



IOWA DEPARTMENT OF NATURAL RESOURCES  
LEADING IOWANS IN CARING FOR OUR NATURAL RESOURCES

**REPORT TO THE GOVERNOR**  
**WATER SAFE TO DRINK**  
**IN IOWA**



**IOWA'S DRINKING WATER**  
**CAPACITY DEVELOPMENT PROGRAM**  
**FISCAL YEARS 2012 - 2014**

# INTRODUCTION



***“Every day, millions of people turn on their faucets, but give little thought to the water that streams out.”***

– American Water Works Association

Fortunately, in communities across the State of Iowa, thousands of water system operators, superintendents, board and council members, trade associations, engineers, and others give enormous amounts of thought and energy to our water. Every day, they commit to providing safe, reliable, high-quality drinking water to residences, businesses, industries, and institutions of all kinds.

Iowa’s Drinking Water Capacity Development program, operated by the Department of Natural Resources (DNR), is dedicated to helping these water

supply personnel continually develop and improve their ability or “capacity” to serve their customers. There are three main elements of water system capacity, also known as “TMF.”

- **Technical:** Enough water, well maintained infrastructure, up-to-date technology, and qualified and knowledgeable staff to operate the system.
- **Managerial:** An effective organization and governance, accountability, properly certified operators, and good relationships and communications between management and staff.
- **Financial:** Enough revenue to cover current costs and future needs, fiscal controls, and credit worthiness.

***“Safe, reliable drinking water is essential to the protection of public health.”***

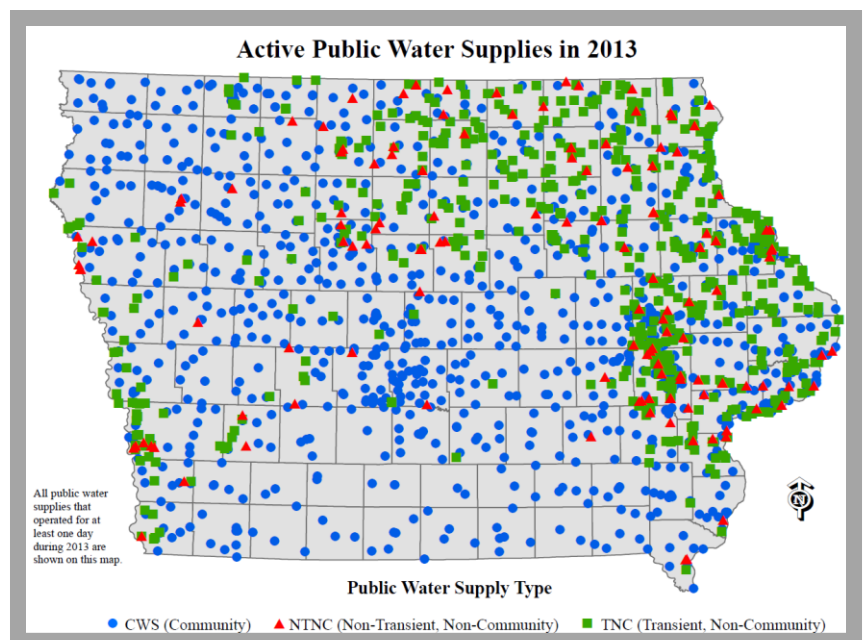
– U.S. Environmental Protection Agency

The Capacity Development program is one of the tools that the DNR uses to carry out its strategic plan goal: “Iowa will have a healthy and safe environment for work and play.” Drinking water quantity and quality is the backbone not only for human health but also for community and economic development. The DNR strives to work in cooperation with the regulated community to gain compliance with state and federal requirements and build stewardship of critical resources.

Community public water systems supply more than 2.76 million people in Iowa. As shown in the map, there are approximately 1,900 public water supply systems across the state.

Of those, 93% serve fewer than 3,300 people. These small systems face unique challenges in gaining “TMF” capacity. However, with the growing complexity of drinking water regulations, even medium and large systems sometimes need assistance.

