# ASSESSING THE OPPORTUNITY AND BARRIERS FOR WATER CONSERVATION BY PRIVATE INDUSTRIAL WATER USERS

***FOR THE TWIN CITIES METROPOLITAN AREA***

METROPOLITAN COUNCIL

January 2014


CLEAN
WATER
LAND &
LEGACY
AMENDMENT

A final report detailing the development and execution
of all the project assistance deliverables from December 9, 2011 to December 31, 2013.

Submitted by
**Minnesota Technical Assistance Program (MnTAP)**
University of Minnesota EFS 3003-11174-00028407
under contract with
**METROPOLITAN COUNCIL (MCES)**
CONTRACT NUMBER 11 I076

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## Introduction

Private industrial water users have water supply allocation permits administered by the Minnesota Department of Natural Resources (DNR). A water use permit is required for all water users in Minnesota withdrawing more than 10,000 gallons of water per day, from surface or groundwater, or one million gallons per year. The permits limit the maximum amount of water withdrawn annually.

According to the DNR water use data, Industrial water consumers use approximately 101 billion of gallons/year. Approximately 75% of withdrawals are from surface water sources.[1]

This project supported the intent of the Metropolitan Council to better understand the industrial water use needs of private well water users in an eleven county area including Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright counties. Through this project, the Metropolitan Council and MnTAP worked to identify opportunities for industrial water conservation as well as factors that motivated implementation of operational changes to capture water conservation savings. The project helped to fill an existing knowledge gap in water conservation data in the metropolitan area. Data gained from this project will be used in water supply planning projections for the metropolitan area. Private industrial water users received site-specific water conservation recommendations and will continue to be followed up with through at least 2015 to see if additional assistance is useful.

This final report documents the entire series of tasks identified in the original contract, or as otherwise amended:

Task 1. Survey Private Industrial Water Users

Details, analysis and conclusions found in a separate survey report.

Task 2. Conduct Industrial Water Use Onsite Assessments

Task 3. Intern Project

Task 4. Compile and Share the Results

Each task and its relationship with the other tasks is elaborated on in detail in the following sections. Notes on administrative details are inserted where appropriate.

[1] Minnesota Department of Natural Resources website *Water use - Water Appropriations Permit Program*, http://www.dnr.state.mn.us/waters/watermgmt_section/appropriations/wateruse.html

*Table 1:*

**Project activities and timelines.**

| Project timeline | | |
|---|---|---|
| | **Activity** | **Date** |
| **Task 1 Survey** | Project award start date | December 9, 2011 |
| | Survey questions developed | By February 23, 2012 |
| | Pre-survey email sent | March 12, 2012 |
| | Survey emailed | Beginning March 19, 2012 |
| | Reminder emails sent | Beginning April 2, 2012 |
| | Submitted surveys received | March 19 to August 23, 2012 and one additional survey obtained March 7, 2013 |
| | Survey report originally submitted<br>Report resubmitted to correct ADA formatting | December 20, 2013<br><br>January 2, 2014 |
| **Task 2 Assessments** | Follow up on survey requests for assessments | Beginning July 25, 2012 and concluding July 8, 2013 |
| | Assessment report template example provided | September 21, 2012 |
| | Follow up on assessment report receipt, questions, implementation | On-going |
| **Task 3 Intern projects** | Reminder to surveyed of intern project interest | Beginning January 10, 2013 |
| | Candidate facility applications | January 12, 13, and 22, 2013 |
| | Intern projects confirmed | February 15, 2013 |
| | Project start dates | May 28 and June 3, 2013 |
| | Project public presentations | August 22, 2013 |
| **Task 4 Reporting and Sharing** | Monthly summaries in agreed upon template<br><br>Reporting template modifications incorporated to conform to Americans with Disabilities Act compliance<br><br>Additional template update | Every month beginning February 28, 2012<br><br>Beginning January 1, 2013<br><br>August 29, 2013 |

| | | |
|---|---|---|
| | Contract adjustments approved to reduce assessment goal and increase intern project goal | February 27, 2013 |
| | Update meetings | January 11, 2012<br>February 17, 2012<br>May 15, 2012<br>November 29, 2012<br>July 11, 2013 |
| | Participation in White Bear Lake water conservation public forum showcasing project | July 16, 2013 |
| | MnTAP SOURCE article featuring MCES project | 2013 Issue I – sent in August 2013 |
| | MnTAP ***SOLUTIONS*** booklet highlighting intern projects | December 12, 2013 |
| | Final report submitted | January 2, 2014 |

## Task 1. Survey Private Industrial Water Users

Five hundred thirty-four survey candidates were assembled from the DNR State Water Use Data System (SWUDS). Table 2 below compiles a list of industry sectors among the industrial private well water users in the target eleven county metro area.

MnTAP staff refined the industrial water conservation targets by eliminating industries that would not have the potential to adjust their dependence on water. Water dependent processes like agriculture and other irrigation and landscaping use applications were removed from the target list since well water use would fluctuate as a function of seasonal weather, and not reduction opportunities. Among these were cemeteries, educational services, floriculture production, golf courses, athletic fields, nurseries, orchards, and sod farms. An additional refinement to the survey list eliminated a small number of water use sources that did not come from groundwater wells, including dug pits and gravel pits.

The SWUDS data was normalized and collated to help with verification of addresses and 5-digit zip codes, to add potential contact individuals, and to add email addresses, which were largely absent from the SWUDS information. The final list comprised 84 candidate companies to receive the water use survey.

### *Survey process*

The project survey by email was conceived to develop information on opportunities and barriers to private well water use by industry. Beginning in March, 2012, a survey pre-notice was emailed to candidate company contacts identifying the grant award details, objectives, water conservation resource information, and contact information (***Appendix A***).

A subsequent email with the interactive survey formatted through the on-line Internet survey tool SurveyMonkey™<https://www.surveymonkey.com/> was sent shortly after (***Appendix B***) and (***Appendix C and C1)***. Reminder emails were also sent (***Appendix D***).

The original email survey was designed to take approximately 10-15 minutes to complete in order to maximize the potential participation and responses. The original survey answers depended on who the survey contact was and who else may have contributed information to complete the survey answers.

The survey response rate is summarized in Table 2 and indications of interest in assistance summarized in Table 3.

### *Table 2:*

**Survey response rate.**

| **Survey response results** | | |
|---|---|---|
| Number of candidate companies | Surveys returned | Survey response rate |
| 84 | 33 | 39% |

*Table 3:*

**Indications of assistance interest from surveyed parties.**

| Survey response categories | | | |
|---|---|---|---|
| Interested in water conservation assessment | Interested in a water conservation intern | Unsure about either assistance offering | Not interested in assistance offerings |
| 12 | 14 | 17 | 15 |

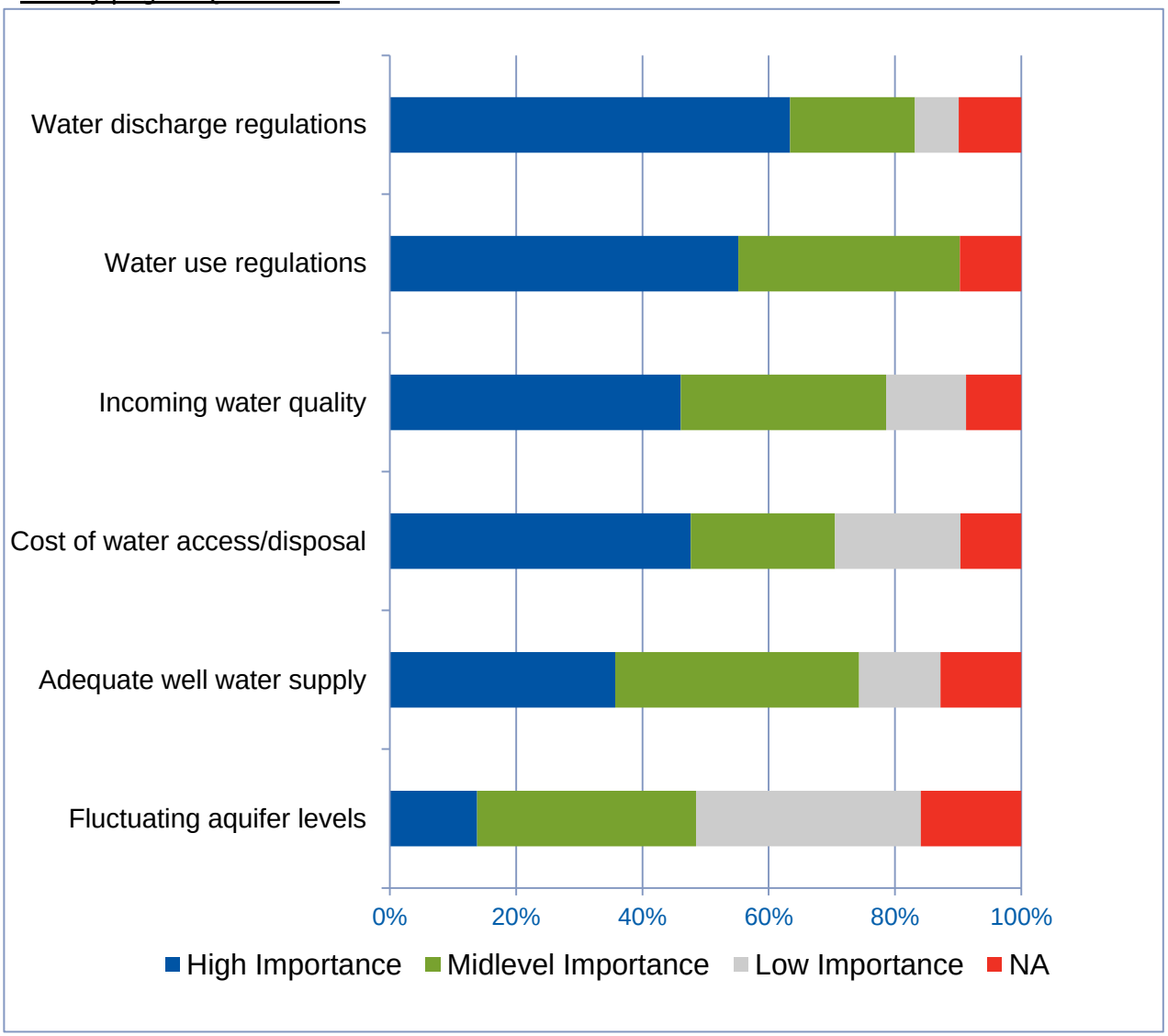
## *Compiled results*

Detailed information about the survey responses, the follow up questions and responses and analysis and conclusions are found in the separate survey report. Select insights into issues and concerns and water conservation initiatives offered by respondents are reproduced from the survey report in Graphs 1 and 2 below.

