



WATERLINE



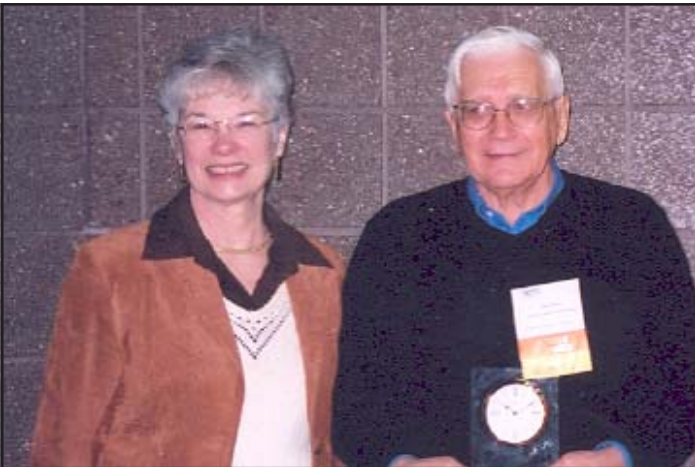
NEWS AND INFORMATION
FOR PUBLIC WATER SUPPLIERS IN MINNESOTA

Waterline to End in Paper Format

In an effort to improve efficiency, save money, and evolve with changing business practices, the Minnesota Department of Health (MDH) is switching from postal delivery of printed newsletters to electronic delivery of newsletters as of March of 2007.

The plan is to publish a web-only version of the *Waterline*, which will contain the same information about upcoming training and regulatory updates as well as other news and feature stories. A new issue will be produced quarterly, and e-mail will be used to notify people when it has been posted on the MDH website. Many operators and others are already receiving a notice when current issues are put on the website. Others may register to get these notices by going to <http://www.health.state.mn.us/divs/eh/water/newsletters.htm> and clicking on the link to subscribe (next to the red envelope beneath the description of the *Waterline*).

Information about schools, exams, certification, regulatory changes, and security issues will still be sent by regular mail.



MDH Commissioner Dianne Mandernach (left) was the keynote speaker for the awards luncheon at the Minnesota Rural Water Association (MRWA) Technical Conference in March. Among the awards she presented was one for distinguished service to John Baerg of Red Rock Rural Water System. John has served on the MRWA board of directors for more than 20 years.

Record Attendance for Management Institute



Forty-six students, the highest total ever, attended the 2006 Midwest Regional Water Utility Management Institute in March. The Institute, sponsored by the University of Minnesota's College of Continuing Education and Minnesota American Water Works Association in cooperation with the Suburban Utility Superintendents Association, is structured to build strong supervisory and management skills. The topics of the three-day event included leadership skills, goal setting, decision making, and organizational behavior.

Upcoming Water Operator Certification Exam Dates

June 9, Deerwood

June 21, Wahkon

July 12, Mabel

September 14, St. Cloud

October 12, Windom

October 17, Morris

October 18, Collegetown

October 24, Champlin

October 27, Red Wing

November 30, Detroit Lakes

See calendar on back page for more information

St. Cloud Boils

A Look at How St. Cloud Handled Its Recent Drinking Water Advisory

By Lisa Vollbrecht
Water Service Manager
St. Cloud Public Utilities

The St. Cloud Water Treatment Facility (WTF) provides drinking water to the 68,000 residents in the cities of St. Cloud and St. Augusta. On Monday, February 20, 2006, the city of St. Cloud issued a Public Notification of a Drinking Water Advisory (Boil Water Advisory) because two finished water samples tested positive for *E. coli* bacteria. Prior to the notification, in its 100-plus year history, the St. Cloud Water Treatment Facility had never issued a public notice or advisory for contaminated drinking water.

Saturday, February 18, 2006 at 8:00 p.m., finished water and lime softened clarifier samples were collected and stored in the laboratory refrigerator until Sunday, February 19. On Sunday at 1:25 p.m., the daily finished water and lime softened clarifier samples were collected. For quality control purposes, a duplicate finished water sample was also collected with the sample series. Sunday at 1:30 p.m., the samples (five finished water and two lime softened clarifier) were analyzed for total coliform bacteria using the Colilert-24 method. The samples were incubated for the required 24 hours.

On Monday, February 20, 2006, the samples were removed from the incubator at 1:30 p.m.; two of the finished water samples were positive for total coliform bacteria. The presence of *E. coli* bacteria was confirmed on the samples using the fluorescence confirmation procedure. The results for the two lime softened clarifier samples and the finished water duplicate sample were negative, indicating no total coliform bacteria.

