

**Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance**

CAPACITY DEVELOPMENT REPORT TO THE GOVERNOR 2014

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Executive Summary

The 1996 Amendments to the federal Safe Drinking Water Act (SDWA) added provisions for each state to develop a Capacity Development Program (CDP). The objective of the CDP is to enhance public health protection by helping water systems develop and maintain the capability, or capacity, they need to deliver a safe, reliable, and adequate supply of drinking water to all customers. Capacity has three components:

- Technical – Physical infrastructure and operational ability
- Managerial – Personnel expertise and institutional and administrative capabilities
- Financial – Monetary resources

The purpose of this document is to report to Governor Rick Snyder the effectiveness of Michigan's capacity development strategy as managed by the Michigan Department of Environmental Quality (MDEQ) for the 2011-2013 time period. Each state risks losing 20 percent of the annual Drinking Water Revolving Fund (DWRF) allotment if it does not submit a report to its Governor by September 30 of every third year or does not make the report available to the public under Section 1420(c)(3) of the SDWA.

Many capacity development-related activities have been conducted and incorporated into Michigan's drinking water program since its inception in 1913 and later integrated into the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). In addition to establishing health-based standards, Act 399 also includes requirements for water well isolation, system reliability, operator certification, standards of construction, and system planning. As a result, the strategy to help systems maintain technical, managerial, and financial (TMF) capacity is a reflection of our long-standing tradition of technical assistance, with the recent addition of a capacity assessment component.

The strategy is effective. New public water systems are demonstrating adequate capacity before they begin serving water to the public, and existing systems are continuing to enhance and maintain capacity. A strong emphasis on assistance has moved systems toward enhanced capacity.

Systems with adequate TMF capacity are able to maintain high rates of compliance with health-based standards. Additionally, systems use a multibarrier approach to providing safe water to the public, which begins with securing a safe source, such as groundwater from a confined aquifer, and then protecting that source from contamination. The multibarrier approach continues with proper construction of water wells, pumps, treatment plants, and distribution systems. Finally, well-trained, certified operators perform proper oversight (operation and maintenance) and conduct routine monitoring to ensure that these multiple barriers continue to function.

Systems are also taking advantage of programs to enhance their TMF capacity. These programs help systems stay in compliance with existing requirements, prepare systems to comply with upcoming requirements, and help operators and local officials to better manage their systems. These programs include:

- DWRF: The 1996 Amendments to the SDWA provide low-interest loans for repairs or enhancements to help water systems comply with the SDWA. To date, the DWRF has

committed over \$758 million in low-interest loans for 252 projects to construct, upgrade, and replace infrastructure.

- Relationship with MDEQ District staff: Water system operators maintain a relationship with district staff who are the primary contact with water systems for capacity development. A prime objective of the district staff is to provide excellent customer service, from the construction permit process through regulatory oversight, and continual assessment and assistance for the duration of a system's operation.
- Source Water Protection: An increasing number of systems are taking steps to protect their drinking water sources.
 - Federal funding for Wellhead Protection Programs (WHPPs) is available through the DWRP for systems using groundwater. Under the sponsorship of the MDEQ, Michigan State University's Department of Civil and Environmental Engineering recently developed an innovative modeling tool for mapping Michigan's Wellhead Protection Areas (WHPAs). The new tool, which is now called the Michigan Groundwater Management Tool (MGMT), makes systematic and intelligent use of statewide groundwater-related data to develop a WHPA. The MDEQ uses the MGMT to delineate WHPAs at no cost. Before the MGMT, the cost for producing a traditional WHPA was an average of \$36,000 to the public water system. The MGMT has provided nearly 2,600 provisional WHPAs in the state.
 - Beginning in fiscal year 2015, the MDEQ will also provide a new surface water intake protection grant to assist in the development and implementation of a plan to protect surface water sources used for public drinking water.
 - Operator Certification and Training: Act 399 requires a certified operator to be available at all community and nontransient noncommunity water systems. These operators must maintain their certification by earning continuing education credits. As a result, new training courses are developed based on operator feedback and district staff input and in response to new regulations with which water systems must comply.
 - Other programs available to systems include financial assessments, technical assistance provider services, security training, and electronic reporting systems.

New regulations will continue to challenge water systems. The United States Environmental Protection Agency promulgated regulations to expand requirements on systems that disinfect. The Stage 2 Disinfection Byproducts Rule builds incrementally on existing rules and requires systems to further evaluate their distribution systems. Systems must identify the locations with high disinfection byproduct concentrations and sample these sites to determine compliance at each location. For the first time, many consecutive systems are now required to monitor for disinfection byproducts.

The Ground Water Rule was promulgated to reduce the risk of exposure to fecal contamination that may be present in public water systems that use groundwater sources. Groundwater systems with identified risks may be required to perform source water monitoring, implement corrective action, or conduct further compliance monitoring.

The Revised Total Coliform Rule (RTCR), which takes effect in early 2016, will require all public water systems that are vulnerable to microbial contamination to identify and fix problems. The

RTCR will also establish more stringent criteria for systems to qualify for and stay on reduced monitoring, thereby providing incentives for improved water system operation.

The impact of the RTCR on resources will be nominal to Michigan's Community Water Supply Program but will be significant to Michigan's Noncommunity Water Supply Program. There are approximately 9,800 noncommunity water supplies in Michigan. Among the 50 states, Michigan and Wisconsin have the largest number of noncommunity water supplies in the country. Michigan's Noncommunity Water Supply Program is administered by local public health departments under contract with the DEQ. All of the local public health departments will see increased workload demands under the RTCR without additional financial compensation for the work.