*Graph 1:*

**Please score these topics in order of concern to your facility as they relate to industrial water use processes.**

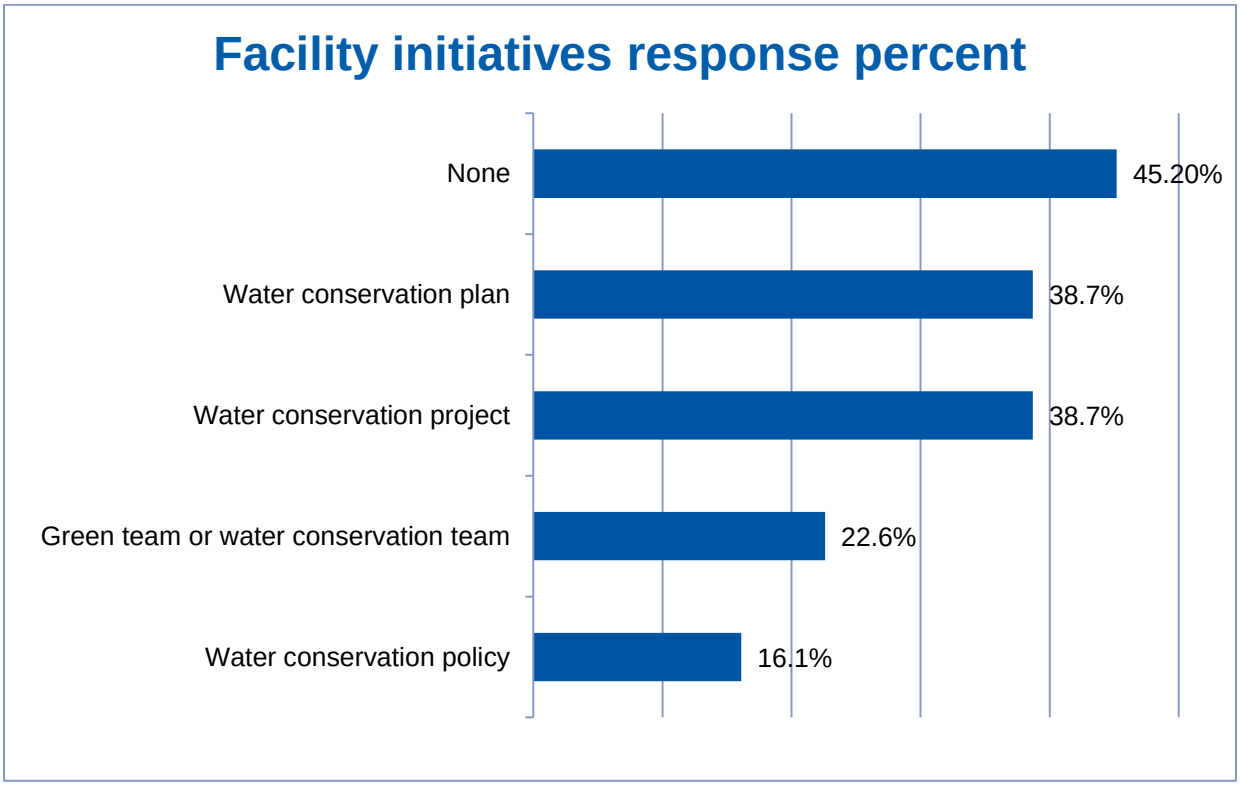
Survey page 5 Question 1.



*Graph 2:*

**Does your facility have any of the following in place currently? Select all that apply.**

Survey page 5 Question 3.




Additional follow up questions related to survey responses, as well as new questions were incorporated into phone follow up with ten company contacts receiving and completing the survey. Answers to these questions were presumed to be more impromptu and potentially less accurate or informed than the original survey answers. The responses were from notes taken during the interviews and interpreted and condensed. The following table capsulizes the responses to the follow up questioning.

*Table 4:*

**Survey follow up questions summary.**

| Survey Report Tables | Question | Summary |
|---|---|---|
| 9 | Does your business monitor water **quality** daily/monthly/annually? | 8 responses:<br>Some highly detailed testing, some not testing |
| 10 | Does your business have an **environmental policy** related to water? | 9 responses:<br>Mostly positive, some generic inclusions in other goals |
| 11 | Is it anticipated that your business will **investigate water reuse opportunities in the future? If yes, what opportunities might those be?** | 9 responses:<br>Largely yes, some uncertainty |
| 12 | How much water **do your processes use** per day/month/year? | 8 responses:<br>Range from no to 450,000g/day |
| 13 | Is the cost of water **treatment** an important criterion for business decision-making? | 9 responses:<br>Largely no |
| 14 | Is the **energy spent** on heating or cooling water for industrial processes a significant business expenditure? | 9 responses:<br>Mixed |
| 15 | Who does your business **rely on or trust** for water treatment information:<br>consultants, vendors, state agencies, industry trade groups, academics, peers…. | 9 responses:<br>Vendors often mentioned |
| 16 | Has your business **changed, added, or removed industrial processes** because of:<br>an increase or decrease in industrial **production** rates? | 7 responses:<br>Largely no |
| 17 | Has your business **changed, added, or removed industrial processes** because of the water treatment system is **too expensive or difficult** to operate? | 5 responses:<br>Largely no |
| 18 | Has your business **changed, added, or removed industrial processes** because of the water **quality** of the water supply has changed over time? | 7 responses:<br>Largely no |
| 19 | If your business needs additional water, would another **private well be installed**? Or would a connection to a **municipal water supply be sought**? Why or why not? | 9 responses:<br>Mixed answers |
| 20 | What state, regional, and local agencies is your business aware of that are involved with water? | 7 responses:<br>Varied |
| 21 | Is your business located within a Source Water Management Area? | 9 responses:<br>Unknown or unsure |

Facilities were chosen for this survey based on expectations that their industrial processes would have reasonable water conservation opportunities. Outreach was meant to frame a positive outcome for any level of participation- either an assessment, the possibility of a sponsored intern, or at the very least additional information and assistance from MnTAP. The survey report outlines a number of conclusions based not only on the survey responses, but also on the concurrent assessment work, and development and completion of the three intern projects.

Factors that motivate implementation of operational changes to capture water conservation savings vary across industries. Process needs, the perceived value of the water resource, and the operational constraints of keeping water-use costs under control all contribute to the priority given to these projects.

Twelve electronic survey respondents self-selected interest in having a MnTAP staff water conservation on site assessment.

## Task 2. Conduct Industrial Water Use Onsite Assessments

Task 2 called for ten water conservation assessments at industrial well water users conducted by MnTAP technical staff. Twelve survey respondents indicating positive interest, and an additional ten indicating possible interest were followed up with to discuss moving forward on assessment opportunities.

Based on conversations, conflicts, information sensitivity, and schedules, a subset of facilities able to participate in the assessment assistance was developed and scheduling begun. After finishing five onsite visits by December 2012, it became apparent that completing the remaining five water conservation assessments was going to pose some difficulty with the identified candidate pool.

In February, 2013, MnTAP proposed a contract change (***Appendix E***) reducing Task 2 numeric assessment goals from ten to six, and increasing the intern project goal from one to three. This proposal was approved by email from Brian Davis, Metropolitan Council Environmental Services (MCES) Project Manager, on February 27, 2013 (***Appendix E1***).

Two additional assessments previously in negotiations were subsequently conducted on May 15 and July 8, 2013 for a total of seven. An example assessment report template is found in (***Appendix F***)

Seven assessments were ultimately conducted between July 25, 2012 and July 8, 2013. The companies included six varied food-related facilities, and a metal fabrication facility. The following table describes the variety of opportunities discovered during the assessments.

*Table 5:*

**Aggregated water conservation assessment opportunities.**

| Water conservation potential opportunities |
|---|
| Cleaning water reuse |
| Transport water efficiency improvements |
| Last stage clean-in-place/sanitation water reuse in earlier stage(s) |
| Condensate water capture and reuse |
| Well shaft lubrication water adjustment |
| Washing system adjustments to reduce flow |
| Recirculating non-contact cooling water |
| Using mechanical cleanup first to reduce wet cleanup |
| Redirect heated water to needed processes |
| Improve boiler feedwater |

All seven site assessments identified water conservation opportunities, and often also included discussions related to energy, process, and labor efficiency improvement potentials. In one case, the opportunities represented upwards of 50% reduction in water use. Estimates of water use reduction potential were made whenever possible and were derived from operational data, or from facility estimates. Six of the seven assessments were able to quantify water savings potential. One assessment was not quantified due to lack of comparative information.

Where estimates were made, implementing the identified water conservation opportunities would result in a conservative annual savings of over 71.9 million gallons of water[2]. Follow up since the assessments has confirmed implemented water savings estimates from repairing leaks and transport efficiency improvements. These improvements were not originally included in the assessments and total an additional 5.7 million gallons of water.

Follow up with each of the seven assessed facilities will be conducted for at least a two year period. With additional technical assistance, and follow up encouragement, implemented water savings is anticipated to increase substantially.

## Task 3. Intern Project

MnTAP has been offering an intern program to support pollution prevention, energy and process efficiency, and water conservation projects at Minnesota businesses and industries since the mid

[2] Where a range of savings was estimated, the lower amount of the range is used for this total.

1980's. Documentation in the form of the final project presentation, project summary, or other publication is available for select projects at: http://mntap.umn.edu/intern/pastproj.htm.

Fourteen survey respondents were interested in an intern. To encourage their participation an email reminder with application details was sent beginning January 10, 2013 (***Appendix G).*** A preliminary step in the MnTAP intern project application process is a scoping visit by MnTAP technical staff in order to understand the objectives and help design a focused project. The seven onsite water conservation assessments conducted in 2012 met this requirement in order to add candidate projects to the selection pool. With the approval of the February 2013 project revisions, MnTAP was able to include two additional intern projects to meet the overall MCES project goals. Three intern projects were identified and formalized from the five assessments conducted in 2012.

In recent years, intern project awards have been contingent on the company providing a $2,500 educational stipend for the student upon successful completion of the project. Of the three intern projects sponsored through this project, the stipend cost for one project was covered and the other two projects paid the stipend.

The projects were conducted at the following companies

- Northern Star Company (Michael Foods Inc.) in Chaska, MN
- Gedney Foods Company, Chaska, MN
- Federal Cartridge Company, Anoka, MN

As with all MnTAP intern projects, the three sponsored projects agreed to have certain project findings and recommendations disclosed and published. The approved executive summary for Northern Star Company is found in (***Appendix H)***; Gedney Foods Company (***Appendix I)***; and Federal Cartridge Company (***Appendix J).***

All the executive summaries for the 2013 MnTAP intern program are in a booklet format publication titled ***Solutions.*** Print copies are available in limited quantities. ***Solutions*** was made available electronically on the MnTAP website on December 10, 2013.

The following table identifies the water conservation impacts and status of the three intern projects that concluded in late August, 2013.

*Table 6:*

**Intern project results.**

| **Northern Star Company** | **Annual water savings** | **Status** |
|---|---|---|
| Lower water level in potato washer | 2.8 million gallons | Completed |
| Replace float in basket washer | 6.7 million gallons | Completed |
| Reduce peeler exhaust spray time | 93,000 gallons | Completed |
| Replace leaking solenoid | 1.4 million gallons | Completed |
| Reuse RO reject water | 5.25 million gallons | Completed |
| Reuse scrubber water | 8.25 million gallons/ scrubber | Recommended |
| Install auto fill valves on pump tanks | 4.2 million gallons | Recommended |
| Optimize surge bin water level | 1.9 million gallons | Recommended |
| **Gedney Food Company** | **Annual water savings** | **Status** |
| Reroute pasteurizer overflow | 3.08 million gallons | Planned |
| Reuse fermentation tank brine | 214,500 gallons | Testing in progress |
| Reduce salt storage level | 383,000 gallons | Testing in progress |
| Reduce fermentation and salt storage level | 543,200 gallons | Testing in progress |
| Fix water leaks | 2.22 million gallons | Planned |
| **Federal Cartridge Company** | **Annual water savings** | **Status** |
| Timed rinse faucets | 2.8 million gallons | In progress |
| Wash tub spray nozzles | 173,000 gallons | In progress |
| Effluent recycle | 1.75 million gallons | In progress |
| Automatic shut-offs | 778,500 gallons | In progress |
| Chiller Installation | 54,750 gallons | Recommended |

The recommendations already implemented total annual water savings of 16.24 million gallons. Fully implementing recommendations not yet completed would add another 26.34 million gallons for a total water savings estimate of 42.58 million gallons per year.

## Task 4. Compile and Share the Results

Sharing the project progress and results took several forms. Monthly summaries capsulized current and anticipated activities under each of the four tasks in a tabular format as shown in the example below:

| **MnTAP *month* 2013 MONTHLY PROGRESS REPORT** | | | |
|---|---|---|---|
| **Task # 1. Survey Private Industrial Water Users** | | | |
| | Task Description | Progress to Date (*month start – month end*) | Anticipated Progress (*following month start - end*) |
| | | | |

*Table 7:*

**Face-to-face meetings and discussions with various MCES and MnTAP staff.**

| | Date | Topics |
|---|---|---|
| | August 16, 2011 | Pre-project award brainstorming and strategizing meeting |
| | January 11, 2012 | Project kickoff; staff introductions, discussion of timeline, project expectations |
| | February 17, 2012 | Confidentiality and other contracting issues |
| | May 15, 2012 | Project overview and update for Dr. Ali ElHassan |
| | November 29, 2012 | Mid-grant update meeting |
| | July 10, 2013 | White Bear Lake water conservation public forum presentation practice |
| | July 11, 2013 | Update meeting |
| | July 15, 2013 | White Bear Lake water conservation public forum presentation practice/adjustments |
| | July 16, 2013 | Forum presentation at Century College |

The White Bear Lake water conservation forum series was a key example of sharing the objectives of industrial water use conservation with a broader audience.