Background Information

The St. Cloud WTF laboratory is certified to analyze total coliform bacteria and *E. coli* using three methods: membrane filtration, Colilert-18, and Colilert-24. Membrane filtration and Colilert-24 have an incubation period of 24 hours. Colilert-18 has an incubation period of 18 hours.

The St. Cloud WTF has two 8-million-gallon flow trains. A flow train was started February 9, 2006. The second-stage lime softening clarifier was testing positive for coliform bacteria and *E. coli*. A systematic approach was in place to correct the clarifier.

Monday, February 20, 2006, was President's Day, a national holiday.

Confirmation of Public Notification of Drinking Water Warning

When the finished water samples were confirmed positive for *E. coli*, Public Utilities staff began implementing the St. Cloud Water Treatment Facility's Emergency Response Plan (ERP). On Monday, February 20, 2006, the finished water samples were analyzed using three distinct methods for detection of bacteria and *E. coli*. The



A positive Colilert sample.

distribution system was sampled and analyzed using Colilert-18.

Operational data was thoroughly reviewed. An assessment of first-stage and second-stage treatment showed all parameters were in normal ranges. Chlorination and filtration were exceptional with low turbidities, normal pHs, and high chlorine residuals. The WTF was also visually inspected.

All laboratory procedures and operational laboratory data were reviewed and found acceptable. The Minnesota Department of Health's guidance manual, *Bacteriological Contamination Response Procedures for Community Water Supplies*, was referenced for the following procedure.

Public Notification of a Boil Water Advisory

Monday, February 20, 2006 at 4:15 p.m., the cities of St. Cloud and St. Augusta issued a Boil Water Advisory. A standard template with required language was used for the public notification document.

In accordance with the St. Cloud Water Treatment Facility's ERP, critical customers were notified first. Direct communication was made with the city of St. Augusta, St. Cloud Hospital, Veterans Medical Center, nursing homes, St. Cloud School District, and daycare facilities.

The second tier notification was to the St. Cloud Media Services Department. The public notification was posted on the local cable access channel and the city of St. Cloud's website. The St. Cloud Community Services Department was contacted to assist with translating the Boil Water Advisory into other languages. St. Cloud's Health and Inspections Department was also notified.

The third tier of notification was local radio stations and the St. Cloud Times; each was telephoned and faxed details of the Boil Water Advisory.

Residents began calling the WTF for confirmation and details of how to respond. All concerns were addressed and residents were thanked for their time and patience.

The metro area news stations carried the story on their 10:00 p.m. broadcasts. Some stations were thorough and informative; others projected panic and fear.

Throughout the evening on Monday and during the day on Tuesday, updates were posted on City of St. Cloud's website and were broadcast on the local cable access channel.

Lifting the Boil Water Advisory

Multiple finished water samples, using three laboratory methods for analysis, were incubated throughout the evening on Monday, February 20, 2006. The sample results that were available throughout the day were all negative for bacteria. The city was required to delay lifting the Boil Water Advisory until Tuesday, February 21, 2006 at 3:05 p.m., when the last distribution system sample set test results were confirmed negative for contamination.

St. Cloud Boil Water Advisory—Continued on next page

A news conference was held at 3:05 p.m. on Tuesday, February 21, 2006, to lift the Boil Water Advisory. Multiple area news media representatives attended.

Follow-up to Re-establish Credibility with Our Customers

Using local media outlets, the Boil Water Advisory was lifted. The city of St. Cloud's website and local cable access channel were updated with the notification that the Advisory was lifted. Critical customers were notified directly by telephone.

Additional distribution samples were taken on Tuesday, February 21, 2006 and Wednesday, February 22, 2006. Updates of the sample results were posted on the City of St. Cloud's website and the local cable access channel. Customers were thanked for their patience and understanding.

Multiple meetings and presentations were scheduled. A presentation was made to St. Cloud City Council. Follow-up assessment meetings were held with city, county and state officials, and critical customers.

What Caused the Event

All operational parameters and treatment met or exceeded operational standards. The visual inspection of the WTF showed no signs of contamination. The finished water and water distribution system samples taken after the two initial confirmed positive samples were negative for bacteria. The inspections prior to laboratory analysis did not show possible indications of contamination.

Bacteria/*E. coli* was not found in the distribution system to indicate contamination of the finished water sample tap. Because the samples were held on Saturday and analyzed on Sunday, Saturday's error was repeated on Sunday's samples.

Corrective Action

The Boil Water Advisory presented the opportunity for evaluation of daily activities as areas for improvement. Multiple tasks and work duties have been reviewed to provide additional safety and effectiveness.