The continuing endeavors of water systems to maintain technical, managerial, and financial capacity will help them meet the challenges of these new regulations. This report is available on the MDEQ's Web site at <http://www.michigan.gov/deqwater> and to the public in paper format, on request.

List of Acronyms

| | |
|---------|---|
| ABE | Advisory Board of Examiners |
| ACO | Administrative Consent Order |
| Act 399 | Michigan Safe Drinking Water Act, 1976 PA 399, as amended |
| ARRA | American Recovery and Reinvestment Act of 2009 |
| AWWA | American Water Works Association |
| CCR | Consumer Confidence Reports |
| CDP | Capacity Development Program |
| CWS | Community Water Systems |
| DWRF | Drinking Water Revolving Fund |
| eDWR | Electronic Drinking Water Reporting |
| ERP | Emergency Response Plan |
| FAP | Financial Action Plan |
| FOS | Field Operations Section |
| FY | Fiscal Year |
| LHD | Local Health Departments |
| MDEQ | Michigan Department of Environmental Quality |
| MGMT | Michigan Groundwater Management Tool |
| MOR | Monthly Operation Reports |
| NCWS | Noncommunity Water Systems |
| NTNCWS | Nontransient Noncommunity Water Systems |
| ODWMA | Office of Drinking Water and Municipal Assistance |
| OTCP | Operator Training and Certification Program |
| RCAP | Rural Community Assistance Program |
| RTCR | Revised Total Coliform Rule |
| SDWA | Federal Safe Drinking Water Act |
| SME | Subject Matter Experts |
| SWIPP | Surface Water Intake Protection Program |
| SWPP | Source Water Protection Program |
| TMF | Technical, Managerial, and Financial |
| TNCWS | Transient Noncommunity Water System |
| TTX | Table Top Exercises |
| USEPA | United States Environmental Protection Agency |
| WHPA | Wellhead Protection Area |
| WHPP | Wellhead Protection Program |

1.0 Introduction

This report examines the effectiveness of the strategy, progress toward improving capacity, and tools used to help to improve capacity.

1.1 Capacity Development Program (CDP) Overview

Water system capacity is the ability to plan for, achieve, and maintain compliance with drinking water requirements. Capacity has three components:

- Technical – Physical infrastructure and operational ability
- Managerial – Personnel expertise and institutional and administrative capabilities
- Financial – Monetary resources

Michigan's capacity development strategy is to help community water systems (CWS) and noncommunity water systems (NCWS) achieve and maintain technical, managerial, and financial (TMF) capacity by adding a capacity assessment component to the Public Water System Supervision Program. The strategy is an ongoing process to:

- Assess systems' capacity or "capability."
- Prioritize systems most in need of assistance.
- Determine the best means of assistance.
- Provide assistance or refer systems to other capacity assistance or technical assistance providers.
- Measure improvements in TMF capacity during subsequent assessments.

The CDP is implemented by the MDEQ, Office of Drinking Water and Municipal Assistance (ODWMA), through amendments to the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399); by application of CDP policies and guidance documents; and through cooperation and/or partnerships with other agencies.

The CDP focuses on both new systems and existing systems. The new systems program ensures systems have sufficient capacity prior to commencing operation, and the existing systems program works to achieve, maintain, and enhance capacity. These two programs are detailed in two documents and were approved by the United States Environmental Protection Agency (USEPA) in 2000.

1.1.1 New Systems

New Community Water System Capacity Guideline Document, May 1, 2000. New systems must demonstrate TMF capacity before serving water to the public. The new systems program relies on two control points: construction permits and final inspection. Generally, a construction permit is issued based on the technical capacity of the proposed system. For CWS, the financial and managerial capacity requirements may still be pending while the system is under construction. Approval to commence operation is only granted after a final inspection when the CWS has demonstrated capacity in all three areas.

For nontransient noncommunity water systems (NTNCWS), the ODWMA has delegated the authority to the local health departments (LHD) to review, approve, and issue construction permits. When these water systems begin the permit application process, the LHD helps them outline their financial and managerial capacity. Prior to receiving approval to commence operation, the NTNCWS must submit a financial plan and a managerial plan that includes an emergency response plan and designation of a certified operator.

1.1.2 Existing Systems

Capacity Development Strategy for Existing Public Water Systems, August 1, 2000. The existing system strategy relies primarily on the capacity assistance component of the drinking water program, which the ODWMA has traditionally referred to as technical assistance. Through routine system evaluations, also known as sanitary surveys or capacity assessments, ODWMA staff identify which systems need capacity assistance and prioritizes assistance subject to available resources. The ODWMA will not request a financial capacity assessment of an existing water system unless violations, deficiencies, or other factors indicate the system lacks technical or managerial capacity. For CWS, capacity assistance is provided through ODWMA staff or through other technical assistance providers to help communities build TMF capacity. For NCWS, the ODWMA delegated the authority to the LHD to assess capacity and to provide assistance. If capacity assistance is not accepted or effective, Michigan practices a program of progressive enforcement.