- Our Water Our Future- Resources in the Northeast Metro was held on April 4, 2013.
- Our Water Our Future- Restoring the Balance held on June 17, 2013.

- Our Water Our Future- Cutting-edge Conservation held on July 16, 2013.

MnTAP participated in the third forum, staffing a display with technical handout information and talking with some of the almost 100 attendees. MnTAP produced a poster highlighting water conservation expressly for the forum (***Appendix L)***. It will continue to be used at appropriate venues as we continue to educate audiences on the topic of water conservation.

In the formal presentations portion of the evening, MnTAP provided a short presentation on the MnTAP program and services, examples of industrial water use and improvement opportunities, overall practical solutions, and employee engagement. The MnTAP intern program presentations scheduled for August 22, 2013 were also highlighted and the audience was invited to attend. On-Location TV 19 filmed the forum event which is posted on YouTube at: http://www.youtube.com/watch?v=ubLcxLIQE18*.*

Issue I, 2013 of the MnTAP SOURCE newsletter published in August 2013 featured the MCES project on page 3 (***Appendix M***).

Beginning in early August, 2013, contacts and invitations to the 2013 Intern program presentation were being made. Invitees included the list of respondents to the MCES well water survey, Minnesota Department of Health (MDH) water planners, contacts from the Minnesota Rural Water Association (MRWA), and administrative contacts for the Clean Water Council. An informational flyer and agenda about the presentation program was included (***Appendix N***). The 2013 MnTAP intern program presentations were held at the McNamara Alumni Center on the University of Minnesota east bank campus on August 22, 2013. Each of the students public presentations are posted permanently on the MnTAP website:

- Northern Star Company (Michael Foods Inc.) in Chaska, MN
  http://mntap.umn.edu/intern/presentations/2013/AHoppes.pdf
- Gedney Foods Company, Chaska, MN
  http://mntap.umn.edu/intern/presentations/2013/RVenteicher.pdf
- Federal Cartridge Company, Anoka, MN
  http://mntap.umn.edu/intern/presentations/2013/KBrase.pdf

The December 12, 2013 MnTAP E-News included a summary of the 2013 intern program and the link to the ***Solutions*** booklet (***Appendix O***). A January 2014 MnTAP SOURCE newsletter will also feature the intern project successes.

## Analysis and conclusions

This two year project was conceived to gain an understanding of industrial water use needs of private well water users in the Twin Cities metro area and to provide those businesses with informed, practical and technical assistance aimed at reducing their use of water.

### *Outreach process*

We chose to investigate and engage about 16% of the applicable businesses based on our assessment of whether the business and industry sectors represented could be reasonably expected to have opportunities for water conservation through process improvements.

The outreach method chosen was through email. This was seen as a contemporary and accessible way to reach the audience, but was ultimately found difficult due to lack of publicly available email addresses. However, once prepared, the outreach survey resulted in a good return rate of 39% (33 respondents). It found that factors that motivate implementation of operational changes to capture water conservation savings vary across industries, process needs, and the perceived value of the water resource.

In many cases, the survey pointed to a lack of information, focus, or priorities concerning water. Companies have tried some initiatives aimed at water conservation, maybe have water conservation teams, plans, or projects, know what processes use the water, but don't necessarily have any plans to reduce water use on that process. The anticipated project impact to identify use and opportunities didn't seem to resonate with the survey respondents as either an opportunity for water and cost savings, or more generally as a call to action across the metro. Except in the seven cases where survey participation ultimately translated into assessment assistance, interaction with MnTAP beyond the survey was limited.

### *Outcomes*

MnTAP's extensive experience most often points to the higher value of longer-term working relationships with companies. Those partnerships established in our assessments and intern projects was and will be the most productive driver for meaningful water reduction efforts as we continue to follow up. We already have confident expectations that one assessment project will apply for a 2015 intern project to quantify and allocate reclaimed water.

A majority of survey respondents did not indicate activities or motives aimed at water conservation efforts. MnTAP will have increased influence in implementing water conservation in the seven assessment cases, and resulting intern projects, but will need to re-position ourselves with the larger majority of metro industrial well water users. The intern project successes specifically, will be an important mechanism to increase interest in industrial water conservation.

### *Conclusions*

MnTAP had an interesting exposure to a microcosm of specific well water needs in selected industries in the last two years. Our previous experiences are again reinforced with a number of conclusions coming from this project:

Manufacturing process modifications can be very challenging, even with strong cost and efficiency justification. Changes can include production downtime, re-piping systems, recalibrating flow rates, re-assignments and other modifications to the currently productive and profitable facility layout and routine.

There are in-situ and practical limits to knowing about water use- how much is used, where it goes, how much it costs per use. The cost of water is an industry overhead expense, and in many cases not scrutinized. Whatever water supply treatment needs that are necessary are part of that operating expense, to be maintained and operating at the risk of production curtailment or shutdown.

MnTAP's experience with this project has given us a renewed appreciation for, and focus on the pervasive implications and prominent opportunities surrounding water conservation. Program initiatives will continue to target water conservation education, project, and technical assistance outreach. We look forward to continuing our relationship with MCES and other water supply and treatment system operators around the state to work with their communities on meaningful and cost-effective water conservation.

# Appendix

### Appendix A:
Minnesota Technical Assistance Program (MnTAP) Water Conservation for Private Well Users-, *Please Take Our Water Conservation Survey SurveyMonkey cover email-*

### Appendix B:
SurveyMonkey survey- *Private Well Users- Water Conservation-*

### Appendix C1:
Survey closure website thank you page

### Appendix D:
Survey email reminder

### Appendix E and E1:
Contract change proposal and approval email

### Appendix F:
Example assessment report template

### Appendix G:
Intern project solicitation email

### Appendix H:
Northern Star Company Executive Summary

### Appendix I:
Gedney Foods Company Executive Summary

### Appendix J:
Federal Cartridge Company Executive Summary

### Appendix K:
White Bear Lake public forum flyer

### Appendix L:
MnTAP Water conservation poster

### Appendix M:
MnTAP SOURCE Issue 1, 2013 newsletter

### Appendix N:
MnTAP 2013 Intern presentation event flyer

### Appendix O:
Excerpt from December 12, 2013 MnTAP E-News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## Appendix A

Reproduction of pre-survey email announcement


### Assessing Water Conservation Opportunities and Barriers

Has your facility considered reducing water use, primarily in process operations? If so, then you know the impact water conservation can have on both your bottom line and environmental impact. If not, tackling water conservation projects may help your facility save money, improve your processes, and lessen your impact on water resources. In Minnesota, we are fortunate to have abundant water resources, but we can't overlook the impact that increasing population, seasonal conditions, and community development can have on the reliability of our water supply.

The Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota is beginning a project focused on identifying water conservation opportunities for industrial private well water users, such as your facility. We will be providing at least 10 facility assessments and one in-depth intern project through 2013 to assist volunteer facilities in assessing industrial water conservation strategies. This project is supported through funding provided by the Clean Water, Land, and Legacy Amendment through the Metropolitan Council.

As a first step, we'd like to better understand your facility and your water conservation efforts and needs. Therefore, **you'll be receiving a survey via email in the next few days**. We hope you take the time to answer the survey, as your answers will help us tailor this project to better meet the needs of industrial private well water users.

### Learn More about Water Conservation

If you are interested in learning more about water conservation efforts, please review three of MnTAP's recent publications:

**Fact Sheet:** Water Conservation Tips

**Intern Project Summary:** Recycled Water Cools Welds, Saves Money at Johnson Screens

**Source Article:** Automating Rinse Flow Controls Saves Water

### Contact MnTAP for More Information

For more information about the water conservation project or MnTAP and our services, please contact Mick Jost at 612.624.4694.

CLEAN WATER LAND & LEGACY AMENDMENT

*MnTAP is a non-regulatory program in the School of Public Health at the University of Minnesota and is funded by the Minnesota Pollution Control Agency. The University of Minnesota is an equal opportunity educator and employer. The Metropolitan Council Environmental Services Water Supply Planning Unit is supporting this project.*

*Funding is provided by the Clean Water, Land, and Legacy Amendment through the Metropolitan Council.*

## Appendix B

Reproduction of survey email

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Minnesota Technical Assistance Program

Water Conservation for Private Well Users

### Please Take Our Water Conservation Survey

The Minnesota Technical Assistance Program (MnTAP) is recruiting businesses to participate in a focused on water conservation for industrial private well water users in the Twin Cities metropolitan area. The next step in this project is to survey industrial private well water users on their thoughts, needs, and efforts regarding water conservation.

Specifically, we are interested in your views of well water use and management at your facility. We also would like more information about what types of assistance your facility could benefit from, if you choose to work toward improving industrial water-intensive processes. By completing this survey, your facility will be considered for one of the 10 free water conservation assessments and the in-depth intern project.

Please take a few moments to complete this **brief survey** to provide us with additional information. This survey should not take more than 10 to 15 minutes to complete. Company names and contact information gathered in this survey will be kept confidential and used only by MnTAP. This survey enables you to start taking it and return to it later if you wish. However, once you have completed the survey and submitted your responses, you will be unable to make changes to your responses.

Take our Survey

### Contact MnTAP for More Information

For more information about the water conservation project or MnTAP and our services, please contact Mick Jost at 612.624.4694.

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*Funding is provided by the Clean Water, Land, and Legacy Amendment through the Metropolitan Council.*

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Please note: If you do not wish to receive further emails about this survey, please email MnTAP, and you will be automatically removed from our mailing list for this project.

This email was sent by the Minnesota Technical Assistance Program at the University of Minnesota, 200 Oak Street SE, Suite 350, Minneapolis, MN, 55455. To stop receiving this email communication from MnTAP entirely, please email us. Please read the University of Minnesota's mass email privacy statement.

Appendix C - Water Conservation Survey

# Private Well Users - Water Conservation

The Minnesota Technical Assistance Program (MnTAP) recently was awarded a grant from Metropolitan Council Environmental Services to conduct water use and conservation assessments for industrial facilities that are private well users in the Twin Cities metropolitan area. This project is supported through funding provided by the Clean Water, Land, and Legacy Amendment and the Metropolitan Council.

To gain a better understanding of what facilities think about and need in terms of industrial water conservation, we are conducting this short survey of facilities. Your facility is being contacted regarding this project as you have been identified as a private well user. From the information we gather, we will be able to provide focused water conservation information that may meet your needs for conserving water at your facility. Company names and contact information gathered in this survey will be kept confidential.

Following this survey, we will be working to offer facilities:
• One of ten FREE water conservation assessments
• A student intern to focus on implementing water conservation opportunities

Please take a few moments to fill out this survey. We estimate it should take 10-15 minutes to complete. If you have questions regarding this survey or would like to speak with someone about the project, please contact the project lead, Mick Jost at jostx003@umn.edu or 612.624.4694.

Thank you for your help and input!

# Private Well Users - Water Conservation

## Contact Information

***1. Please provide us with your contact information. We will use this information to contact you to learn more about water use and potential water conservation opportunities in your facility.**

**Name:**
**Company:**
**Job Title:**
**Address:**
**City/Town:**
**State:**
**ZIP:**
**Email Address:**
**Phone Number:**

**2. If there is another person in your facility that you would like us to contact, please provide their information**

**Name:**
**Company:**
**Job Title:**
**Address:**
**City/Town:**
**State:**
**ZIP:**
**Email Address:**
**Phone Number:**

***3. May we contact you for more information on your facility and to provide you with information about this project and how your facility may benefit from our on-site assessments or intern project?**

- ◯ Yes, by email or phone
- ◯ Yes, by email only
- ◯ Yes, by phone only
- ◯ No, not at this time

***4. Please describe your facility either by entering your NAICS code or describing your process/products.**

# Private Well Users - Water Conservation

## Facility-Specific Water Use Information

***1. Do you monitor water use in your facility? (Select the one that best fits your situation)**

- ◯ Yes. We monitor total facility use only.
- ◯ Yes. We monitor process and non-process use separately.
- ◯ No. We do not monitor water use.