A summary of corrective action measures taken to reduce the possibility of a water advisory was added to the ERP. Public notification procedures were also evaluated and summarized in the ERP.

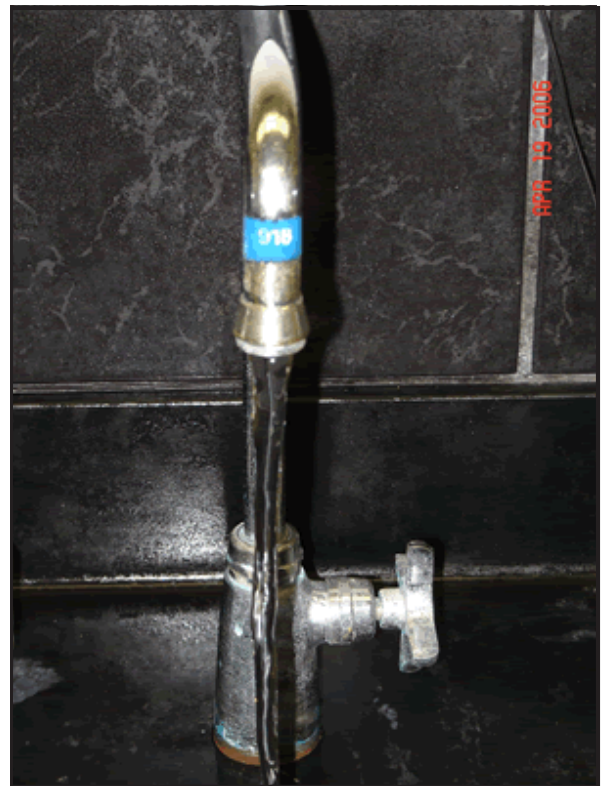
What Went Well

The residents in the Cities of St. Cloud and St. Augusta were kept informed with updates throughout the event and after the event. Overall, they responded positively to the experience.

Local grocery stores kept bottled water stocked and additional shipments were on order depending on the duration of the event.

The public notification specifically requested residents to notify their neighbors of the situation. Word of mouth was an effective tool to notify residents that don't watch television or listen to local radio.

Multiple organizations offered assistance throughout the event.



The finished water tap for the St. Cloud Water Plant. It is also the first distribution site after the clearwell.

What Needed Improvement

The ERP addressed critical customer bases, including elderly and young people and immune compromised people. The ERP did not address large customer bases including malls, correctional facilities, and industries with large populations.

The water utility did not activate the Emergency Operations Center (EOC) for the Boil Water Advisory. The magnitude of the event was such that the EOC should have been activated to assist with phone calls and to channel information to a single source. Most water utilities are not familiar with emergency response procedures that occur daily in the community. All city departments should review their use of the EOC and procedures to activate it.

The local cable television company was not responsive to the emergency. Requests were made to put a crawler along the bottom of all network channels to ask residents to tune to the city's local cable access channel for details regarding the Boil Water Advisory. The cable company responded two days later.

The city of St. Cloud provides regional wastewater services to five area cities. Many residents in neighboring communities called the St. Cloud WTF to ask if their water was safe to drink. Each area city should have been asked to put information on its cable access channels and websites explaining that their water comes from a different source and was safe to drink.

Closing

The public health and safety of the residents served by the St. Cloud WTF was the priority during the event. It was important to the water utility to show extreme caution and concern. The customers responded with patience and understanding.

Prepare Now for Pandemic Flu

What will happen with the Avian H5N1 flu strain (bird flu) is still anyone's guess, but water systems are among those who should be developing contingency plans in case the flu strain changes so that it can be passed easily from human to human. Such a pandemic would have widespread ramifications and could affect interstate shipping, which could interrupt deliveries of chemicals and other supplies. The workforce could also be affected if employees become sick.

Utilities should address this issue and include it in their emergency response plans. Identifying backup personnel and developing an assistance network with other utilities are also important.

Other recommendations:

- Cross-train employees to perform essential functions.
- Stockpile personal protective equipment, including masks and gloves, to reduce the chances of essential workers becoming infected.
- Stockpile chemical supplies.
- Purchase back-up generators in case the electrical supply is interrupted during a pandemic.

The continuation of water supply is always critical, but it could take on an even more important role in the event of a pandemic. Those who get sick will need to drink large quantities of water. Death can occur as a result of dehydration. In addition, frequent handwashing will be a major component of the good sanitation practices that will help to keep the disease from spreading.