Iowa’s Capacity Development program provides training, technical assistance, operator certification, and financing geared to the specific needs of small, medium, and large water systems.





***“When you drink the water, remember the spring.”***  
– Chinese proverb

The DNR’s efforts overall are based on collaborations with stakeholders and other experts, and the Capacity Development program is no different. An advisory group was instrumental in the preparation of Iowa’s original capacity development strategy in 1999 and 2000; the group was reconvened in 2005 and 2008 as the strategy was updated and revised.

The strategy has provided a framework for identifying the greatest needs, focusing on the most effective activities, and prioritizing limited resources. Without a plan, progress cannot be measured. With the strategy, the efficacy of the Capacity Development program can be evaluated.

The purpose of this report is to discuss and share with the Governor of Iowa, program users and stakeholders, the EPA, and the public the accomplishments, challenges, and ongoing activities of Iowa’s Capacity Development program.

## **CAPACITY DEVELOPMENT BACKGROUND**

***“We can celebrate over a century of public drinking water disinfection and treatment – one of the greatest public health achievements of the 20<sup>th</sup> century.”***

--U.S. Centers for Disease Control

In 1855, Dr. John Snow demonstrated that an outbreak of cholera in London, England could be traced to a well that was contaminated by bacteria from sewage. When he convinced the local authorities to take the handle off the pump so it couldn’t be used, the epidemic stopped.

In 1908, Jersey City, New Jersey became the first U.S. city to disinfect its drinking water. As more and more communities began to establish public utilities to treat drinking water, the incidence of disease dropped dramatically.



For example, in 1900 typhoid fever affected one out of every 1,000 Americans. By 1920 that had been decreased by two-thirds, and today typhoid is almost never seen in the U.S.

Federal regulation of drinking water systems began in 1914 via the United States Public Health Service. Through the decades the standards for drinking water have expanded considerably. In 1974 the passage by Congress of the Safe Drinking Water Act (SDWA) addressed concerns about bacterial contamination and included regulation of a new list of chemicals and substances that affect public health.

Out of the SDWA came the Public Water System Supervision (PWSS) Program, national drinking water regulations, and source water protection and groundwater protection efforts. The SDWA Amendments of 1996 laid the groundwork for the Capacity Development program and several of its components. The state programs that resulted focus on making sure that water systems in the U.S. have the capacity to achieve the SDWA's public health protection objectives now and in the future.



***“Capacity development is the process through which water systems acquire and maintain adequate technical, managerial, and financial capabilities to enable them to consistently provide safe drinking water.”***

--U.S. Environmental Protection Agency

The DNR has developed a series of categories and questions to assess whether or not water systems have TMF (technical, managerial, financial) capacity. Some of the questions are shown below to illustrate the issues involved in capacity development.

#### **Technical Capacity:**

- Is system demand growing, declining, or remaining stable?
- What potential sources of contamination exist that could affect water supplies?
- Will treatment be required for radium, arsenic, fluoride, nitrate/nitrite, pesticides or herbicides, industrial or commercial chemicals?
- Does the system have adequate storage, emergency generation, pumping capacity?
- Is the system being maintained in good condition?

#### **Managerial Capacity:**

- Does the staff have the right training and credentials to operate the system?
- Are there clear rules and standards for system modifications, construction, cross-connection and backflow prevention?
- Does the system have an organized approach to maintenance, record-keeping, and regulatory compliance?
- Is the governing board transparent and accountable to the community and customers?

#### **Financial Capacity:**

- Does the system have an annual budget as well as a long-term plan?
- Are water rates set appropriately to bring in enough revenue for current and future needs?
- Are financial controls in place?
- Does the water system keep all the water revenues or does it cross-subsidize other departments or activities?