# Private Well Users - Water Conservation

## Water Use Monitoring

***1. How often do you monitor water use in your facility?**

- ◯ Daily
- ◯ Weekly
- ◯ Monthly
- ◯ Annually

Other (please specify)

# Private Wells Users - Water Conservation

## Water Use Concerns / Decision-Making

*** 1. Please score these topics in order of concern to your facility as they relate to industrial water use processes.**

| | 1 - Most Important | 2 | 3 - Mid-Level Importance | 4 - Mid-Level Importance | 5 | 6 - Least Important | N/A |
|---|---|---|---|---|---|---|---|
| Fluctuating aquifer levels | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Adequate water supply from the well | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Quality of incoming well water | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Impact of water use regulations | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Cost of access or disposal of water | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |
| Discharge regulations | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ |

Other (please specify)

*** 2. Are significant business decisions guided by water use considerations? For example, expanding your facility, increasing production, etc.**

◯ Yes (Please describe below)

◯ No

Comments

*** 3. Does your facility have any of the following in place currently? Select all that apply.**

☐ Water conservation plan

☐ Water conservation policy

☐ Water conservation project

☐ Green team or water conservation team

☐ None

☐ Other (please specify)

# Private Well Users - Water Conservation

***4. Has your company investigated water conservation opportunities like reuse and recycling?**

- ◯ Yes
- ◯ No

Comments

# Private Well Users - Water Conservation

## Process Water Use Information

***1. Please identify your top three process water uses (if known).**

Process #1 - Uses Most Water

Process #2 - Second Largest Water Use

Process #3 - Third Largest Water Use

***2. Do you have conservation goals for water use in each process described in Question #1 on this page?**

Process #1 Goal

Process #2 Goal

Process #3 Goal

Unknown (enter "unknown")

***3. Does your process water use fluctuate?**

- ◯ Yes, it is seasonal or variable
- ◯ Yes, it is intermittent
- ◯ No, it is fairly consistent
- ◯ Unknown

Comments

***4. Do you treat incoming water prior to using in production processes? Examples might include filtering, softening, purifying, heating, etc.**

- ◯ Yes
- ◯ No

# Private Well Users - Water Conservation

## Water Treatment Processes

***1. Please describe how water is treated prior to using in production processes? For example, do you heat the water to a certain temperature, cool it down, treat it to remove chemicals or other particulates, or some other treatment?**

# Private Well Users - Water Conservation

## Project Information

***1. As stated in the introduction, MnTAP will be working directly with facilities as part of this project. We will be offering free one-day assessments to help define process water use and potential conservation opportunities that may exist. Please indicate whether you are interested in potentially having an on-site water use assessment conducted by MnTAP staff engineers and scientists.**

- ◯ Yes, I'm interested in an assessment.
- ◯ No, I would not be interested at this time.
- ◯ Not sure

Comments

***2. Another part of this project is to place a highly-qualified student intern within a facility for approximately three to four months to investigate and implement water conservation opportunities. A student will likely be placed within a facility in 2013. This intern will be funded by MnTAP at no cost to the participating facility. Please indicate whether you are interested in potentially having an intern work on water conservation issues in your facility.**

- ◯ Yes, I'm interested in an intern.
- ◯ No, I would not be interested at this time.
- ◯ Not sure

Comments

***3. MnTAP offers a wide variety of services in addition to this special project. Would you like to be contacted to learn more about how MnTAP can help your company reduce waste and improve efficiency?**

- ◯ Yes
- ◯ No

Comments

# Private Well Users - Water Conservation

## Thank You

Thank you for taking the survey. We will be following up with survey respondents by phone in March and April. If you have any questions about this project you can contact Mick Jost at jostx003@umn.edu or 612.624.4694.

**Appendix C1**

Survey closure thank you webpage

Appendix D - Survey Email Reminder

Trouble viewing this message? Read this message on the Web.


**Water Conservation for Private Well Users**

# Please Participate In Our Water Conservation Survey

Recently you received an email from the Minnesota Technical Assistance Program (MnTAP) regarding a new project focused on water conservation for industrial private well water users in the Twin Cities metropolitan area. The next step in this project is to survey industrial private well water users on their thoughts, needs, and efforts regarding water conservation.

Specifically, we are interested in your views of well water use and management at your facility. We also would like more information about what types of assistance your facility could benefit from, if you choose to work toward improving industrial water-intensive processes. By completing this survey, your facility will be considered for one of the 10 free water conservation assessments and the in-depth intern project.

Please take a few moments to complete this **brief survey** to provide us with additional information. This survey should not take more than 10 to 15 minutes to complete. Company names and contact information gathered in this survey will be kept confidential by MnTAP. This survey enables you to start taking it and return to it later if you wish. However, once you have completed the survey and submitted your responses, you will be unable to make changes to your responses.

Take our Survey

# Contact MnTAP for More Information

For more information about the water conservation project or MnTAP and our services, please contact Mick Jost at 612.624.4694.


*MnTAP is a non-regulatory program in the School of Public Health at the University of Minnesota and is funded by the Minnesota Pollution Control Agency. The University of Minnesota is an equal opportunity educator and employer. The Metropolitan Council Environmental Services Water Supply Planning Unit is supporting this project.*

*Funding is provided by the Clean Water, Land, and Legacy Amendment and the Metropolitan Council.*

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Appendix E - Project Scope Revision Proposal

UNIVERSITY OF MINNESOTA MnTAP
Minnesota Technical Assistance Program
200 Oak Street SE, Suite 350 • Minneapolis, Minnesota 55455-2008
612/624-1300 • 800/247-0015 • fax 612/624-3370 • www.mntap.umn.edu

helping businesses implement solutions that maximize resource efficiency, prevent pollution and reduce costs and energy use

February 21, 2013

Lanya Ross
Senior Environmental Scientist
Metropolitan Council Environmental Services
390 Robert Street North
St. Paul, MN 55101

Lanya,

I am writing to propose a change in the scope of the contract between the Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota and the Metropolitan Council Environmental Services (MCES) contract number 111076 titled "Assessing the Opportunity and Barriers for Water Conservation by Private Industrial Water Users." The proposed change is to decrease the number of onsite assessments to individual companies from ten (10) to six (6) and increase the number of supported interns from one (1) to three (3) with no change to the total project budget. As outlined in the contract documents any changes in scope need to be proposed in writing and approved in writing.

Background

MnTAP has completed five (5) of the ten (10) originally scheduled onsite industrial water use assessments. MnTAP plans to support companies that come forward for assessments through the duration of the project. As part of the assessments, the companies have been encouraged to apply for an intern for the summer 2013 to assist with implementation of the recommendations identified in the assessments. MnTAP has received three (3) applications for interns to support water conservation projects from the identified companies. All three applications show strong opportunity for implementation of water conservation projects. These companies are located in north and west metro communities. The current scope of the contract includes one funded intern for summer 2013.

It is becoming evident from the work on the project that there are few remaining companies that are interested and willing to make the time for the onsite assessments focused on water use. The most interest has been from companies where water use is, in some way, a barrier to business growth. Water conservation for its own sake has not seemed to motivate companies to engage in the assessments.

Proposed Scope Change

The following table summarizes the changes proposed to the project scope. MnTAP project staff believe substituting additional intern support for the remaining assessments will be a good investment, leading to an increase in the implementation of water conservation change at companies where it will make a difference in both water use and business performance.

| Original Project Scope | Proposed Project Scope |
|---|---|
| Task 1. Survey private Industrial Water Users | |
| 110 hours effort, Budget: $11,000 | No change, Budget: $11,000 |
| Task 2. Conduct Industrial Water Use Onsite Assessments | |
| 10 onsite assessments, Budget: $55,000 | 6 onsite assessments, Budget: $33,000 |
| Task 3. Intern Project for Water Conservation Project Scoping and Implementation | |
| 1 intern salary and stipend, Budget: $7,500<br>MnTAP staff intern support, Budget: $16,000 | 3 interns salary, 1 stipend*, Budget: $17,500<br>MnTAP staff intern support, Budget: $29,500 |
| Task 4. Final Report and Communications | |
| 80 hours effort, Budget: $8,000 | No change, Budget: $8,000 |
| Local travel, Budget: $1,000<br>Supplies/Equipment, Budget: $1,500 | Local travel, Budget: $1,000<br>Supplies/Equipment, Budget: $0 |
| Total Budget: $100,000 | Total Budget: $100,000 |

*Two remaining $2,500 stipends will be collected as cost share from companies.

I appreciate the opportunity to work with MCES on this grant project. We are learning about the motivations of industries for water conservation. Many industries have significant opportunity for water conservation; however, they often do not know where to begin the evaluation and project scoping process. Through the assessments, MnTAP has been able to engage companies who can most benefit from water conservation and will be most likely to implement recommended changes. MnTAP staff support the addition of more interns in the project scope as a possible means to reward and motivate companies that are ready to implement water conservation projects and may realize business advantage for doing so.

Direct technical assistance to businesses has been demonstrated to be effective means to encourage and support business change. MnTAP is currently compiling our environmental benefit results for 2012. While not yet published, MnTAP onsite assessments and interns have realized significant water use reductions reported by industrial companies, over 40 million gallons of savings reported in 2012. Of this total over 25% resulted from intern projects.

I thank you for considering this proposed project scope change.

Sincerely,

Laura M. Babcock, Ph.D.
Director
Minnesota Technical Assistance Program
200 Oak St. SE, Suite 350
Minneapolis, MN 55455
lbabcock@umn.edu
612-624-4678

## Appendix E1

Reproduction of email approving February 21, 2013 project scope revision proposal

**From:** "Davis, Brian" <Brian.Davis@metc.state.mn.us>
**Date:** Wed, 27 Feb 2013 16:13:34 +0000
**To:** 'Laura Babcock'<lbabcock@umn.edu>
**Cc:** Davis, Brian<Brian.Davis@metc.state.mn.us>
**Subject:** RE: Proposed MnTAP MCES Project Modifications #111076

Hi Laura,

This scope change is approved.

METROPOLITAN COUNCIL

Brian M. Davis, Ph.D., P.G., P.E.
Senior Environmental Scientist | Water Supply Planning
brian.davis@metc.state.mn.us
P. 651.602.1519 | F. 651.602.1130
390 North Robert Street | St. Paul, MN | 55101 | metrocouncil.org

CONNECT WITH US

**Appendix F – Example Assessment Report Outline**

University of Minnesota

Minnesota Technical Assistance Program MnTAP

# *Water Conservation Opportunities*
# *Company*

## *Example assessment summary*

CLEAN WATER LAND & LEGACY AMENDMENT

*Assessing the Opportunity and Barriers for Water Conservation by Private Industrial Water Users*

This assessment was completed as part of the project listed above. The project, led by MnTAP, is sponsored by the Metropolitan Council through funding from the Clean Water, Land and Legacy Amendment.

## Contacts

*Company contacts*

Minnesota Technical Assistance Program (MnTAP)
University of Minnesota
Mick Jost
Project lead
612.624.4694 direct
651.325.7367 mobile
jostx003@umn.edu

## Assessment Description and Goals

MnTAP is working with businesses to identify water conservation strategies as part of a two-year project sponsored by the Metropolitan Council through funding provided by the Clean Water, Land, and Legacy Amendment. The *Company* participated in a site assessment conducted by MnTAP on July 25, 2012. The goal of this assessment was to determine how water is used in the facility and what measures could be taken to reduce water use.

## Assessment Overview

A site assessment meeting and walk-through of processing areas was conducted at *Company* on July 25, 2012.

Well water is used to *insert process uses*.

As outlined and discussed in detail with *Contact*, water related concerns fall into two broad categories: water supply and wastewater discharge. Details on these two categories are provided in Table 1.

**Table 1.** *Company* **water use topics**

| | **Issues** |
|---|---|
| Water supply | |
| | |
| | |
| Wastewater strength charges | |
| | |
| | |

## Facility Process Overview

## Water Balance

Water data (supply and discharge amounts) are available by shift as shown in Figure 1 and Table 2.