1.2 Involved Parties

The CDP encompasses the efforts of water systems, the MDEQ, technical assistance providers, and other organizations and agencies that affect the capabilities of water systems including:

- MDEQ, ODWMA, Field Operations Section
- MDEQ, ODWMA, Revolving Loan Section
- LHDs
- MDEQ, ODWMA, Environmental Health Section
- Michigan Finance Authority
- Technical Assistance Providers such as:
 - Michigan Section, American Water Works Association (AWWA)
 - Michigan Rural Water Association
 - Rural Community Assistance Program (RCAP)
 - United States Department of Agriculture, Rural Development, Rural Utilities Service
- MDEQ, ODWMA, Enforcement Section

2.0 Effectiveness of the Capacity Development Strategy

Many capacity development-related activities have been conducted and incorporated into Michigan's drinking water program since its inception in 1913 and later integrated into Act 399. In addition to establishing health-based standards, Act 399 also includes requirements for well isolation, system reliability, operator certification, standards of construction, and system planning. As a result, the strategy to help systems maintain TMF capacity is a reflection of our long-standing tradition of technical assistance, with the recent addition of a capacity assessment component.

The strategy is effective. New public water systems are demonstrating adequate capacity before they begin serving water to the public, and existing systems are continuing to enhance and maintain capacity. A strong emphasis on capacity assistance has moved systems toward enhanced capacity.

2.1 New Systems

New systems must demonstrate TMF capacity before serving water to the public. As a result, they are better able to remain in compliance with health-based standards and monitoring requirements. When violations occur, they are usually minor monitoring violations. District staff report that new systems that have complied with capacity development requirements are well developed from start-up and perform at a higher level than some older systems. These new systems use modern technology, competent engineering support, and acceptable management. Prior to a formalized CDP, district staff only required adequate technical capacity before a construction permit was issued.

2.1.1 CWS

Proposed CWS are primarily new residential developments such as subdivisions, apartment complexes, and elderly care facilities. District staff interacts with developers and their engineering consultant to complete the capacity assessments before approval is granted to serve water to the public. Most developers who phase their projects understand that it is more cost-effective to install a system meeting CWS requirements at the beginning of the project instead of upgrading the water system when they expand. In addition to the traditional technical assessment, these new CWS must complete financial and managerial assessments. The financial capacity assessment requires some thought about future operations and costs. The managerial capacity assessment requires an operations plan, a certified operator, a sampling site plan, as well as other plans to ensure the system has adequate managerial oversight and organization before commencing operation.

A system that simply increases the number of customers without having to alter or construct water system infrastructure is not considered a new system. However, the following existing systems are considered new and subject to capacity development policies:

- Systems that did not meet the definition of a CWS at start-up, but are designed to one day meet the definition.
- Systems that are not currently a CWS, but propose to extend the water system to serve additional customers, thereby growing to become a CWS. These systems are usually privately-owned, residential subdivisions that were previously exempt from CWS requirements due to their small size.

Many times, a new developer begins to expand a subdivision or the original developer returns to complete a final phase after many years. These systems pose the greatest challenge because they often expand before fully complying with capacity development requirements and because the control point of a final inspection before commencing operation no longer exists.

2.1.2 NTNCWS

Due to the financial and managerial capacity requirements now placed on new NTNCWS, these systems have a qualified operator and a higher level of awareness of the responsibilities of supplying water to the public. These systems begin operation with an emergency response plan already in place—a valuable tool during emergencies.

2.2 *Existing Systems*

Existing systems are achieving and maintaining TMF capacity as demonstrated by their high rates of compliance, as discussed in section 3.1, and their efforts to manage their systems effectively with qualified and educated staff to meet the needs of their customers. This improved compliance rate is a result of several factors, including:

- District staff interaction with systems.
- Financial assistance in the form of loans and grants.
- Financial management assistance.
- Source water protection and water system security programs.
- Operator training and certification.
- Compliance and enforcement interaction via letters, phone calls, site visits, and administrative fines.
- Support of data systems for MDEQ district staff and LHDs.
- Support of Web sites for MDEQ district staff, LHDs, and water systems.
- Policy updates, guides, fact sheets, templates, and forms provided to district staff, LHDs, and systems.

Many of these factors will be discussed in Section 4.

3.0 **Progress Toward Improving TMF**

Systems with adequate TMF capacity maintain high rates of compliance with health-based standards, monitoring, reporting, and other capacity requirements, which is one measure of success of the CDP. A multibarrier approach to providing safe water is more difficult to measure, but it is an integral part of ensuring water systems have sufficient TMF capacity. Through the construction permit and sanitary survey process, district staff helps to ensure systems obtain a safe source and continue to provide safe drinking water.

3.1 Compliance Rates

Comparing compliance data from one year to the next is difficult because of the rapidly increasing number and complexity of rules and requirements each year. With new regulations that have had a disproportionate impact on small systems, the number of systems in compliance may not tell the true story of improved capacity.

Small systems make up the majority of systems in Michigan as well as the majority of systems in noncompliance. However, the majority of the population served by CWS is supplied by larger systems that generally comply with requirements. To put compliance data into perspective, it may be useful to compare the percent of population served by CWS that are in compliance with health-based standards and monitoring and reporting requirements.

The following table summarizes compliance in Michigan with health-based drinking water standards and with monitoring and reporting requirements compared to the goals shared with the USEPA for fiscal year (FY) 2011 to FY 2013:

| Compliance with Health-Based Standards | <i>Goal</i> | <i>FY 2011</i> | <i>FY 2012</i> | <i>FY 2013</i> |
|--|-------------|----------------|----------------|----------------|
| Percent of people served by CWS meeting all health-based standards | 95 | 96.6 | 99.0 | 99.3 |
| Percent of NTNCWS meeting all health-based standards | 95 | 94.4 | 94.5 | 97.2 |
| Percent of Transient NCWS (TNCWS) meeting all health-based standards | 95 | 97.5 | 97.6 | 97.3 |
| Compliance with Monitoring and Reporting Requirements | <i>Goal</i> | | | |
| Percent of people served by CWS without significant violations ¹ | 95 | 97.4 | 96 | * |
| Percent of CWS without significant violations | 90 | 95 | 92.9 | * |
| Percent of NTNCWS without significant violations for acute health risks ² | 95 | 95.8 | 94.8 | 94.3 |

¹ Significant monitoring violations are generally defined as any major monitoring violation. A major monitoring violation, with rare exceptions, occurs when no samples were taken or no results were reported.

