DEPARTMENT OF HEALTH

Protecting, Maintaining and Improving the Health of All Minnesotans

October 2, 2020

The Honorable Tim Walz
Governor of Minnesota
130 State Capitol
75 Rev Dr. Martin Luther King Jr. Blvd.
St. Paul, MN 55155

Re: 2020 MDH Drinking Water Capacity Development Report to the Governor

Dear Governor Walz:

Every year the Minnesota Department of Health (MDH) publishes an annual report of drinking water activities and sampling results from the past year. In addition, every three years, we are required by the federal Safe Drinking Water Act to submit the attached report which summarizes the capacity of water supply systems to provide safe water. In determining the capacity of a system to provide safe water, we review the technical, managerial, and financial capabilities of a system so they can maintain compliance with federal regulations.

Minnesota drinking water is some of the safest in the nation and Minnesota can take pride in many things including:

- MDH has awarded over 900 grants to public water suppliers totaling over $6.2 million for wellhead protection purposes with money provided by the Clean Water Fund.
- Minnesota has funded 588 drinking water infrastructure projects totaling approximately $1 billion since 1998.
- MDH and partner associations provide training for system operators at over 50 geographically distributed locations throughout the year.
- Samples for nitrate at Community systems are collected on time 100 percent of the time.

If you have any questions, please contact Corey Mathisen of my staff at 651-201-4494.

Sincerely,

Jan K. Malcolm
Commissioner

Enclosure: 2020 Minnesota Department of Health Drinking Water Capacity Development Report to the Governor

MINNESOTA DEPARTMENT OF HEALTH

DRINKING WATER CAPACITY DEVELOPMENT REPORT TO THE GOVERNOR

SEPTEMBER 2020

DEPARTMENT OF HEALTH

Background

The Minnesota Department of Health (MDH) is responsible for public drinking water safety throughout the state. Part of this responsibility includes ensuring public water system owners have the technical, financial, and managerial ability to consistently and effectively provide safe water. The process of fulfilling this responsibility is called capacity development.

Each year MDH publishes a report with a summary of activities and the results of testing done on public water systems over the previous calendar year. The annual report also addresses timely and emerging contaminants affecting the safety of drinking water in the state.

In addition to the annual report, the U.S. Environmental Protection Agency (EPA) requires that the department submit a capacity development status report to the governor every three years. This report addresses the department's capacity development strategy and effectiveness and meets the EPA's report requirements.

Summary

In fiscal year 2020 the Minnesota Department of Health equaled or exceeded most of its benchmarks for determining capacity development effectiveness.

- **Program objectives**
  - MDH operates as a compliance agency, with a goal of protecting public health, rather than an enforcement agency. Although we can and will use enforcement methods, including fines and administrative penalty orders, when necessary, we work with water systems to help them maintain compliance with the federal Safe Drinking Water Act (SDWA).
  - If water systems have a high rate of compliance with national standards, which has been the case, the overall system is effective.

- **Program responsibilities**
  - MDH helps system capacity by:
    - performing sanitary surveys (inspections of water systems);
    - training and certifying city staff and operators of water systems;
    - monitoring the water to ensure compliance with federal standards;
    - reviewing plans for additions and modifications to water systems;
    - providing low-interest loans to systems for capital improvements to maintain compliance with the SDWA; and
    - helping systems with new or revised federal regulations.

  MDH also addresses contaminants of emerging concern, partners with other associations to provide technical assistance, and provides systems with the information they need to report to their customers about the quality of their water each year.

While treatment and monitoring is important, protecting source waters is the first step in ensuring safe water. Source water and wellhead protection programs overseen by MDH allow water systems to proactively work to safeguard their water sources.