**Figure 1. Percent of facility water use by shift.**

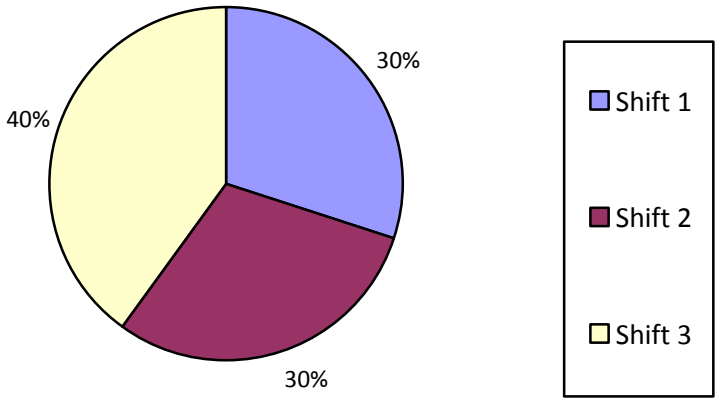



**Table 2. *Company* nominal daily water balance**

| | |
|---|---|
| Shift 1 | _____ gal |
| Shift 2 | _____ gal |
| Shift 3 | _____ gal |
| **Total** | _____ gal |

## Discussion

*Company* has goals to reduce water use and strength charges to wastewater. The facility also has corporate goals to expand product production.

*Discussion of additional water supply*

*Discussion of discharge constraints*

## Opportunities

Four ideas emerged from the assessment that merit additional discussion and investigation with the facility's water conservation team.

Reuse *process* water

This process is estimated to use _____ gal/minute in a once-through *process description.* Improving *process* water use can be achieved by *insert process adjustments.*

Table 3 indicates the per day water saving potential by identifying a reuse strategy. The range of savings in this water reuse opportunity represents ___% to____% of the facility's current discharge.

**Table 3. *Process* water savings per full production day**

| | |
|---|---|
| Shift 1 | _____ to _____ gal |
| Shift 2 | _____ to _____ gal |
| **Total** | _____ to _____ gal |

Capture more water from the *process*

Water is used to *process description.* A conservative estimate of ____ gallons/minute could be lost to the drain. Capturing this water for return to the *process* would save water use and discharge/strength charges. Redesigning the *process* could incur material and labor costs. The range of savings in this water reuse opportunity represents ____% of the current discharge.

**Table 4. *Process* water capture savings per full production day**

| | |
|---|---|
| Shift 1 | _____ gal |
| Shift 2 | _____ gal |
| **Total** | _____ gal |

Reuse water from *process*

*Process description* can be reused for _____, reducing overall discharge by approximately ___%.

Table 5 provides water saving estimates for this recommendation based on *process use* and the following assumptions:

- *X*
- *X*
- *X*

**Table 5. *Process by shift***

| | |
|---|---|
| Shift 3 | _____ gal |
| **Total** | _____ gal |

Recover *process* water

*Process discussion and feasibility of opportunity*

…potential from this process is between ___ and ____ gal/day. This water recovery potential represents ___ to ___% of the current discharge.

**Table 6. *Process* water recovery potential per full production day**

| | |
|---|---|
| Shift 1 | ____to_____ gal |
| Shift 2 | ____to_____ gal |
| **Total** | ____to_____ gal |

## Summary

Implementing all four outlined opportunities represents a potential water reduction volume of between ___ and ___ gallons/day. This combined potential represents a ____ to ____% reduction in the current wastewater discharge volume.

Reducing water use, or reusing water in certain process steps, could *insert advantages discussion.*

## Next steps

This assessment report will be submitted to *Company* for review and revised as needed. MnTAP will subsequently return to *Company* to meet with the water conservation team to discuss this report and what appropriate actions to take in pursuing these and other water conservation opportunities.

## Appendix G

Reproduction of email reminder to survey parties interested in interns


*News from the* **MnTAP Student Intern Program**

We are reconnecting with you about next steps coming up in our grant award from the Metropolitan Council Environmental Services to conduct private well water use and conservation assessments and provide one no-cost intern for industrial facilities. Your survey responses earlier this summer indicated you would like to be considered for the no-cost summer 2013 water conservation internship available through the grant.

This grant internship will be part of how we administer our annual overall MnTAP intern program- first by conducting an assessment of your facility well water process uses, which we have already done, and then working with you to develop a project proposal that will be weighed against other candidates.

Each year, the interns are chosen based upon their outstanding educational background and leadership capabilities. Proposed projects are evaluated for reduction potential, specific goals achievable in three months, relation to previous projects, application of results to other Minnesota businesses, and company interest and commitment. The no-cost internship project under this grant will need to focus on identifying specific options for well water conservation.

**Intern proposals are due by February 1.** We still have time to help put together an intern project plan, but **we need to hear from you soon.**

Contact either one of us on next steps, or to answer your questions related to this grant funded opportunity:

| | | |
|---|---|---|
| Mick Jost | and | Paul Pagel |
| 612.624.4694 | | 612.624.4638 |
| Jostx003@umn.edu | | ppagel@umn.edu |

For more information about the intern program or the application process, visit MnTAP's Web site at http://www.mntap.umn.edu/intern or contact Linda Maleitzke at MnTAP at 612.624.4697 or 800.247.0015.

Until we connect again, we wish you and your organization success in the new year.

LinkedIn Facebook Twitter

To ensure continued delivery, add mntap@umn.edu to your safe senders list or address book.

This email was sent by the Minnesota Technical Assistance Program at the University of Minnesota, 200 Oak Street SE, Suite 350, Minneapolis, MN, 55123. To stop receiving this email communication, click here to opt-out. Please read the University of Minnesota's mass email privacy statement.

**Appendix H**

# Executive Summary

# Northern Star Company

## Chaska, MN

## Alex Hoppes, Civil Engineering, University of MN

*"The internship gave me hands-on experience in an industry, allowed me to be in charge of a project, work with all levels of employees, and make a real difference in terms of water conservation and cost savings." ~ Alex Hoppes*

---

## Company Background

Northern Star®, a leading producer of refrigerated potato products, was founded in 1951. Northern Star, located in Chaska, MN, specializes in a variety of refrigerated (but never frozen) potato products such as the Simply Potatoes product for both the foodservice and consumer markets. The Chaska plant employs approximately 260 people.

In 1987, Northern Star joined the Michael Foods family of businesses, which offers a full line of dairy case and refrigerated potato products and is the world's largest supplier of processed eggs.


## Project Background

The goal of the project was to find economical solutions to conserve water, reduce wastewater, and save money. The focus was in three main areas of the facility: receiving, peelers/scrubbers, and the clean room.

## Incentives to Change

Water is used in some amount, large or small, in just about every aspect of production. On a daily basis, the facility processes approximately 1,000,000 pounds of potato products. Well water is used to wash, prepare (peel, slice, dice, and mash), transfer, and cook the potatoes, as well as cleaning and sanitizing steps. Reducing water use or reusing water in certain process steps would improve the plant efficiency and help avoid the cost of permitting and drilling an additional well. Water conservation also reduces expenses for water treatment, pumping, and sewering. The availability of extra water would allow the company to expand their business and increase production.

## Recommendations and Results

**Lower Water Level in Potato Washer:** Maintaining the appropriate water level in the potato washer is necessary to ensure that floating debris is scraped off the top and that the potatoes flow at a level above the bottom so that they do not drop out. At the onset of the internship, Alex noticed the water level was set at 27.5 feet and the vessel was constantly overflowing.

**Replace Float in Basket Washer:** During his initial facility walk through, Alex noticed the basket washer was

overflowing significantly. Alex scouted out the machine associated with the basket washer and found that a float should be controlling the water level in the bottom of the tank. In addition to the missing float, the operator has a large impact on the amount of water entering the machine.


**Reduce Peeler Exhaust Spray Time:** The peeler exhaust spray is necessary to keep the exhaust tank cool and to knock down particulate. The machine was recommended to be run much lower than the 40-50 seconds it was set at when Alex arrived. The time has now been lowered to around 30 seconds which should save 93,000 gallons annually.

**Replace Leaking Solenoid:** Peeler #2 appeared to be regularly overflowing. Research into this situation led to the discovery that a solenoid, an electronic device that signals when to open and close a valve, was no longer working and needed to be replaced. This may be a harsh environment for the solenoid and it will need to be checked more frequently so that water is not being wasted.

**Reuse RO Reject Water:** The reverse osmosis (RO) system generates reject water which is stored in a tank. The water can be used for certain steps in the process such as potato washing and peeler exhaust spray. The tank can store up to 5,000 gallons. The potato washer was originally selected as the only machine to receive the reject water. Since the tank was not running dry, the reject water was also tied into peeler #2 exhaust spray. Approximately 15,000 gallons of fresh water a day are being saved.

**Reuse Scrubber Water:** One of the biggest water users in the plant is the scrubbers. Not only do they run at over 30 gallons per minute, they run constantly, close to 20 hours a day. The water they use becomes laden with potato waste and grime and is sent down the drain. Filtering this water and recycling it to the scrubber is an option to consider.

**Install Auto Fill Valves on Pump Tanks:** There are two pump tanks located on the peel floor. The tanks must have water in them or the pumps will become plugged. The valves filling the tank are currently manually operated, and flow at around 50 gallons per minute. Since someone must turn the valve on and off, the tanks constantly overflow resulting in a significant amount of wasted water. An auto fill valve would be able to take the operator out of the picture and not waste water to overflow.

**Optimize Surge Bin Water Level:** The surge bin stores the potatoes before they are sent to the blancher or cutter. The surge bins need to be nearly full of water after the potatoes are inside or the potatoes will start to rot. Currently, the operators fill the surge bins too full initially so that when potatoes reach it, the water will overflow. The water level needs to be regulated so that it is full enough for the potatoes but not so full that it overflows.

The following table lists the solutions the intern studied throughout the course of this project, the potential environmental and cost savings, and the status at the end of the project.

| Recommendation | Impact | Potential Savings | Status |
|---|---|---|---|
| Lower water level in potato washer | 2.8 million gallons | N/A | Completed |
| Replace float in basket washer | 6.7 million gallons | N/A | Completed |
| Reduce peeler exhaust spray time | 93,000 gallons | N/A | Completed |
| Replace leaking solenoid | 1.4 million gallons | N/A | Completed |
| Reuse RO reject water | 5.25 million gallons | N/A | Completed |
| Reuse scrubber water | 8.25 million gallons/ scrubber | N/A | Recommended |
| Install auto fill valves on pump tanks | 4.2 million gallons | N/A | Recommended |
| Optimize surge bin water level | 1.9 million gallons | N/A | Recommended |
| TOTAL | 38,843,000 gallons | $166,300 | |

**Appendix I**

# Executive Summary

# Gedney Foods Company Chaska, MN

## Ryan Venteicher

### Civil Engineering, University of MN

*"The internship was a great experience. It provided me with real-world engineering experience and allowed me to run my own project – to do my own research and test out new ideas to see if they work. Plus, it's hard to beat free pickles on Thursdays!" ~ Ryan Venteicher*

---

## Company Background

The Gedney Foods Company is a pickling plant based out of Chaska, MN. Established in 1881, Gedney is one of Minnesota's oldest food companies and employs approximately 200 employees. The company produces an assortment of goods, including relishes, condiments, preservatives, fermented pickles, and fresh pack pickles. Cucumbers from all over the world are brought in from the receiving dock or tank yard, washed and desalted, packed into jars along with brine and various spices, and then pasteurized, thus completing their transformation into a pickle.

## Project Background

Water use at the plant has risen due to an almost doubling of the plant's production outputs. In addition, some salt used while making products unavoidably ends up in the waste stream, thereby increasing the strain the company puts on its surrounding environment. The intern examined ways to reduce water and salt use within the plant in order to lessen Gedney's consumption of raw materials and also to reduce the company's environmental impact.

## Incentives to Change

The Gedney Company has long been concerned with reducing its impact on the environment. Gedney draws its water from two wells, and has endeavored for years to reduce its overall water usage. Of high concerns are the company's water usage, and the impact its wastewater stream has on the surrounding ecosystem. Gedney also has a limited wastewater treatment system. Permits stipulated by Minnesota regulatory agencies prevent the discharge of a wastewater until environmental requirements are met. If a discharge were to be prevented it would force a production shutdown at Gedney, one that the company cannot afford. As such, Gedney must conserve water so its waste disposal system does not reach capacity. Also, reducing the salt usage for the plant would lessen the consumption of a costly ingredient, and would reduce the strain felt on the company's wastewater stream. The intern was hired by MnTAP to research and recommend water and salt saving suggestions for the Gedney Foods Company.

## Recommendations and Results

**Reroute Pasteurizer Overflow:** Pasteurizers are important components in the pickle producing process, as pasteurization is necessary to ensure food safety. Pasteurizers for two separate production lines run parallel to one another. One utilizes steam while

pasteurizing, the other hot water. The steam pasteurizer has excess hot water discharging from it. By reusing the hot overflow water from the steam pasteurizer as makeup water for the hot water pasteurizer, both energy and water can be saved. It is estimated that 22,000 therms of energy and 3,085,000 gallons of water can be saved per year through this change.