² Acute health risks mean those contaminants that have serious adverse effects on human health as a result of short-term exposure.

*Not available at this time due to recent changes in the EPA data system.

Compliance with monitoring requirements is considered a measure of success. However, the failure to collect a sample is not necessarily a direct public health threat because Michigan's drinking water program does not automatically assume the absence of a sample creates a public health threat, as discussed in the following section. A missed sample from a properly constructed water system having a satisfactory history of safe samples is a concern, but not a direct threat to public health.

3.2 Multibarrier Approach

The multibarrier approach to providing safe drinking water begins with securing a safe source, such as a confined aquifer, and protecting that source from contamination. It continues with proper construction of water wells, pumps, treatment plants, and distribution systems. Proper oversight and monitoring by trained personnel provide confirmation that the multiple barriers are functioning and the integrity of the water system is maintained.

Act 399 provides public health protection through requirements on construction of wells, surface water intakes, treatment facilities, and distribution systems. Construction permits require an engineering review and a sound basis of design that incorporates reliability and redundancy.

Some aspects of management and operations are also regulated. A cross connection control program must be developed and implemented in municipal systems to eliminate and prevent potential pathways for contaminants to enter the water system. A system must also conduct a study of water supply requirements and update it every five years. A general plan, or layout and description of the water system and its service area, must be submitted. This plan now requires systems which intend to provide fire protection to include a hydraulic analysis showing pressures under peak demands; an inventory of main size, material, and age; and maps showing existing and future boundaries. Finally, an emergency response plan (ERP) must be developed. These long-standing requirements are key to achieving and maintaining capacity. Compliance with these requirements is part of the continual sanitary survey or evaluation process by district staff.

The ODWMA is encouraging systems, particularly new systems, to consider both short- and long-term needs and expected growth as they determine their water capacity requirements and develop their general plans and ERPs. This asset management approach is expected to enhance their capacity to manage their assets at the lowest possible cost.

The 1996 amendments to the SDWA required states to assess all source waters used for drinking water. All of Michigan's nearly 18,000 sources were assessed in 2003 to identify areas that supply public drinking water, to evaluate the susceptibility of those water systems to contamination, and to inform the public of the results. After the heavy investment in the assessment process, efforts are being made to move from assessment to protection. Water systems are encouraged to protect their sources through voluntary programs discussed in section 4, Tools Used to Improve TMF.

Finally, oversight of the water system by qualified operators helps to ensure all the elements of the waterworks system are functioning. Each CWS and NTNCWS and certain TNCWS must be under the responsible charge of an operator certified by the MDEQ. Larger systems are also required to designate a certified backup operator. Certification is renewable through continued education credits obtained through training approved by the MDEQ.

4.0 Tools Used to Improve TMF

This section discusses some of the tools used to enhance system TMF capacity, to achieve and maintain compliance with requirements, to prepare for new regulations, and to better manage water systems.

4.1 Drinking Water Revolving Fund (DWRF)

The 1996 amendments to the federal Safe Drinking Water Act (SDWA) authorized the creation of a revolving fund to provide low-interest loans for repairs or enhancements to help water systems comply with the SDWA. This fund is similar to the State Revolving Fund created to assist water pollution control projects. Many of the capacity development provisions of the SDWA are funded through the DWRF allotment.

Prior to the creation of the DWRF, project financing for CWS was left largely to the local unit of government or to individuals investing in their own systems. The DWRF provides a source of infrastructure financing. To date, the DWRF has committed over \$758 million in low-interest loans for 252 infrastructure projects. Of the 252 projects with committed funds, 223 have been completed, and the loan payments are revolving back into the fund. Some systems receive commitments from the DWRF, but may not be ready to proceed with the project until they are

able to assure the revenues will be generated to repay the loan. In these cases, the system remains on the priority list for the next year.

The American Recovery and Reinvestment Act of 2009 (ARRA) was signed into law on February 17, 2009. Included in the ARRA was an additional \$2 billion in capitalization for DWRF administered by the states, of which Michigan received \$67,454,000. These funds provided Michigan with the ability to tender more loans through the DWRF and provided additional subsidy (principal forgiveness for 40 percent of a project's cost). To date, 21 of the 28 ARRA funded projects have been completed.

The following table summarizes the loan commitments for FY 2011 to FY 2013:

| DWRF Loan Commitments by FY | | | |
|-------------------------------------|-------------|-------------|-------------|
| | 2011 | 2012 | 2013 |
| Number of Projects Committed | 15 | 7 | 7 |
| Commitments of Funds (\$M) | \$41.23 | \$27.33 | \$38.60 |
| Number of Green Qualifying Projects | 8 | 6 | 3 |

Commitments in FY 2013 include projects to increase systems' capacity to reliably provide an adequate supply of water. Many of the projects involve replacing aging distribution infrastructure.

The city of Ann Arbor made improvements to their Barton Dam Intake Pump Station to include the replacement of switchgear, motors, transformers, starters, disconnects, and other associated equipment. They added soft starts, control improvements, and added a 29 kilowatt generator. These projects were funded at just over three million dollars.

