assessment that will be a starting point for the summer intern.



### Project Inspiration: St. Luke's Hospital

The current blue wrap waste project is based upon the success of an intern project from 2008. The project was conducted at St. Luke's Hospital in Duluth to determine the feasibility of replacing blue wrap with sterilization containers. Healthcare facilities incur considerable expenses annually to purchase blue wrap. Additional expenses are incurred when disposing of blue wrap. During the project at St. Luke's, a MnTAP intern conducted a cost and disposal analysis for the purchase of hard cases. Each hard case offset blue wrap purchase and disposal costs by approximately \$390 and reduced, on average, 50 pounds of waste annually. In that study, the intern found that each hard case cost about \$400 and provided a return on investment of just over one year. It was determined that by purchasing an additional 224 sterilization containers, St. Luke's can reduce blue wrap waste by 5.4 tons, reduce lead-contaminated indicator waste by 22.4 pounds and save almost \$100,000 annually.

# Event Center Food Waste Reduction

## 2011 Outputs

- 1 waste sort (2-day)
- 1 site visit
- 1 city-wide meeting
- 50 calls/emails

## Sponsor

U.S. EPA Region V

## Project Overview

MnTAP initiated this project in October 2011. The goals are to develop and demonstrate opportunities for food waste management for an event center in Dakota County, Minnesota. This specific area of the State was chosen because a residential food compost site currently exists within the County and has the potential to accept commercial waste. According to the County, in 2009 214,888 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. The results from this project will be used to develop a replication model that could be used by event centers statewide.

## 2011 Project Activities

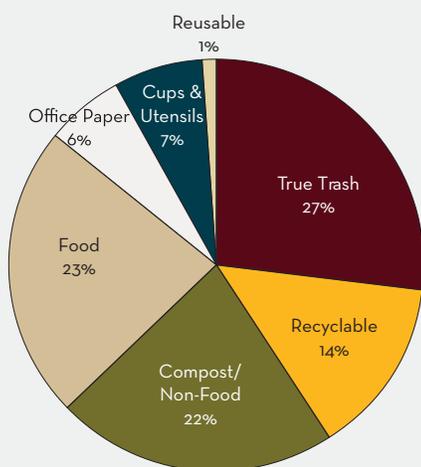
The MnTAP team working on this project accomplished the first project task in 2011.

## Event Center Waste Sort

MnTAP identified project partners and selected an event center in Eagan at which to conduct the waste sort. The selection process included inventorying facilities within the City then completing an evaluation by MnTAP staff, City of Eagan officials, and a recycling expert from Dakota Valley Recycling. In December 2011, MnTAP staff members conducted a waste sort. The community center collected and labeled all waste generated by day of the week and facility area. All garbage was sorted into several categories to provide specific data that could be used to determine if implementing a composting or food-to-hogs program would make a difference in the waste stream sent to the landfill.

## Future Plans

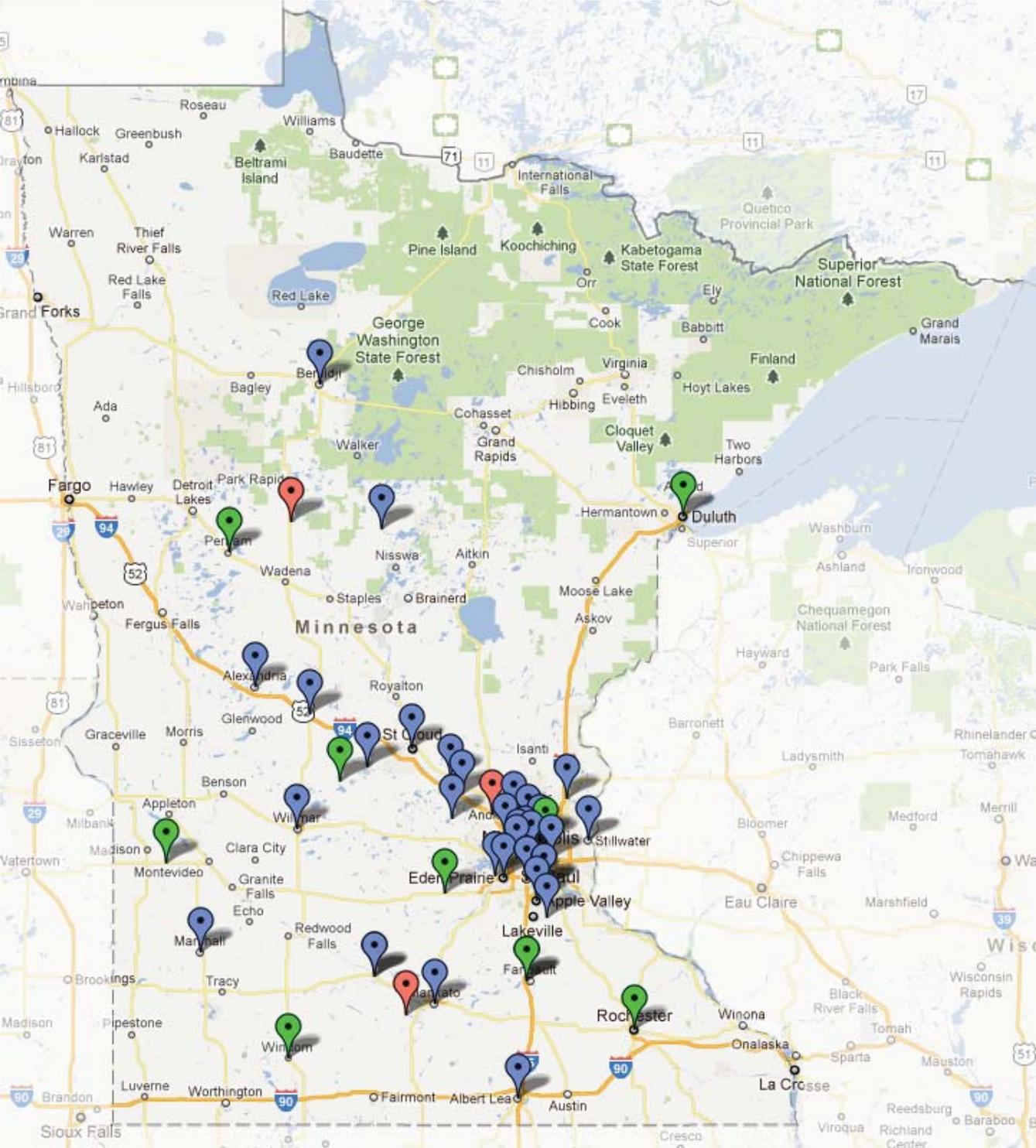
The project team will use the data from the waste sort, annualize it to give the City staff members information regarding total annual waste currently sent to landfill and discuss opportunities for beneficial reuse. Following that report-out, MnTAP may coordinate a trial at the facility where organic material will be sent to beneficial reuse. Results will be presented in an open meeting and other event centers will be invited to participate.