**Reuse Fermentation Tank Brine:** Cucumber fermentation occurs in outdoor tanks before the cucumbers are sent to the production line. Through research and consulting with representatives from other companies, it was determined that reusing tank fermentation brine may be an option for Gedney to reduce salt and water demand. Reusing brine for additional fermentation processes will reduce salt and water usage by an amount of 213,400 lbs. of salt and 214,500 gallons of water per year.

**Reduce Salt Storage Level:** The product in the tank farm is currently stored at a salt level of 12% in order to prevent the growth of product harming enzymes and tank freezing during the winter months. Through research and contacting other pickle companies, the idea emerged that this salt level may be lowered to directly preserve salt, and indirectly lessen the water used by the plant. Additional testing and research is needed in different climate conditions, however calculations indicate that if the salt storage level is reduced to 7%, the plant's salt and water use would drop by 364,500 lbs. of salt and 383,000 gallons of water.

**Reduce Fermentation and Salt storage Level:** Since reusing fermentation brine and reducing salt storage levels are both modifications to the same process, calculations were made to estimate the savings achieved if both recommendations are implemented. If both a brine reuse system is implemented and procedures are changed so that the salt storage levels were reduced, a combined savings of 460,500 lbs. of salt and 543,200 gallons of water would be observed.

**Fix Water Leaks:** Leaks in the plant often go unnoticed, and as such a large amount of water is currently being lost due to them. It is estimated that about 2.2 million gallons of water can be saved per year by fixing water leaks in the plant. Instituting a culture of water conservation with the employees at Gedney will also make a big impact on reducing the water losses for the plant.

The following table lists the solutions the intern studied throughout the course of this project, the potential environmental and cost savings, and the status at the end of the project.

| Recommendation | Environmental Impact | Annual Savings | Status |
|---|---|---|---|
| Reroute pasteurizer overflow | 22,000 therms; 3,085,000 gallons water | $10,600 | Planned |
| Reuse fermentation tank brine | 213,000 lbs. salt; 214,500 gallons water | $21,300 | Testing in progress |
| Reduce salt storage level | 364,500 lbs. salt; 383,000 gallons water | $36,450 | Testing in progress |
| Reduce fermentation and salt storage level | 460,500 lbs. salt; 543,200 gallons water | $46,500 | Testing in progress |

| | | | |
|---|---|---|---|
| Fix water leaks | 2,220,400 gallons water; 790 therms | $380 | Planned |

**Appendix J**

# Executive Summary

# Federal Cartridge Company

## Anoka, MN

## Kaylea Brase

### Chemical Engineering, Calvin College, Michigan

*"Through the MnTAP program, I developed the initiative and confidence needed to work with others to help the company and the environment. The job is almost like being a detective, trying to identify problems, meet the people involved, track the history of the situation, brainstorm solutions, and implement changes. The best part is seeing the numbers add up at the end, both in waste reduction and cost savings." ~ Kaylea Brase*

---

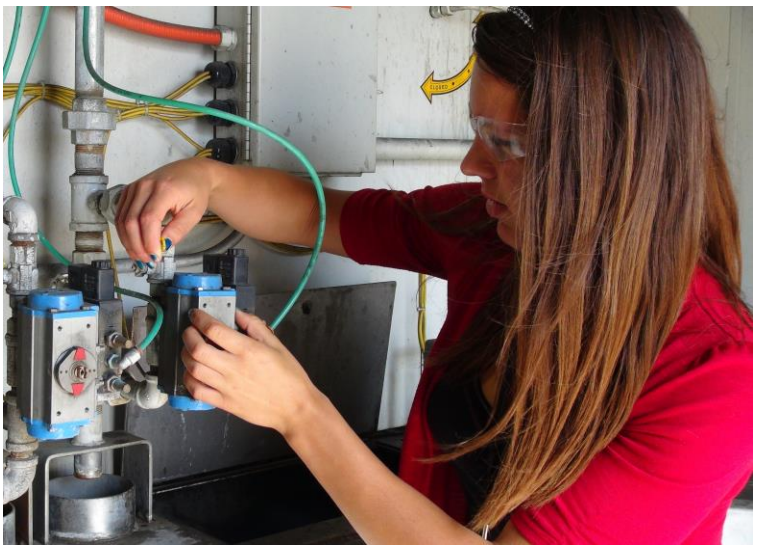
## Company Background

Federal Cartridge Company (FCC) is a small arms ammunition manufacturer located in Anoka, MN. Since 1922, Federal Premium® Ammunition has been providing hunters and shooters with high-quality shotshell, centerfire and rimfire ammunition. A wholly-owned subsidiary of ATK, Alliant Techsystems, the company employs nearly 1,400 employees. The facility is located on 175 acres in Anoka County and spans the border of Anoka and Coon Rapids with half a million square feet of manufacturing space.

## Project Background

Small arms ammunition manufacturing involves many metalworking operations, including pressing, stamping, annealing, and washing of the bullet cases. Because many of the metal working operations are automated, the metal components require tempering and lubrication steps. The process chemicals and lubricants must be rinsed before proceeding to the next step, so large rinsing processes are employed.

Water is used for cooling, washing, rinsing, and also for hydrating explosive material. The water piping system has suffered from scale and deposits from the dissolved minerals and rust in the hard water, which can clog nozzles and alter valve settings. Most of the equipment is designed to reuse water in a closed loop system or to fill on a timed-rinse basis; however, many of the settings and valves have been by-passed due to clogging. Valves are typically manually adjusted based on operator experience.



## Incentives to Change

By reducing the amount of water FCC uses in the manufacturing process, the company can lower operating costs, improve efficiency of the on-site wastewater treatment plant, reduce environmental impact, and avoid SAC charges. The Sewer Availability Charge (SAC), equivalent to 274 gallons of water per day on average, is a measure of wastewater volume. Every three years a charge is accessed by the Metropolitan Council Environmental Services (MCES) for each SAC unit above the assigned baseline for a facility. FCC's water monitoring has indicated that the facility is

currently using about 200 SAC units above their baseline level. To avoid heavy SAC charges, Federal applied for a MnTAP intern to identify water conservation opportunities and aid in implementation.

## Recommendations and Results

**Timed Rinse Faucets:** Faucets run continuously in areas where explosive material, or primer, is charged into the primer cups. The faucets are used to clean the charging equipment and to prevent explosive material from collecting in the piping system. Because the nine faucets run continuously at high flow rates, they represent about 8% of the industrial water use at FCC. A significant amount of water could be saved by installing faucets that turn on for one minute and turn off for one minute. Installation would result in approximately $40,900 in savings annually.

**Wash Tub Spray Nozzles:** FCC has about fifty wash tubs around the facility which use 16% of overall industrial water use. Water is dumped on the ammunition rounds via an open pipe end. The process could be improved if a wider fan spray pattern were used to impact a larger area of the casings inside the tub. Spray nozzles would allow the pressure to be increased while the flow would be decreased. About $2,500 in annual water savings could be realized if only two of the spray nozzle opportunities were implemented.

**Effluent Recycle:** The on-site wastewater treatment plant often uses a continuous flow of water to clean the sand filters, which remove suspended solids from the wastewater. If a portion of the exiting water is recycled back to the sand filters instead of using fresh city water, a total of $28,300 could be saved annually. This process would allow effective cleaning and circulation of the sand filters reducing the high cost of water.

**Automatic Shut-Offs:** The inline washers represent about 37% of FCC's industrial water use. Water continuously flows over the rinse tank cage at about 5 GPM, even without any product in the cage. By installing valves which would automatically shut off the water flow when product is no longer running through the machine, $11,400 per year could be saved.

**Chiller Installation:**
The condenser for an environmental test chamber is cooled by de-ionized water, flowing at 5 GPM. This water is sent directly to the drain. Instead, the water could be recycled by installing a chiller to return the water to initial temperature. In addition to reducing maintenance and upgrade costs to the de-ionized water delivery system, the chiller would save about $11,700 in water costs.

The following table lists the solutions the intern studied throughout the course of this project, the potential environmental and cost savings, and the status at the end of the project.

| Project | Annual Cost Savings | Environmental Results | Status |
|---|---|---|---|
| TIMED RINSE FAUCETS | $40,900 | 2,803,000 GPY | IN PROGRESS |
| WASH TUB SPRAY NOZZLES | $2,500 | 173,000 GPY | IN PROGRESS |

| | | | |
|---|---|---|---|
| EFFLUENT RECYCLE | $28,300 | 1,752,000 GPY | IN PROGRESS |
| AUTOMATIC SHUT-OFFS | $11,400 | 778,500 GPY | IN PROGRESS |
| CHILLER INSTALLATION | $11,700 | 54,750 GPY | RECOMMENDED |

Appendix K - Our Water Our Future Flyer

**FORUM 3 OF 3**

# Our Water, Our Future:

## Resources in the Northeast Metro

A series of community forums on preserving water resources

"Business as usual" is depleting the region's most robust source of groundwater, the Prairie du Chien-Jordan aquifer. Out of sight, but hardly out of mind for residents of the northeast metro, who are getting a first-hand glimpse of the impact of depleting aquifers on surface waters.

Join local officials and water experts for the third in a series of community forums on water resources, this time focusing on water conservation. Learn from experts how simple fixes around the house can make a big impact on your water usage. No registration is required.

## Water Use: Cutting-edge Conservation

### Tuesday, July 16, 2013

### 6:00 to 8:00p.m.

**6:00 – 8:00 p.m. Displays and Networking**

**6:30 p.m. Presentation**

Century College,
East Campus in the Lincoln Mall
3300 Century Avenue N. White Bear Lake

Principal planners of this event include White Bear Lake Mayor Jo Emerson, White Bear Lake Area Chamber of Commerce, former Minnesota Representative Carol McFarlane, Ramsey County Commissioner Victoria Reinhardt and Metropolitan Council members Sandy Rummel and Harry Melander.

To view the 1st forum, held on April 4, go to http://tinyurl.com/groundwater1
To view the 2nd forum, held on June 10, go to http://tinyurl.com/groundwater2
For more information, visit www.metrocouncil.org

Displays by: Rice Creek Watershed Conservation District, Neighborhood Energy Connection, Clean Energy Resource Teams (CERTs), Minnesota DNR, Minnesota Technical Assistance Program (MnTAP), Metropolitan Council, White Bear Area Chamber of Commerce, and other local businesses

METROPOLITAN COUNCIL

Minnesota DEPARTMENT OF NATURAL RESOURCES

WBLCD

Minnesota Technical Assistance Program MnTAP

UNIVERSITY OF MINNESOTA

Appendix L - Water Conservation Forum Poster

# Squeezing the Most From Every Drop

***Make your operation more efficient and save money on the volume of water used and treated***

## Water Conservation Tips

- Understand your water flow
- Reuse or recycle
- Recirculate cooling water
- Improve rinsing systems
- Install a clean-in-place system
- Locate and fix leaks
- Use high-pressure, low-volume wet cleaning systems
- Optimize nozzle type for your application
- Create incentives for employees to reduce water use

MnTAP can help your business identify water conservation opportunities through:

- On-site assessments
- Intern projects
- Team facilitation
- Special projects

For more information, visit www.mntap.umn.edu or call 612.624.1300 or email mntap@umn.edu.

## Water Savings You Can Count On

MnTAP has a successful track record of assisting businesses with water conservation. Since 2008, MnTAP has helped industry save over **150 million gallons of water!**

| | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|
| GALLONS SAVED (MILLIONS) | 69.9 | 5.7 | 17.4 | 13.9 | 42.8 |

University of Minnesota Driven to Discover℠
Minnesota Technical Assistance Program

MnTAP is a non-regulatory program in the School of Public Health at the University of Minnesota and is funded by the Minnesota Pollution Control Agency.

MnTAP
University of Minnesota

SOURCE

2013 Issue 1

# Resource Efficiency = Savings for Businesses

**Inside...**



Sign up for your own copy of **Source:**
http://mntap.umn.edu/source/SignUp.htm

Route:

- ☐ health and safety
- ☐ maintenance
- ☐ owner/president
- ☐ process engineer
- ☐ purchasing

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 and lean processes, as well as solid and organic waste management.