How these questions are answered helps determine whether or not systems have the capacity to provide safe, reliable drinking water at a reasonable cost for the foreseeable future. The assessment, as shown on the next page, can point to weaknesses and problems that the efforts of Iowa's Capacity Development program can then begin to address.

|                   | Strong Capacity   | Moderate Capacity  | Weak Capacity   |
|-------------------|---|--|---|
| <b>Technical</b>  | Water supply and demand are regularly monitored. Long-term supply and demand projections are updated regularly.         | Water supply and demand are occasionally evaluated. Projections are several years old.                               | System is unaware of current water demand or supply levels. System has no projections or they are more than 10 years old. |
| <b>Technical</b>  | No compliance issues for previous three years.  | A few violations over previous three years, but no chronic issues.   | Many compliance problems over previous three years.   |
| <b>Managerial</b> | Meetings of the governing body are open to customers and staff. Advanced notice of meetings is provided.                | The governing body has procedures for open meetings, but does not follow them. Notice of meetings is inadequate.     | The governing body does not hold open meetings.   |
| <b>Managerial</b> | Guidelines and funding are in place for all staff at a water system to have regular training at defined time intervals. | Staff attend job-related training they specifically request and training requests are granted sporadically.          | Training is generally not requested or granted.   |
| <b>Financial</b>  | System has both annual operating and capital budgets. The governing body reviews a budget comparison each month.        | System has an annual operating budget. System lacks a capital budget or multi-year capital improvement plan.         | System does not have an annual operating budget.  |
| <b>Financial</b>  | System has enough funding available to cover the most expensive or vulnerable component of the system.                  | System has some funding available, but not enough to cover the most expensive or vulnerable component of the system. | System does not have any funding available to respond to an emergency.  |

## CAPACITY DEVELOPMENT GOALS AND ACTIVITIES



*“As drinking water regulations become more complex, the goal of the capacity development program is to give water supply operators the tools they need to ... provide safe water to the public.”*  
 --2011 Report to the Governor, Iowa DNR

Iowa’s Capacity Development program, implemented by the DNR in partnership with other agencies and organizations, provides training, technical assistance, operator certification, and financing.

### ***Training***

The DNR facilitates and participates in the training of water system owners and operators across the state. Much of the training is performed by technical assistance providers or professional trade organizations, such as the Iowa Rural Water Association, the Iowa Association of Municipal Utilities, or the Iowa Section of the American Water Works Association. Many times, DNR is represented on the planning committees for these meetings to provide input on the type of training needed by water system operators. Almost without exception, DNR staff attends these meetings to present on new or updated regulations or other areas of expertise requested by the meeting organizers.

Performance Based Training. The DNR also provides a unique training opportunity for operators of surface water treatment plants, called Performance Based Training (PBT). This training is conducted in six workshops over approximately 18 months for a group of five to eight treatment plants. It is progressive, with each session building upon information provided during the previous workshop. At least two operators from each system participate in the training, and each plant is provided with a DNR staff “facilitator” to assist with homework and questions throughout the training.

The operators participate in a variety of hands-on workshops in water treatment plants, conduct studies at their own plants, and provide feedback on their results to the group via presentations. The training focuses on optimization of the water treatment processes using existing equipment already available to the operators. During the 2012-2014 timeframe, DNR conducted its third series of PBT training with approximately 15 operators and seven DNR staff. There is not a lot of advanced training available for experienced operators in the state, so PBT fills a need for those with higher grade licenses. At least three plants have sent multiple groups of operators to the training.

***“What I liked most about the PBT course was the networking and consultation between plants, operators, and facilitators. The idea of a common purpose pursued by operators and regulators is excellent. Our success is dependent upon this interaction.”***

--Participant in the Performance Based Training program



Small System Training. In 2012, EPA awarded grants to four organizations for Small Water System Training and Technical Assistance. As a condition of each of these grants, the organizations were required to coordinate with the state to provide training that was relevant to its operators and systems. The DNR assisted the grantees with the selection of training topics, curriculum development, location and reservation of training sites, notifying the operators of training opportunities and taking registration, and reviewing and entering Continuing Education Units (CEUs). Department staff also attended each training session to answer questions and provide feedback for the training providers. Training sessions were held on a variety of topics, such as energy efficiency, water conservation and drought planning, and general introductory topics and disinfection for operators of Iowa’s smallest community water systems.