Bay County is building a new water treatment plant to replace the city of Bay City's current plant. In addition, two raw water transmission lines will receive water from Lake Huron through the Saginaw Midland Municipal Water Supply Corporation. This source will provide more consistent and higher water quality than the current source in Saginaw Bay. The installation of membrane filtration and new variable frequency drives will qualify for green project funding to allow over seven million dollars in principal forgiveness.

Michigan's drinking water program relies heavily upon proper water system design and construction to prevent jeopardizing the safety of both the source and finished water. To that end, priority of DWRF projects favors communities that are participating in a Source Water Protection Program (SWPP), which is discussed in section 4.4.

4.2 District Staff

Water system operators develop a relationship with district staff who are the primary contact for capacity development. The CWS are served by ODWMA staff in one of 8 district offices, and NCWS are served by staff from one of 44 LHDs under contract with the ODWMA. A primary objective of district staff is to provide excellent customer service from the construction permit process for new infrastructure through the continual assessment and oversight process during operation.

Assistance or consultation during site visits has been the preferred method to maintain system compliance. District staff serve as both capacity assistance providers as well as regulators. When assistance is not accepted or effective, staff initiate enforcement actions.

Capacity of systems is assessed through the sanitary survey process. District staff detail their findings and recommendations in a letter to the system, which may include a list of items to address and deadlines to meet. Options for capacity assistance may also be offered, such as contacting a technical assistance provider. Sanitary survey letters help systems understand the severity of the deficiencies and importance of acting on the recommendations. For CWS, the sanitary survey includes an overall evaluation to indicate no deficiencies, minimal deficiencies, or significant deficiencies exist.

The following table summarizes sanitary surveys, visits, and timeliness of construction permits issued for CWS:

| CWS Sanitary Surveys, Visits, and Construction Permits | | | |
|---|----------------|----------------|----------------|
| | FY 2011 | FY 2012 | FY 2013 |
| Number of Sanitary Surveys Conducted | 520 | 429 | 415 |
| Percent with no deficiencies | 63 | 63 | 61 |
| Percent with minimal deficiencies | 36 | 35 | 36 |
| Percent with significant deficiencies | 1 | 2 | 3 |
| Number of Visits | 1791 | 1729 | 1838 |
| Number of Construction Permits Issued | 736 | 737 | 779 |
| Average number of days to issue water main construction permits | 14.1 | 10.9 | 11.1 |

The data reflect the following:

- The number of visits has increased approximately 10 percent over the previous three-year reporting time frame of this report. This increase may be due to the filling of previous vacancies in the district offices.
- The average number of days to issue simple water main permits has been reduced by 20 percent over the last three years, even with an increase in the total number of permits issued.

Deficient systems receive priority for assistance. Ratings are based on compliance with health-based standards, monitoring requirements, qualified operator requirements, and requirements in Act 399 for TMF sufficiency, such as well construction, general and emergency response plans, and financial requirements for privately-owned systems.

Two ODWMA policies and procedures were developed recently to help district staff effectively use sanitary surveys and address water system deficiencies. The sanitary survey policy confirms the requirements for surveys to be conducted every three years; however, a reduced survey frequency may apply if certain criteria are met. In addition, surveys may be performed more frequently if significant deficiencies exist or corrective action is necessary. The significant deficiency policy was developed to help staff identify a significant deficiency and set forth steps to resolve the deficiencies. These policies help staff provide greater oversight and attention to those deficiencies that also helped CWS return to compliance or obtain a satisfactory rating in the next survey.

Often staff have found that a one-time capacity assistance meeting is sufficient to keep systems in compliance. In other situations, the district engineer spends more time with the system operators to help solve more complicated concerns or refers the system to other capacity assistance providers. At times, water system operators want to comply, but lack the financial resources or support from community leaders to make necessary changes. When capacity assistance is met with resistance, enforcement notices are used to outline the consequences of failing to correct deficiencies. These letters may offer one more opportunity to meet with staff to arrive at a mutually agreed upon compliance schedule.

In some cases, district staff may meet with community leaders or attend municipal meetings to discuss the benefits of agreeing to a course of action with a compliance schedule that allows them time to address their problems without further enforcement or penalties.

System operators and managers have many other opportunities to interact with district staff outside the capacity assessment arena. District staff attend, participate, and present at periodic regional operator meetings to discuss upcoming regulations and regional issues and to network with operators and managers. District staff also serve as instructors at operator training workshops, serve as subject matter experts (SME) for operator certification examinations, and present training at professional meetings. When a system begins to develop a project plan to apply for a DWRFF loan, district staff consult with the system and work with its consulting engineer to ensure the project plan addresses system priorities.

As previously mentioned, oversight of NCWS is provided by 44 LHDs under contract with the ODWMA. The NCWS staff maintains communication with each of the 44 LHDs during the year. This communication occurs during the formal quarterly reviews and annual evaluations of each of the 44 LHD's work in achieving and maintaining water system compliance. Training of LHD staff is conducted extensively during these visits to inform, explain, and discuss new and updated program issues and procedures. The NCWS staff periodically updates a handbook for LHDs and distributes it to LHD staff. This handbook includes policies, procedures, guidance, templates, and forms to implement the drinking water program. The NCWS staff also presents topics at groundwater, other environmental health conferences, and training webinars.

4.3 *Financial Assessments*

Both new and existing systems have opportunities to achieve and maintain financial capacity. Financial capacity assessments are not required of existing systems unless serious deficiencies in technical or managerial capacity exist. However, voluntary participation in financial assessments has been increasing.