> *"MnTAP has been forturnte to work with committed clients, sponsors and assistance organizations in 2012 to provide conservation results for Minnesota."*
>
> *-- Laura Babcock, MnTAP Director*

MnTAP has pulled together another impressive set of implemented outcomes for the calendar year 2012. We have:

- Visited with approximately 100 companies on site.
- Reached out to nearly 200 more across the entire state.
- Supported nine intern projects at businesses throughout Minnesota.

With MnTAP assistance, companies have realized reductions of more than **1.8 million pounds** of waste, **7.5 million kWh** and **350,000 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 operations. This is good business for Minnesota. ■

**Be sure to check out . . .**

- The full 2012 Environmental Benefits Report: http://www.mntap.umn.edu/resources/reports/EnvBenefits/2012EnvBenefits.pdf
- The GreenBiz.com article about MnTAP's life-cycle assessment of surgical sterilization equipment at the Mayo Clinic: http://www.greenbiz.com/blog/2013/03/28/cutting-hospital-waste-emissions-blue-wrap

## 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) | | |
| 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 |
| **TOTAL** | 1.8 million | | | | 7.5 million | 357,000 | 42.8 million | $2.0 million |

# MnTAP conducts solid waste assessments in rural Minnesota

Solid waste is a growing problem in Minnesota that impacts businesses, counties and communities. In 2010, Minnesota generated 5.6 million tons of solid waste, with 2.5 million tons collected for recycling.

To begin tackling the issue of solid waste in rural communities, MnTAP is partnering with counties and other concerned partners, such as chambers, civic organizations and tribal communities, to host training sessions and assessments in 10 locations in northern and western Minnesota. The events will provide resources, insights and a forum for sharing ideas and information about solid waste management and diversion. MnTAP is also conducting no-cost solid waste assessments for businesses in each training location. MnTAP will work with the businesses in advance to understand their waste generation cost burden and their priority waste issues. This will help tailor assessments to the businesses' needs.

**What they said...**

"This is a great opportunity for northern Minnesota businesses and local units of government to learn how they can reduce wastes and costs."

-- *Sandy Gunderson, Becker County Environmental Services*

Five counties have already scheduled trainings that began in February, with **five additional training sessions still available.**

An assessment with a solid waste specialist takes two to four hours, depending on the size of the facility. MnTAP will discuss your facility's waste concerns and management practices; after the assessment, we will provide a detailed, site-specific report with information about the opportunities identified, cost analysis and recommendations for moving forward. MnTAP will also provide follow-up for one year to help implement changes that will reduce or divert solid waste from landfills.

These trainings and assessments are supported by a grant from the United States Department of Agriculture Rural Development Utilities Program, with no cost to your organization.

If you have any questions about the current training calendar or partnering with MnTAP to bring a solid waste event to your county or group, please contact Anna Arkin, Solid Waste Specialist, at 612.624.0808 / 800.247.0015 or aiarkin@umn.edu. ■

# Company teams find efficiencies and savings for their businesses

Forming a pollution prevention and energy efficiency team within your facility can not only improve process efficiencies, but also boost your bottom line. MnTAP can help develop an internal team designed to investigate your waste-related issues.

***"A company's greatest resource is the innate, creative potential of its employees,"*** says MnTAP Food Processing Specialist John Polanski, who has been helping businesses build successful teams for over 15 years. Polanski has refined the MnTAP model for creating a team-based approach to improving waste, water and energy efficiency that is being piloted at companies over the coming year.

Many companies have employed the team structure and have realized significant waste and energy use reductions - and the associated cost savings. Often, teams consist of members from all ranks of the company and all locations in the facility. This enables the team to tackle projects and get many points of view to define solutions.

Franklin Foods, a fluid milk bottling plant in Duluth, Minn., realized product and cost savings through MnTAP team facilitation. Franklin Foods serves customers throughout northern Minnesota, Wisconsin and the Upper Peninsula of Michigan. At the plant, approximately 129,500 gallons of fluid milk and 5,000 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 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, with the company realizing $346,900 in energy, water and materials savings.

To find out if forming an internal team is the right move for your business, contact John Polanski, Food Processing and Team Facilitation Specialist, at 612.624.4619 or polan001@umn.edu. ■

**Franklin Team Savings**

| Energy | Water Use | Raw Material Recovery | Hazardous Material Recovery | Total Savings |
|---|---|---|---|---|
| 53,000 kWh | 2.1 million gallons | 1.2 million lbs | 1,000 gal & 8,500 lib/yr | $346,900 |

# Industry finds millions of gallons in water savings

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 (MCES). The remaining 30% of consumptive groundwater use is from private well users.

> ***MnTAP staff have made industrial water conservation recommendations totaling over 150 million gallons over the past five years.***

Currently, MnTAP is exploring the opportunity for water conservation by private industrial water users across the eleven county Twin Cities metro. The project team will identify factors that encourage or create barriers for implementation of identified industrial water conservation projects. Project goals include:

- **A survey of private industrial water users to assess general trends in water use and conservation activities.**
- **Numerous on-site assessments with MnTAP engineering staff to directly identify water conservation opportunities.**
- **An in-depth investigation of three facilities through summer intern projects.**

This water conservation project is sponsored by MCES and supported with Clean Water Land & Legacy Amendment funds.

Here are a few highlights of water conservation projects throughout 2012:

- Five assessments were conducted by MnTAP staff experienced in industrial process improvements.
- 70 million+ gallons of water conservation opportunity have 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

MnTAP will support implementation of identified water conservation opportunities and additional assessments though the end of 2013. ■

## Squeeze the most from every drop: *Water conservation tips for your business*

- **Understand your water flow**
- **Reuse water**
- **Use high-pressure, low- volume wet cleaning systems**
- **Optimize nozzle type for your application**
- **Prevent leaks**

- **Turn water off when not in use**
- **Review your clean-in-place system**
- **Train your employees about water conservation**
- **Create incentives for employees to reduce water use**

***More on how to maximize your water use at: http://www.mntap.umn.edu/greenbusiness/water.htm***

# Organic waste management is now in vogue

Food businesses can save money and lighten their trash loads when they manage organic waste. Whether it's a tomato or a tomAHto, waste costs your business money.

***"Businesses pay for materials three times during the life of the product,"*** says MnTAP Organic Waste Specialist Matt Domski. The first time is the initial purchase, the second cost comes through processing and the third is paid when the unconverted material is disposed as waste.

A business that recycles their organic waste may be able to reduce cost number three, their disposal cost.

***"There is a large percentage of food that is wasted that could be put to beneficial reuse. It can be donated to food banks or pig farms, composted or burned for energy,"*** said Domski.

Following are three examples of businesses that found savings by implementing organic waste management processes. ■

**What they said...**

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

*-- Cherryl Mesko, City of Eagan, Parks and Recreation Superintendent of Operations*

## Eagan Community Center finds cost savings through composting

With the help of the Eagan Energy and Environment Commission and Dakota Valley Recycling, MnTAP helped the Eagan Community Center establish a collection system to send organic waste to a composting facility, with support from an EPA solid waste management assistance grant. The implementation included purchasing color-coded bins, training staff members, purchasing and offering compostable service ware, and engaging the public with signage.

Based on the results of a waste sort, the facility has reduced its daily trash by 55%, with the potential to divert 45,000 pounds of waste annually from the landfill. Cost savings may be achieved by reducing the number of trash pickups each week. The facility now recycles three pounds of material for every one pound thrown in the dumpster.

The City of Eagan is looking to expand organics separation to other city-managed facilities. ■

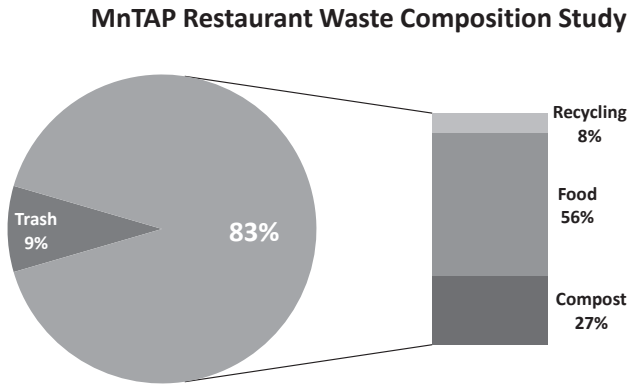

**As part of the composting project with the City of Eagan, MnTAP helped generate signage for composting, recycling and trash.**

# Restaurant waste is mostly compostable or recyclable

As part of the Ramsey/Washington County Resource Recovery Project, 10 restaurants participated in a MnTAP intern project during the summer of 2012: Burger Moe's, Donatelli's, The Downtowner, Leo's Grill & Malt Shop, Rudy's Redeye Grill, Sweeney's Saloon, The Day by Day Café, The Green Room, Ursula's Wine Bar & Café, and Washington Square Bar & Grill.

Each restaurant proved to be conscious of their waste streams, with most having recycling systems in place. A waste sort of the remaining dumpster trash revealed that over half the waste was food that could be composted.

MnTAP intern Jessica Primozich evaluated opportunities to divert food and other organic material in restaurant waste from landfills. The project generated a model for organic waste management, providing businesses with a template to recycle more material and reduce costs.




Primozich spotted other trends that can help restaurants improve recycling rates:

- An average of 83% of total waste was food and other reusable material.
- Common materials that were not recycled properly were food and beverage containers.
- Color-coded bins for trash, recycling and organics could improve waste management efficiency. ■

**Don't let waste eat into your bottom line...**

***No matter how you look at it, waste costs you money.***

MnTAP is offering NO COST organic waste assistance to businesses in the Ramsey/Washington County area through the end of 2013.

Funded through the Resource Recovery Project, MnTAP is focusing on implementing organic waste management best practices with food processing companies and related organic waste generators in Ramsey and Washington Counties.

*Conatct Matt Domski at 612.624.5119 or domsk004@umn.edu*

# Land 'O Lakes R&D reduces disposal costs, improves worker safety

The Resource Recovery Board of Ramsey and Washington counties collaborated with MnTAP on a project to model organic waste management in food processing facilities.

Intern Matt Domski (now MnTAP's organic waste specialist) worked at Land O'Lakes R&D in Arden Hills for three months. He evaluated the waste stream, and conducted employee interviews and meetings with waste haulers to determine the best options for waste management.

The project revealed some key opportunities for Land O'Lakes R&D: 60% of all food waste, or approximately 15 tons per year, could be claimed for beneficial reuse. Land 'O Lakes implemented a food-to-hog farm collection service, which takes excess food, steam-heats it to kill pathogens, and feeds it to the animals.

By removing this portion of food waste from the trash, Land O'Lakes R&D gains value in three main ways:

- **Reduced disposal costs** – adding an organic service and reducing the amount of food waste in their dumpster will help Land O'Lakes save approximately $11,000 annually.
- **Improved employee safety** – adding an organic service helped reduce the amount of heavy lifting done by employees to transport food waste.
- **Increased use of raw material, less environmental impact** – food that was once waste is now a valuable resource to farmers as a food source for their swine.

Combining experience at Land O'Lakes R&D with additional research, Domski developed a comprehensive model for organic waste management. The model will serve as a starting point for other food processing facilities to implement organics recycling programs. ■

# 2013 MnTAP interns identify energy and water savings

On May 20, 2013, nine talented and ambitious students began their summer MnTAP internships. This year, the interns are charged with identifying potential waste, energy and water conservation solutions at companies in the Twin Cities and Duluth.

To begin their projects, each student toured their facility to learn about the production process and facility operations. The students then began to identify where the waste is generated or the energy or water is being used. With guidance from their MnTAP advisors and on-site supervisors, the interns researched and began implementing effective solutions to help the facilities save costs, reduce their regulatory compliance burden, and decrease environmental impacts.

Participating companies in the 2013 summer intern program include:

- St. Luke's Hospital, Duluth
- St. Croix Forge, Forest Lake
- Consolidated Precision Products, Bloomington
- Schwing America, White Bear Lake
- Tennant Company, Minneapolis
- Federal Cartridge, Anoka
- Gedney Foods Company, Chaska
- Michael Foods, Chaska
- CSM Bakery Products, Eagan

**A 2013 MnTAP intern at Federal Cartridge in Anoka researched multiple water conservation and recycling opportunities including single pass cooling applications and other metal-forming manufacturing steps that incorporate washing and rinsing.**

As in past years, a number of utility companies and government agencies are partnering with companies within their service area to offer their clients interns through the MnTAP program. Xcel Energy, CenterPoint Energy, Minnesota Energy Resources Corporation (MERC), Minnesota Power, Metropolitan Council Environmental Services, and the Minnesota Department of Commerce, Department of Energy Resources are all helping to sponsor part or all of a 2013 intern project.