## Project Results: Event Center Waste Sort

Following the two-day waste sort at the event center, the results indicate that roughly 45% of the waste could be diverted to a compost facility. An additional 7% could also be composted if the facility began using compostable cups and utensils. Nearly 20% of the waste sorted (office paper and recyclable materials) is able to be recycled. Should the facility implement a composting program and recycle all recyclable materials, nearly 73% of the current waste could be diverted from the landfill. These results are being presented to the center along with recommendations for reducing waste sent to the landfill.

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



 Teams

 Intern Projects

 Site Visits

## Interaction Summary (Calls, Interns, Team Meetings, and Site Visits)

| NAICS        | Business Type                            | Calls/<br>Emails | Intern<br>Projects | Team<br>Meetings | Site Visits  |                          |
|--------------|--|------------------|--------------------|------------------|--------------|--------------------------|
|              |  |                  |                    |                  | Total Visits | Individual<br>Facilities |
| 221          | Wastewater Treatment Plants / Utilities  | 20               | 2                  | 0                | 10           | 6                        |
| 311/312      | Food processing                          | 76               | 1                  | 75               | 12           | 6                        |
| 321/337      | Wood Products                            | 17               | 0                  | 0                | 3            | 2                        |
| 322          | Paper manufacturing                      | 3                | 0                  | 0                | 1            | 1                        |
| 323          | Printing/publishing                      | 4                | 0                  | 0                | 0            | 0                        |
| 325          | Chemical manufacturing                   | 18               | 1                  | 0                | 13           | 2                        |
| 326          | Plastics & rubber                        | 16               | 2                  | 0                | 17           | 3                        |
| 327          | Concrete and/or stone manufacturing      | 3                | 0                  | 0                | 4            | 2                        |
| 331          | Primary metal manufacturing              | 24               | 0                  | 0                | 4            | 4                        |
| 332          | Fabricated metal products                | 65               | 1                  | 0                | 18           | 8                        |
| 333          | Machinery manufacturing                  | 35               | 0                  | 0                | 12           | 3                        |
| 334          | Computer & electronics                   | 18               | 0                  | 0                | 2            | 2                        |
| 335/336      | Transportation equipment                 | 8                | 0                  | 0                | 0            | 0                        |
| Various      | Miscellaneous manufacturing / businesses | 24               | 0                  | 0                | 3            | 3                        |
| 541          | Prof, scientific, & technical services   | 18               | 0                  | 0                | 1            | 1                        |
| 561          | Waste mitigation and/or management       | 9                | 0                  | 0                | 1            | 1                        |
| 611          | Education                                | 3                | 0                  | 0                | 0            | 0                        |
| 621-624      | Health services                          | 15               | 0                  | 10               | 1            | 1                        |
| 721          | Hotels / motels                          | 35               | 1                  | 0                | 15           | 10                       |
| 811          | Repair & maintenance facilities          | 6                | 0                  | 0                | 2            | 2                        |
| 812          | Cleaners / laundries                     | 3                | 0                  | 0                | 1            | 1                        |
| 999          | Anonymous                                | 13               | 0                  | 0                | 0            | 0                        |
| 921/928      | Government programs                      | 20               | 0                  | 0                | 1            | 1                        |
| <b>TOTAL</b> |  | <b>453</b>       | <b>8</b>           | <b>85</b>        | <b>121</b>   | <b>59</b>                |