- **Highlights of Success**
  - The success of the drinking water program is reflected in several ways:
    - The MDH frequency for completing sanitary surveys of water systems on time is 100 percent.
    - Compliance monitoring is also performed in a timely manner. Samples from community water systems are collected on time 100 percent of the time for nitrate and 97.5 percent of the time for coliform bacteria. Non-community water samples are collected on time 99.9 and 99.6 percent for nitrates and coliform bacteria, respectively. Although national statistics are not known, discussions at national capacity development meetings reveal that averages for other states are generally in the high-80s to mid-90s percent range.
    - Minnesota has used the revolving loan fund program to finance more public water system construction projects to remove arsenic than any other state. In addition, Minnesota project costs are among the lowest in the nation and are significantly lower than other states in the central United States.
    - In communicating water quality to their citizens by providing the annual Consumer Confidence Report (CCR) as required, 99.9 percent of the community water systems in Minnesota were in full compliance with all CCR requirements of the SDWA.

- **Concerns**
  - The department's challenge will be to remain on the leading edge of discovery to ensure that the quantity and quality of drinking water remains high and that residents can be assured of its safety.

The Minnesota Department of Health has a long history in protecting drinking water in the state, one that extends well before the passage of the federal Safe Drinking Water Act in 1974. This history includes strong relationships with water providers as well as other agencies and associations that have the same goals.

The EPA has consistently recognized Minnesota as a leader for its work in terms of compliance with federal standards.

Historical Context

Historically the MDH has had authority for regulating public water systems. It has carried out its authority primarily by approving construction plans, inspecting public water systems, and collecting and analyzing water samples. Department standards, and therefore requirements, were based on U.S. Public Health Service recommendations.

In 1974 the U.S. Safe Drinking Water Act was passed. This act gave the EPA authority to set national drinking water standards and enter into primacy agreements with states to enforce those standards. Primacy means an agency has primary enforcement responsibility for all public water systems within the state. The MDH received primacy status in 1977 and is one of the 49 states currently to have this authority.

The EPA provides safe drinking water grants of approximately $2.5 million annually to help pay the cost for compliance and enforcement. Additional funding of approximately $12.5 million is provided through Minnesota's annual Safe Drinking Water Fee assessed to every home and business receiving municipal public water.

The Safe Drinking Water Act was reauthorized in 1986 and again in 1996. A change in focus took place with the 1996 reauthorization. Previously the EPA emphasized site inspections and water sampling analysis to ensure compliance with public water system and drinking water standards. Although those activities remain core functions, the new approach was to implement proactive assistance for the water systems. This technique was intended to prevent problems from occurring rather than strictly relying on monitoring to identify problems and have them corrected. Minnesota was already moving in this direction; however, some of the EPA-recommended activities were new for the state.

The EPA offered states annual Drinking Water Revolving Fund (DWRF) capitalization grants to help finance their new priorities. Each year Minnesota receives approximately $15,000,000 in these new funds. The grants must receive a 20 percent state match. At least 70 percent of the federal grant must be used for infrastructure improvement loans to public water systems. The remainder can be used for set-aside activities, which include capacity development.

The set-aside activities are the proactive assistance programs states can implement to help support public water systems. The term set-aside refers to the states' ability to set aside a percentage of their federal DWRF capitalization grants to fund these programs.

Capacity Development Strategy

The MDH capacity development strategy is to provide a range of quality services and activities to help ensure public water system capacity. The department then measures overall system compliance with water monitoring, water quality, and public reporting standards. Compliance rates are compared to department established benchmarks. The capacity development program is considered effective if compliance rates compare favorably with the benchmarks.

Capacity Development Services and Activities

The department's major capacity development services and activities are identified below. Before listing them, it is helpful to know there are different public water system categories. Standards, services, and activities differ for each category.

Definitions

Community water systems provide water to year-round, permanent residents. Cities, towns, and some housing developments and manufactured home parks are typically served by community water systems. *Non-community water systems* provide water to the public in nonresidential settings. Examples of non-community water systems include individual water systems for schools, restaurants, resorts, churches, and businesses. *Non-community systems are transient* if different members of the public typically drink the water (e.g., restaurants, resorts, highway rest stops), and *non-community systems are non-transient* if the same members of the public drink the water (e.g., churches, schools, factories).