4.3.1 New Systems

New systems must demonstrate financial capacity before serving water to the public. In the NCWS Program, the system may receive help from the LHD during the permit application process to develop a financial plan. They must submit a financial plan, including a budget, to the LHD in order to receive approval to commence operation. In the CWS Program, systems submit their financial plan and supporting documents to the MDEQ for review and approval during the construction permit stage. Systems may complete their financial plan during the construction phase of the water system, but must receive approval prior to the final inspection to commence operation of the water system.

4.3.2 Existing Systems

To help existing CWS improve financial capacity, the ODWMA conducted financial assessments of systems that serve a population of less than 10,000 that could benefit from and agreed to an assessment. An analyst in the ODWMA revolving loan program assesses the selected communities' existing financial health and develops Financial Action Plans (FAP). The assessment is a review of financial documents and an on-site meeting with system representatives. An FAP is a tailor-made comprehensive plan to strengthen the system's financial situation based on the assessment. Short- and long-range goals are identified in the FAP followed by a step-by-step process to reach the goals. Useful tools to help complete the steps are included with the FAP, such as a sample water use and rate ordinance and a service agreement checklist. The assessment is not designed to provide funding; however, financing options are discussed at the on-site meeting. Further information on obtaining funding is provided with the FAP, such as forms to help apply to the DWRF. The system is expected to carry out the FAP, and the ODWMA is available to assist when requested. The FAP is intended to also be a guide for district staff. An outline of a typical assessment report is included in the Appendix. From FY 2011 to FY 2013, 7 CWS underwent financial assessments.

Another tool to help systems with financial and managerial capacity through asset management is the *Check Up Program for Small Systems*. This no-cost software program released by the USEPA can help small systems to develop an asset management plan.

4.4 Source Protection

Systems are continuing to take steps to protect their drinking water sources. The SDWA established and funded source water assessment activities, including Wellhead Protection Programs (WHPP) and Surface Water Intake Protection Programs (SWIPP) through the DWRF. The SDWA did not provide funding specifically for implementation of SWIPPs for surface water sources. Authority has been obtained to provide grants for communities to protect their surface water intake areas through the DWRF capacity development set aside funds, which is later described in Section 4.4.2.

4.4.1 Source Water Assessments to Protection

The SDWA required that all of Michigan's 18,000 CWS and NCWS drinking water sources be assessed in 2003. Potential sources of contamination were inventoried, and susceptibility to contamination was determined by the combined efforts of the ODWMA and local, state, and national agencies. A project to update the CWS assessments began in 2012 and are planned to be completed within the next three years as district staff conduct their sanitary surveys. The NCWS and LHD staff, which oversee these systems, have been provided a self-assessment form to identify risks to their source water and identify actions they can take to reduce those risks.

4.4.2 SWPP

A Wellhead Protection Program (WHPP) is a SWPP for water systems that rely upon water wells and it assists communities in protecting their groundwater sources. A goal of a WHPP is to minimize the potential for contamination by identifying and protecting the area that contributes to water supply wells and avoids costly groundwater cleanups. Of the 438 municipal systems in Michigan using groundwater as their water supply, 353 are involved in some aspect of wellhead protection, such as performing a delineation, inventorying the potential sources of contamination, and planning for emergencies. Of those 353 systems, 242 have completed all

the steps and have an approved WHPP or have met the substantial implementation standard. As a result, 80 percent of the population that obtains drinking water from groundwater is in communities taking action to protect their sources. Municipalities are encouraged to apply for a WHPP grant using a 50 percent local and 50 percent state match to fund activities involved in protecting their wellheads and updating their approved programs.

The ODWMA, Field Operations Section (FOS), through a contract with Michigan State University's Department of Civil and Environmental Engineering, developed the Michigan Groundwater Management Tool (MGMT), formally known as Michigan Interactive Groundwater for Wellhead Protection. The MGMT can scientifically map wellhead protection areas for public water supply wells using information from existing statewide databases such as Wellogic, Map Image Viewer, and the Groundwater Inventory Mapping project. The Wellhead Protection Area (WHPA) is the surface and subsurface area contributing groundwater to the well. Michigan's WHPP defines the WHPA with a 10-year time-of-travel. This provides a reasonable length of time to respond to environmental problems within the WHPA while providing an area that can be reasonably managed. The MGMT has developed comparably accurate predictions of spatially-detailed and representative groundwater flow patterns and WHPAs. Most of these MGMT delineations closely parallel traditionally developed WHPA's, which cost an average \$36,000.

The ODWMA, FOS, is in the process of redefining "Substantial Implementation," allowing smaller systems to obtain this source water protection status, while increasing Michigan's population that is protected by these implemented activities. Nonmunicipal water systems can obtain substantial implementation by using a self-assessment to identify specific risks to their drinking water sources. Once risks have been identified, corrective actions can be put in place to reduce risk of contamination. This allows these systems to obtain substantial implementation since they have limited control of their WHPA as compared to municipal systems that may have local control by land use planning and ordinances. A total of 893 CWS and 895 NTNCWS systems had provisional delineations completed by the MGMT.

The SWIPP is the surface water counterpart to the WHPP. Under this program, communities develop partnerships with surrounding communities to identify and take action to protect the area around the intake and the watershed that impacts it. To date, seven communities have completed a SWIPP. A SWIPP grant program will begin in FY 2015, which may stimulate activities for municipalities that utilize surface water as their source for drinking water.