Board and Council Training. Specialized training for water system managers such as board members or city council members is made available through a DNR-funded contract with the Iowa Association of Municipal Utilities. This training is provided at the request of a water system or the DNR; it is sometimes required when managerial difficulties have become apparent. Training is conducted at the water system at a convenient time for board/council members and covers the technical, managerial, and financial responsibilities of public water system owners over a period of approximately three hours. Typical topics would include liability, communications, the importance of rate review, and operator responsibilities.



***“Now I will have materials and resources to help in decision making. I am a new [board] member; all of the information was good for me.”***

--Participant in Board and Council Training

**Operator Certification.** The DNR operator certification program is constantly working on new training opportunities for water system operators; one of the most successful is the Water and Wastewater Treatment Technology Diploma program developed in conjunction with the Des Moines Area Community College. This program is available to entry-level students interested in entering the field of water (or wastewater) treatment technology or operators working on improving their certification level or seeking a degree. This program combines classroom education on treatment, communication, human relations, water analysis, and environmental science with an internship requirement that allows students to gain experience with the topics they have covered in the classroom. Many utilities view this program as essential for developing a pool of qualified and motivated operators for the future.

## ***Technical Assistance***

The DNR water supply program considers technical assistance (TA) to be the cornerstone of its program for building water system capacity.

**TA Provided by DNR.** Just about every aspect of the program includes some form of technical assistance provided by DNR staff:

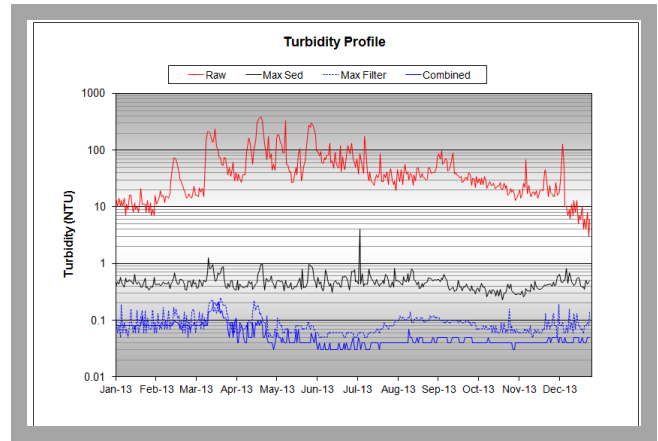
- Water Supply Engineering staff assist engineers and operators in developing construction permit applications to ensure safe and sanitary water supply infrastructure.
- Engineering staff evaluate the capacity of all new systems, systems applying for funding through the Drinking Water State Revolving Fund, and existing systems that DNR field staff consider lacking in capacity. Systems required to complete a self-assessment must comply with TMF requirements to receive construction and operation permits. Assistance with completing TMF requirements is generally provided by DNR's contracted technical assistance provider at no cost to the water systems.
- Water Supply Operations staff develop operating permits to assist water systems in collecting the appropriate samples to ensure compliance with the Safe Drinking Water Act requirements.
- In addition to operation permits, the DNR also sends monitoring reminder notices to help ensure that systems are aware of their sampling schedule.
- Other reminders, notice of staff speaking engagements, and articles of interest are included in the Water Supply listserv (electronic newsletter), which is sent out to over 980 water system owners, operators, engineers, and other interested parties on a biweekly basis.
- Water supply field staff spend a majority of their time surveying water systems and talking with system owners and operators to ensure that their systems are protected from contamination, have properly certified personnel, and are monitoring to ensure the safety of the water. Department field staff also provide many hours of technical assistance to water systems over the phone and via e-mail.
- During emergencies such as floods, tornadoes, or droughts, DNR staff are often available on site to assist systems with their questions and provide a helping hand.



**TA Provided by Other Organizations.** The DNR also contracts for technical assistance using funds from the Drinking Water State Revolving Fund set aside for this purpose. This is especially helpful when systems need on-site technical assistance with items that require recurring visits, such as capital improvement plans, setting rates, developing monitoring plans, or setting up financial controls. Over the past three years, approximately 65 systems have been provided with targeted assistance through this contract.