Services and Activities

Sanitary Surveys – A complete water system inspection, called a sanitary survey, is conducted every 18 months for community water systems and every three years for non-transient non-community systems.

> The national minimum survey standard is every three and five years, respectively. The MDH frequency is 100 percent.

Operator Certification – Certified operators are required for all community and non-transient non-community water systems. Certification helps ensure operator competency. MDH administers the water operator certification program.

> At any current point in time certified operators work for 99 percent of the municipal community water systems (cities), 99 percent of the non-municipal community systems (housing developments, townhouse associations, etc.), and 95 percent of the non-transient non-community systems (schools, churches, manufacturing plants). There are no published national averages, and 100 percent compliance is virtually impossible to achieve due to operator retirement, leaving for other employment, ownership changes, etc. MDH does not have a specific compliance limit but believes rates can be improved. In 2009 the department modified its electronic data information system to more quickly identify systems without certified operators and to send noncompliance notices. This has induced owners to more quickly hire certified replacement operators and improve overall compliance rates.

Training and Education – A broad range of water operator training and continuing education opportunities are available from a variety of sources in Minnesota. They are provided throughout the state and throughout the year. MDH co-sponsors or participates in many of these offerings.

> There are no national standards or goals for providing operator training. Even so, the department wants to ensure a broad range of operator training opportunities are available throughout the state. To accomplish this, department staff provide planning, staffing, financial assistance, and in-service support for the state's two major associations providing operator training. The two associations are the Minnesota Rural

Water Association and the Minnesota Section of the American Water Works Association. Typically these associations provide approximately 50 geographically distributed, continuing education sessions annually. In addition, there are two technical schools that provide training courses. Finally, there are other industry, agency, association, and academic institutions that provide occasional training, including training available via webcast. MDH is participating in a group to start a water/wastewater operator training program at St. Paul College. Some of the training and education opportunities have been impacted by the COVID-19 pandemic. MDH is actively working to provide safe training opportunities for those interested.

Compliance Monitoring – Water samples must be collected and analyzed at prescribed frequencies, according to the federal Safe Drinking Water Act. Many of these samples are collected and analyzed by MDH. In other states this is exclusively the responsibility of the public water supplier. Minnesota takes a more hands-on approach to free system operators from the responsibility and to provide a high compliance rate.

Community water samples are collected on time 100 percent of the time for nitrate monitoring and 97.5 percent of the time for coliform bacteria monitoring. Non-community water samples are collected 99.9 percent and 99.6 percent of the time for these respective contaminants. National statistics are not known, but discussions at national capacity development meetings reveal other states' averages to generally be in the high eighties to mid-ninety percent range.

Plan Review – Engineering plans are reviewed and approved before public water system construction takes place. This helps ensure systems are designed and constructed to provide safe, reliable water.

From fiscal years 2018 to 2020, there were 720, 672, and 642 construction plans received and reviewed for community water systems. In 2015 to 2017 there were 684, 679, and 646 plans submitted. The plan submission did decrease, showing a slight decline in municipal water system construction the past three years.

Any time a system proposes to add a new source, change sources, or change their chemical feed, we also have our lead and copper corrosion control expert review the plans to ensure the changes will not upset the chemical balance of the water. This helps to decrease issues with lead.

Drinking Water Revolving Fund Loans – The state provides a 20 percent match to an approximately $15 million annual federal grant. These combined funds, along with leveraged bonds and loan repayments, are used to bring water systems into compliance for public health standards and upgrade aging drinking water infrastructure.

The revolving fund has funded 588 drinking water infrastructure projects totaling approximately $1 billion since 1998. In fiscal year 2020, approximately $27.5 million dollars of projects were funded, which includes more than $3,500,000 in principal forgiveness. These 20 projects consisted of four drinking water wells, three drinking water treatment facilities, four storage projects, and ten watermain replacement projects. For 2021 the funding need continues; 452 projects were proposed at a total cost of almost $950 million with several high ranked projects needed to allow water systems to meet public health standards.