To further protect surface water intakes, the ODWMA worked with federal and local governmental agencies to install a continuous, real-time water quality monitoring network in the St. Clair River, Lake St. Clair, and Detroit River. Thirteen drinking water treatment facilities are equipped with a range of analytical devices. In addition, the city of Monroe has installed a probe for blue-green algae recently due to their vulnerability of microcystin produced by blue-green algae. The monitoring system includes data transmission, data visualization, automated notification/alarm service, and data archiving. In addition, rapid toxicity test equipment is being used to monitor water distribution systems in Southeast Michigan served by some of these surface water intakes. Nearly instantaneous communication is key to protecting surface water intakes because of the rapid rate of flow and corresponding changes in water quality compared to groundwater rates. Funding for this monitoring network helped purchase the equipment; however, local communities must pay to continue operation and maintenance of this equipment.

4.5 *Operator Training and Certification*

Due to amendments to Act 399, a properly certified operator must be available at all CWS, all NTNCWS, and certain TNCWS. These operators maintain their certification by meeting continuing education requirements through training offered in a variety of venues.

4.5.1 Operator Training and Certification Program (OTCP)

The ODWMA, OTCP, provides over 30 training courses each year. The OTCP certifies over 200 organizations and training providers that offer other opportunities for continuing education, including online courses. Operators certified in distribution systems must provide oversight at over 1,400 CWS and approximately 1,500 NTNCWS. Operators certified in treatment systems must provide oversight at CWS and NCWS that employ treatment.

A CWS that occasionally finds itself without a certified operator is usually due to unanticipated operator turnover, retirements, and the like. District staff work with each of these water systems to pursue an interim certified operator while also pursuing a permanent replacement. There is continual turnover of certified operators in NCWS, and the effort to retain certified operators at these small systems is an ongoing process.

Major OTCP activities during FY 2011 to FY 2013 include:

- Training opportunities available for small community and nontransient, noncommunity operators to meet renewal requirements for their certifications.
- Streamlined the operator certification renewal process.
- Offered webinars for continued education credits.
- Utilized subject matter experts (SME) to validate new questions for licensing examinations. The SME include water system operators holding licenses of the highest level in their category.
- Full implementation and promotion of a Web-based application allowing certified operators to view pertinent information regarding their certifications such as certificate renewal status, the list of courses completed, and other information.
- Provide a Web-based listing of all courses approved by the Advisory Board of Examiners (ABE) to assist drinking water personnel in accessing available training in order to maintain certification.
- Maintaining an Intranet Web-based program allowing ODWMA technical staff access to readily confirm a certified operator's status.
- Web-based search capabilities to manage and track certification and continuing education status of all staff associated with a specific water system.
- Development of all exams using Scantron scored questions, validated by SMEs.
- Promotion of the Level 5 Guide Book geared towards operators of NTNCWS.

- Implementation of rule changes to include technical and managerial training categories for continuing education requirements upon renewal.

4.5.2 Small System Training

For the past several years, ODWMA staff has conducted training specifically for small CWS and awarded continuing education credits to operators who participated. Many attendees are operators employed by more than one system or may also work at NTNCWS, so this targeted training is improving the operation and maintenance of many more systems than the number of operators attending. General topics covered new regulatory requirements, monitoring and reporting, communicating with the public, construction permit preparation, and operational issues. Special topics change each year and have included "Water Accounting – Audits and Leak Detections" and "Cleaning Small Diameter Water Mains," wellhead abandonment, and source water protection. In 2011 and 2012, 148 and 132 individuals, respectively, attended at 1 of 5 sites. In May 2013, 165 individuals attended this training.

Other small system training starts with "train-the-trainer" sessions conducted by the NCWS staff for LHD staff who then train NCWS operators. Topics range from current requirements and practices to discussions of new requirements and regulations.

Training of LHD staff is conducted to inform, explain, and discuss new and updated program issues and procedures. This training occurs in many ways, including formal educational events and during the program evaluation process. In FY 2013, 35 LHD staff and well drillers attended the Annual Groundwater and Wells Fundamental Course. This three-day class consisted of well construction standards, abandoned well plugging, drilling records submission, well driller responsibilities specific to PWS, and preparation for the well drillers exam. Other trainings included:

- Arsenic in Drinking Water – Small System Operator Training with 59 operators in two locations
- 2013 Michigan Environmental Health Association Annual Education Conference-Over 200 participants, some of whom are level 5 operators

Under contract with the ODWMA until December 31, 2013, LHDs provided continuing education for the level 5 operators. Staff conducted training for level 5 operators in several locations for the 2011-2013 time period where 711 operators attended to get information on how to better run their systems, including new regulations, new technologies, and other relevant information.

The NCWS staff has published a comprehensive study guide for individuals pursuing certification to operate an NCWS. It may also be useful for operators of other small CWS. Topics range from regulatory authority through source protection and system construction to monitoring and operation oversight. The guide is available on the Internet.

4.6 Security

The MDEQ, Water Security and Emergency Management Program, is responsive to the various federal programs and the needs of the public water systems. Planning, training, and coordinating are all a part of the effort to emphasize emergency management for all hazards; terrorism and malevolent acts as well as weather-related incidents and accidents.

The USEPA eliminated the Water Sector Security funding as of FY 2010. However, the USEPA Counterterrorism grant was extended until March 31, 2014.

Security tabletop exercises were completed as of March 31, 2014, in order to expend the remaining grant balance. Seventy-two table top exercises (TTXs) were conducted with an average evaluation of 4.5 out of 5, strongly agreeing that the TTX was beneficial. District staff will continue to be involved in safety and security enhancements through the construction permit process and the operation of new systems as well as during inspections.

4.7 Enforcement

Evaluations and compliance information becomes the basis for enforcement. When systems fail to return to compliance, escalated enforcement, including ACOs and MDEQ orders, can be initiated.