**Area-Wide Optimization.** Since 2006, DNR has been an active member of the national Area-Wide Optimization Program. This program seeks to maximize public health protection by optimizing water treatment and distribution using existing resources. Staff attend planning meetings with other states approximately three times per year to discuss strategies, learn about new technical topics, and develop ideas for future assistance projects.

Given the fact that most Iowans served by a public water supply use water from a river or lake, the DNR has focused most of its attention on the optimization of Iowa's 34 surface water treatment plants. Data from each surface water system is analyzed each year to measure progress against adopted optimization goals and discussed with the systems during field surveys.



Operator turnover, changing weather patterns that affect the quality and quantity of the water, and new treatment technologies provide ongoing opportunities for optimization.

### ***Operator Certification***

All community water systems and some other types of systems, such as schools, daycares, and industries employing at least 25 people, must utilize a certified operator to manage the system, collect samples, and report to the DNR on the operation of the system. To assist with meeting this requirement, the DNR manages a program to educate and certify approximately 2,700 drinking water operators.

Operator certification staff develop curriculum and work with training entities and stakeholders to ensure adequate exams and training for all types and grades of operators, work to promote water supply operation as a professional career, keep information for operators and public water systems transparent and available through the web, and assist in matching operators with public water systems.

### ***Source Water Protection***

The DNR provides assistance through a variety of means to public water systems that wish to proactively protect their water source from potential contamination.

Department staff coordinate workshops for systems with funding partners such as the U.S. Department of Agriculture Natural Resource Conservation Service, the Iowa Department of Agriculture Division of Soil Conservation, and others. They prioritize systems for assistance, assist systems with selecting best management practices, and work to develop implementation plans for those practices.



The DNR also develops assessments for each system to show which areas would benefit most from protective practices.



## Financing

Iowa water systems face \$6 billion worth of infrastructure needs over the next 20 years. Ensuring that financing resources are available and understandable is a key task in Iowa's capacity development strategy. DNR participates in the Water/Wastewater Infrastructure Financing Coordination (WIFCO) effort with the agencies that fund drinking water improvements. These agencies/programs include:

**1. State Revolving Fund (SRF).** The Iowa DNR partners with the Iowa Finance Authority to operate the Drinking Water SRF. This revolving loan fund is able to finance all eligible projects with below-market interest rate loans for planning, design, and construction. DNR educates program users through conference presentations, webinars, listserv articles, the IowaSRF.com web site, and individual consultations. The Drinking Water SRF finances approximately \$35 million worth of projects each year, from new treatment plants to replacement of aging water mains.

Special provisions for loan forgiveness have been available since 2010, and DNR has targeted a portion toward disadvantaged communities and water systems with public health violations to make their needed upgrades more affordable. The Cities of Charlotte, Hills, Keokuk, Lidderdale, Ottumwa, Rolfe, and Union, as well as Timber Ridge Water Utility Corporation, have received partial loan forgiveness under these special provisions.

***"The SRF allowed the City of Stacyville to make the necessary improvements to our infrastructure when it was needed."***

--City Clerk, Stacyville



**2. Community Development Block Grants (CDBG).** The Iowa Economic Development Authority (IEDA) operates the CDBG program, using funds from the U.S. Department of Housing and Urban Development. Each year IEDA identifies fundable water system projects that meet criteria of serving low to moderate income people and being shovel-ready. Since these grant funds are limited, projects are usually co-funded with either SRF loans or USDA-Rural Development financing.

DNR Water Supply and SRF staff meet regularly with IEDA officials to coordinate funding and assess project readiness to ensure that the CDBG funds are used in a timely manner for high priority needs.

**3. USDA-Rural Development (RD).** An annual allocation from the U.S. Department of Agriculture funds water system improvements in Iowa's smallest, neediest communities and rural water districts. USDA-RD uses a combination of grant and loan funds to help make projects more affordable in rural areas.

DNR Water Supply and SRF staff meets regularly with USDA-RD staff to coordinate funding and ensure that state design criteria are met.