Compliance With Revised Technical Standards – The EPA continually evaluates and updates water quality standards. The department has assigned staff to provide guidance to public water system owners affected by these changes. This helps the owners achieve compliance before or relatively soon after standards go into effect.

Example: In January 2001 the arsenic rule was revised. The maximum contaminant level was tightened from 50 parts per billion to 10. The standard was to take effect in 2006. In 2001, there were approximately 40 public water systems in Minnesota that contained arsenic that would exceed the new standard. By the implementation date in 2006, 20 of the systems reduced their arsenic and were within the standard. Currently there are only 4 systems which need to reduce arsenic and they are all in some stage of achieving their goal in accordance with their compliance agreement. The major hold up for achieving their goal is funding.

The effectiveness of Minnesota's proactive approach is revealed in 2005 EPA data. Minnesota was using the revolving fund program to finance more public water system construction projects to remove arsenic than any other state. Minnesota's geology is responsible for a high number of naturally occurring arsenic problems, so Minnesota should rank high for the number of systems working to resolve that problem. In addition, Minnesota's technical assistance is believed to have contributed to Minnesota project costs being among the lowest in the nation, and significantly lower than the other central U.S. states.

Contaminants of Emerging Concern – EPA has established maximum contaminant levels for more than 100 substances; however, new contaminants continue to emerge. The EPA maintains a Contaminant Candidate List to identify contaminants that may warrant detailed study. Several of those contaminants are being studied in Minnesota.

In addition, MDH is investigating and communicating the health and exposure potential of other contaminants of emerging concern in drinking water. This program supports the Clean Water Fund mission to protect drinking water sources and the MDH mission to protect, maintain, and improve the health of all Minnesotans. Contaminants of emerging concern are substances that have been released to, found in, or have the potential to enter Minnesota waters and do not have Minnesota human health-based guidance (how much of a substance is safe to drink), in addition to posing a real or perceived health threat. Because there are better detection methods for finding

substances at lower levels, additional substances are being looked at, and new contaminants are being found in Minnesota waters.

Pharmaceutical compounds and personal-care products are some of the chemicals being studied. MDH has worked with the U.S. Geological Survey and local water utilities to determine chemical presence and concentrations within the state. There has also been testing to determine if chemical concentrations are altered through drinking water processing. So far, no areas of concern have been identified in Minnesota, although national research efforts on this are ongoing.

Source Water and Wellhead Protection Assistance – A proactive strategy for providing quality public drinking water is to prevent contamination at the water source. Department personnel provide direct technical support to public water system owners to develop and implement surface water intake and wellhead protection plans. MDH phases public water systems into the wellhead protection program as time and resources permit.

Nine hundred and twenty two (922) community water systems use groundwater. Nine hundred and three (903) of these communities have entered into the wellhead protection program, including 696 with MDH-approved wellhead protection plans. The approved plans cover 4,193,785 residents. In addition, the department implemented a volunteer water intake protection program for community water supply systems that use surface water. The cities of Minneapolis, St. Cloud, and St. Paul have completed their intake protection plans. These three cities, along with Duluth, are the largest communities in the state that rely on surface water for their drinking water source.

The Clean Water, Land, and Legacy Amendment funding, received by MDH, has increased our capacity to fulfill MDH's mission of protecting, maintaining, and improving the health of Minnesotans. MDH has awarded over 900 grants to public water suppliers totaling over $6.2 million. These grants provide funds to correct or prevent water quality problems, implement cost containment measures, and help protect drinking water sources.

For informational purposes, the table below includes estimates of the number of Minnesota residents served by public groundwater, public surface water, and private well water systems. Please be aware that private wells are regulated under a separate program administered by MDH. The data is from 2020.