Before escalated enforcement is used, many systems are encouraged to return to compliance before they are assessed fines for violations. Michigan's administrative fines policy for monitoring and reporting violations helps enforce timely submittals of monthly operation reports (MOR) for systems that employ treatment and timely submittals of the Consumer Confidence Report (CCR), water systems have been reporting MORs and CCRs on time with few exceptions. Since administrative fines were initiated. No fines have been sought in recent years due to disinvestment in this enforcement action due to resource limitations.

When a fine is not applicable or does not prevent further violations, the ODWMA moves to a Notice of Violation and Administrative Consent Order (ACO). District staff prefers technical assistance over enforcement to return systems to compliance or to prepare them to meet upcoming requirements, especially when options are particularly expensive or when acceptable alternatives are not readily available. As a result, only 16 drinking water cases needed further enforcement action from FY 2011 through FY 2013. Of these, 13 were handled in the district and resolved with compliance schedules.

A majority of these cases were referred for escalation based on system inadequacies such as lack of sufficient capacity, water treatment plant deficiencies, or violations of active consent orders. Meeting the revised arsenic standard continues to be particularly difficult for a few small water systems that do not treat their water and have raised insufficient funds to install treatment to remove arsenic. A few of these cases have been referred to enforcement for failure to meet the deadlines and terms of the ACO. Many of the NTNCWS, that have not implemented a permanent solution, continue serving bottled water to remove the public health threat under an agreement with the ODWMA.

Privately-owned new CWS are subject to additional requirements to ensure they are able to provide an adequate supply of drinking water. Proposed systems must stipulate to certain conditions such as: obtain a local government's refusal to accept ownership of the system; establish an escrow account available to the ODWMA for immediate repair or maintenance of the system; provide contact information of operation personnel; and agree to seek MDEQ approval before transferring ownership. The stipulation ensures private owners understand their responsibilities prior to establishing the water system. The ODWMA has increased the minimum required escrow amount to \$10,000.00, while also eliminating the requirement for new water system owners to enter into an ACO with the MDEQ.

4.8 *Electronic Reporting*

The ODWMA is working to develop electronic reporting systems to provide more convenience to water systems and more accurate and complete assessment of capacity. The successful implementation of the Internet-based reporting system for discharge monitoring reports prompted Michigan to expand the project to include electronic Drinking Water Reporting (eDWR.) When operational, the eDWR System will provide for online submittal of drinking water laboratory results and treatment plant operational data. The collection of data will allow the ODWMA to query certain parameters to assess capacity on a systemwide and statewide basis. Unfortunately, project implementation has been delayed due to lack of adequate staffing in both the Michigan Department of Technology, Management, and Budget and the PWSS Program.

4.9 *Summary*

Every three years the ODWMA must report to the Governor on the effectiveness of the CDP. This program is effective as evidenced by the high rates of compliance with drinking water standards and with monitoring and reporting requirements. An even more critical measure of the effectiveness of Michigan's CDP is the absence of any major waterborne disease outbreaks like those that have occurred in neighboring states and provinces.

Public water systems use a multibarrier approach to provide safe water. This approach begins with securing a safe source and continues with constructing quality infrastructure using a sound basis of design. This multibarrier approach is maintained by qualified personnel properly operating the system and routinely monitoring to confirm that the multibarriers are indeed functioning and the integrity of the water system is maintained on a continuous basis.

District staff periodically assesses the capacity of water systems through sanitary surveys and serves as a primary resource as systems address capacity issues. Programs available to systems include the DWRF, SWPP, operator training, financial assessments, and technical assistance provider services.

New regulations will continue to challenge water systems. Continuing endeavors to maintain TMF capacity will help to meet the challenges of these new regulations.

This report is available to the public, on request, or on the MDEQ Web site at <http://www.michigan.gov/deqwater>. Click on Drinking Water, Community Water Supply, and then Capacity Development Reports.

Appendix: Outline of a Typical Financial Assessment and Financial Action Plan (FAP)

Financial Assessment

Introduction: Population, location, transportation routes, and community characteristics; description of the water system and major projects or concerns such as expansion, securing loans, and meeting new drinking water standards; and major financial shortfall such as the need for a rate methodology.

Requested Information: Budget, last two years of audited records, water use and water rate ordinances, latest rate ordinance or resolution, recent rate or feasibility study, and contract or service agreements with outside customers.

Submitted Information: Supply usually does not provide all the information requested.

Analysis: Summary or highlights of each of the documents provided by the supply.

On-site Meeting: Date and attendees; and list of items discussed, such as the financial concerns, the billing method, and major recent projects.

FAP

Goal One: Develop the financial capability to fund present and future needs.

Task 1: Develop a capital improvement projects plan.

- Step 1: List anticipated water projects.
- Step 2: Estimate the cost of each project to be funded.
- Step 3: Project the anticipated date the project is to begin.
- Step 4: Calculate the dollar amount necessary to be set aside annually.
- Step 5: Establish a line item in the budget for capital improvement expenditures.

Task 2: Develop and implement a rate setting methodology.

- Step 1: Identify water system expenses.
- Step 2: Identify replacement expenses and fund the replacement account.

Goal Two: Establish the legal and managerial capability to protect the water system.

Task 1: Develop a penalties section in the water ordinance.

Task 2: Adopt the amendment to the ordinance.

Tools Included With FAP

Sample resolution, sample water use and rate ordinance, service agreement checklist, DWRf informational brochure, DWRf project plan preparation guide, securing a DWRf loan fact sheet, and a fixed variable allocation spreadsheet to prepare the budget and determine water rates.