## MEASURING THE STRATEGY'S EFFECTIVENESS

Through its participation in the Area-Wide Optimization Program (AWOP) and subsequent work on integrating AWOP into the drinking water program, the DNR developed a "status component" to measure improvements in water system capacity. The status component uses selected TMF questions from field survey inspections to assess the capacity of each system. Questions with an answer indicating a capacity deficiency are tallied for each system. The status component was run in 2012 to establish a baseline; subsequent queries can be compared against this baseline to measure improvements or identify weaknesses in water system capacity. The answers to status component questions can also be analyzed to identify specific areas where additional assistance could be provided to help systems to achieve and maintain TMF capacity.

In general, it was determined by comparing DNR field inspectors' knowledge to the data generated by the status component that systems with a score of seven or more deficiency answers were lacking in capacity. Systems that lack capacity often have drinking water compliance problems for a variety of reasons. The goal is to have the fewest number of systems in the high priority category with the majority of systems in the low priority category.

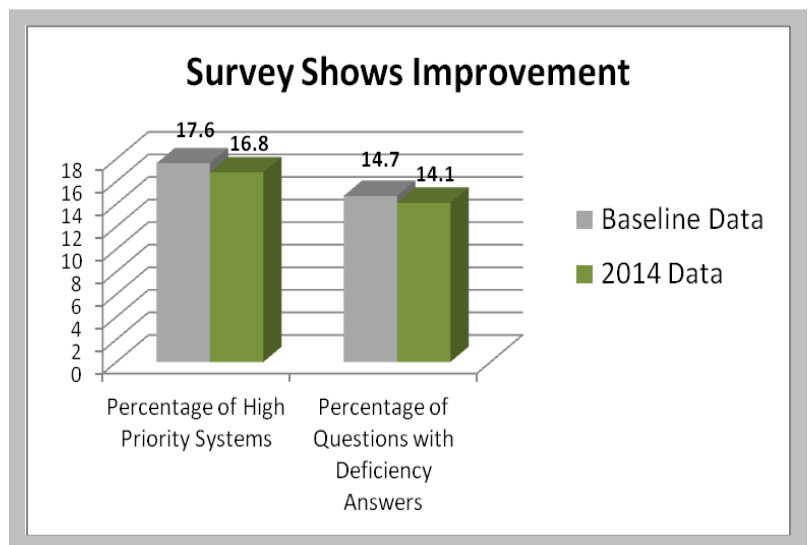
The results of the status component are shown in the table. Approximately 16.8% of systems were in the high priority category. The DNR will focus its technical assistance efforts on these systems to improve capacity and assure the provision of safe drinking water to Iowa consumers.

**2014 Capacity Development Status Component Summary**

| 2014 Priority Ranking Summary           |                    |                   |             |
|---|--------------------|-------------------|-------------|
| Priority Category                       | Deficiency Answers | Number of Systems |             |
| High                                    | Seven or More      | 240               | 16.8%       |
| Low                                     | Less than Seven    | 1,187             | 83.2%       |
| <b>Total Number of Surveys Analyzed</b> |                    | <b>1,427</b>      | <b>100%</b> |

This information will be used every three years to review the progress being made toward achieving and maintaining water system capacity. In comparison to the baseline sample collected in 2012, there was a slight decrease in the percentage of systems in the high priority category. There was also a slight decrease in the overall number of questions with deficiency answers, indicating a slight increase in system TMF capacity.

Overall, this data shows some improvement in system capacity. The DNR will continue to evaluate this data and use it to prioritize its assistance efforts toward drinking water systems.



**AVAILABILITY OF THIS REPORT**

This report must be made available to the public as required by the amended Safe Drinking Water Act of 1996. It will be placed on the IDNR Water Supply Engineering web page and a notice of availability of the report will be sent out via several DNR listserves.

**FOR MORE INFORMATION**

Contact Jennifer Bunton, P.E., at 515/725-0298 or [jennifer.bunton@dnr.iowa.gov](mailto:jennifer.bunton@dnr.iowa.gov) for information related to the Iowa Capacity Development program or this report.