Type of System	Minnesota Population	Population Percent
Public Groundwater	3,034,733	54%
Public Surface Water	1,430,003	25%
Private Well	1,174,896	21%

Circuit Rider Technical Assistance – The department contracts with the Minnesota Rural Water Association to provide technical assistance for water system operators. The assistance is provided by "circuit riders" who make on-site visits to water systems throughout the state. Circuit riders have water system operations experience. They provide non-regulatory operations guidance, continuing education training, and help communities develop and implement source water protection plans. Between 800 and 1,000 problem-solving visits, or contacts, are made by two circuit riders each year.

Consumer Confidence Reports – EPA requires that community water system owners provide an annual water quality status report to each home and business they serve.

> MDH annually provides all necessary data and reminders to system owners to help them meet this requirement. For the last two years, 99.9 percent of the community water systems in Minnesota were in full compliance with all Consumer Confidence Report requirements of the Safe Drinking Water Act. The national average is 87 percent.

Challenges and Concerns

1. Water quality science is changing at a rapid rate. New information leads to changes in water quality standards for known contaminants and changes in sampling techniques and analytical processes. In addition, new contaminants are discovered. What are reliable analytical procedures? How does a chemical or substance get into the water? How does it interact with the human body? What exposure level is safe? How efficiently can a contaminant be removed? These and similar questions challenge, and will continue challenging, public health. Minnesota is blessed with ample quantities of ground- and surface water, but the water is not sufficiently distributed, nor always free from natural or human contributed contaminants. Water reuse and recycling are starting to emerge in industrial settings and will expand to meet the needs of a growing population. The department's challenge will be to remain on the leading edge of discovery to proactively ensure water continues to be safe to drink. The department does not want to rely on standards that are later found to insufficiently protect public health.

2. Water quality standards are valid for protecting public health whether a system serves 25,000 people or 25 people. Large and medium-sized communities, however, have the economies of scale for installing, maintaining, and operating public water systems to meet those standards. System cost can be shared among many people. This isn't the case for small businesses and very small communities. Some of these communities have declining populations, low median household income, and a significant percentage of elderly people on fixed incomes. Likewise, the cost and effort for treating water for a small business can be relatively high compared to business income. This is especially apparent for resorts that treat surface water. The consequence is borne out by compliance statistics; see the end of the next section, "Capacity Development Quality Assurance, Monitoring and Results."

Capacity Development Quality Assurance, Monitoring and Results

The department's water quality protection goal is to ensure safe drinking water throughout the state. The department believes the most effective way to meet this goal is to provide a comprehensive support service for public water systems. Enforcement is applied if the support process is unsuccessful, but support services continue to be provided even when enforcement action takes place.

MDH evaluates Minnesota capacity development effectiveness by how well Minnesota public water systems comply with EPA standards. The rationale is, if water systems have a high rate of compliance with the national standards, then the overall system is effective. If compliance slips the department looks into the reasons and adjusts appropriately. The department looks for ways to continuously improve outcome but recognizes marginal improvements become increasingly difficult to achieve at very high rates of compliance, which is where the state stands. Cost efficiency is sacrificed when additional resources are applied to improve outcomes even more. Instead, the department improves performance through existing program refinement.

Two types of public health statistics are used for capacity development monitoring. The first is drinking water compliance for chemical, biological, and radiological contaminants. The second is compliance with water monitoring frequencies and community reporting.

Nineteen benchmarks were established by MDH when the capacity development program was formalized seventeen years ago. The benchmarks were created by averaging previous performance, and current performance is annually compared to the benchmarks. The benchmarks represent average targets rather than minimum limits. Even so, each year the benchmarks are equaled or exceeded in most categories. The benchmarks were last revised in 2017. 2020 performance equaled or exceeded most of the benchmarks. The data met or exceeded 16 of the 19 benchmarks. The data can be seen in Appendix 1.

Benchmarks aside, the data show a very high compliance rate with the EPA standards. In fiscal year 2020, Minnesota public water systems achieved 100 percent compliance in 6 out of 22 categories, 99 percent compliance in 11 categories, 97 percent compliance in three categories, and 95 percent compliance in one category.