The World Health Organization (WHO) points out that contingency planning, especially during times of limited resources, is often difficult to justify. "Preparation will mitigate the direct medical and economic effects of a pandemic, by ensuring that adequate measures will be taken and implemented before the pandemic occurs," the WHO maintains. "Preparing for the next influenza pandemic will provide benefits now, as improvements in infrastructure can have immediate and lasting benefits, and can also mitigate the effect of other epidemics or infectious disease threats."

Membrane Technology Conference Slated for Minneapolis in August

The Minnesota Section of American Water Works Association will conduct the Upper Midwest Membrane Technology Conference at the Holiday Inn Metrodome in Minneapolis from Wednesday, August 16 to Friday, August 18.

For more information, go to <http://mnawwa.org/membranetechnologyconference2006.pdf>.



Met Council to Develop Water Supply Master Plan for Twin Cities

Prompted by an act of the Minnesota Legislature last summer, the Metropolitan Council is developing a master plan for water supply in the Twin Cities. Chris Elvrum of the Metropolitan Council says that regional planning will address the cumulative impact of decisions and actions by individual water systems. Another goal of the program, Elvrum says, is to streamline the regulatory and permitting process.

The Council will develop and maintain a database of technical information about Twin Cities water systems. Much of the information will come from the Minnesota Department of Health's existing database, but Elvrum said there are some gaps that will have to be filled in. The information gathered will provide guidance for future regional investments in water supply.

The Council will report its findings and recommendations to the Legislature in time for the 2007 session and every five years thereafter.

More information on the master plan is available at <http://www.metrocouncil.org/environment/watersupply/index.htm>.

MDH Releases Annual Report

The Minnesota Department of Health (MDH) released its annual report on the state of drinking water in Minnesota in May. Once again, the results indicate few problems and that drinking water supplies in the state are generally in very good shape.

Topics discussed in the Emerging Issues section include an update on rule revisions and a section on dealing with contaminated sources.

The report is on the MDH website at:

<http://www.health.state.mn.us/divs/eh/water/com/dwar/report05.html>

Past reports, back to 1995, are also available at this site.

School News

More than 300 operators came to the Metro District school in Bloomington in April. One of the highlights was a presentation at the operator breakfast on the final morning by the University of Minnesota Raptor Center. Laura Freeman of the Raptor Center brought a red-tailed hawk, peregrine falcon, great-horned owl, and bald eagle. This was the last Metro District School to be held at the Thunderbird Hotel and Convention Center in Bloomington. The 2007 school, which will be held from Wednesday, April 18 to Friday, April 20, will be at the Earle Brown Heritage Center in Brooklyn Center.

The Northeast District held its school in late April at Ruttger's Sugar Lake Lodge near Grand Rapids and will be back in the spring of 2007 (April 25-27). The 2006 school included hands-on sessions at the Grand Rapids Water Plant.

Ethanol Production Dependent on Water

“People don’t realize how important water is in the manufacture of ethanol,” says John Lapointe, a design engineer for U. S. Water Services of Plymouth, Minnesota. Ethanol as a fuel additive is growing in prominence, particularly in Minnesota, which is a prolific producer of corn, the raw material needed for ethanol.

In Minnesota, the southwestern part of the state has an abundance of corn, but it is also the region where the water quantity and quality challenges are the greatest. “That usually means significantly more capital costs, installing equipment to treat the water,” said Randy Meyer, one of the co-founders of U. S. Water Services, which supplies water treatment systems for industrial use and assists with the design.

“It’s amazing how much water is needed for the ethanol process,” Lapointe adds. “The second part of it is it’s amazing how the treatment of it is so critical. The water has to be brought up to ultrapure standards for the cooling tower, for the boiler, and all these things. And it’s hard to discharge. So it’s finding a good source—finding volume—and it has to be high quality or it has to be treated at a high level, and then it’s being able to discharge it.”

Meyer cited other factors to be considered in selecting a site for an ethanol plant, such as rail lines, infrastructure, power, labor, and raw materials. “Water is just one of the factors, but without it, you can’t run the plant,” said Meyer, noting also that the plant also couldn’t be operated without a way to discharge the water. Depending on what minerals and other constituents are in the raw water, a facility may have to treat the water before discharging it into the environment following its operations. “The quality of the raw water is the biggest factor as to whether they’ll be able to discharge into the environment and how the design of the water treatment plant occurs with the plant.” Regulations regarding discharge vary from state to state. In Minnesota, the amount of total dissolved solids in the discharge water is a significant issue.

For an ethanol plant, the water first goes through a pre-treatment phase, which can consist of reverse osmosis, iron filters, and/or lime softening, before splitting into two streams. Some of the water goes to the process, or contact, side. This water is recycled during the process and none leaves in liquid form, only through evaporation.