The 2013 interns will be presenting their projects at a public forum on August 22, 2013 from 1:00 p.m. - 4:30 p.m., at the University of Minnesota. To register for the event go to: http://form.jotformpro.com/form/31607012241943. For more information about the intern program, visit MnTAP's web site at www.mntap.umn.edu or contact Linda Maleitzke, 612.624.4697. ■

## *Welcome new MnTAP Staff!*

**Anna Arkin** is a Solid Waste Specialist who manages the Minnesota Materials Exchange, the state's online business reuse network, and serves as interim coordinator for ReUSE Minnesota, a new trade association for the reuse sector. She previously developed an organics recycling program with U of MN Recycling through Minnesota GreenCorps.

**Matt Domski** is an Organic Waste Specialist. He began with MnTAP as a summer intern, after graduating with a B.S. in Bioproducts Marketing & Management and a minor in Corporate Environmental Management. He will focus on organic waste reduction in food processing and institutional facilities.

**Monique Dubos** joins MnTAP as Communications Associate. She has more than 10 years of experience as a freelance writer and editor, and has been published in preriodicals across Minnesota, including Ensia.com.

**Linda Maleitzke** is the new Communications Specialist and Intern Program Administrator. She is responsible for providing outreach and communication leadership for MnTAP programs and initiatives. Linda has more than 20 years of experience in communications and marketing in the private, public, and non-profit sectors, including over five years of experience as a communications professional in higher education.

**Mark Powers** is an Engineering Coordinator. He has more than 12 years of experience as a process engineer, with expertise in agricultural and renewables processing, renewable chemicals, reverse osmosis membrane manufacture, and microelectronics manufacturing. He is active with Enterprise Minnesota on GreenLean™ projects and provides technical assistance to all industries. His MnTAP focus is within the ethanol and pulp/paper industries, as well as on energy conservation projects.

# Materials Exchange

**The Minnesota Materials Exchange program lists one company's unwanted material and makes it available for use by another company.**

The Minnesota Materials Exchange program (www.mnexchange.org) connects organizations that have reusable goods they no longer need to those who can use them. This reuse network helps prevent usable materials from becoming waste and entering our landfills and also saves users money.

### Recent Accomplishments

MnTAP introduced an entirely new Materials Exchange website in 2011. Throughout 2012, we refined the website and launched an improved site at the beginning of 2013. The improved website is user-friendly and intuitive, and offers new options for listing and browsing items listed on the exchange.

During 2012, MnTAP strengthened its partnership with the University of Minnesota ReUse Center and their"Virtual Warehouse," through which they are expanding their on-campus reuse program to the web.

In 2012, MnTAP registered 345 new members to the Materials Exchange and saw 11,220 unique visitors, 271 listings, 70 successful exchanges reported, 13 tons of waste diverted, and thousands of dollars saved.

### Wanted!

The Materials Exchange is a great place to list items that you have available. But did you know that you can also list items that you want? Check out the items wanted by others to see if you have something that someone else needs:

- Wood pallets
- Padded envelopes
- 55-gallon food-grade plastic drums
- Used computers
- Packing materials, including bubble wrap, foam peanuts and cardboard

Log in to www.mnexchange.org today. Who knows? Other users may just need what you have or have what you need!

### For More Information

If you have questions regarding the Materials Exchange or solid waste issues, please email mnexchange@umn.edu or call Anna Arkin at 612.624.0808. ■

## ReUSE Minnesota: *Dedicated to Strengthening Minnesota's Reuse Sector*

Through an Environmental Assistance grant from the MPCA and support from several Minnesota reuse organizations, MnTAP has been coordinating a new nonprofit organization dedicated to increasing the visibility of Minnesota's reuse sector.

**ReUSE Minnesota is focused on bringing visibility to the reuse, rental and repair sector through networking, publicity and events.**

The organization's official launch was celebrated at Summit Brewery in St. Paul in June and drew over 100 business owners and other reuse advocates. Their exhibit at the Minnesota State Fair this year, "Room with a 'Re'Purpose," will demonstrate opportunities to reuse and repair everyday items through beautiful interior design and furniture ideas.

"The three R's" have been part of MnTAP's conversation for many years; reuse is only recently getting the attention it merits due to its environmental, social and economic benefits.

Learn more at www.reusemn.org or contact ReUSE Minnesota Coordinator Anna Arkin at 612.624.0808 or info@reusemn.org.

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# MINNESOTA TECHNICAL ASSISTANCE PROGRAM

UNIVERSITY OF MINNESOTA

The Minnesota Technical Assistance Program (MnTAP) helps businesses and industries develop and implement industry-tailored solutions that maximize resource efficiency, prevent pollution and reduce costs and energy use to improve public health and the environment. As an outreach program at the University of Minnesota, MnTAP provides technical assistance tailored to individual businesses. By reducing waste and increasing efficiency, companies save on disposal and raw-material costs and make working conditions healthier and safer for employees.

MnTAP is funded primarily by the Minnesota Pollution Control Agency's Resource Management and Assistance Division and is located at the University of Minnesota in the School of Public Health, Division of Environmental Health Sciences. 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.



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## Calendar

August 13, 2013. **Pro Paint Incorporated 6th Annual Trade Show and Seminars.**

August 22, 2013. **Intern Program Final Presentations.** Learn more about pollution prevention and energy efficiency solutions from students participating in the 2013 MnTAP intern program. Each presentation is 15 minutes with 5 minutes for questions.

August 26-28, 2013. **Next Steps for Campus Sustainability: Connection, Integration & Transformation.** This workshop will help campus sustainability leaders push their institutions towards a deeper commitment to sustainability.

September 22-24, 2013. **ACEEE National Conference on Energy Efficiency as a Resource.** This conference draws together leading experts from a broad spectrum of energy industry stakeholders.

September 24-26, 2013. **International Institute for Sustainable Laboratories Annual Conference.** Industry professionals from around the world will gather in Minneapolis to experience dozens of technical sessions, symposia, workshops, and offsite evening tours on a variety of laboratory design, construction, architecture, engineering, and maintenance topics.

September 25-26, 2013. **16th Annual Pollution Prevention Conference and Trade Show.** The pollution prevention conference and trade show is a two day event. Day one will consist of GreenScreen™ Training, workshops, and other speakers as well as an evening reception. Day two will have keynote presentations and three concurrent breakout tracks.

Editors: Linda Maleitzke and Monique Dubos. Contributing writers: Anna Arkin, Matt Domski, Karl DeWahl, Mick Jost, Paul Pagel, John Polanski, Mark Powers and AJ Van den Berghe.  This newsletter is sent free to Minnesota businesses and is available online at www.mntap.umn.edu/source. This publication/material is available in alternative formats upon request. Direct requests to Linda Maleitzke 612.624.1300 or lmaleitz@umn.edu.

Appendix N - 2013 Intern Presentation Program Flyer

## Minnesota Technical Assistance Program

Each summer, MnTAP interns help identify solutions for wastes including:

- Energy use
- Raw material use
- Air emissions, VOCs, HAPs
- Solid or hazardous waste
- Water use and wastewater

Hear about their projects at this year's intern presentation session.

Each presentation is 15 minutes with 5 minutes for questions. Interns will present in the order listed to the right.

### RSVP by August 15, 2013

Register at: http://form.jotformpro.com/form/31607012241943
or call: 612.624.4697 • 800.247.0015
Email: mntap@umn.edu

### Directions

For directions to the McNamara Alumni Center, visit: mntap.umn.edu/us/directions.htm

Please note that Washington Avenue through the University is closed to vehicle traffic. Significant road construction projects may require additional time to get to campus.

### Looking for a 2014 MnTAP intern?

Contact Linda Maleitzke to discuss your potential project for 2014.

Call: 612.624.4697 • 800.247.0015
Email: lmaleitz@umn.edu

Pollution Prevention and Energy Efficiency Solutions

# 2013 Intern Presentation Program

Learn more about pollution prevention and energy efficiency solutions from students participating in the 2013 Minnesota Technical Assistance Program (MnTAP) intern program.

**Thursday, August 22, 2013 • 1:00 p.m. - 4:30 p.m.**
**Maroon and Gold Room, McNamara Alumni Center, University of Minnesota**

**1:00** **Welcome.** *Linda Maleitzke, MnTAP Intern Program Coordinator*

**1:05** **St. Luke's Hospital, Duluth.** The intern researched opportunities to reduce the hospital's electric energy consumption. *Benjamin Wagener, University of Minnesota, Duluth, Mechanical Engineering*

**1:25** **St. Croix Forge, Forest Lake.** The intern evaluated hydraulic cooling, air compressor, and press lubrication systems identifying ways to cost effectively reduce process energy and material use. *Amanda Spencer, Washington University in St. Louis, Electrical and Biomedical Engineering*

**1:45** **Consolidated Precision Products, Bloomington.** The intern researched energy efficiency and water conservation improvement opportunities in the aluminum casting processes. *Anshul Gupta, University of Minnesota, Mechanical Engineering*

**2:05** **Schwing America, White Bear Lake.** This intern researched opportunities to reduce energy use and increase efficiency through the lean manufacturing process. *Paul Senne, University of Minnesota, Duluth, Mechanical Engineering*

**2:25** **Tennant Company, Minneapolis.** The intern developed an inventory of all waste streams targeting source reduction and diversion initiatives; the intern also analyzed water consumption in the reverse osmosis system. *Jaclyn Thomes, University of Minnesota, Environmental Sciences*

**2:45** **Break**

**3:00** **MnTAP's Water Conservation Efforts.** *Mick Jost, MnTAP Project Coordinator*

**3:10** **Federal Cartridge, Anoka.** The intern researched multiple water conservation and recycling opportunities including single pass cooling applications and other metal-forming manufacturing steps that incorporate washing and rinsing. *Kaylea Brase, Calvin College, Chemical Engineering*

**3:30** **Gedney Foods Company, Chaska.** The intern focused on reducing water use and wastewater created during product processing as well as improving efficiencies, reducing salt use, and reducing chloride content in the wastewater. *Ryan Venteicher, University of Minnesota, Civil Engineering*

**3:50** **Michael Foods, Chaska.** The intern researched possible well water reduction and reuse opportunities in the potato scrubbing process and other plant operations. *Alex Hoppes, University of Minnesota, Civil Engineering*

**4:10** **CSM Bakery Products, Eagan.** At this food processing facility, the intern focused on researching opportunities to reduce energy use, conserve water, and improve process efficiencies. *Zachary Metz, University of Minnesota, Chemical Engineering*

**4:30** **Wrap-up.** *Linda Maleitzke, MnTAP Intern Program Coordinator*

MnTAP works with Minnesota businesses to implement industry-tailored solutions that maximize resource efficiency, prevent pollution, increase energy efficiency, and reduce costs. MnTAP is a non-regulatory program in the School of Public Health at the University of Minnesota and is funded by the Minnesota Pollution Control Agency's Resource Management and Assistance Division.

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## Appendix O

Reproduced excerpt of December 12, 2013 MnTAP E-News email showcasing the 2013 intern results including the three MCES project-sponsored projects


### Learn about the success of the 2013 intern program in *Solutions*

SolutionsMnTAP has launced a new publication called ***Solutions*** to highlight the successful projects from the intern program. By implementing the recommendations identified by the eleven 2013 interns, host companies could realize the reduction of over 522,570 pounds of waste, 2.2 million kWh and 317,327 therms of energy, and conserve over 54 million gallons of water. Combined, these reductions have the potential to save companies $872,200 annually! We hope that as you read about the 2013 MnTAP intern projects and the results achieved, you will be inspired to contact MnTAP to learn how your company can benefit from having an intern at your site to maximize resource efficiency, increase energy efficiency, reduce costs, and prevent pollution.

For more information about the intern program or the application process, visit MnTAP's Web site at http://www.mntap.umn.edu/intern or contact Linda Maleitzke at MnTAP at 612.624.4697 or 800.247.0015.

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