One category had a compliance rate of just above 85 percent:

- Non-community water systems meeting surface water treatment procedures had a compliance rate of 85.5 percent which is down from 2017's 89.4 percent compliance rate. The compliance rate is still above the benchmark compliance rate. Sixty-one non-community systems use surface water for drinking purposes. The water systems belong to resorts and small businesses. Compliance has been difficult and relatively expensive for owners to achieve, and it has been a challenge to find effective, economical solutions. MDH staff provide effective

> technical assistance. Our challenge is to ensure the owners have the managerial capacity and understand the need for the financial capacity.

Staff are not aware of state-by-state or overall compliance data for the EPA drinking water system standards. State-by-state comparisons are dangerous without knowing individual state circumstances; nevertheless, discussions at regional and national capacity development conferences reveal Minnesota achieves a consistently high rate of success.

Conclusion

MDH, in partnership with other agencies and organizations, provides a variety of services, assistance, and oversight to public water system owners, as summarized in this report. This is done to ensure the owners provide consistent, safe drinking water. The department also tracks and enforces system compliance for meeting water monitoring and reporting standards.

Minnesota public water systems continue to achieve a high Safe Drinking Water Act compliance rate. MDH compares annual performance data against benchmarks to measure program effectiveness; based on those comparisons, capacity development and implementation strategy are very effective. Compliance with meeting benchmarks for water monitoring and reporting standards is very high, at or near 100 percent for most requirements. However, even with high compliance rates, the department continues to seek ways to improve services and achieve even better results.

Activities that comprise the Minnesota Department of Health's capacity development program contribute to this success by ensuring public water systems in Minnesota have the technical, managerial, and financial ability to provide safe drinking water. In addition, Minnesota's technical assistance is believed to have contributed to Minnesota project costs being among the lowest in the nation and significantly lower than the other central U.S. states.

Appendix 1

Fiscal Year 2020 Public Water System Compliance Rates

Requirement	Minnesota Benchmark Compliance Rate (%)	2020 Minnesota Compliance Rate (%)
Community Water Systems Meeting Volatile and Synthetic Organic Contaminant Standard	100	100
Non-community Water Systems Meeting Volatile and Synthetic Organic Contaminant Standard	100	100
Community Water Systems Meeting Nitrate Contaminant Standard	99.8	99.8
Non-community Water Systems Meeting Nitrate Contaminant Standard	99.8	99.9
Community Water Systems Meeting Nitrite Contaminant Standard	100	100
Non-community Water Systems Meeting Nitrite Contaminant Standard	100	100
Community Water Systems Meeting Nitrate Monitoring Frequency	99.9	100
Non-community Water Systems Meeting Nitrate Monitoring Frequency	99.9	99.9
Community Water Systems Meeting Coliform Contaminant Standard	98.7	99.9
Non-community Water Systems Meeting Coliform Contaminant Standard	97.5	99.8
Community Water Systems Meeting Coliform Monitoring Standard	95.7	97.5
Non-community Water Systems Meeting Coliform Monitoring Standard	99.4	99.6
Community Water Systems Meeting Surface Water Treatment Technique Standard	97.6	100

Non-community Water Systems Meeting Surface Water Treatment Technique Standard	80.0	85.2
Community & Non-community Water Systems Lead & Copper Monitoring Standard	98.4	97.4
Community Water Systems Arsenic Contaminant Standard	99.7	99.7
Community Water Systems Gross Alpha Radiation Contaminant Standard	99.9	99.6
Community Water Systems Radium Contaminant Standard	99.8	99.7
Community Water Systems Annual Water Quality Reporting to Consumers	99.6	99.9
Municipal Community Systems with a Certified Water Operator	99.2	99.6
Non-Municipal Community Systems with a Certified Water Operator	94.0	95.3
Non-Transient Non-Community Systems with a Certified Operator	97.5	97.9