An article in the December 26, 2005 *Star Tribune: Newspaper of the Twin Cities* said that farm-related businesses, particularly ethanol plants, are closing in southwestern Minnesota because of the arid nature of the region. Tim Cowdery, a hydrologist with the U. S. Geological Survey, was quoted in the article as saying, “People can see they’re running out of water. They’d like to build more industry. They’d like to build more ethanol plants. They just don’t have the water to do it.”

The rest is utility, or noncontact, water, which requires a higher degree of treatment for the boiler system and cooling tower. Reverse osmosis is used to remove approximately 98 percent of the minerals, which enhances the cycling process in the boiler and cooling system.

Cycling up refers to the inverse of the fraction of the solution containing the solids that are left behind when the water is boiled and evaporated. For example, if $\frac{3}{4}$ of the water is boiled off, $\frac{1}{4}$ of the solution is left. This is four cycles of concentration. The cycling also occurs in the cooling tower. Meyer said they run the plants at approximately 75 cycles of concentration. “If we can cycle up the water, we use less energy, fewer chemicals, less water, and have less environmental impact. It’s just more efficient for the plant.”



An ethanol plant. *Photo courtesy of Badger State Ethanol.*

As for the southwestern part of Minnesota, some smaller ethanol plants have been operating, and U. S. Water Services is involved in several new ones that are now under construction. Meyer notes that the area contains many of the factors necessary for such a plant, including raw materials, transportation, and fuel sources and adds, “These plants require new and innovative ideas on how to handle the water and what waters can be used to allow them to operate economically in this area.”



John Lapointe and Randy Meyer of U. S. Water Services.

Waterline

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To request this document in another format, call 651-201-4700; TDD 651-201-5797 or toll-free through the Minnesota Relay Service, 1-800-627-3529 (ask for 651-201-5000).

CALENDAR

Water Operator Training

Minnesota Section, American Water Works Association

*June 7-9, Central Water Operators School, Ruttger's Bay Lake Lodge, Deerwood. Contact Lyle Stai, 320-212-8590.

September 20-22, Section Conference, Duluth Entertainment and Convention Center. Contact Dave Schultz, 320-650-1059.

*October 12, Southwest Water Operators School, Windom. Contact John Blomme, 507-537-7308.

*October 18, Central Water Operators School, St. John's University, Collegeville. Contact Lyle Stai, 320-212-8590.

*October 27, Southeast Water Operators School, Red Wing. Contact Paul Halvorson, 507-292-5193.

*November 28-30, Northwest Water Operators School, Holiday Inn, Detroit Lakes. Contact Stew Thornley, 651-201-4655.

*Suburban Superintendents School

October 24, Champlin Ice Forum. Contact Charlie Borash, 651-681-4300.

Minnesota Rural Water Association, Contact Kyle Kedrowski, 800-367-6792.

*June 21, Operation & Maintenance, Wahkon

June 28, Operation & Maintenance, Green Lake

*July 12, Operation & Maintenance, Mabel

August 9, Operation & Maintenance, Warren

*September 12-14, Water Certification Exam Prep, St. Cloud

September 20, Operation & Maintenance, Northfield

October 4, Securing Financing for Small Systems, Mankato

October 11, Securing Financing for Small Systems, St. Cloud

*October 17, Operation & Maintenance, Morris

October 24, Winterizing Your Water System, Owatonna

October 25, Winterizing Your Water System, St. Cloud

November 8, Cross Connection and Backflow Prevention, St. Cloud

November 28, Management Seminar, St. Cloud

December 6, Operation & Maintenance, Biwabik

December 13, Operation & Maintenance, Waite Park

MRWA Nonmunicipal and Class E Training

June 20, Bemidji (Class E)

September 19, Ramsey (Nonmunicipal)

American Water Works Association Teleconference

November 2, St. Paul, Duluth, and Grand Forks, North Dakota. Contact Stew Thornley, 651-201-4655.

***Schools/meetings marked with an asterisk include a water certification exam. To be eligible to take a certification exam, applicants must have hands-on operations experience at a drinking water system.**

For an up-to-date list of events, see the training calendar on the MDH web site at:
http://www.health.state.mn.us/divs/eh/water/wateroperator/trng/wat_op_sched.html

MDH Drinking Water Protection web page: <http://www.health.state.mn.us/divs/eh/water>

Past issues of the *Waterline* are available at:

<http://www.health.state.mn.us/divs/eh/water/com/waterline/index.html>



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